SAINT LOUIS UNIVERSITY.

Program-Level Assessment: Annual Report

Program Name (no acronyms): Aeronautics – Aviation Management	Department: Oliver L. Parks Department of Aviation Science
Degree or Certificate Level: B.S.	College/School: School of Science and Engineering
Date (Month/Year): June 2023	Assessment Contact: Stephen Magoc

In what year was the data upon which this report is based collected? Fall 2022 and Spring 2023

In what year was the program's assessment plan most recently reviewed/updated? June 2022

Is this program accredited by an external program/disciplinary/specialized accrediting organization? Aviation Accreditation Board International (AABI)

1. Student Learning Outcomes

Which of the program's student learning outcomes were assessed in this annual assessment cycle? (Please list the full, complete learning outcome statements and not just numbers, e.g., Outcomes 1 and 2.)

Student Learning Outcome 2 - Describe historical trends, current issues, and emerging opportunities in aviation.

2. Assessment Methods: Artifacts of Student Learning

Which artifacts of student learning were used to determine if students achieved the outcome(s)? Please describe the artifacts in detail and identify the course(s) in which they were collected. Clarify if any such courses were offered a) online, b) at the Madrid campus, or c) at any other off-campus location.

The artifacts of student learning used included the final exams, final presentations, and airline simulation presentation of the following courses.

- ASCI 1010 Professional Orientation
- ASCI 1510 The Air Transportation System
- ASCI 2250 Aviation and Airport Security
- ASCI 3100 Air Carrier Operations
- ASCI 4900 Senior Seminar

The ASCI 1510 The Air Transportation System and the ASCI 3100 Air Carrier Operations courses were taught online.

3. Assessment Methods: Evaluation Process

What process was used to evaluate the artifacts of student learning, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and **include them in/with this report document** (please do not just refer to the assessment plan).

The faculty of the Department of Aviation Science met to assess the student learning outcome. Performance indicator rubrics prepared by the faculty were used to determine if student and graduates were able to meet the requirements of the student learning outcome being assessed. The rubric used to determine if students and graduates met the student learning outcome, and the course performance indicator rubrics used in this assessment are found in Appendix A of this assessment report.

4. Data/Results

What were the results of the assessment of the learning outcome(s)? Please be specific. Does achievement differ by teaching modality (e.g., online vs. face-to-face) or on-ground location (e.g., STL campus, Madrid campus, other off-campus site)?

The result of the assessment of the student learning outcome is that students and graduates do meet the student learning outcome requirements.

5. Findings: Interpretations & Conclusions

What have you learned from these results? What does the data tell you?

The data tells the faculty of the department that its students and graduates currently have the ability to describe historical trends, current issues, and emerging opportunities in aviation.

6. Closing the Loop: Dissemination and Use of Current Assessment Findings

A. When and how did your program faculty share and discuss these results and findings from this cycle of assessment?

All faculty in the department met on 05/24/2023 to assess the student learning outcome, therefore all faculty are aware of the results and findings of this assessment cycle.

B. How specifically have you decided to use these findings to improve teaching and learning in your program? For example, perhaps you've initiated one or more of the following:

Changes to the Curriculum or Pedagogies	• Course content • Teaching techniques • Improvements in technology • Prerequisites	• Course sequence • New courses • Deletion of courses • Changes in frequency or scheduling of course offerings
Changes to the Assessment Plan	• Student learning outcomes • Artifacts of student learning • Evaluation process	• Evaluation tools (e.g., rubrics) • Data collection methods • Frequency of data collection

Please describe the actions you are taking as a result of these findings.

The faculty agreed to take certain actions/make changes to course content so as to better enable students to perform at higher level when working to achievement of the requirements of the student learning outcome. These changes are as follows:

Course	Action Item
ASCI 1850 Safety Management Systems	Develop a rubric for grading course assignments.
ASCI 4035 Team Resource Management	In addition to group assignments, will require individual assignments.

ASCI 4050 Human Factors	As a means of continuous improvement, will require all assignments to be mandatory and assign a more rigorous grading scheme.
ASCI 4800 International Aviation	As part of the group presentation assignment, will require each student to submit a written summary of their contribution to the group presentation.

If no changes are being made, please explain why.

7. Closing the Loop: Review of Previous Assessment Findings and Changes

A. What is at least one change your program has implemented in recent years as a result of assessment data?

In the 4050 Human Factors course, more specific measures for all performance indicators were to be implemented.

In the ASCI 4650 Economics of Air Transportation course, reduce the final grade weight of the management audit oral and written presentation from 30 percent to a lower value as this activity was the most-heavily weighted in the syllabus, consider a new textbook, and allow the students to form their own groups for the airline simulation.

B. How has this change/have these changes been assessed?

ASCI 4050 Human Factors – the course instructor created specific assignments for professional and ethical components of human factors, problem identification and problem solving in high consequence environments, and individual differences/diversity in multi-disciplinary teams.

ASCI 4650 Economics of Air Transportation – the course instructor reported the changes implemented and reported the results of the changes to the department for assessment.

C. What were the findings of the assessment?

ASCI 4050 Human Factors – the instructor reported the following:

- Individual student performance was assessed in a more detailed manner.
- Student performance increased with an average score on all three assignments exceeding 90%.

ASCI 4650 Economics of Air Transportation – the instructor reported the following:

- The weighted grade for the management audit report was reduced to 20 percent of the total final course grade. This was a much better balance with other assessments within the course. A peer team member evaluation instrument was added as 10 percent of the final grade.
- The instructor evaluated three possible textbooks and considered each of them to be at the freshman/sophomore level. The textbook choice was not changed.
- Instead of allowing students to determine the members of their airline management team, the instructor utilized a random drawing for the determination of team members.

D. How do you plan to (continue to) use this information moving forward?

The department will implement the changes to the courses and assess the effect(s) of the changes on the student learning outcome.

IMPORTANT: Please submit any assessment tools (e.g., artifact prompts, rubrics) with this report as separate attachments or copied and pasted into this Word document. Please do not just refer to the assessment plan; the report should serve as a stand-alone document.

Assessment of B.S. in Aeronautics – Aviation Management Student Learning Outcomes

Student Learning Outcome #2: Describe historical trends, current issues, and emerging opportunities in aviation.

Date of this assessment: May 24, 2023

The following assessment is based on coursework of students and surveys of graduates.

Performance Indicator Assessed	Do not Meet	Meet
Students and graduates engage in and recognize the need for life-long learning.		**X**
Students and graduates are capable of assessing contemporary issues.		**X**
Students and graduates are capable of using the techniques, skills, and modern technology necessary for professional practice.		**X**
Students and graduates are capable of using the techniques, skills, and modern technology necessary for professional practice.		**X**
Students and graduates are capable of applying pertinent knowledge in identifying and solving problems.		**X**
Students and graduates are capable of applying knowledge of business sustainability to aviation issues.		**X**

List any prior change(s) made to the curriculum to aid graduates in meeting this student learning outcome:

- In the ASCI 4050 Human Factors course, develop specific measures to use to determine if the course performance indicators are being met.
- In the ASCI 4650 Economics of Air Transportation course, reduce the final grade weight of the management audit oral and written presentation from 30 percent to a lower value as this activity was the most-heavily weighted in the syllabus, consider a new textbook and allow the students to form their own groups for the airline simulation.

Describe the effect of any change(s) made to the curriculum:

- ASCI 4050 Human Factors – the instructor reported the following:
  - Individual student performance was assessed in a more detailed manner.
  - Student performance increased with an average score on all three assignments exceeding 90%.

- ASCI 4650 Economics of Air Transportation – the instructor reported the following:
  - The weighted grade for the management audit report was reduced to 20 percent of the total final course grade. This was a much better balance with other assessments within the course. A peer team member evaluation instrument was added as 10 percent of the final grade.
  - The instructor evaluated three possible textbooks and considered each of them to be at the freshman/sophomore level. The textbook choice was not changed.
  - Instead of allowing students to determine the members of their airline management team, the instructor utilized a random drawing for the determination of team members.

List recommendation(s) for changes to be made to the curriculum as a result of this assessment:

- The department made the change to put the ASCI 1010 Professional Orientation course back into the curriculum as it sees the need to introduce course topics back into the curriculum.

Department of Aviation Science

B.S. in Aeronautics Concentration – Aviation Management

Program Assessment

Continuous Improvement Items

05-24-2023

Course	Student Learning Outcome	Action Item
ASCI 1850 Safety Management Systems	SLO #2	Develop a rubric for grading course assignments.
ASCI 4035 Team Resource Management	SLO #2	In addition to group assignments, will require individual assignments.
ASCI 4050 Human Factors	SLO #2	As a means of continuous improvement, will require all assignments to be mandatory and assign a more rigorous grading scheme.
ASCI 4800 International Aviation	SLO #2	As part of the group presentation assignment, will require each student to submit a written summary of their contribution to the group presentation.

Assessment of AABI Section 3.1 – 3.9 Baccalaureate Degree Requirements Date of this Assessment: May 30, 2023					
AABI Goals	**Performance Indicator Assessed**	**Meets**	**Does Not Meet**	**Previous Recommendation(s)/Results**	**Current Recommendation(s)**
Students	Students can assess decisions and can make ethical and professional decisions.	X		None.	None.
	Admission requirements for the aviation programs are adequate to meet the requirements of the concentration.	X		None.	None.
Program Mission and Educational Goals	Students demonstrate knowledge of aviation business practices and principles and their application to the aviation industry.	X		None.	None.
	Students understand and appreciate the financial and economic aspects of the aviation industry.	X		None.	None.
	Students have knowledge of the business structure, management and administrative aspects of airlines,	X		None.	None.

	corporate flight operations and airport operations.				
Student Learning Outcomes	Students are adequately prepared for a career in the student's chosen profession.	X		None.	None.
Curriculum	The curriculum prepares the students to conduct aviation operations in a safe and efficient manner.	X			None.
Faculty	Enough qualified faculty and staff with industry credentials and/or an active research agenda are utilized and retained in the program (where applicable.)	X		Recommendation: Advise Saint Louis University administration of the need to hire a minimum of two additional faculty to better meet the needs of the department. Result: Saint Louis University administration determined not to hire additional faculty at this time.	Advise Saint Louis University administration of the need to hire a minimum of four additional faculty to better meet the needs of the department.
Facilities, Equipment, and Services	The department facilities remain adequate for the aviation department's academic training activities.	X		None.	None.
	Saint Louis University will continue to support the aviation department to operate the aviation		X	Recommendation: Advise Saint Louis University administration of the need to replace aging aircraft and simulators on a set schedule.	Advise Saint Louis University administration of the need to replace aging aircraft and simulators on a set schedule.

	academic and flight training activities.			Result: Saint Louis University administration determined not to replace aging aircraft at this time.	
Aviation Safety Culture and Program	Students, staff, and faculty are aware of the PEDALS reporting system and can use it to report safety issues.	X		None.	None.
	Students, staff, and faculty attend the Safety Standdown sessions held each semester.	X		Stress the importance of attendance at the Safety Standdown sessions to students, staff, and faculty.	Continue to stress the importance of attendance at the Safety Standdown sessions to students, staff, and faculty.
Relations with Industry	The department's Industry Advisory Board is utilized in providing guidance to the department.	X		Recommendation: The Industry Advisory Board recommended revising the program curriculum to include additional business and management courses in place of the Approved Emphasis Area electives found in the current concentration's curriculum. Result: The department revised the concentration's curriculum and approvals were obtained to begin the revised curriculum in the fall 2022 semester.	Begin assessment of the business and management content in the revised curriculum of the concentration.

In the overall assessment of Student Learning Outcome 1, is this Student Learning Outcome Met? Yes **X** No

Date of this assessment: 05-30-2023

AABI 3.10 Criteria: Students

(Aviation Management Concentration)

Dates of this assessment:

- January 2023 and May 2023.

Do the students of the Aviation Management concentration meet the Students criteria as listed in the Comprehensive Assessment Plan?

- Yes. The evidence collected and assessed shows that the students meet SLO 2 and the Students' goals.
- See the data collected and assessed in Appendix A of this document.
- It is important to note that standardized test scores were not required by the Office of Admission during the assessment period.

Closing the Loop:

Were any changes recommended at the last assessment of the Students criteria.

- Yes, changes were recommended as a result of the 2021-2022 assessment.

State the purpose of the recommended change and whether the change met its intended purpose.

- ASCI 4050 Human Factors – the instructor reported the following:
    - Individual student performance was assessed in a more detailed manner.
    - Student performance increased with an average score on all three assignments exceeding 90%.
- ASCI 4650 Economics of Air Transportation
    - To better grade the course, the weighted grade for the management audit report was reduced to 20 percent of the total final course grade. This was a much better balance with other assessments within the course. A peer team member evaluation instrument was added as 10 percent of the final grade. The change met its intended purpose.
    - To allow for a better course flow, the instructor evaluated three possible textbooks and considered each of them to be at the freshman/sophomore level. The textbook choice was not changed, therefore there is no change to the course.
    - To increase group presentation performance. instead of allowing students to determine the members of their airline management team, the instructor utilized a random drawing for the determination of team members. There was no appreciable change in the group performance.

As a result of today's assessment of the Students criteria, are any changes recommended at

this time? List any recommended change(s) to be assessed at the next assessment of the Students criteria.

The following recommendations are being made at this time:

- ASCI 1850 Safety Management Systems - develop a rubric for grading course assignments.
- ASCI 4035 Team Resource Management – in addition to group assignments, will require individual assignments.
- ASCI 4050 Human Factors – as a means of continuous improvement, will require all assignments to be mandatory and assign a more rigorous grading scheme.
- ASCI 4800 International Aviation – as part of the group presentation assignment, will require each student to submit a written summary of their contribution to the group presentation.

AABI 3.10 Criteria: Program Mission and Educational Goals

(Aviation Management Concentration)

Dates of this assessment:

- January 2023 and May 2023

Do the Program Mission and Educational Goals of the Aviation Management and concentration meet the Program Mission and Educational Goals criteria as listed in the Comprehensive Assessment Plan?

- Yes. The evidence collected and assessed shows that the students meet SLO 2 and the Program Mission and Educational goals.
- See the data collected and assessed in Appendix A of this document.

Closing the Loop:

Were any changes recommended at the last assessment of the Program Mission and Educational Goals criteria as listed in the Comprehensive Assessment Plan?

- There were no recommendations made as a result of the June 2022 assessment.

If yes, state the purpose of the recommended change and whether the change met its intended purpose.

- N/A

As a result of the assessment of the Program Mission and Educational Goals criteria, are any changes recommended at this time? List any recommended change(s) to be assessed at the next assessment of the Program Mission and Educational Goals criteria.

- There are no recommendations being made at this time.

AABI 3.10 Criteria: Student Learning Outcomes

(Aviation Management Concentration)

Dates of this assessment:

- January 2023 and May 2023

Do the Student Learning Outcomes of the Aviation Management concentration meet the Student Learning Outcomes criteria as listed in the Comprehensive Assessment Plan?

- Yes. The evidence collected and assessed shows that the students meet SLO 2 and the Student Learning Outcomes goals.
- See the data collected and assessed in Appendix A of this document.

Closing the Loop:

Were any changes recommended at the last assessment of the Student Learning Outcomes criteria?

- No changes were recommended for the 2021-2022 assessment.

State the purpose of the recommended change and whether the change met its intended purpose.

- N/A

As a result of today's assessment of the Student Learning Outcomes criteria, are any changes recommended at this time? List any recommended change(s) to be assessed at the next assessment of the Student Learning Outcomes criteria.

- There are no recommendations being made at this time.

AABI 3.10 Criteria: Curriculum

(Aviation Management Concentration)

Dates of this assessment:

- January 2023 and May 2023.

Does the Curriculum of the Aviation Management concentration meet the Curriculum criteria as listed in the Comprehensive Plan?

- Yes. The evidence collected and assessed show that the students meet SLO 1 and the Curriculum goals.
- See the data collected and assessed in Appendix A of this document.

Closing the Loop:

Were any changes recommended at the last assessment of the Curriculum criteria?

- Yes, the department used input from its Industry Advisory Board and modified the Aviation Management curriculum.
- Yes, the department modified the curriculum to meet the University Core Curriculum requirement.

State the purpose of the recommended change and whether the change met its intended purpose.

- The department revised the curriculum to add more business and management coursework that became effective with the fall 2022 semester. It is too early to determine if the revision meets its intended purpose.
- The department is required to modify the Aviation Management curriculum to include the University required Common Core. This modification became effective with the fall 2022 semester. It is too early to determine if the revision meets its intended purpose.

As a result of today's assessment of the Curriculum criteria, are any changes recommended at this time? List any recommended change(s) to be assessed at the next assessment of the Curriculum criteria.

- The department made the change to put the ASCI 1010 Professional Orientation course back into the curriculum as it sees the need to introduce course topics back into the curriculum.

AABI 3.10 Criteria: Faculty and Staff

(Aviation Management Concentration)

Date of this assessment:

- January 2022 and May 2022.

Do the Faculty and Staff of the Aviation Management concentration meet the Faculty and Staff criteria as listed in the Comprehensive Assessment Plan?

- Yes. The evidence collected and assessed shows that the students meet SLO 1 and the Program Mission and Educational goals.
- See the data collected and assessed in Appendix A of this document.

Closing the Loop:

Were any changes recommended at the last assessment of the Faculty and Staff criteria?

- The department propose to the Dean and Provost that the department requires an additional four faculty.

State the purpose of the recommended change and whether the change met its intended purpose.

- The department needs additional faculty to accommodate the increase in both undergraduate and graduate programs and to strengthen its research agenda. No additional hiring of faculty is being considered by SLU administrators as part of the proposal.
- The department was approved to hire a non-tenure track faculty by being awarded one of the faculty positions to be hired as part of the Taylor Geospatial Institute Hiring Initiative

As a result of today's assessment of the Faculty and Staff criteria, are any changes recommended at this time? List any recommended change(s) to be assessed at the next assessment of the Faculty and Staff criteria.

- The department recommends the hiring of at least two full-time tenured faculty members to teach the undergraduate and graduate student populations, and to help grow the research agenda of the department.

AABI 3.10 Criteria: Facilities, Equipment and Services

(Aviation Management Concentration)

Dates of this assessment:

- January 2023 and May 2023

Do the Facilities, Equipment and Services of the Aviation Management concentration meet the Facilities, Equipment and Services criteria as listed in the Comprehensive Assessment Plan?

- No. The evidence collected and assessed show that the Program Mission and Educational goals are not being met.
- Facilities, Equipment, and Services do not meet the goals listed in the Comprehensive Assessment Plan.

Facilities

- The McDonnell Douglas Hall facility remains adequate for the current level of staff and faculty.
- The Center for Aviation Science facility continues to leak in different areas when it rains and needs continual roof repairs. This facility is due for the resumption of the phased renovations in the 3rd or 4th quarter of 2023.

Equipment

- Equipment used in McDonnell Douglas Hall is generally in adequate condition except for the CRJ 700 flight simulator used by the department. The CRJ 700 flight simulator is due for replacement during the summer 2023. The replacement unit will be a Boeing 737 MAX AATD manufactured by Flightdeck Solutions (FDS).
- Equipment at the Center for Aviation Science is becoming aged. The aircraft continue to be maintained in an airworthy condition, but it is becoming increasingly expensive to maintain them in such a condition. The Diamond DA20 aircraft were manufactured in 2008 and the Piper Seminole aircraft were manufactured in 2001 and overdue for replacement, based on the department's seven-year replacement cycle.
- The 2018 aircraft simulators are operating adequately and are within the seven-year replacement cycle.
- The 1996 ground support truck used by the department needs replacement and is becoming increasingly difficult to use in support of snow removal from the hangar ramp areas.
- The forklift vehicle used by the department needs replacement or overhaul.
- The aircraft oil storage shed is in an unusable, unsafe condition and requires replacement.

Services

- The services at McDonnell Douglas Hall are adequate.
- The services at the Center for Aviation Science are barely adequate as the facility continues to deteriorate, the roof leaks, several doors require replacement, the HVAC in the simulator room requires adjusting, there is a lack of SLU branding on the exterior and in the interior of the facility, Site 41 aircraft ramp drainage pipe is clogged and does not

sufficiently drain, causing a large, long-standing pool of water on the ramp (large area of ice in the winter), etc.

Closing the Loop:

Were any changes recommended at the last assessment of the Facilities, Equipment and Services criteria?

- Yes, the replacement of the Diamond DA20 and Piper Seminoles was recommended by the department.
- Yes, the CRJ 700 Advanced Aircraft Training Device (AATD) was recommended to be replaced. Saint Louis University administration approved the replacement of the CRJ 700 AATD with a Boeing 737 MAX AATD, with delivery to occur during the summer of 2023.

State the purpose of the recommended change and whether the change met its intended purpose.

- The purpose of the recommended changes was to modernize the flight training aircraft and was not implemented by the University.
- Replacing the CRJ 700 simulator is necessary due to no support from the manufacturer (no longer in business) and increased delays in student training caused by software and hardware issues. The CRJ 700 is being replaced in the summer of 2023 with a Boeing 737 MAX unit manufactured by Flightdeck Solutions.
- Replacement of the ground support truck was not approved by the University.

As a result of today's assessment of the Facilities, Equipment and Services criteria, are any changes recommended at this time? List any recommended change(s) to be assessed at the next assessment of the Facilities, Equipment and Services criteria.

The department recommends replacement/repair of the following items of equipment:

- The nine Diamond DA20 aircraft with 10-12 Piper Pilot 100i aircraft.
- The two Piper Seminoles with two or three new Piper Seminoles.
- The ground support vehicle which is being used by the Center for Aviation Science.
- Replacement/overhaul of the forklift which is being used by the Center for Aviation Science.
- Replacement of the oil storage shed which is being used by the Center for Aviation Science.
- Repairs of the hangar facility.
- Repair the Site 41 clogged drainage issue.

Further, the department recommends the hiring of a custodian who can be dedicated to a schedule which allows for daily cleaning/servicing at the Center for Aviation Science.

AABI 3.10 Criteria: Aviation Safety Culture and Program

(Aviation Management Concentration)

Dates of this assessment:

- January 2023 and May 2023

Does the Aviation Safety Culture and Program of the Aviation Management concentration meet the Aviation Safety Culture and Program criteria as listed in the Comprehensive Assessment Plan?

- Yes. The evidence collected and assessed show that the students meet SLO 1 and the Aviation Safety Culture and Program goals.
- See the data collected and assessed in Appendix A of this document.

Closing the Loop:

Were any changes recommended at the last assessment of the Aviation Safety Culture and Program criteria.

- Yes, the implementation of a safety survey to be sent to the University's aviation community.
- The Center for Aviation Science administrators were advised to begin developing safety goals for the flight operations.

State the purpose of the recommended change and whether the change met its intended purpose.

- The survey is used to determine how knowledgeable the aviation community is of the Aviation Safety Culture and Program utilized by the department. The change met its intended purpose.
- The flight operations are needed to become a participating partner in the safety culture of the department. The change met its intended purpose.

As a result of today's assessment of the Aviation Safety Culture and Program criteria, are any changes recommended at this time? List any recommended change(s) to be assessed at the next assessment of the Aviation Safety Culture and Program criteria.

- The department recommends exploring additional survey tools to use for assessing the Aviation Safety Culture and Program.

AABI 3.10 Criteria: Relations with Industry

(Aviation Management Concentration)

Dates of this assessment:

- January 2023 and May 2023

Do the Relations with Industry of the Aviation Management concentration meet the Relations with Industry criteria as listed in the Comprehensive Assessment Plan?

- Yes. The evidence collected and assessed show that the students meet SLO 1 and the Relations with Industry goals.
- See the data collected and assessed in Appendix A of this document.

Closing the Loop:

Were any changes recommended at the last assessment of the Relations with Industry criteria?

- There were no recommendations made at the last assessment.

State the purpose of the recommended change and whether the change met its intended purpose.

- N/A.

As a result of today's assessment of the Relations with Industry criteria, are any changes recommended at this time? List any recommended change(s) to be assessed at the next assessment of the Relations with Industry criteria.

- There are no recommendations being made at this time.

SAINT LOUIS UNIVERSITY

OLIVER L. PARKS DEPARTMENT
OF AVIATION SCIENCE

Appendix A

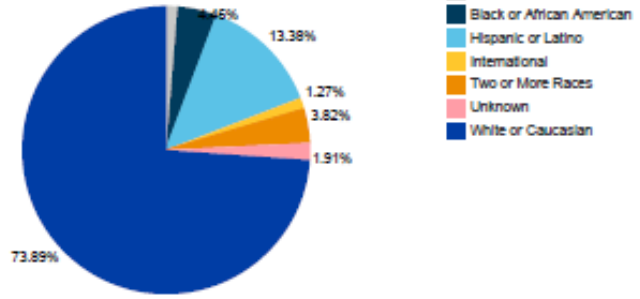
Data and Course Evidence Collected to Support the Assessment of the Program Goals and SLO 2 for the Aviation Management Concentration

June 2023

Appendix A Table of Contents

Aviation Management – Data collected in support of Students' Goals and SLO 2

Race/Ethnicity by All for Current Week



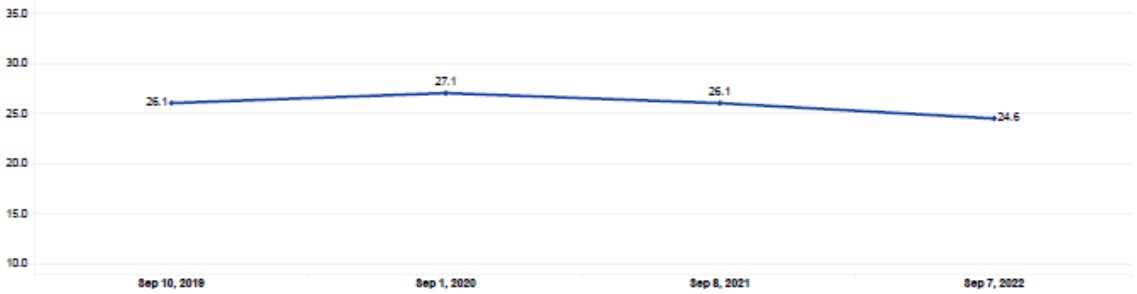
Gender by All for Current Week

	September 10, 2019		September 1, 2020		September 8, 2021		September 7, 2022	
ACT Groups	Female	Male	Female	Male	Female	Male	Female	Male
34 - 36						5.26%		
30 - 33		12.82%	42.86%	25.00%			20.00%	6.45%
27 - 29	50.00%	30.77%	14.29%	25.00%		13.16%		12.90%
24 - 26	50.00%	28.21%	28.57%	35.71%		2.63%	20.00%	9.68%
18 - 23		28.21%	14.29%	14.29%	33.33%	5.26%	40.00%	19.35%
12 - 17						2.63%		3.23%
Not Reported					66.67%	71.05%	20.00%	48.39%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Student Count
by Race/Ethnicity: All and by Gender: All

	Sep 10, 2019	Sep 1, 2020	Sep 8, 2021	Sep 7, 2022
Student Count (All)	45	35	41	36
Student Count w/Test Scores	45	35	12	20

ACT Scores (includes Concordant SAT)
Race/Ethnicity: All - Gender: All - Status: Registered - FTPT: All



Performance Indicator Rubric

Course: ASCI 1510 The Air Transportation System Course Instructor: Nancy Childrey, PhD

Semester Taught: Spring 2023 Number of Students in Course: 23

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	**Assessment Results: (Indicate what % of class achieved a minimum 70%)**	**Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")**
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	Discussion Post #14 Homework #4	Yes
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	Midterm Final	Yes

Course Assessment (Intended Use of Results)

The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

**Attach description of assignment used for assessment and samples of student work.*

Discussion Post 14: How are drones handled in airspace (for those outside of the US, please share with us how it's handled in your country)? And how do you think they should be handled?
How do you think airspace will be handled in 80 years when there are flying cars?

Example 1: Drones have become a problematic topic in the US within the past few years. Drones have become an affordable, fun, and creative way for people to film, and even have sporting events (drone racing). Problems come about when people start using them around the altitudes that are considered "low to the ground" for planes, around 0 to 1000ft or so. Drones are also hard to spot due to their small size. There are a couple of ways that the US handles drone operations,

- Categorization: Drones are categorized based on their weight, size, and intended use. Each category has specific regulations that must be followed, including where and how they can be flown.
- Registration: The FAA requires certain drones to be registered depending on their class.
- Restricted airspace: There are certain areas where drone flight is prohibited, such as airports, military bases, and other sensitive areas. These areas are marked as no-fly zones, and drone operators must ensure they do not fly in these areas.
- Communication: Drone operators must communicate with air traffic control (ATC) when flying in certain areas or under specific circumstances, such as when flying in controlled airspace or near airports.

I believe that AI will drastically improve the operations within airspace. I think that AI will help advise ATCs and help them make decisions that lead to efficiency and safety for everyone.

Example 2: The United Kingdom has a number of drone rules and regulations that must be followed. Laws there state that drones are not permitted to fly higher than 400 feet (120 meters), and the operator must maintain a line of sight with their drone at all times. Operators are also not allowed to operate their drones within a 5 km radius of an airport, and the drone must be a least 50 m away from any uninvolved persons at all times. If the drone weighs 250 grams or more, it must be operated at least 150 meters away from parks, industrial areas, residential zones, and other built-up locations.

Even if it's 80 years from now, I have my doubts about whether or not flying cars will be a thing then. I don't doubt that technology will eventually be able to get there, but it just seems like a regulatory and safety nightmare. The airspace would be insanely crowded and it doesn't seem like it'd be safe or practical, at least not with the ATC system we have in place now. Also, think about how many car crashes there are on the roads. If you crash in the air it's almost certainly going to be deadly. Not only would the flying car need to be a technical marvel itself, but so would future airspace management and regulations. I also think the qualifications for getting a "flying car driver's license" would be much more stringent than a normal driver's license.

Example 3

In Nigeria, drones are subject to specific regulations to ensure their safe and responsible use and are regulated by the Nigerian Civil Aviation Authority. The NCAA's Remotely Piloted Aircraft System (RPAS) Operator Certificate (ROC) is one major regulation that drone pilots must follow. Both commercial and non-commercial operations require the ROC, and operators must meet specific requirements, such as getting the proper insurance coverage, proving that they are familiar with drone operations, and following safety regulations. Restricted and prohibited areas, customs regulations, and other operational restrictions must also be followed.

I believe that in order to ensure safe, effective, and sustainable operations, the integration of flying cars into airspace in the future will likely call for an extensive plan involving regulatory frameworks, technological advancements, infrastructure development, training and licensing requirements, traffic control systems, safety and privacy measures, and environmental considerations.

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Homework #4: Discuss airport privatization: should St. Louis Lambert International Airport be privatized? If you cannot answer this question, what information do you need to make an informed decision? If privatization should not occur, what would need to happen so that it would work?

Example 1: In the United States the concept of airport privatization is remarkably foreign, although some airports have been privatized in the past the current list of US privatized airports is only one. Only two airports have even completed this process with one of them reverting back to privatization. I bring this up because it may be small sample size but before I could make any recommendation, I would want to do an in-depth look at how the currently privatized airport is functioning, and why the other airport reverted to a public state. Without those key details it will be hard to make an informed decision. As such I would have to say that the limited success of the APPP means that I could not recommend full privatization of Saint Louis Lambert International Airport.

That said even under the APPP there are more options for privatization than simply selling or leasing the entirety of the airport and its operations. One such example that I would recommend is “developer financing” which utilizes private investment and development on certain projects which can range from small to large. A good example of this would be Chicago O’Hare’s terminal 5. This method to me favorable because it allows for private investment which can mean renovation and updating for an airport. But this method also avoids what I would personally consider to be the greatest risk for privatization of airports. Aviation has long been considered one of the most dynamic economic forces, with great highs and even greater lows.

Privatization of airports puts at risk the loss of investors as the aviation environment changes for the worse. This is where Europe and the United States differ greatly. Europe is remarkably smaller than the United States and has also seen far greater success with privatization. While these two may seem disconnected I do not believe that they are, a failure of any one airport do to privatization, however temporary may mean that a flight from France to Germany must go through another city a few miles away and while that can greater affect the ATS of Europe it does not cripple the system, but with the United States far more spread out geography, the loss of a large investor in a private airport especially a major hub could set back air lines days and result in a cascade of problems. A public airport is given government subsidies to keep operations moving. These are not based off taxes in a local area or an investment firm or individual. Both of which can be volatile in nature.

While I fully believe that privatization of airports may be something I see within my lifetime and that systems may be put in place in order to ensure the security of airports (at least large ones) from failure; I do not see those securities being put in place in the current time. Until those assurances can be made, and the airports protected from the volatility of the economics of aviation, I do not believe St. Louis Lambert should be privatized fully. This does not stop the city of St. Louis from allowing partial privatization like they are doing already with management and service contracts. It also does not stop Lambert from taking the next step towards privatization which is developer financing and the DBFOM model.

Example 2: Airport privatization came into action in 1996 when Congress created the Airport Privatization Pilot Program. The Airport Privatization Pilot Program, which can be located in Section 149 of the Federal Aviation Reauthorization Act of 1996, increased “access to sources of private capital for airport development and to make airports more efficient, competitive, and financially viable” (Tang, 2017).

There has been a long debate within the city of St. Louis concerning the privatization of St. Louis International Airport. A bill produced by the Board of Aldermen President Lewis Reed proposed delegating the control of St. Louis Lambert International Airport to a private contractor within a fifty-year, $1.7 billion lease. St. Louis City has considered privatizing St. Louis Lambert International Airport, but in order to follow through with the action, the city must first ensure that the majority of the airlines are in agreement with privatization before beginning the process.

On top of gathering the popular vote from airlines, St. Louis City must also gain the popular vote from the city. I believe that St. Louis Lambert International Airport should not be privatized due to the high risk associated with the failure of the privatization process. If the privatization of St. Louis Lambert International Airport were to fail or the airport’s private operator decided to discontinue the privatization, taxpayers will be at stake. For example, Stewart International Airport in New York attempted, but failed privatization of the airport. Stewart International Airport’s private operator, National Express (NEG), discontinued the privatization, costing taxpayers $75 million to escape the privatization. St. Louis politicians and citizens against the privatization of St. Louis Lambert International Airport are concerned that as a city, we will find ourselves in a similar situation. Without privatization, St. Louis Lambert International Airport has been growing; Passenger traffic has been increasing, there has been an increase in flights, Southwest Airlines has become a significant hub at the airport, and bonds have been refinanced, saving the St. Louis City millions of dollars. A concern that myself and other St. Louis residents may have is that the process of privatization will bring a lack of transparency and decline the options for public opinion.

Midterm: The aviation industry went from an industry with demand to a saturated market in a matter of weeks due to COVID-19.

1. The importance of the air transportation system can be summed up in three ways. What are those ways, define and explain them, and use COVID-19 as an example of how the disease has impacted the air transportation system.
2. What are the roles of ICAO and IATA in the air transportation system? How have they helped guide the reaction to COVID-19 for consumers and the aviation industry?
3. What is TSA and what is their primary purpose? How has COVID-19 impacted security in the air transportation system?

Example 1: The air transportation system is arguably the most important global factor in achieving economic growth and global development. The air transportation system utilizes its three strengths – economic, social, and political factors – to promote global diversity and relations. Organizations within the aviation industry, such as the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA), collaborate to promote safe and effective operations within the air transportation system. Any significant global impact could hinder the safe and effective operations of the air transportation system, causing it to become saturated and less effective. In March 2020, the World Health Organization (WHO) officially classified COVID-19 as a pandemic. The effects of the COVID-19 pandemic significantly impacted the world, causing the aviation industry to experience adversity. The air transportation system had experienced a major downfall during the COVID-19 pandemic, but global efforts have continuously been made to prevail through the economic hardships. In order to overcome the adversity of the pandemic, the air transportation system has reflected on economic strategies, partnered organizations such as ICAO and IATA to aid the reaction to COVID-19, and utilized the Transportation Security Administration (TSA) to meet the security demand of traveling passengers and promote innovations during the period of hardship and recovery.

The Three Factors of the Air Transportation System

The three major parts of the air transportation system–economic, social, and political factors–influence the global economy, international travel and cultural exchange, and the political relationships between nations. The three factors of the air transportation system determine the flow and safety of aviation operations around the globe. Each factor, whether economic, social, or political, creates a strong foundation for global aviation and relationships.

The Economic Factor

The economic factor of the air transportation system allows for the continuous advancement of aircraft and airlines without a significant increase in passenger fares. The continuous improvement of the global economy has allowed the air transportation system to become an industry with high demand. In 2020, the COVID-19 pandemic struck the globe, and resulted in increased restrictions and a decline in air transportation demand. According to IATA, passenger revenue miles (PRM) decreased by 90% as of April 2020 and were at 75% in August 2020. Freight transportation declined about 30% year-on-year in April 2020 and was at 12% in August 2020 (“COVID-19 and the Aviation Industry,” 3). The quick hit that the air transportation system took had caused airlines to experience immense pressure,

leading to liquidity buffers. A study conducted by the Travel Association had predicted a 45% decline in industry revenues, resulting in a years' loss of $519 billion. The two main concerns that the aviation industry experienced during the pandemic were health-related

operating costs and the recovery costs of commercial aviation. The health and safety requirements brought about by COVID-19 required the aviation industry to implement enhanced disinfection techniques, temperature checks, and virus checks. The social distancing protocols were anticipated to cause a reduction in passengers by up to 50% (“COVID-19 and the Aviation Industry,” 3), which would have impacted the overall PRM. The slow recovery of commercial aviation had impacted the number of flights across the globe, which resulted in an economic decline. In September, 2020 the number of commercial flights was more than 40% under pre- pandemic levels (“COVID-19 and the Aviation Industry,” 3). COVID-19 prevented a significant amount of international travel, which was a big factor of the air transportation economy. International aviation had been the main source of aviation income for airports around the globe, therefore the aviation industry had to find a way to combat the hardships of the pandemic and aid the economic demands of the air transportation system. According to the Center for Aviation (CAPA), the air transportation system had anticipated a five to ten year recovery period in order to fully recover from the COVID-19 pandemic. To economically recover from the downfall caused by the pandemic, the air transportation system must adopt a multitude of actions; Some of these actions being to work with stakeholders, improve and share data for future operations, and adapt new innovations to present new economic growth opportunities.

The Social Factor

The social factor within the air transportation system allows people from different cultural backgrounds to travel around the globe. The spread of cultures around the world by aviation leads to trade, which can be linked to economic growth. The aviation industry provides transportation to remote locations, allowing for social inclusion. Lastly, air transportation provides timely emergency aid and relief around the world. During the COVID-19 pandemic, the social and economic aspects of the air transportation system went hand-in-hand. IATA had predicted tourism levels to decrease by 850 million to 1.1 billion international tourists, resulting in a total revenue loss of $910 billion to $1.2 trillion (“COVID-19 on Aviation,” 1). International travel had taken a plummet once the pandemic prevailed. A statement by the World Tourism Organization explained that “global tourism suffered its worst year on record in 2020, with international arrivals dropping by 74%.” The 74% decline in internal travel had cost the tourism industry a $1.3 trillion loss in export revenues (Patel, 2022).
The long duration of the COVID-19 pandemic forced the aviation industry to learn how to adapt to the ongoing adversity regarding travel circumstances. It was important that the aviation industry reflect on aspects that would affect social travel such as fleet costs, the proper protocols for air transportation disruption, and aircraft recommission in order to combat the hardships brought about by the pandemic. The chief adventure officer for Steller, Richard Bangs had stated, "The next incarnation of tourism is on the way." "As we go out and redefine how we experience the world – with our senses re-attuned, our situational awareness reengaged – let it bring awakenings and inventions, the way we travelers have always risen to the greatest challenges." The aviation industry must learn to make instant changes and adapt to upcoming demand for travel as passengers begin to feel more confident about air transportation.

The Political Factor

The political factor within the air transportation system greatly influences international trade, tax regulations, and global competition. Political aviation is impacted by threats such as global conflict (war), terrorism, and outbreaks–such as the COVID-19 pandemic. COVID-19 resulted in multiple countries closing their borders, preventing foreign and political personnel from entering different

countries. One hundred eighty-nine countries, containing about 65% of the world population, completely closed their borders due to the pandemic (“Closed Borders,” 1). As COVID-19 continued, border closure eased, but countries still implemented travel bans and partial

closures. The United States implemented travel bans on China, Iran, and twenty-six European countries. The travel bans placed on countries impacted international relations, leading to a decline in global politics.

The Roles of ICAO and IATA

Though global politics experienced a downfall, many global organizations within the aviation industry continued to collaborate in order to improve the air transportation system during the pandemic. Many of these aviation organizations have helped to combat the adversity caused by the COVID-19 pandemic and guide consumers as well as the aviation industry. Two organizations that have played respective roles in aiding the air transportation system during the pandemic were ICAO and IATA. ICAO is a government association that was established to enhance the air transportation efforts and cooperation between multiple countries. The mission of ICAO is "to maintain an administrative and expert bureaucracy supporting diplomatic interactions, and to research new air transport policy and standardization innovations..."(Loh, 2022). IATA is a non-government organization that was established to promote trade amongst commercial industries around the globe. The mission of IATA is to formulate policies for aviation subjects in order to uphold the best interest for global airlines. IATA challenges "unreasonable rules and charges" (Loh, 2022) and holds rule makers accountable, pushing them to strive for “sensible regulation” (Loh, 2022). Since the COVID-19 pandemic, ICAO and IATA have made continuous efforts to help guide consumers as well as the aviation industry. ICAO put their best effort forward to keep the air transportation system up and running. ICAO collaborated with multiple organizations, such as IATA, to create new reports and recommendations in order to resume international air travel. ICAO also created a “COVID-19 Response and Recovery Platform.” The platform offered forecasts, guidance, resources, and tools that aided consumers and the aviation industry in combating the COVID-19 virus. IATA had teamed up with ICAO by encouraging government personnel to practice and enforce the guidelines set by ICAO. The Director General and CEO of IATA, Alexangre de Juniac stated: “The universal implementation of global standards has made aviation safe. A similar approach is critical in this crisis so that we can safely restore air connectivity as borders and economies re-open...” IATA held government workers to the standards set by ICAO, allowing the aviation industry to have a more effective recovery.

The Purpose of the TSA

Aside from ICAO and IATA, another vital organization within the air transport system is the Transportation Security Administration (TSA). TSA was established following the events of 9/11 in order to enhance the United States’ (U.S.) transportation security as well as uphold the freedoms guaranteed to individuals. TSA is stationed at airports around the United States and is responsible for screening all passengers' bags entering, remaining, or exiting the U.S. The COVID-19 pandemic had made a significant impact on the security system within the air transportation system by pushing the industry to implement new security procedures. Close- contact security checks, such as pat-downs, had become limited, crowd control technological measures, such as modern screening equipment and biometric scanning, had been put to use, and high standards for passengers to arrive prepared had been enforced. The security procedures implemented within the aviation industry as a result of COVID-19 has become strictly focused on the avoidance of physical contact. The pandemic had created a new security culture within the air transportation system: one in which allowed for safety and security innovation.

Facing the COVID-19 Pandemic

The COVID-19 pandemic had a significant impact on global operations, especially the air transportation system. The air transportation industry had experienced adversity economically, socially, and politically. In order to combat the hardships caused by the pandemic, organizations such as ICAO, IATA, and the TSA collaborated and implemented new innovations to prevail through the global hardships of COVID-19. Though the pandemic caused a significant downfall for the air transportation system, organizations within the aviation industry have been joining forces to create solutions, allowing the air transportation system to make a global come-back.

Example 2: Our air transportation system is arguably one of the most critical aspects of society today. Through the benefits that it brings, economies are able to flourish, people can see and experience the world, and countries and their economies have the ability to become closer than ever. With such an important system, it's critical that professionals are at the helm, guiding and leading the industry to operate safely and efficiently everyday. When threats come into play, and our air transportation system is put at risk, we begin to really appreciate it and the organizations and individuals who inform us, who keep us safe, and who guide the industry back to flourishment. The importance of the air transportation system can be summed up by the economical, social, and political effects that it has on our world. Airlines are drivers of the economy, there's no doubt about that. Having easy and unrestricted access in and out of a particular place allows growth and development to thrive. According to Airlines for America, commercial aviation contributes to over 5% of the US's total GDP. In other words, the air transportation system contributes more than $1.25 trillion to our economy (Airlines for America, 2023). In addition, there are countless jobs in our society that can be somehow tied back to the air transportation system. First, there are the direct jobs. These consist of airline and airport employees, etc., in other words, those who work directly with the air transportation system. Then there are indirect jobs which are fueled by the aviation industry, like tourism and rental car companies. These jobs aren't directly related to the air transportation system, but they are driven by the people that it transports. Finally, it also creates induced jobs. This could be in the form of a construction worker who is building a house for an airline employee moving to the community. The success of the air transportation system induces more jobs in the community because of the economic prosperity it brings. Another cool example that I discovered relating to aviation and induced jobs was when Kenya Airways began non- stop flights from Nairobi to New York–JFK, it reduced shipping times and freight costs enough to open up the North American market to Kenyan flowers. According to an Aviation Benefits Report, "In Kenya, over 100,000 jobs depend on the cut flower industry" and it "generates around USD 700 million in foreign exchange each year" (ACI, CANSO, et al., 2019). Having this air link creates, or induces, these jobs in Kenya. In fact, Airlines for America also estimates that commercial aviation drives and supports over 10 million jobs, just in the US alone, and over 65 million worldwide. (Airlines for America, 2023; ACI, CANSO, et al., 2019). In 2020, when COVID essentially shuttered the industry, it obviously affected airline employees, but it had a ripple effect across the entire economy. Not only did it also affect the indirect and induced jobs, but with people being unable to travel for business, it brought a good majority of economic growth to a halt. The importance of the air transportation system as it relates to our social world cannot be overlooked either. The whole mission and purpose of the airline industry is to connect people to the things that matter most to them. Delta even states that their mission is to connect "people to people, people to places, and people to potential," and for many years, United's purpose has been "Connecting People. Uniting the World." (Delta, 2022; United, n.d.) The air transportation system brings people together and unites us as a society. When COVID shut down international aviation, many really began to realize and remember how socially important aviation really is. With these critical links provided by aviation gone overnight, people were cut off from one another, and there are so many heartbreaking instances where loved ones were separated for years. Furthermore, by allowing us to see and experience different cultures and ways of life, the air transportation system allows us to overcome some of our differences, helping to conquer the hate and divisiveness that often divides us, and we can learn how our unique differences and shared experiences can actually bring us closer together.

Finally, the air transportation system has immense political effects on the world. Aviation allows for international trade to be more easily facilitated between two countries. This in turn allows for those countries to forage better relationships. In an article titled Building Peace

and Prosperity Through International Trade, it suggests that “cross border trade is one of the key gauges and engines of national development” and that “nations with greater trading links and partnerships tend to have more harmonious foreign relations” (Pinto, n.d.). In the past few decades with the development of more fuel efficient, long-haul aircraft, it has allowed allied countries to be closer connected with the countries they have strong ties with, even if they may be far apart. Flights between two countries can also represent a warming of political relations between those countries, like when US airlines were able to resume flights to Cuba in 2016. Clearly, the air transportation system has profound effects on the world, economically, socially, and politically, and COVID made these effects especially clear. We are an interconnected society that relies on the air transportation system to effectively function. The International Civil Aviation Organization, or ICAO, fosters the planning and development of international air transport. According to their website, their mission is “to promote the safe and orderly development of civil aviation around the world” (U.S. Mission to the International Civil Aviation Organization, n.d.). They establish standards and recommended practices related to and required for aviation security, efficiency, regularity, safety, and environmental preservation. ICAO consists of 193 member states, almost the entire globe. In response to COVID-19, ICAO created the COVID-19

Response and Recovery Platform in order to “collate the forecasts, guidance, tools, and resources which are needed by national regulators pursuing pandemic responses” (International Civil Aviation Organization [ICAO], n.d.). They laid out standard and recommended practices along with framework and mitigation measures to help prevent the spreading of the disease and manage the public health risk while also strengthening confidence among the traveling public. Under the COVID-19 Response and Recovery Platform, they have categories relating to health and safety, operational measures, passenger facilitation measures, economic analysis and forecasts, as well as a Council Aviation Recovery Task Force (CART). CART includes a section on “Public Health Risk Mitigation Measures” as well as four additional modules relating to Airport Guidelines, Aircraft Guidelines, Crew Guidelines, and Cargo Guidelines (ICAO, n.d.). The International Air Transport Association, or IATA, is the trade association for the world’s airlines. They represent around 300 airlines in over 120 countries, accounting for 83% of global air traffic. IATA helps develop the global standards that airlines need in order to connect the world. Some of those include standards that simplify processes, increase safety, enhance passenger convenience, reduce costs, and help achieve sustainable goals. Their mission is “to represent, lead, and serve the airline industry” (International Air Transport Association [IATA], n.d.). As it relates to COVID-19, IATA published and continually updated guidance and information as it related to travel restrictions, mask usage, and cabin air quality, keeping everyone informed about the seemingly ever changing conditions (IATA, n.d.). Organizations like ICAO and IATA are critical to the safety, efficiency, and success of the air transportation system. As witnessed by the COVID-19 pandemic, they helped guide us all, airlines, aviation personnel, and the flying public included, through these uncertain times. The Transportation Security Administration, or TSA, is tasked with screening passengers and cargo to protect the US airline industry from security threats and acts of unlawful interference. They were created in the wake of the 9/11 attacks in an effort to ensure an event such as that never happens again. TSA’s mission is to “protect the nation's transportation systems to ensure freedom of movement for people and commerce” (Transportation Security Administration [TSA], n.d.).

As it relates to the COVID-19 pandemic, this drop in travel volume allowed for multiple changes as it relates to aviation security. According to an article by Securityinformed.com: As passenger traffic plummeted, the aviation community sought to explore the

potential of new technologies to make security checkpoints more contactless and flexible when the traffic numbers return. The

pandemic has seen an increase in touchless technology deployed in the screening area. Used for cabin baggage screening, Computed Tomography (CT) produces high-quality, 3-D images to enable a more thorough analysis of a bag's contents. (Anderson, n.d.)

Not only did the pandemic allow for an opportunity to make security checkpoints more hygienic, but this drop in passengers also allowed for new and innovative screening technologies to be tested and implemented. Just as 9/11 changed airport security, COVID-19 created another opportunity to create a safer and more secure environment. Changes were made and implemented so that passengers and aviation staff alike can continue to have confidence in the air transportation system during and after the pandemic.

Since the beginning of 2020, society has realized more than ever the criticality of the air transportation system to us, to our well-being, as well as to the success of society. As we've navigated this global crisis, we've gained a whole new appreciation for air travel, and it's the millions of aviation professionals around the globe who enable this freedom of movement. With these strong international organizations, the individuals behind them, and what we've learned from the pandemic, it is my hope that the air transportation system can be stronger, safer, and more resilient than ever before.

Final

You found the password to your old Bitcoin wallet and you decided to invest in the aviation industry.

A portion of the money will be used to build an airport. Discuss how you would determine the site selection of your airport (don't forget to take into account the natural environment!). What regulatory considerations must be taken into account? Describe how the operational environment impacts your airport. What terminal style would your airport have and what type of passengers would access your airport? Describe and defend your rationale for choosing what services you would want your airport to offer.

In addition to the airport, you also decide to start an airline carrier. As you build your airline, articulate what steps you would need to take to make sure your business is financially viable. What service quality indicators would be important to have? Describe and defend (think about route selections here!) the type of aircraft(s?) you would have in your fleet. What type of airport(s) would you want to be based out of? What organizations would you need to work with to ensure your airport is safe (think security and airspace for this question!)? For fun: what would you name your airline carrier?

Example 1:

Introduction

As I invest in the aviation industry, the focus of my investment will gravitate towards two main aspects: the construction of a new airport and the creation of an airline. Both factors contain precise requirements and considerations. When investing in the construction of a new airport, I will have to determine the site selection, specific regulatory considerations, the operational environment, terminal style and passenger types. All of these factors play a critical role in the successful development of an airport, therefore it is important to consider each aspect. As I also invest in creating a new airline, I will need to consider which service quality indicators would be important to have, which type of aircraft to have to my fleet, the type of airport I want my airline to be based out of, and which organizations I need to work with in order to ensure the safe and effective operations of my airline. All of these factors will help to ensure that my airline business is financially viable and is able to provide the best airline service that money can buy.

Airport Construction: Site Selection

The airline service created with my investment will be a small regional business airport that provides service throughout the midwest. The airport will be located in Northern Minnesota. Minnesota has a large number of pine trees and lakes; therefore, it is important to select the proper site, while also preserving the natural environment that will allow passengers to enjoy Minnesota's beauty. When selecting a site, I will have to consider terrain, lakes, vegetation and surrounding public facilities. I will select a flat terrain to ensure effective flight operations when taking off from and landing at the airport. Minnesita, "The land of 10,000 lakes," is known for its natural beauty, tall trees, and surrounding water, but when selecting a site for my airport, I will have to consider these natural factors. The selected airport site will be a clear space between pine trees and away from surrounding lakes. The clear space for the airport will allow for enough distance between the runway and vegetation so that afcat can safely and effectively clear the trees. This will allow passengers to be able to fly safely and comfortably, while also being able to experience the beauty of Northern Minnesota.

Airport Construction: Regulatory Considerations

The beautiful state of Minnesta holds a wide variety of environmental factors. Factors can vary from natural environment types, public

business environments, and large cities. When fundinging the construction of my new airport, I will have to consider a multitude of regulations due to the variety of environmental factors in Minnesota; one regulation being the Federal Aviation Administration's (FAA)

land use planning. When designing an airport, it is important to consider land compatibility. One compatibility factor is the use of land and effects of noise. When investing in the airport, I will have to consider the legislation put in place to control noise factors. A regulation that I will consider is the requirement of “Airport operators to ensure that actions are taken to establish and maintain compatible land uses around airports” (FAA, n.d.). I will consider other regulations by the FAA in order to properly “establish and maintain compatible land uses” when designing my airport. Compatible land use regulations I will consider are zoning regulations. Zoning regulations will allow me to understand specific land types that are not compatible with my airport design. The next regulations I will consider are subdivision regulations. Subdivision regulations will provide me with the proper framework to consider if noise pollution from the airport will negatively impact any local residents. The consideration of established public facilities is important when mapping an airport; therefore, I will utilize official map regulations to recognize where public businesses are located in relation to my airport site. Referring to map regulations will prevent my airport from interfering with day-to-day public facility operations and allow me to implement my own effective operational environment.

Airport Construction: Operational Environment

Implementing an effective airport operational environment is essential for proper investment use as well as the performance of safe and effective operations. In order to get the most out of my investment, I will be utilizing the Concept of Operations (CONOPS). The objective of CONOPS “is to cover end-to-end traceability between operational needs and system safety and performance requirements derived in future phases” (ADB Safegate, 2017). The utilization of CONOPS will allow my airport to maintain a safe and operationally effective environment. The implementation of CONOPS will also allow operations within my airport to properly flow, providing economic stability. The Concept of Operations has four aspects: Operational Environment, Concept of Air Traffic Control (ATC) Services, Operational Scenarios, and User/Operational Needs. The Operational Environment pillar of CONOPS focusses on airport structure, operational structure and layout, and the modern systems utilized by an airport. The Concept of ATC Services pillar describes approach and ground operations, runway models and separation regulations, an airport’s visibility procedures, and an in- depth description of standards and procedures for specific operations. The Operational Scenarios pillar utilizes the data obtained from other pillars to perform precision calculations to provide a proper number of materials needed for different operations. This allows for the enhancement of an airport’s environment. The User/Operational Needs provides a framework for how an airport should operate in order to effectively utilize and maintain the material gained from the Operational Scenarios pillar. The proper implementation of CONOPS will help create a successful airport operational environment, allowing my airport to provide quality service to terminal users and passengers.

Airport Construction: Terminal Style and Passenger Types

My airport will be utilized by business, leisure, and scheduled passengers. In order to provide the best possible service to my airport’s users and passengers, I must consider my audience. The regional airport I am investing in should have a modernized and stress-free terminal design, as a large number of business passengers will be utilizing my airport. The terminal will have a linear design to provide clear orientation for the passengers, provide lower baggage costs, and to allow passengers to walk directly from the terminal, through an airbridge, and onto the aircraft. The terminal style that I will implement within my airport is similar to the design of the Paine Field Airport located in Seattle, Washington. The mission of the Paine Field Airport is “Bringing civility back to the airport experience” (Paine Field Passenger Terminal, 2023). Terminal experiences can be stressful for a lot of passengers. It is extremely important that my terminal design implements a sense of stability and organization that will allow passengers to enjoy their experience. The simple, modern construction of my terminal will create an environment where business travelers are able to be productive and leisure travelers are able

to relax. Since the airport I am investing in will be a smaller, regional airport, the terminal design will display attention to detail and will be easily maintained. A detailed aspect of my terminal design will be large glass windows on the side of the terminal facing the

runway so that passengers can watch the aircraft operate and enjoy natural sunlight. The large windows will also provide passengers with a beautiful Northern Minnesota view of pine trees and nature. Another design feature will be workspace layouts. There will be quiet sections within the terminal with desks and additional material to provide a productive environment for business travelers. My regional airport terminal will also have a modern feel with wood decor, a variety of plants, tall ceilings, adjustable lighting, and fireplaces.

Airport Construction: Services

In addition to the modern, cozy design of my linear terminal, the airport I am investing in will provide a number of services to its passengers. There will be a parking lot on the backside of the terminal (the side opposite of the runway) where valet parking will be available. There will also be a small rental car service located in the parking lot. There will be a single restaurant with multiple dietary options, a small coffee shop, and a convenient store with a wide-range of selection. The airport will also offer complimentary coffee when passengers enter the terminal. In the linear airport terminal, airport personnel will be walking around, monitoring operations, answering questions, directing passengers, and ensuring people are having a productive and relaxing experience. To add to all of the previous services, my airport will have high-speed wi-fi to ensure travelers are able to work efficiently or contact their loved ones. My airport will provide passengers with carriers such as Southwest Airlines, American Airlines, and corporate business jets; such as my newest airline service creation: Beck's Corporate Aviation Co.

Airline Creation: Service Quality Indicators

Beck's Corporate Aviation Co. is my newest airline creation. In order to provide a finally viable airline, Beck's Beck's Corporate Aviation Co. will be an airline that provides the absolute best service quality to passengers. The better the service quality of my airline, the more frequent passenger satisfaction and use. My airline will exceed service quality expectations to provide safe, comfortable, affordable, and efficient service to the passengers of Beck's Corporate Aviation Co. An example of a service quality indicator that will be implemented in my airline is the use of modern and clean aircrafts that offer free wi-fi services to passengers. This factor is especially important, as a majority of Beck's Corporate Aviation Co. passengers will be business personnel. An additional service quality indicator that Beck's Corporate Aviation Co. will implement is the use of post-flight surveys. In order to persuade individuals to fill out the survey, an incentive of "Beck's Corporate Aviation Co. reward points" will be offered. Reward points can be cashed towards flight deals. The Beck's Corporate Aviation Co. survey will ask questions concerning safety, comfort, and efficiency. Each completed survey will be entered into a database to analyze and assess, allowing Beck's Corporate Aviation Co. management personnel to continuously improve the airline.

Airline Creation: Aircraft Types

Beck's Corporate Aviation Co. will hold true to their promise to continuously provide and improve safety, comfort, and efficiency by selecting the proper aircraft for its passengers. Beck's Corporate Aviation Co. will be operating throughout the midwestern region; through areas of fluctuating weather. It is important to select an aircraft for my airline that will provide passengers with safety and comfort, even when the midwestern weather does not display the best conditions. When determining an aircraft for Beck's Corporate Aviation Co., I decided to select a mid-size business jet that will travel at a significant cruising speed. As fluctuating weather is a common factor in our midwest routes, it is important to select a jet that can depart and land in a timely fashion to avoid issues presented by the weather. Beck's Corporate Aviation Co. will provide safe, comfortable, and efficient service to all of its passengers with the Boeing Business Jet 2. The 11,000 kilometer range and 473 knot cruising speed of the Boeing Business Jet 2 will allow the midwestern routes to be flown safely and efficiently. The Boeing Business Jet 2 will provide business passengers with luxurious comfort, amenities such as entertainment options, and enough space for 19 personnel.

Airline Creation: Airport

The amenities and services offered by Beck's Corporate Aviation Co. Boeing Business Jets will be based out of two midwest regional airports: Brainerd Lakes Regional Airport, Minnesota (BRD) and Columbia Regional Airport, Missouri (COU). The strategic placement of Beck's Corporate Aviation Co. aircraft in the northern and southern area of the Midwest allows business travelers to have better access to our aircraft services. BRD is a competitive selection for the placement of Beck's Corporate Aviation Co. Boeing Business Jets because it provides a less hectic service than flyinging out of major cities, such as the Twin Cities, Minoesita. The parking at BRD is free and there are a variety of rental car agencies offered at the airport. BRD also provides passengers with services such as a restaurant and wi-fi. The easy access and stress-reducing services offered by BRD is perfect for Beck's Corporate Aviation Co. business travelers. I also selected COU as an airport to base Beck's Corporate Aviation Co. out of. The new and improved terminal provided by COU is a great environment for Beck's Corporate Aviation Co. business travelers. The updated terminal will provide business travelers with a comfortable and productive environment where they are able to travel with ease.

Airline Creation: Organizations

In order to provide a safe and comfortable aviation environment, Beck's Corporate Aviation Co. will work with three main organizations to ensure the safety of our business travelers and the airport we operate out of. Beck's Corporate Aviation Co. will work with the Transportation Security Administration (TSA), the Air Traffic Organization (ATO) and the Airline Pilots Association (ALPA). TSA will provide the proper safety measures such as screening and baggage checks in order to keep Beck's Corporate Aviation Co. passengers safe. ATO, responsible for 17% of the world's airspace (FAA, n.d.) will allow for the safe and efficient travel of our Boeing Business Jet 2 aircraft through the National Airspace System (NAS). ATO will help to identify risks with the airscape before they become an issue to Beck's Corporate Aviation Co. flights. ALPA will ensure that our Boeing Business Jet 2 pilots are taken care of, allowing them to provide our passengers with quality service. ALPA will guarantee Beck's Corporate Aviation Co. airline the safety, security, and pilot assistance (APLA, 2023) we need to provide our passengers with the best airline service that money can buy.

Conclusion

Providing passengers with substantial service is the main focus of my two major investments: a new airport and a new airline. In order to provide quality service to passengers and users, the construction and design of my new airport and airline, Beck's Corporate Aviation Co., required detailed consideration along with a multitude of factors. When designing the airport, I had to consider site selection, specific regulatory considerations, the operational environment, terminal style and passenger types. When creating Beck's Corporate Aviation Co., I was required to consider the service quality indicators I would implement, which type of aircraft would provide the best properties for the specific operations of Beck's Corporate Aviation Co., the airports I wanted my airline to be based out of, and which organizations I needed to work with in order to ensure the safe and effective operations of my airline. All of the factors that go into designing an airport and developing an airline help to ensure that the aviation industry remains financially viable, operationally safe and effective, and continuous to provide quality service to all passengers.

Example 2: For this final paper assignment, I will create a fictional airline based on the current conditions in the US airline industry. That means, I will be taking into consideration the current competitive environment and real world factors. My first consideration is that I want my hub to be in a central location, that way my airline can take advantage of connecting passengers and so I'll be able to effectively utilize the hub-and-spoke model. I also want an airport that currently doesn't have much competition, as that can drive down yields and thus profit. Also, competing against another airline's fortress hub and trying to gain any reasonable footing, say against Delta in Atlanta, would be futile and unrealistic. Another consideration is I want a somewhat large city so I can take advantage of origin and destination passengers, along with the connecting passengers. It will also be important to have a city with some large companies to take advantage of corporate contracts. I also would prefer a location that is less susceptible to weather, as weather is often considered the great equalizer of the airline industry and it can wreak havoc on operations. I will be avoiding areas prone to severe storms, fog, or other conditions that could disrupt flight operations. Finally, it will be important to choose an airport with a large footprint to accommodate growth. There must be sufficient land available to accommodate the airport's facilities and future expansion needs.

With all this taken into consideration, my chosen location for my airport will be the Cincinnati/Northern Kentucky International Airport (CVG). First of all, Cincinnati is in a very central location, perfect for a hub-and-spoke operation. It is able to facilitate east-west connections, north-south connections, intra-midwest connections, and it is an efficient jumping off point to Europe for a large majority of the US. Going onto my second consideration, CVG currently doesn't have too much competition. No airline at CVG has a dominant market share, thus it will be easier to establish ourselves and gain market share. As of January 2023, the largest airlines were Delta with 24.49% market share, Allegiant with 14.32% market share, and Frontier with 12.54% market share (Bureau of Transportation Statistics [BTS], 2023). As you can see, market share is very fragmented, and there is only one legacy carrier in the top 3, who are typically the fiercest competitors. This makes it easier to gain traction than if one airline had 70-80% market share and could easily step on us and drive us out. In addition, the Cincinnati metro area is fairly large. The metro population of Cincinnati in 2021 consisted of 2,256,884 residents, not a number to shake a stick at. Furthermore, it's a growing region. Greater Cincinnati grew 5.6 percent in the last decade, and the Tri-State area gains thirty-three new residents every day (Planalp, 2023). Dayton, OH is also only an hour away, a metro area with over 800,000 people. CVG is also in the center of Indianapolis, Columbus, Louisville, and Lexington. These metro areas could also help feed the airport and its O&D passenger count. To put these population numbers into context as it comes to airport passengers, Charlotte, NC has a population of 2,701,046, and Charlotte Douglas International Airport (CLT) serves over 47.7 million passengers a year. Cincinnati/Northern Kentucky, on the other hand, saw only 7,573,416 passengers in 2022. That's only around 16% of the traffic at CLT for a metro area 83.5% of the size. CVG used to be busier back in the day, but I'll go into that later. It's also important to see what large companies have a presence in the area, as they can bring corporate contracts and high yielding business passengers. Cincinnati is the headquarters for multiple Fortune 500 companies, including Kroger, Proctor and Gamble, Western & Southern Financial Group, American Financial Group, and Cintas, among others. Even more recently in January 2023, GE announced it would move the headquarters for GE Aerospace to Evendale, a suburb of Cincinnati (Coolidge, 2023). Next topic I will cover is related to the natural environment. Obviously, it would be best to have an airport in a location free from as much bad weather as possible (thunderstorms, fog, wind, snowstorms, hurricanes, etc.) since that can negatively affect airport operations. According to Aceable, Dayton and Columbus, both within a stones throw of CVG, are ranked number two and three respectively for safest cities against natural disasters in the US. Other major cities like Miami, New York, and Dallas, while not only being extremely competitive, are susceptible to excessive weather. Miami, being in Florida, experiences numerous hurricanes and thunderstorms, New York battles hurricanes and harsh winter storms, and Dallas suffers from being on the southern edge of Tornado Alley and thus is especially prone to severe storms

that produce lightning, hail, strong winds, and of course, tornadoes (Aceable, n.d).

The next portion I want to talk about pertains to facilities, space, runways, etc. But before going into this, I think this is a good time to bring up Delta's past hub operations that once existed at CVG. In the 1990's and into the early 2000's, Delta had a massive fortress hub at the Cincinnati/Northern Kentucky International Airport. In 2005, they were operating over 650 flights per day, and in that same year the airport welcomed 22,778,785 passengers. At the time, it was one of the busiest airports in the country. Around this time, Delta was facing significant financial pressures due to rising fuel prices and increased competition from low-cost carriers. It was also just years after 9/11, the start of the global financial crisis, and Delta was in bankruptcy. In response, Delta undertook a restructuring plan to reduce costs, which included reducing the number of flights from CVG. The final nail in the coffin though, was Delta's merger with Northwest Airlines. When Delta merged with Northwest, they inherited Northwest's much larger hub in Detroit, which is just up the road from Cincinnati. Because it doesn't make sense to have two hubs so close together competing for the same traffic flows, the decline of CVG continued. However, because of Delta's retrenchment, there is a lot this airport has to offer. The airport sits on 7,000+ acres and has four major runways. In 2005, right before Delta began to pull out, CVG opened a new quarter of a billion dollar runway. Other runways were also extended to accommodate widebody transoceanic flights (WCPO 9, 2010). Another deciding factor in choosing CVG is because of its terminal design. Like I mentioned in previous homework assignments and discussion boards, I believe the linear/satellite model is superior in terms of its efficiency and convenience for both passengers and planes. Using this design will hopefully reduce ground delays for my airline. Funny enough, CVG already employs these designs, so no immediate changes would need to be made concerning terminal design. Currently, the airport has a headhouse with check-in and security, and an underground train that connects the headhouse to the two linear satellite concourses. Along with the train, I would ensure there are sufficient moving walkways in the concourses to minimize the amount people have to walk and to make getting around easier for those who might have a mobility issue. Like I mentioned before, CVG has a lot of space, so not only can I use these underutilized concourses that Delta largely abandoned, but there is room to easily extend these concourses in the future as passenger counts grow, with little disruptions to current operations. I would make sure there are plenty of shops and restaurants in the concourses in order to make the airport experience as enjoyable and stress free as possible. In addition, having more places travelers can spend money while waiting for their flights, the more money the airport will make. It's a win-win situation. Other amenities I would invest in would be airport lounges. These would be a great way to reward your most loyal and frequent travels, and provide them with an oasis before they have to get on the plane. This would also be an important consideration when trying to attract those high yielding business travelers.

Now, onto regulations. While this part may not be as fun, they are crucial to the operation. There are numerous regulatory considerations our airport will have to take into account. First and foremost, the airport must be certified. Airports must obtain certification from their country's civil aviation authority (CAA), which in this case would be the FAA, in order to operate. This would involve meeting certain safety and security standards and demonstrating compliance with various rules and regulations. Airports must also comply with safety regulations related to runway design and construction, airport lighting and markings, aircraft rescue and firefighting services, and emergency response planning. Being a top target for acts of terror, airports have strict security requirements they must abide by. They need to comply with regulations relating to passenger and baggage screening, access control, and perimeter security. With the environment being at the forefront of the public's mind, certain environmental regulations must also be met. They must comply with regulations related to noise, air, and water pollution and waste and wildlife management. If we want our airline to serve international destinations from our airport, we will need to comply with customs and border protection (CBP) regulations. International airports must be in compliance with customs and immigration regulations related to the screening of passengers and cargo entering and leaving the country. Thus, our airport will also need to have a CBP facility to process passengers, baggage, and cargo

arriving from international destinations. Finally, we must be in compliance with air traffic regulations, a topic we've been recently discussing in this course. Our airport must coordinate with air traffic control authorities to ensure that aircraft are safely separated and

guided during takeoff and landing (Federal Aviation Administration [FAA], n.d.). Overall, our airport will need to be in compliance with a wide variety of regulations, rules, and standards to ensure safe and efficient operations.

Now, time to start the airline itself! As mentioned earlier, I will be using Cincinnati/Northern Kentucky Airport to employ a hub- and-spoke model of air transportation. As a reminder, the hub-and-spoke model focuses on a central hub airport, with a large number of spokes, aka routes to different cities. The plane is more likely to be filled up with a hub-and-spoke model because you're able to take demand from all over and put everyone onto one flight. It also helps the hub airport as well. On a random day I checked, AA997 from Dallas/Fort Worth to Buenos Aires was booked to 222 passengers, however, only 55 of those passengers originated in Dallas (Information from internal company website). 167 passengers came from other cities, so it allows Dallas to be able to support a nonstop flight to Argentina. Not only does a hub-and-spoke model keep planes full, but it makes it easier for people to get where they need to be. In my case, the hub-and-spoke model will allow Cincinnati to sustain services to cities across the country and the globe. I will want my airline to strive for reliability, as misconnecting at the hub and getting to your destination late can taint a passengers view of your airline. My airline would operate planes from small regional jets like CRJs and ERJs, to mid-sized narrowbody aircraft like the B737 and A320, to large intercontinental widebodies like the B787 and A330. This way I can operate from all types of airports. The regional jets would allow my airline to serve smaller and nearby communities and cities like Cleveland, Knoxville, Memphis, Huntsville, etc. The narrowbody planes would be used to serve larger, further out destinations. Think of places like Austin, Orlando, Los Angeles, Seattle etc. These planes can also serve vacation destinations in the Caribbean like Cancún, Montego Bay, Punta Cana, etc. Finally, the widebodies will serve long-haul destinations. Some examples might include Honolulu, London, Paris, Tokyo, etc. I would want my airline to serve hundreds of destinations from Cincinnati, as network depth is critical with hub-and-spoke operations since it opens up exceptional amounts of possible connections. I would also work with international airlines and create partnerships and codeshare agreements to allow for onward connections at international destinations. For example, I might partner with Air France, and then passengers on my airline's flights to Paris will have hundreds of connection opportunities onward on Air France flights. This way, passengers are able to connect on both ends of the flight, which will increase the chances of it being full. Of course, the airline will have to work with the Transportation Security Administration (TSA) to ensure passengers and cargo are properly screened for threats. When it comes to airspace, the airline will work with the FAA, the primary regulator of U.S. airspace, and ATC. We will work closely with these organizations to ensure we are in compliance with all required regulations so that we run a safe, efficient, reliable, and well-respected air carrier.

After learning a multitude of topics throughout this course, I effectively applied that knowledge and thought critically about different operational, regulatory, and design aspects and environments to come up with a plan for my proposed airline. Starting and running an airline requires careful planning, analysis, and decision making in order for the operation to run safely and smoothly while also being profitable. As future leaders in the air transportation and airline industry, it is important that we know how to do this and can do it effectively in order to maximize profits. Who knows, one of us just might be the next leader for one of these airlines!

Performance Indicator Rubric

Course: FSCI 2250 Instrument Flight Foundations

Course Instructor: Stephen Belt Number of

Semester Taught: Fall 2022

Students in Course: 39

FLIGHT SCIENCE CONCENTRATION

Student Learning Outcome Assessed	**Assessment Results: (Indicate what % of class achieved a minimum 70%)**	**Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")**
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	76.03% within this category	Yes
SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot.	74.66% within this category	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

Quarter Exam Level Assessment attached

FAA Written Exam: 79% pass rate (30/38)

Additional FAA-style quizzes and study sessions during course.

**Attach description of assignment used for assessment and samples of student work.*

FSCI 2250 SLO 1 and 5 Fall 2022

Category Performance Report

At-Risk Categories: 0 | Total Courses: 1

Date Range: 8/18/22 - 12/31/22 | Category At-Risk Threshold: 70% | Needs Review Threshold: 77%

Flight Science Student Learning Outcomes

At-Risk Categories: 0 0 | Total Categories: 2

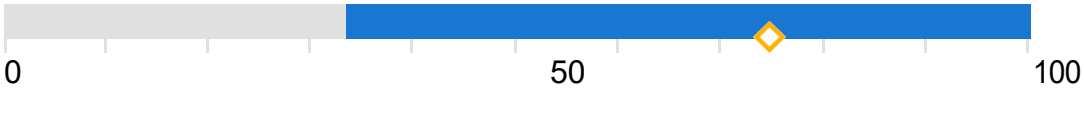
Average ◇ Score Range ▼ At-Risk ● Needs Review ▲ Doing Well

CATEGORY NAME	AVERAGE	ASSESSMENTS	STATUS
SLO 1: Conduct aviation operations in a professional, safe, and efficien	76.03%	3	▲

0 50 100

ASSESSMENT NAME	AVERAGE SCORE WITH THIS CATEGORY	QUESTION / CRITERIA WITH THIS CATEGORY
E a I	67%	3
FSCI 2250 E a 2	78%	3
E a 3	84%	3

SLO 5: An ability to apply the techniques, skills, and modern aviation t	▲



74.66%

3

ASSESSMENT NAME	AVERAGE SCORE WITH THIS CATEGORY	QUESTION / CRITERIA WITH THIS CATEGORY
E a 1	76%	4
FSCI 2250 E a 2	66%	2
E a 3	79%	3

FSCI 2250 Fall 2022 Exam 1

Assessment Performance

AVERAGE SCORE

71%

(71.3/100)

LOW SCORE

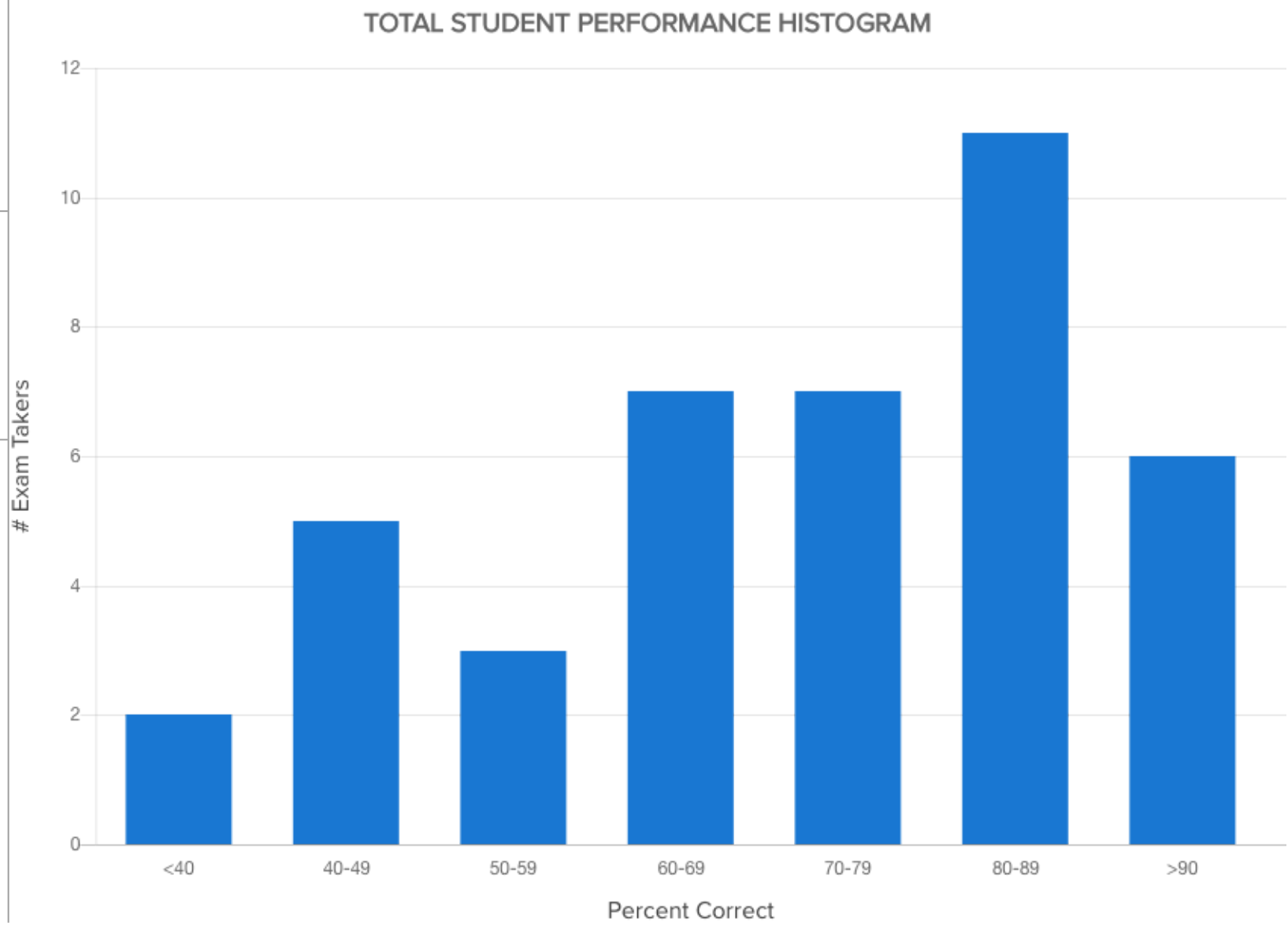
31%

(31.0/100)

HIGH SCORE

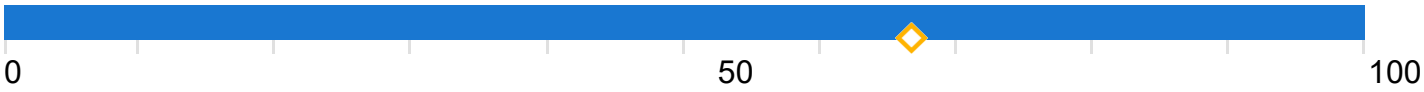
98%

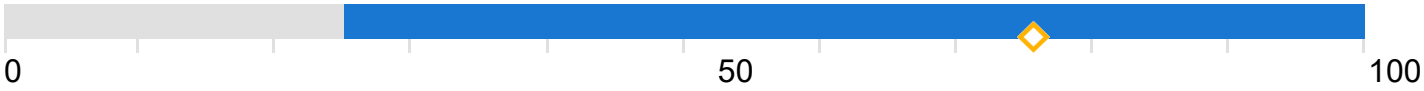
(98.0/100)



Cate oryPerformance

CATEGORY NAME	AVERAGE SCORE	QUESTIONS
In Fli t Science St dent Learnin O tcomes SLO 1: Cond ct aviation operations in a professional, safe, and efficient manner.	66.67%	3
In Fli t Science St dent Learnin O tcomes SLO 5: An ability to apply t e tec niq es, skills, and modern aviation tools to perform aviation r	75.61%	4





Assessment Performance

AVERAGE SCORE

88.5%

(88.5/100)

LOWEST SCORE

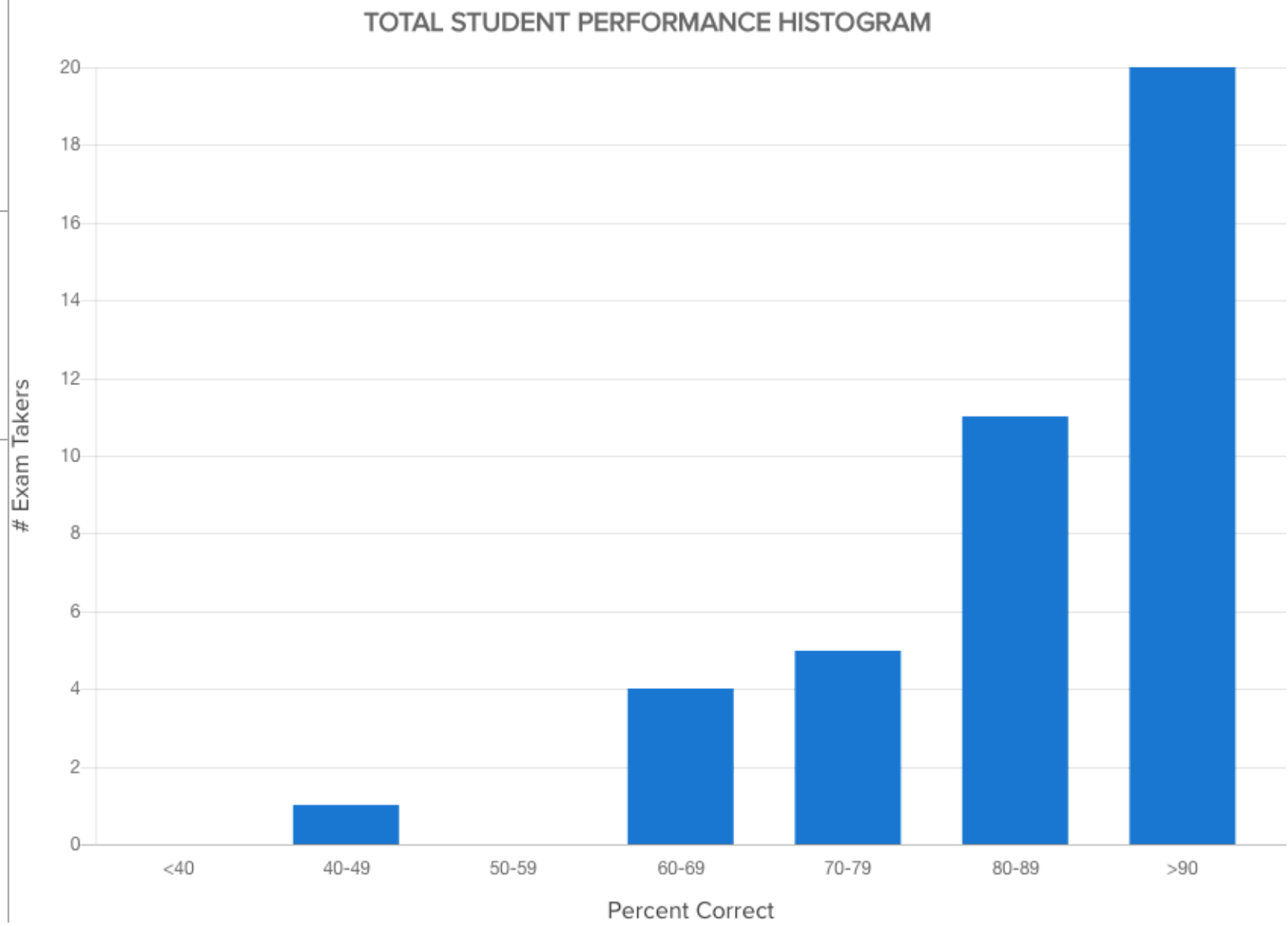
46.9%

(46.9/100)

HIGHEST SCORE

110%

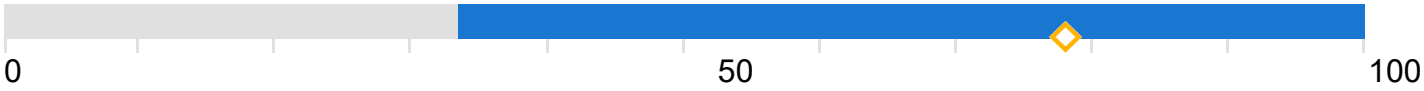
(110.4/100)

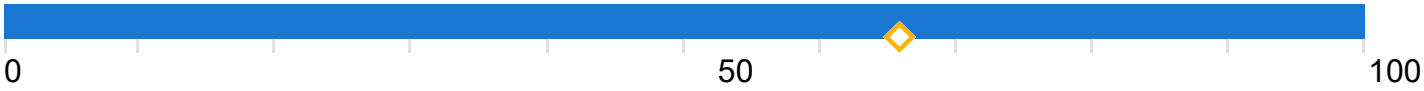


Cate oryPerformance

Avera e Score Ran e

CATEGORY NAME	AVERAGE SCORE	QUESTIONS
In Fli t Science St dent Learnin O tcomes SLO 1: Cond ct aviation operations in a professional, safe, and efficient manner.	78.05%	3
In Fli t Science St dent Learnin O tcomes SLO 5: An ability to apply t e tec niq es, skills, and modern aviation tools to perform aviation r	65.85%	2





FSCI 2250 Exam 3 Fall 2022

Assessment Performance

AVERAGE SCORE

86%

(85.5/100)

LOW SCORE

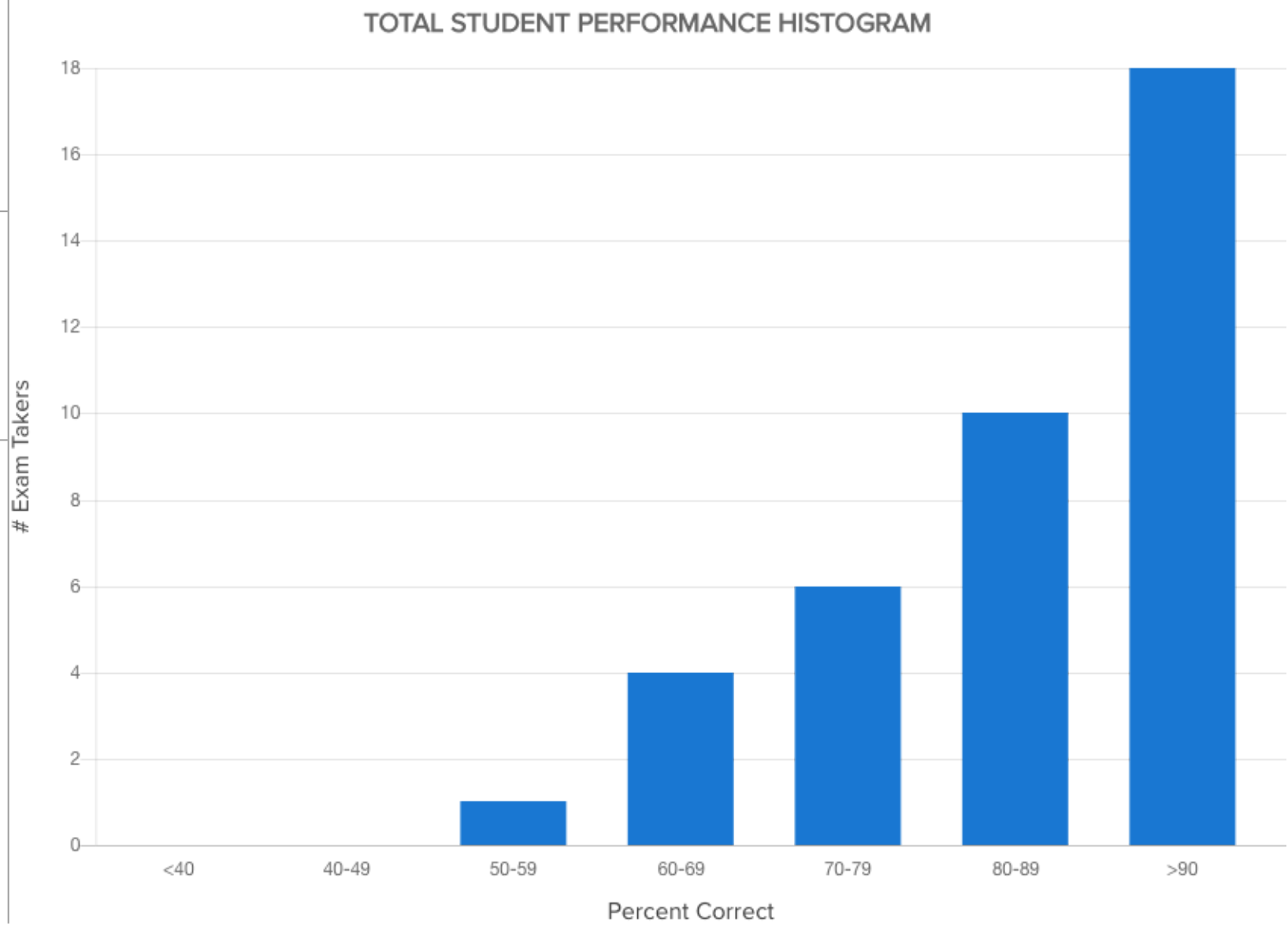
57%

(57.0/100)

HIGH SCORE

104%

(104.0/100)



Category Performance

Would you like to select the categories for this report use the top 25 categories used on this assessment?

SELECT CATEGORIES | USE TOP 25

FSCI 2250 Assessment Report Fall 2022

Date and Time of Exam Creation: 01/11/2022 6:10PM CST Total Exam Points: 188 Est. Completion Time: 155 mins Avg. Point Biserial: 0.35 Upper 27%: 0.88 Lower 27%: 0.53 Disc. Index: 0.35 Difficulty: 0.75 Total Questions: 188 Multiple Choice: 166 Fill in the Blank: 1 Essay: 1 1

Prior to using GPS for IFR operations, what actions must you take?
1. 1.

A. For WAAS-certified GPS equipment, you must verify that RAIM will be available for the intended route and duration of the flight and ensure that your GPS navigational database is current.

B. ✓ B. For non-WAAS GPS equipment, you must verify that RAIM will be available for the intended route and duration of the flight and ensure that your GPS navigational database is current

C. For all GPS equipment, you must verify that WAAS will be available for the intended route and duration fo the flight and ensure that your GPS navigational database is current.

D. You do not have to do anything. The system does it for you.

Question ID: 9520 Point Value: 1 Categories: AABI Student Learning Outcomes, H. Use the techniques, skills, and modern technology necessary for professional practice, Flight Science Student Learning Outcomes, SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.

Preflight tolerance of the Altimeter is +/- ft. When the current local altimeter setting is properly set.
2. 2.

A. 50

B. 100

✓ C. 75

D. 25

Question ID: 9388 Point Value: 1 Point Biserial: .6 Difficulty: 0.59 Categories: AABI Student Learning Outcomes, A. Apply mathematics, science, and applied sciences to aviation related disciplines, AABI A-1, Flight Science Student Learning Outcomes, SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.

When performing a VOR operational check , who must document the it? What is required to be documented?
3. 3.

A. The pilot-in-command must enter date, place, bearing error in the aircraft log or other record.

B. The pilot-in-command must enter the date, place, bearing error, and sign the aircraft log book

C. The person conducting the check must enter date, place, and bearing error in the aircraft log books.

✓ D. The person conducting the check must enter the date, place, and bearing error and sign the aircraft log or other record.

Question ID: 9374 Point Value: 1 Point Biserial: .29 Difficulty: 0.81 Categories: Flight Science Student Learning Outcomes, SLO 1: Conduct aviation operations in a professional, safe, and efficient manner., FSCI 2250 Course Level Objectives, 6. Recognize applicable federal aviation regulations, and discuss basic applications of these regulations.

t2lchart.png

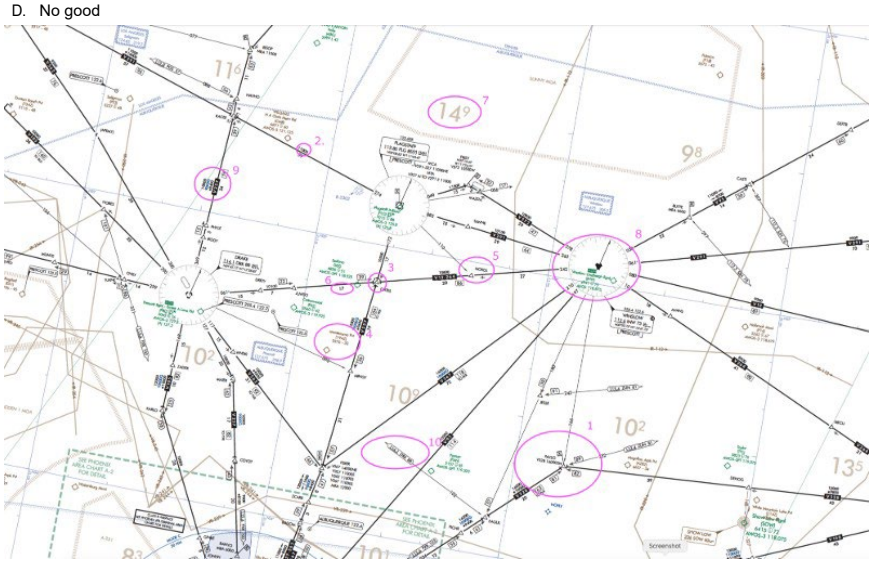
(Please use the L-chart excerpt provided to answer this question) What is the significance of the color of Item 4?
4. 4.

A. Non-towered airport

✓ B. No published IAP

C. No Voice

D. No good



Question ID: 17094 Point Value: 1 Point Biserial: .11 Difficulty: 0.99 Categories: Flight Science Student Learning Outcomes, SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.

00548poake.pdf (https://phx004-public-prod-bucket.s3-us-west-2.amazonaws.com/attachments/d/4/d4ab4237-7d95-4885-a1c5-9ecd7abd1be3.pdf?X-Amz-Security-Token=IQoJb3JpZ2luX2VjEGwaCXVzLXdlc3QtMiJHMEUCIGj%2FyPhqfGGt6RNb8XoHwuUT%2BMXvg0DPGsdtcaip8LfNAiEAwpEtdltXEMqOul6CdOROUlY80Z37a5gDWps3HRSfDd8q1QQIxf%2F%2F%2F%2F%2F%2F Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20230112T212633Z&X-Amz-SignedHeaders=host&X-Amz-Expires=3600&X-Amz-Credential=ASIA4TBQZ2TGNVVCK6H5%2F20230112%2Fus-west-2%2Fs3%2Faws4_request&X-Amz-Signature=e5328f41d7183ed3ea92d22b1b844689af4cf5f0fc731b184e035727f0d5074e)
DEPARTURE
5.

You are preparing to depart Santa Fe Municipal SAF on an IFR cross country to Denver. You receive the following clearance: cleared to Denver International Airport via the Poake Two Departue, Taos transition, then as filed." Once you copy and read back the clearance, you request taxi clearance are cleared to taxi to runway 20. Prior to departure, you review the SID. At what point does the DEPARTURE segment end and the TRANSITION segment begin?

A. CFFDN

B. SAF

✓ C. POAKE

D. TAS

Question ID: 10156 Point Value: 1 Point Biserial: .21 Difficulty: 0.79 Categories: Flight Science Student Learning Outcomes, SLO 1: Conduct aviation operations in a professional, safe, and efficient manner., FSCI 2250 Course Level Objectives, 3. Identify, explain and apply the important elements of instrument departure, enroute and approach procedures.

When Cindy receives her IFR clearance to Chicago she hears the phrase cleared as filed." What does that specific phrase tell her? (Cleared as filed includes _)
6. 6.

A. She may fly the flight plan she has filed, including the altitudes and departure procedures.
B. She may fly the route she has filed, and is automatically cleared to her destination.
C. She may fly the entire flight plan she has filed, and is automatically cleared to her destination.
✓ D. She may fly the route she has filed, but she will still receive a clearance limit, altitudes, and departure procedures.

Question ID: 10149 Point Value: 1 Point Biserial: .37 Difficulty: 0.61 Categories: Flight Science Student Learning Outcomes, SLO 1: Conduct aviation operations in a professional, safe, and efficient manner., FSCI 2250 Course Level Objectives, 3. Identify, explain and apply the important elements of instrument departure, enroute and approach procedures.

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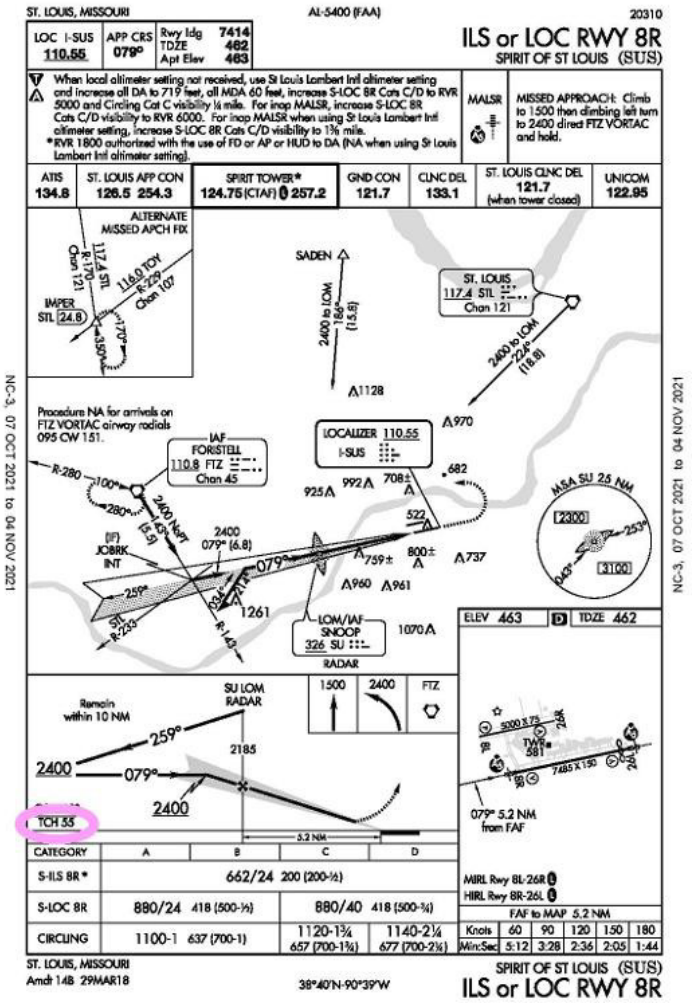
Explain item 3. (TCH 55)
7. 7.



✓ A. IF you are on glide slope, you will cross the runway threshold at 55' AGL
B. IF you are on glide slope, you will touch down 55' past the threshold
C. The Tower Clearance Height is 55'
D. The Tower Enroute Clearance is on page 55

Question ID: 10624 Point Value: 1 Point Biserial: .51 Difficulty: 0.88 Categories: Flight Science Student Learning Outcomes, SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.

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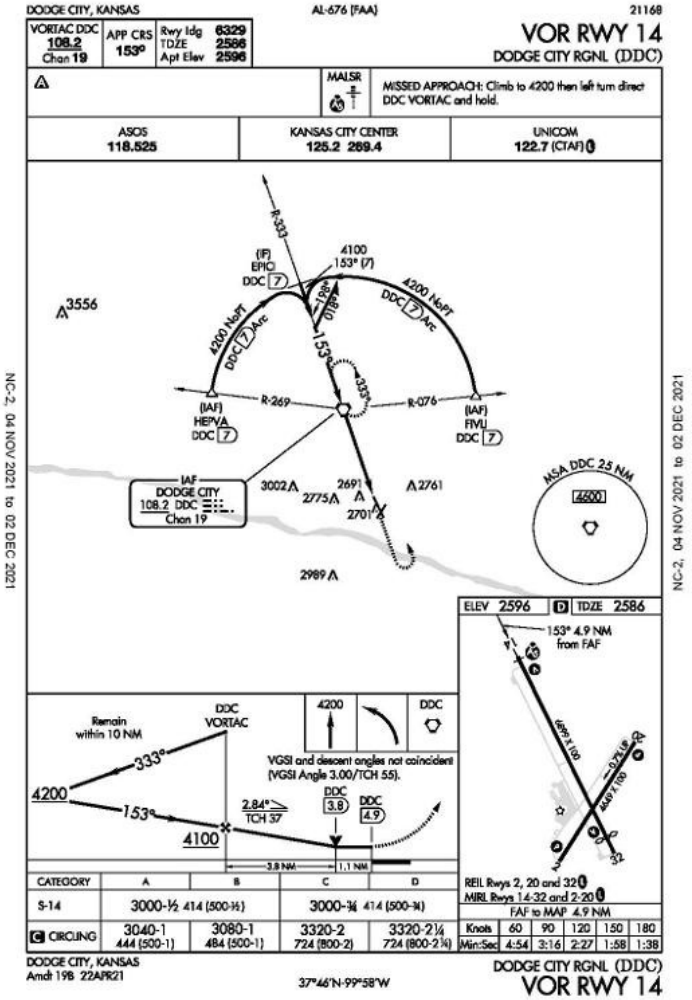
What is the Missed Approach Point for this approach?
8. 8.



A. 4 minutes 54 seconds at 60 KIAS
✓ B. 4.9 DME from the Dodge City VORTAC
C. 1.1 NM
D. DDC 3.8

Question ID: 10621 Point Value: 1 Point Biserial: .32 Difficulty: 0.74 Categories: AABI Student Learning Outcomes, AABI H-1, Flight Science Student Learning Outcomes, SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.

How do you determine you are on the intermediate segment if there is no intermediate fix?
9. 9.

A. When you cross the IAF" outbound toward the procedure turn
B. When you are headed to the airport
C. With a Maltese Cross
D. It is when you are established on the published route and proceeding inbound to the final approach fix, are properly aligned with the final approach course, and are located within the prescribed distance from the FAF.

✓ D. It is when you are established on the published route and proceeding inbound to the final approach fix, are properly aligned with the final approach course, and are located within the prescribed distance from the FAF.

Question ID: 10610 Point Value: 1 Point Biserial: .14 Difficulty: 0.87 Categories: Flight Science Student Learning Outcomes, SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.

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10. Only the attitude indicator provides information of pitch and bank.

✓ A. Direct and immediate
B. Indirect
C. Derived and interpolated
D. Any

Question ID: 9376 Point Value: 1 Categories: Flight Science Student Learning Outcomes, SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot., FSCI 2250 Course Level Objectives, 1. Explain the requirements of ICAO/FAA for instrument flight, 5. Recognize and evaluate various conditions effecting the safety of flight, aeronautical decision-making, airmanship, and physiological readiness of instrument flight.

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11. How does the blockage of the static port affect each of the pitot-static instruments during a descent from the altitude where the blockage occurred?

A. The airspeed indicator will show lower than actual airspeed, the VSI will read zero, and the altimeter will be frozen at the altitude the blockage occurred.
B. The airspeed indicator will give incorrect readings, the VSI will read zero, and the altimeter will be frozen at the altitude the blockage occurred.
✓ C. The airspeed indicator will show faster than actual airspeed, the VSI will read zero, and the altimeter will be frozen at the altitude the blockage occurred.
D. The airspeed indicator will give incorrect readings, the VSI freeze at the rate of descent it indicated when the blockage occurred, and the altimeter will be frozen at the altitude the blockage occurred.

Question ID: 9391 Point Value: 1 Point Biserial: .34 Difficulty: 0.54 Categories: Flight Science Student Learning Outcomes, SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot., FSCI 2250 Course Level Objectives, 5. Recognize and evaluate various conditions effecting the safety of flight, aeronautical decision-making, airmanship, and physiological readiness of instrument flight.

12. Describe the proper sequence to recover from a nose-low unusual attitude:

1 _____
2 _____
3 _____

✓ 1. Power to Idle, Pull the power, Reduce Power
✓ 2. Level the Wings, Wings Level
✓ 3. Pitch to the horizon, Pick up, Raise the Nose

Question ID: 9518 Point Value: 1 Point Biserial: .28 Difficulty: 0.71 Categories: Flight Science Student Learning Outcomes, SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot., FSCI 2250 Course Level Objectives, 5. Recognize and evaluate various conditions effecting the safety of flight, aeronautical decision-making, airmanship, and physiological readiness of instrument flight., 7. Assess best practice as it relates to instrument flight.

13. What does staying on the VASI glide path assure on final approach?

✓ A. Obstruction clearance within 10° of the extended runway centerline and out to 4 nautical miles from the threshold
B. That you will land on the runway
C. That you will have enough runway for your rollout
D. Obstruction clearance within 30° of the extended runway centerline and out 1 nautical mile from the threshold

Question ID: 10146 Point Value: 1 Point Biserial: .43 Difficulty: 0.66 Categories: Flight Science Student Learning Outcomes, SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot., FSCI 2250 Course Level Objectives, 3. Identify, explain and apply the important elements of instrument departure, enroute and approach procedures.

14. In order, what are the 5 T's?
(Please write your essay response on a separate piece of paper)

Question ID: 10184 Point Value: 1 Point Biserial: .53 Difficulty: 0.64 Categories: Flight Science Student Learning Outcomes, SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot., FSCI 2250 Course Level Objectives, 7. Assess best practice as it relates to instrument flight.

15. What is the standard climb gradient for departure obstacle clearance

✓ A. 200 feet per nautical mile
B. 200 feet per minute
C. 300 feet below traffic pattern altitude
D. 152 feet per minute

Question ID: 10152 Point Value: 1 Categories: Flight Science Student Learning Outcomes, SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot., FSCI 2250 Course Level Objectives, 3. Identify, explain and apply the important elements of instrument departure, enroute and approach procedures.

16. Immediately after passing the final approach fix in bound during an ILS approach in IFR conditions, the glide slope warning flag appears. The pilot is

A. permitted to continue the approach and descend to the DH.
B. required to immediately begin the prescribed missed approach procedure.
✓ C. permitted to continue the approach and descend to the localizer MDA.

Question ID: 14829 Point Value: 1 Point Biserial: .47 Difficulty: 0.68 Categories: Flight Science Student Learning Outcomes, SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot.

17. Ryan is flying a sidestep maneuver. At what point may he begin the maneuver?

A. When he is cleared for the approach
B. When he reaches the MDA
✓ C. When he has the runway that he is sidestepping to in sight
D. Only after reaching the DA

Question ID: 10628 Point Value: 1 Point Biserial: .46 Difficulty: 0.95 Categories: Flight Science Student Learning Outcomes, SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot.

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18. Austin is flying the ILS RWY 1 approach to WYS. His airplane is equipped with dual Avidyne IFD 440 receivers. ATIS is reporting 1200 overcast with 3/4 mile visibility and calm winds. He turns inbound from the procedure turn, intercepts the final approach course and descends to 9600 msl. He intercepts the glide slope and begins his descent at 90kias. At TARGY, he starts his timer. Shortly after that, he notices that his glide slope receiver has failed. What should he do? Could he continue the approach? How?

A. He should continue the approach to the DA6849
B. He should descend no lower than 7449 and proceed for 4:36 to the MAP
✓ C. He should descend no lower than 7780 and proceed for 4:36 to the MAP
D. He should immediately turn left to enter the hold at TARGY and query the controller

Question ID: 10632 Point Value: 1 Point Biserial: .25 Difficulty: 0.75 Categories: Flight Science Student Learning Outcomes, SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot.

Performance Indicator Rubric

Course: ASCI 3100 Air Carrier Operations Course Instructor: Ken Weinberg

Semester Taught: Spring 2023 Number of Students in Course: 34

FLIGHT SCIENCE CONCENTRATION

Student Learning Outcome Assessed	**Assessment Results: (Indicate what % of class achieved a minimum 70%)**	**Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")**
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	82	Y
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	88	Y
SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.	97	Y
SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot.	94	Y

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

The course just underwent a full review during the semester. I plan to go back and review the study time and will try to add more assessments built in to the presentations. There were weekly and at times daily updates on my work in the industry including a visit to United Airlines Aviate Program in Goodyear AZ. This content was posted to the students for them to read in addition to required curriculum.

**Attach description of assignment used for assessment and samples of student work.*

1.29.2023

Week #2 Findings

TO
Board of Directors of Magis Air

FROM
Consultant Team 5

CC
Kenneth Weinburg

RE
Candidate Recommendation for Chief Pilot

Selecting someone for a Chief Pilot position is important so all candidates should be considered based on their qualifications. Bob and Shirley both have great experience in the airline industry, but their different experiences certainly set them apart. Captain Bob has more hours, and has previous experience as a Chief Pilot, but he retired from that position after the previous airline had its air carrier certificate revoked. This is not a great sign especially because the cause was related to safety which is a priority for Magis. He also has experience with regional airlines as he was the training and standards manager at Eastsky Airlines. He has extensive experience flying a 747, but that is not what Magis flies, and 747's are being phased out of passenger operations. While this experience is good to have, 14 CFR 119.67 (b) says that to be a Chief Pilot the person must be an ATP and hold ratings for at least 1 of the airplanes used in the certificate holder's operations. Magis operates the EMB-175 which is a different type rating than the 747. Bob also retired 7 years ago, and if he hasn't flown in a 121 carrier since, he will not be adjusted to current operations.

Captain Shirley on the other hand, also has an ATP but has fewer hours than Captain Bob. However, her type rating on the EMB-175 and 5 years PIC more than make up for it. Referring back to 14 CFR 119.67 (b) that type rating she has qualifies her to be a Chief Pilot for that fleet. While she has never been in the position of Chief Pilot, she is well respected and has worked from the ground up. Fellow pilots would respect a Chief Pilot that has more experience in their aircraft, and someone who has worked hard to get to where they are. Captain Bob has been out of the industry for 7 years, and Captain Shirley is fresh and clearly a hard worker. Since this would be her first time, we need to look again at 14 CFR 119.67, but this time we need to look at paragraph (b)(1). This says that if someone is becoming a Chief Pilot for the first time, they need 3 years of experience within the last 6 as PIC of a large airplane under 121 or 135. She has experience in the exact plane that Magis flies she fits this requirement. Another thing to consider for a first time Chief Pilot is an experience rating worksheet. This worksheet needs FAA approval and Captain Shirley would need a minimum of 360 points to qualify. A good resource to get additional information on this would be in 8901.1 CHG 815 2-162 D2. In addition to just meeting the PIC requirements for her airline, it mentions that she was also a check airman. This is a title Captain Bob does not have and shows she can be trusted to train and check new Magis pilots. Her additional experience in the KC-46 is also helpful because it is the same airframe as the Boeing 767.
Magis plans to expand their fleet and move to international operations, and if they decide to add Boeing 767's to their fleet, her experience will prove to be valuable.

When seriously considering both candidates I think the best decision for Magis would be to hire Captain Shirley. She has much more experience on the type Magis flies which Captain Bob does not. Having this experience on your company's airplanes is very important for a Chief Pilot. Captain Bob has not worked with an airline for 7 years, and the airline he previously worked for had its certificate revoked due to safety concerns. Captain Shirley's clear drive and motivation to keep climbing the company ladder has been apparent and noticed by her peers. This would make her more personable and relatable to the pilots under her. Magis needs someone with the drive and specific experience Captain Shirley has. I think she is a strong candidate and if she continues working as hard as she has in the past, she will be a great Chief Pilot.

Thank you,

Ben Niederer

Consultant Team 5 Member

Week 2 Discussion - Key Personnel item options

You are part of a team of consultants hired by the Board of Directors of Magis Air, a Part 121 air carrier that has operated regional jets as a partner airline for Span America Airlines a legacy major airline. Span America has had its air carrier certificate revoked by the FAA and ceased operations.

The Board of Directors of Magis has decided to fill the void left by Span America and would like to grow the airline. They are focused on being the best airline in the industry for employees, customers and the general public. They strive to design the airline with an eye for "quamplurimi et quam apptissimi", that is "as many as possible of the very best". Unlike Span America, safety and compliance are paramount for them and the foundation of their operation. As ethical executives they expect sound moral judgement in the guidance you will provide to them even if it seems to conflict with their initial proposals.

Over the next 8 weeks you will be consulting them on decisions that they post to your team. You must provide them with sound advice from the content covered in that week from lectures, the text book, online references, material learned from other courses outside this, life experiences and possibly guest speakers. Discuss that advice on the discussion board and then make your final recommendation to Magis Air in bold type.

Week 2: Required Personnel, Airline Organization, Operations Manuals Issue:

Capt. Chuck Reliable has just retired and Magis Air needs to hire a new Chief Pilot. Nothing else has changed at Magis yet. They are down to

two options for candidates. Compare the two, make your recommendations and highlight any concerns you may have based on material covered in the text, lecture or other relevant information.

Option 1:

Captain Bob Bigwatch is a very experienced pilot who has an ATP rating and 15,000 hours with most of his time flying domestic, international and supplemental operations in the 747-400 for which he also holds a type rating. Some on the Board are very impressed by this because of the eventual hope to fly international long-haul flights.
Although the current Magis fleet now consists of EMB 175 regional jets. Captain Bob was the former Chief Pilot at Wingingit Airlines for 10 years up until 7 years ago when he retired. This occurred shortly after Wingingit's air carrier certificate was revoked by the FAA for Safety Concerns regarding flight operations. Prior to Wingingit Airlines, Captain Bob was the manager of training and standards and Eastsky Airlines, a Part 121 air carrier that provided regional domestic service for Wingingit, as well as Span America Airlines. He is also a decorated, retired US Navy fighter pilot flying the F-18 Hornet.

Option 2:

Captain Shirley Ujest has an ATP rating and 9,000 hours, is type rated in the EMB-175 which is part of the Magis fleet, and for the last 5 years has experience as PIC of EMB-175. This would be her first time as a Chief Pilot. Captain Shirley is well respected by her fellow pilots at Magis having worked her way up from the bottom of seniority and proven to be an excellent pilot. She has been a check airman for Magis for two years. Captain Ujest is also a USAF ANG pilot, flying the KC-46 Pegaus as aircraft commander with the 157th Air Refueling Wing out of Pease ANGB.

Team 4 Consulting

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February 4th 2023

The Board of Directors of Magis Air,

Our team has reviewed and discussed this event, and we have reached the following conclusions and suggestions.

First of all, Magis needs to ground the aircraft involved. Although these errors were made by Flemco Tecknec, 14 CFR 121.363 (a) stipulates that the carrier Magis shall be mainly responsible for the airworthiness of its aircraft, including the fuselage, aircraft engine, propeller, equipment and parts, and emergency equipment and parts shall comply with its manual. Because Magis has realized that the parts may not come from an approved source.
Therefore, the aircraft involved is no longer airworthy and it should be grounded immediately.

As for the action after the aircraft is grounded, magis can evaluate the cost and decide whether to retire the aircraft in advance. If it decides not to retire the aircraft in advance, magis needs to find out whether uncalibrated tools and/or illegal parts are used on the aircraft through the maintenance log of the lake chasing mechanic. If uncalibrated tools or illegal parts are not used, the aircraft may be put into service again. If uncalibrated tools or illegal parts are used, Magis should find another part 145 MRO audited by CASE to conduct independent inspection of Flemco Technik's work. If it is decided to retire the aircraft in advance and sell it to other airlines, the above procedures need to be repeated. After the aircraft recovers its airworthiness, it can be sold. At the same time, the maintenance records and airworthiness release of the aircraft shall be transferred to the buyer at the time of sale. Finally, magis can also scrap the aircraft in advance, which will depend on the remaining life of the aircraft and its assessment

of economic costs.

For Flemco Tecknec, we recommend that Megis immediately terminate all relations with Flemco Tecknec and continue to cooperate with companies using counterfeit parts, which will cause more potential safety problems and affect the company's reliability in the public. And we suggest that magis seek legal action against Flemco. Because according to the provisions of CFR 121.368, each maintenance provider must perform all covered work in accordance with the maintenance manual of the certificate holder. Flemco Tecknec's use of counterfeit parts violates this provision, so magis can claim compensation from Flemco through legal channels.

In general, we recommend that Magis terminate its cooperation with Flemco and ground the aircraft involved. After the aircraft recovers its airworthiness, it is decided to sell it or continue flying. Magis must not conceal the information that the aircraft uses fake parts to sell the aircraft. At the same time, Magis should sue Flemco through legal channels to obtain compensation.

Team 4

2/19/2023

RECIPIENT NAME

TO
Board of Directors, Magis Air

From Consultant Team 5

CC
Kenneth Weinburg

RE
Transitioning to join IATA

Greetings,

As Magis air consultants, we feel that a number of issues, such as crew scheduling, training, limits, rules, and more will change after studying the concerns that Magis air sent to us. For Magis to go to the next significant stage of the company, the board of directors will need to abide by new regulations. According to CFR 121.463, Magis will have to meet additional requirements for its dispatchers. beginning with the initial dispatcher training (Except that someone who has successfully completed similar training for another type of airplane in the same group merely has to complete the appropriate transition training.) Moreover, operational familiarization entails spending at least 5 hours watching operations included in CFR 121.463.
As far as selecting alternates for flag operations in accordance with 121.621, the ceiling must be at least 1,500 feet above the circling MDA if it as a circling approach required, at least 1,500 feet above the lowest published instrument approach minimum or 2,000 feet above the airport elevation, and the visibility at the airport must be at least 3 SM or 2 SM above the lowest applicable visibility minimums (whichever is greater). There is also a concern that the flight can be along a route approved without an alternate if the aircraft meets the fuel requirements of 121.641(b) or 121.645(c). The weather at the alternate airport must be suitable for the operations specified by the certificate holder. In essence, the standards for visibility and ceiling for alternate airports in flag operations are stricter than those for domestic operations, as stated in 121.619. Diversion to an airport that Magis does not frequently utilize could result in a few problems. Fuel, maintenance, baggage, equipment, and passenger care would be a significant problem. Generally, airlines have their ground crew ready to take care of the aircraft waiting for them at the destination airport. But if an aircraft had to divert for any reason to an airport that they do not usually operate in, Alliances can be useful in such situation as they can take care of the aircraft and use their ground crew. In addition, Magis need to rent out a gate of there are passengers involved in the flight. The concerns that may encounter the crew from longer flights could be the necessity to use a new aircraft, which would necessitate new training. Due to this, pilots will need to undergo new type rating training after being removed from the current existing fleet which may take months to develop. Moreover, the rules for flying time and crew rest are extensively covered in 14 CFR 121.471. For example, it states that if a pilot is to fly for more than 8 hours during a period of 4 hours, they must have a rest period that is at least twice the number of hours flown since the preceding rest period at a or before the eight scheduled hours of duty. The rest period must be at least twice as long as the preceding rest period, but not less than 8 hours. The pilot must be relieved of all duty during this rest period. It also states that if flying more than 8

hours during 24 consecutive hours, the pilot must be given at least 18 hours of rest before being assigned to further duty.
High minimums captain basically indicates that some aircraft procedures and regulations have higher minimums since the pilot of the aircraft has less expertise flying the aircraft that they are operating. For example, a pilot who has not flown the kind of aircraft they will be flying for at least 100 hours as PIC. According to 14 CF 121.652, this increases the minimum ceiling and visibility criteria for landing by 100 feet and half a mile.
Ops Spec D.095 permits the certificate holder to replace a more specified MEL with an FAA-approved MMEL. The MMEL for the aircraft would then be used by aviation routers to route aircraft to maintenance facilities capable of complying with each of the repair categories.

Thank you, Mohammed Alfawaz
Consultant Team 5 Member




Group Discussion: Week 5 Discussion

You are part of a team of consultants hired by the Board of Directors of Magis Air, a Part 121 air carrier that has operated regional jets as a partner airline for Span America Airlines a legacy major airline. Span America has had its air carrier certificate revoked by the FAA and ceased operations.

The Board of Directors of Magis has decided to fill the void left by Span America and would like to grow the airline. They are focused on being the best airline in the industry for employees, customers and the general public. They strive to design the airline with an eye for "quamplurimi et quam apptissimi", that is "as many as possible of the very best". Unlike Span America, safety and compliance are paramount for Magis and the foundation of their operation. As ethical executives they expect sound moral judgement in the guidance you will provide to them even if it seems to conflict with their initial proposals.

Over the next 8 weeks you will be consulting them on decisions that they post to your team. You must provide them with sound advice from the content covered in that week from lectures, the text book, online references, material learned from other courses outside this, life experiences and possibly guest speakers. Discuss that advice on the discussion board among your team during the week. Decide on your final recommendations and answers to the questions. Then, ONE teammember posts your final recommendation to Magis Air in a proper business response, before it is due. (I will review discussions to ensure everyone contributes fairly. Your team only needs one submission from a scribe.)

WEEK 5 - Operational Control

The Board at Magis has decided to follow your earlier advice regarding supplemental operations as well as joining IATA as part of their long-term strategy. Regardless of whether they expand or not they feel this can assist them in additional revenue significantly. Captain Shirley Ujest has been hired as the new Chief Pilot and is working with the Director of Operations on a strategy to train pilots for which they will reach out to you again in about a week. In the meantime, accomplishing the growth they expect will obviously require a new fleet, new routes and some significant changes to their Operations Center.

With this in mind they have the following questions:

1. What do they need to do to comply with 14 CFR 121.463 for this transition?
    1. What training do their dispatchers need?
2. For flight planning purposes how does flag operations differ when selecting alternates?

3. What might be some of the concerns with off-line alternate airports if they have to divert?
4. With these longer flights what concerns might crew scheduling now be faced with?
5. Changing fleets may result in "high minimums" captains. What does that mean? How might this impact planning purposes in relation to landing in bad weather?
6. Since Magis doesn't have line or base maintenance in every location that they fly to, how might aircraft routers be impacted when trying to comply with the repair categories A, B, C and D required in Ops Spec D.095 the approved minimum equipment list?

Week 6: Flight and Cabin Operations

Issue:

Recently at Magis a gate agent required a customer to gate check a bag that did not meet the size requirements in Magis' FAA approved Carry-On Baggage Program. The customer was a famous and influential politician from the airline's home district and an elite customer who voiced his displeasure. The Senior Flight Attendant and First Officer intervened and wanted to let the customer on with the bag because they determined there was room for the bag in the overhead bins so that it could be securely stowed. The gate agent explained that while there might be room the bag exceeded the approved size from Magis' FAA approved program.

What is the correct resolution to this issue that is safe and regulatorily compliant? Are there options? Cite your references in your response.

Follow up Policy Question

Post 9/11 at the creation of the TSA, the TSA established a requirement for carry-on baggage allowing only one carry on and a small personal item such as a purse or briefcase, which became known as 1+1. This was done to ensure efficiency in scanning and reduce the population of bags that could conceal weapons. If this restriction were to be lifted, Magis would have freedom to revise its carry-on baggage program. The program would still need FAA approval.

With this in mind if Magis were to consider revising their carry-on bag program from 1+1 and limiting the size to 9"x14"x22", what does your group suggest as a more effective way to manage carry-on bags?

1. Should they allow passengers to bring what they want until bins are full and too bad for late boarders?
2. Should they not allow any carry-on bags?
3. Should they charge for carry-on bags?
4. Should they be unlimited?

Consider the repercussions of your recommendation on safety as well as customer satisfaction and provide Magis leadership with options to select from and your recommended option.

Group Discussion: Week 7 Discussion

You are part of a team of consultants hired by the Board of Directors of Magis Air, a Part 121 air carrier that has operated regional jets as a partner airline for Span America Airlines a legacy major airline. Span America has had its air carrier certificate revoked by the FAA and ceased operations.

The Board of Directors of Magis has decided to fill the void left by Span America and would like to grow the airline. They are focused on being the best airline in the industry for employees, customers and the general public. They strive to design the airline with an eye for "quamplurimi et quam apptissimi", that is "as many as possible of the very best". Unlike Span America, safety and compliance are paramount for Magis and the foundation of their operation. As ethical executives they expect sound moral judgement in the guidance you will provide to them even if it seems to conflict with their initial proposals.

Over the next 8 weeks you will be consulting them on decisions that they post to your team. You must provide them with sound advice from the content covered in that week from lectures, the text book, online references, material learned from other courses outside this, life experiences and possibly guest speakers. Discuss that advice on the discussion board among your team during the week. Decide on your final recommendations and answers to the questions. Then, ONE teammember posts your final recommendation to Magis Air in a proper business response, before it is due. (I will review discussions to ensure everyone contributes fairly. Your team only needs one submission from a scribe.)

Magis leadership has decided that since they will be becoming a major airline they wish to become a "will carry" airline in regards to Hazmat/Dangerous Goods. They have several questions.

1. Which of their Ops Specs will be impacted by this change?
2. How will their Hazmat manual need to change?
3. How will this add to the pilot's training requirements if they now have to accept hazmat?
4. How will this benefit mechanics and storekeepers who need to move AOG parts that are considered hazmat?
5. The airplanes they plan to use don't have tie down points like military airplanes. Provide some options and recommendations. What is your team's recommendation for the best, most logical and cost efficient way to ensure they comply with 49CFR175.88 in regards to securing hazmat?

Performance Indicator Rubric

Course: ASCI 4900 Senior Seminar
Course Instructor: Nithil Kumar Bollock
Semester Taught: Spring 2023 Number of Students in Course: 17

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	**Assessment Results: (Indicate what % of class achieved a minimum 70%)**	**Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")**
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	100%	Yes
SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.	100%	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

**Attach description of assignment used for assessment and samples of student work.*

Assignment 1:

1) Watch the video (Case Study 1: Crossed Wires)

Case Study No.1: 'Crossed Wires' - YouTube

2) Open the links provided below. The links include the personal and organizational professionalism traits that should be practiced and implemented by individuals in aviation industry according to National Business Aviation Association (NBAA).

https://nbaa.org/aircraft-operations/safety/professionalism-in-business-aviation/personal-professionalism/

https://nbaa.org/aircraft-operations/safety/professionalism-in-business-aviation/organizational-professionalism/

Task: From the links provided, identify atleast 10 personal or organizational professional traits not practiced by the characters in the video. Also, explain the situation/scenario to justify the trait.

List of Characters:

Man 1: Roy (Mechanic 1)

Man 2: No Name (Assistant 1)

Man 3: Harry (Manager)

Man 4: Bruce (Customer)

Women 1: Leanne (accountant/auditor)

Man 5: Jonny (Mechanic 2)

Man 6: Jase (Assistant 2)

Example:

1) Maturity: Man 2 (Assistant 1) does not show qualities of responsible adult. He is not paying attention to Roy (Mechanic 1). He is texting on the phone and wearing earphones while at work.

Upload the pdf or word file in the assignment submit

Assignment 2:

Professionalism in Aviation (Week – 2)

Activity – 2

Task 1: Find an article on professionalism in aviation or where professionalism failed in aviation (15 minutes).

Task 2: Explain and debate with your group member about the importance of the article and why you think the article you found should be presented to the class. Decide as a group and confirm the article that your group want to present to the class (15 minutes).

Task 3: Present and explain one article that is critical and important to share with the class. (Each group gets 2 - 3 minutes to present the article).

Task 4: Complete the Peer Review Worksheet

Assignment 3

Name:_____Group No:

_____Date:_____ International

Aviation (Week – 3)

Activity: Prepare a Power Point Presentation (PPT) based on the criteria below. Use pictures and tables as appropriate.

Assume you are aviation ambassador's representing a country as a group at an international conference. Hence, in the PPT you are required to discuss the pros and cons of aviation aspects of your country.

Task 1: In the first 10 minutes, announce the country you are selecting for the PPT. Look for the conditions below for selecting a country. First come first serve.

Conditions for Country Selection:

- Do not select USA.
- If there is an international student in the group, then do not select the country she/he came from.

Task 2: Prepare a PPT about your country based on the questions below. The questions in red color are required by every group to be answered in their PPT. The remaining are suggestions but not limited ideas for PPT.

- Which organization regulates and controls the aviation aspects in your country.
- How many airports, airlines, aviation organizations, aerospace manufacturing companies etc. are there in your country.
- Do you think the aviation field in your country is very well developed, or do you think there is a need for development? If so, what should be developed and what do you suggest.
- Describe the aviation emphasis in the military of your country.
- Compared to the USA, where does your country stand in aviation aspects overall?
- Is there any critical information or an incident that happened in your country that should be remembered or caused a change to the aviation perspective like 9/11 in the USA?
- How many aircraft accidents happened in your country, and what is the most common cause of those accidents?
- How many flight trainings schools, clubs etc. are there in your country? How much does it cost to become a pilot? How much do pilots earn in your country?
- What is the history of aviation in your country?
- Describe the aviation security and safety aspects of your country. Is there an organization that handles the security in your country? If yes,

what are the measures implemented by that organization to attain security? If no, why there is no organization in your country and how security is provided to passengers at airports and in aircrafts?

Assignment 4

Aviation and Airport Security

Suggestions for the Debate

Videos:

https://www.youtube.com/watch?v=qu5FdrsGZoA&ab_channel=CNN
https://www.youtube.com/watch?v=hWDolIZeDyE&ab_channel=CBSN
https://www.youtube.com/watch?v=StXLEsaqx8E&ab_channel=TRUEfoe
https://www.youtube.com/watch?v=cHRdaXfWTc8&ab_channel=Denver7%E2%80%93TheDenverChannel
https://www.youtube.com/watch?v=Iwysq6TrnWQ&ab_channel=HLN
https://www.youtube.com/watch?v=LuPEcLAUOE0&ab_channel=WCVBChannel5Boston
https://www.youtube.com/watch?v=WlFjPRr88G8&ab_channel=ABCActionNews
https://www.youtube.com/watch?v=ziyW73g25kY&ab_channel=Denver7%E2%80%93TheDenverChannel
https://www.youtube.com/watch?v=s8qhLMY88vE&ab_channel=CBSDFW
https://www.youtube.com/watch?v=ddAZA-l64-0&ab_channel=WXYZ-TVDetroit%7CChannel7
https://www.youtube.com/watch?v=i-9R8Zg5nQ0&ab_channel=CNN
https://www.youtube.com/watch?v=5yKeufLazdc&ab_channel=FoxBusiness
https://www.youtube.com/watch?v=SRCj9BiwYwQ&ab_channel=CBSDFW
https://www.youtube.com/watch?v=MpbJ1fhwBdE&ab_channel=FOX9Minneapolis-St.Paul
https://www.youtube.com/watch?v=0AgvjeLD8L4&ab_channel=FoxNews
https://www.youtube.com/watch?v=4e6GW6fRX_E&ab_channel=NBCNews

Questions:

- Did TSA employees cross the line or are they just doing their job? What do you think about the pat-down procedures? Are they important? If yes, why? If no, why? Did pat-down procedures become a cliché (losing the actual meaning)? Do you support the TSA employees or the passengers in the videos? Who should be enlightened: is it the passengers or the TSA employees? How and why? Do you think TSA officers

needs more training or are the passengers that needs more awareness about the importance of security procedures?

- Is TSA following its mission? Are the TSA employees doing their duty effectively? Is TSA failing? Do you think TSA should be replaced? Do you support privatizing airport security? What are the advantages and disadvantages of privatizing airport security in your opinion? Is TSA maintaining or implementing required security measures to attain security? If not, do you have any suggestions for TSA on how to attain more security?
- Why is aviation security an important topic? What are the challenges that aviation security is facing?
- What is the most important security threat in your perspective that aviation or airports are facing today? (Ex: insider threat, terrorism, inflight disruptions, etc)
- Are TSA being more aggressive or are they doing their duty?
- What are the different technologies implemented at airports for security?
- What are the different kinds of crimes that happen at airports?
- How many crimes did TSA stop till now?
- How many crimes took place in all USA airports?
- Do we need to increase security at airports and is it useful?
- What different technologies do you suggest to increase the security at airports?
- What are your comments on passenger's comfortability vs TSA security screening?
- Is there a possibility that a security breach could occur with current security measures implemented at the airports and in-flight?
- What are the security measures implemented in the aircraft flying in the air?
- Some people do not feel comfortable due to pat-down screening. What do you suggest we should do to make those passengers feel comfortable or do you suggest any other method or technology better than pat-down?
- Do you think it is possible to zero down the security breaches in airports and flights?
- Which airports have very fewer security measures?
- Provide statistics on airport crimes like smuggling, trafficking, guns, etc.
- Is it true that TSA will disappear someday and what do you think will happen then or how will the security be attained then?
- What is a 3-1-1 rule and are there any other rules and regulations of TSA like this?

- Explain airport security screening procedures. What are canines? Are canines important? If so why? What do canines do?

Assignment 5

Career Tests:

Task 1: Complete the Princeton Career Quiz. Create an account to see results. https://www.princetonreview.com/quiz/career-quiz

Once you get the quiz results. You will see two aspects: “Your Interest” and “Your Style”. Identify the colors associated with your interests and style. Read the activities and strengths you identified based on color you get. Now select “Print” by pressing right click or select “Ctrl + P”. Save the file as PDF and submit in Canvas.

In the next tab you will see recommended careers. Review the careers.

Task 2: Complete the O*Net Interest Profiler. https://www.mynextmove.org/explore/ip

After getting the results, you will see an option to “Print”. Select the print option and save the report. Read the report and submit in the Canvas. Select “Next” and review the “Job Zones” and “Careers”

Task 3: Go to https://www.careeronestop.org/Toolkit/ACINet.aspx

Under “Training” tab select “Certificate Finder”. Search a profession in the “Search tab”. Example: Aviation Management Professional. You will find certifications associated with the profession. Not all certifications are related. However, you might find something interesting. Task is to review the certifications and learn. There is no submission for this task.

Task 4: Go to https://www.queendom.com/tests/access_page/index.htm?idRegTest=3296

Complete the Ambition Test. At the ends you when you select “Score my test” you will see the results. Select “View Sample Report” in blue color. A new tab will open. Read the report. Select the “Details” option and save the report in pdf.

Task 5: Go to https://www.myskillsmyfuture.org/.

Enter a career that you had pursued and find the career matches. Save the results as pdf by selecting “CTRL+P”. Submit the results as pdf in canvas.

Task 6: Go to https://www.myplan.com/index.php.

Create an account. Go to Assessments tab in the top. You will see “Career Values Assessments” test for free. Remaining will be priced. Do not do them. Just complete the Career Values Assessments. Submit the “Work Value Clusters” you attained as results. Read the result. Save the results as pdf and submit in

Canvas.

Assignment 6

Final Exam Questions

Due: 5/12/2023 (11.59 PM CST)

(Note: References must be included as appropriate)

1) **Sustainability in Aviation (20 Marks)**

- What are the roles and responsibilities of aviation stakeholders (government institutions, airlines, aircraft manufacturing companies, fuel producers, and aviation fuel distributers) in promoting Sustainable Aviation Fuels? **(150 Words)**

(Hint: Refer to Sustainable Aviation Fuels Guide of ICAO)

- Read the article "*Business Aviation and Sustainability: An Industry with a Good Story to Tell"* and provide your summary. **(150 words)**

Link to Article: https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2019/ENVReport2019_pg177- 181.pdf

2) **Aviation Environmental Issues (20 Marks)**

- Define FAA CLEEN and CLEEN II programs? Explain the developments of different manufacturing companies involved in CLEEN? **(150 words)**

(Hint: Refer United States Aviation Greenhouse Gas Emissions Reduction Plan)

- Provide different electric and hybrid-electric large commercial aircraft projects in United States. Describe the details and technical specifications of each project like category, MTOW, range, seat capacity, speed, payload, entry in service, etc.

(Hint: Refer to Electric and Hybrid Aircraft Platform for Innovation (E-HAPI))

3) **Aircraft Maintenance and Importance (20 Marks)**

Watch the videos and provide your insights about each video in 50 words.

- https://www.youtube.com/watch?v=abVTKt2Db_0 **(50 Words)**

(**Title:** Dealing with Challenges in the Aircraft Maintenance Business – AIN)

- https://www.youtube.com/watch?v=0OEt6SkdA4M **(50 words)**

(**Title:** You Can't Fly Without Us - The World of Aviation Maintenance)

- https://www.youtube.com/watch?v=xmiGL-1qvuE **(50 words)**

  (Title: Federal Aviation Administration on Aviation Maintenance**)**

4) Aircraft Accident Investigation (20 Marks)

*Read the **Case Study -1** document attached in the Canvas and complete the **worksheet** which is at the end of the document and post your answers here.*

CHAIN OF EVENTS 1)

2)

3)

4)

5)

6)

7)

8)

SAFETY NETS 1)

2)

3)

4)

5)

6)

7)

8)

5) **Careers in Aviation and Aviation Management (20 Marks)**

- What is the job or career that you wish to pursue after graduation or in the future? Describe the importance of that job in aviation. **(150 words)**
- What are the roles and responsibilities of the job that you want to pursue?
- Why do you want to pursue that job? Provide any statistics related to the job like salary, number of job available in the USA, racial diversification, etc. (Provide references) **(150 words)**
- Research and provide five best job searching (posting) websites for aviation jobs?

Assessment 1

Name:_____Group No:_____Date:_____

Peer Review Worksheet – 1 (30 Points) Activity – 1 [Professionalism in Aviation (Week – 2)]

List the traits identified by you and your group members (10 Points)

Your Name:	Name:	Name:

Evaluate the Performance and Contribution of your Group Members (20 Points)

Group Member Name:

- *Give a score to your Group Member*

1	2	3	4	5	6	7	8	9	10

- *Justify the score you gave to your Group Member. Why did you give this score?*

Group Member Name:

- *Give a score to your Group Member*

1	2	3	4	5	6	7	8	9	10

- *Justify the score you gave to your Group Member. Why did you give this score?*

Assessment 2

Name:_______________________________Group No:________Date:________

Peer Review Worksheet – 2 (30 Points) Activity – 1 [International Aviation (Week – 3)]

Evaluate the Performance of Other Groups on their Presentations.

Group Number _______________

Give a score to the Group

1	2	3	4	5	6	7	8	9	10

Justify the score you gave to the Group. Why did you give this score?

Group Number _______________

Give a score to the Group

1	2	3	4	5	6	7	8	9	10

Justify the score you gave to the Group. Why did you give this score?

Group Number _______________

Give a score to the Group

1	2	3	4	5	6	7	8	9	10

Justify the score you gave to the Group. Why did you give this score?

Group Number _______________

Give a score to the Group

1	2	3	4	5	6	7	8	9	10

Justify the score you gave to the Group. Why did you give this score?

Final Exam Questions

Due: 5/12/2023 (11.59 PM CST)

(Note: References must be included as appropriate)

1) **Sustainability in Aviation (20 Marks)**

   - What are the roles and responsibilities of aviation stakeholders (government institutions, airlines, aircraft manufacturing companies, fuel producers, and aviation fuel distributers) in promoting Sustainable Aviation Fuels? **(150 Words)**
     (**Hint:** Refer to Sustainable Aviation Fuels Guide of ICAO)

Answer:

In promoting innovation in the biofuels industry through research and development, there are diverse stakeholders that directly involved to achieve the development and deploying SAF such as government institutions (ie. civil aviation authorities, environmental , regulatory and financial agencies and research and development institutions), airports, airlines, aircraft and associated equipment manufacturers, fuel producers and aviation fuel distributors. These are the roles and responsibilities of aviation stakeholders:

- **Government Institutions**
  - Governments define and create public policy with the goals and targets needed to develop a SAF market, to evaluate the impacts, benefits and implications, and coordinate the different public agencies and institutions needed to achieve them. They cooperate with the private sector to achieve this goal.
  - The national government is also to develop and implement measures to improve the economic feasibility of SAF projects to mitigate risks generally associated with innovation.
  - The other actions to reduce risk perception are information and demonstration programs, such as developed in Mexico by ASA, a federal agency in charge of management and operation of Mexican airports, including aviation fuel supply.

- The other role of the government is to control or fund support research and development institutions and encourage them to participate in SAF initiatives.
- Government also controls some practical and operational aspects of promoting the use of SAF, focusing on economic competitiveness and logistical issues
- They also initiative to foster the development of a SAF market.

- **Airlines**

  - Many airlines participated in the development of SAF.
  - Support the use of SAF in reducing the fuel emission even though the cost might be higher. Many airlines have used alternative fuels during their flights in order to support environmental sustainability.
  - Join other airlines organizations in the aviation industry to promote the technology and also develop and deploy SAF.

- **Aviation Equipment Manufacturers**
  - Participate in the development of SAF
  - Aircraft manufacturers have sponsored national studies on perspectives for the production and use of SAF, assessing feedstock production, processes, logistics and legislation for introducing drop-in SAF.
  - Aircraft manufacturers have also supported and followed several experimental flights using alternative fuels on their aircraft.

- **Fuel Producers**
  - Produce a sustainable fuel such SAF
  - Fuel producers should make sure that SAF meets the same high quality standards as CAF.

- **Aviation Fuel Distributors**
  - The distributor also participate in the development of SAF
  - As suppliers and handlers of SAF, they must have the knowledge to comply with the regulations and procedures required by the aviation fuel market.

- Read the article "*Business Aviation and Sustainability: An Industry with a Good Story to Tell"* and provide your summary. **(150 words)**

Link to Article: https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2019/ENVReport2019_pg177- 181.pdf

In this modern world with all the environmental issues, the aviation business industry has been investing their effort in making the environment more sustainable. As global business aviation operations have an impact in creating CO2 emissions, they have been committed to ongoing exploration of new methods and technologies to significantly reduce the greenhouse gas emissions from aircraft. For instance, business aircraft that used winglets, advanced aerodynamics, state of the art avionics, and to demonstrate improved fuel burn from engines. One of the most promising ways for reducing CO2 emissions with today's business aircraft is through the use of sustainable aviation fuels (SAF). By using SAF, the benefit effect is a cleaner burn and commensurate reduction of overall CO2 emissions over the life-cycle of the fuels' manufacturing process, and using the renewable resources creates more environmentally friendly. There are three important aspects of SAF use: that such fuels for business aviation are safe, approved and available for use. Therefore, it is crucial in spreading the awareness in the aviation industry of using SAF for a more sustainable aviation environment for the future and to mitigate and reduce carbon emissions.

2) Aviation Environmental Issues (20 Marks)

- Define FAA CLEEN and CLEEN II programs? Explain the developments of different manufacturing companies involved in CLEEN? **(150 words)**

(**Hint:** Refer United States Aviation Greenhouse Gas Emissions Reduction Plan)

Answer:

Continuous Lower Energy, Emissions, and Noise (CLEEN) program is the FAA's principal environmental effort to accelerate the development of new aircraft and engine technologies that will reduce noise, emissions, and fuel burn. The FAA

partners with the aviation industry via a cost-sharing approach to enable the industry to expedite integration of these environmentally beneficial technologies into current and future aircraft with less noise, fewer emissions, and use less fuel. Different manufacturing companies involved in CLEEN are:

- Boeing

The CMC nozzle has the potential for 1 percent fuel burn savings- enabling hotter, more efficient engines-while allowing for noise reduction treatment and reducing nozzle weight.

- General Electric (GE)

Trajectory synchronization will provide pilots and controllers better predictability of an aircraft's location, enabling fuel savings through more efficient aircraft routing.

- Honeywell

Honeywell completed engine tests of a number of its CLEEN technologies validating their capability of increased engine temperature and efficiency. The Honeywell CLEEN technologies will contribute 5 percent toward an overall 15.7 percent reduction in fuel burn resulting from an engine upgrade relative to baseline engine technology.

- Pratt & Whitney (P&W)

The P&W built wind tunnel for a ultra-high bypass ratio geared turbofan engine which is projected to reduce single aisle aircraft fuel consumption by 20 percent relative to a CFM International, CFM56-7 engine and reduce noise by 25 dB relative to the Stage 4 noise standards.

- Rolls-Royce

Rolls-Royce completed CMC turbine blade tracks (shrouds) component tests. This technology, along with RollsRoyce's dual wall turbine vane, is aimed at increasing thermal efficiency in the turbine section of the engine. Technology benefits from Rolls-Royce's work will realize up to a 1 percent reduction in fuel consumption.

- Provide different electric and hybrid-electric large commercial aircraft projects in United States. Describe the details and technical specifications of each project like category, MTOW, range, seat capacity, speed, payload, entry in service, etc.

(**Hint:** Refer to Electric and Hybrid Aircraft Platform for Innovation (E-HAPI))

- **The general aviation/recreational aircraft group** consists of aircraft with MTOW from 300 to 1000 kg. These are mostly electric powered aircraft with a seat capacity of two. This category includes aircraft which are already produced and certified.
- The aircraft under **the business and regional aircraft category** claims a longer flight range close to 1000 km with increased seat capacity (around ten).
- **The large commercial aircraft category** includes initiatives focused on hybrid-electric, single-aisle aircraft with seat capacities of 100-135 and targeted entry into service after 2030.
- **The VTOL (Vertical Take off and Landing) category** made significant progress over recent years, with seat capacities from one to five, MTOWs between 450 and 2200 kg and projected flight ranges from 16 to 300 km. These aircraft projects are only electric powered and aim to entry into service in the period of 2020-2025.

3) Aircraft Maintenance and Importance (20 Marks)

Watch the videos and provide your insights about each video in 50 words.

- https://www.youtube.com/watch?v=abVTKt2Db_0 **(50 Words)**

(**Title:** Dealing with Challenges in the Aircraft Maintenance Business – AIN)

There are issues of shortage in aircraft maintenance/technicians in the aviation industry due to the lack of skilled technicians, the past experience of them didn't get treated well from the industry as well as the low interest of young

people in pursuing a career in this area of aviation. Even though aircraft maintenance workers are a crucial part of the aviation industry as they build fixed aircrafts to be used in the business and for transportation within the nation, this issue created concern for everyone such as maintenance companies, airlines, customers and the industry as a whole. Maintenance is one of the biggest cost items associated with operating business aircraft to ensure safety as the labor rates are climbing to $200-$300/hr due to the needs of skilled and certified technicians/maintenance personnel. Other than cost, two other factors of choosing the provider: the convenience of location of the maintenance provider, the ability to get aircraft into service on time. As for service providers that want qualified technicians, required maintenance personnels understand the aircraft model, which will create better quality and decrease the costs and make sure to have the right training.This made the technicians want to pursue technician career in other industries.

- https://www.youtube.com/watch?v=0OEt6SkdA4M **(50 words)**

(**Title:** You Can't Fly Without Us - The World of Aviation Maintenance)

Aircraft maintenance is as important as air travel even though they are the least known and understood part of aviation. Planes can't fly without maintenance because they maintain, build, repair, overhaul the aircraft, aircraft parts and components to make it safe and ready to be used. Maintenance and aircraft technicians/specialists work on complicated technologies that are deployed in the airplane which will bring safety, reliability, comfort and operational performance. The industry needs different specialists in different areas to work on aircraft as there are different parts of equipment in a plane. Aviation maintenance industry is crucial to both safety and economy. Global maintenance market is expected to grow which means opportunities for people looking for existing careers and jobs.Therefore, aircraft maintenance, technicians, specialists in aircraft parts are crucial individuals in maintaining safe, and effective aircraft that affect the industry success as a whole.

- https://www.youtube.com/watch?v=xmiGL-1qvuE **(50 words)**

  (Title: Federal Aviation Administration on Aviation Maintenance**)**

There are endless opportunities in the aviation industry that we can pursue whether right after graduating high school or bachelor and making a good salary by working for companies. There are many different aviation programs opportunities launched by the FAA, airlines and other aviation organizations that we can join and connect in pursuing our career in aviation including maintenance.

4) <u>Aircraft Accident Investigation (20 Marks)</u>

*Read the **Case Study -1** document attached in the Canvas and complete the **worksheet** which is at the end of the document and post your answers here.*

<u>CHAIN OF EVENTS</u>

1) A few days prior to the day of the accident, the aircraft was grounded for 36 hours for a repair to the radar system. During this down time, while waiting for parts, the 125 hour "A" check was begun (32.5 hours before it was due) and the recorded tire pressures indicated two(#1 & #4) were low. A planned four hour maintenance stop was commenced which called for changing 5 tires, however it didn't happen and the tires were loaded into the aircraft instead after a call from the project manager. Routine post-flight maintenance was carried out on the same day.

2) On the day of the accident, the lead mechanic carried out a pre-flight check, and requested nitrogen for a low tire. The request was made to a support facility who informed them that the nitrogen bottles were empty. The project manager then told them to ignore it and the flight engineer signed the pre-flight check as having been completed on the maintenance release while the lead mechanic and project manager boarded the aircraft.

3) The airline was lined up for take-off from Runway 34L at Jeddah, Saudi Arabia with 247 passengers and 14 crew members on board. As the airline began their take-off run, an oscillating sound was heard. The conversation between the first officer and captain demonstrated there might be an issue with the tire, however it was ignored.

4) During the take-off roll, the front tires, then the front wheels failed on the main undercarriage and remnants of the failed tires were burning when the landing gear was retracted after take-off.
5) After the brake release, the flight engineer reported the four low pressure lights warning which resulted in losing pressurization, but the captain ignored it. The first officer requested flaps ten and the captain contact tower to inform them about the slight pressurization problem. However, the tower mistook them with another airplane and didn't give clear instructions about the emergency situation.
6) The spoiler lights, gear unsafe light were on, and losing hydraulics which the first officer tried to solve the problem by putting up the flaps and the airbrake broke. While, the captain was doing all the radio transmissions and was not using the aircraft callsign.
7) A fire developed within the main gear wheel wells causing loss of pressurization, loss of hydraulics, structural damage and finally loss of control of the airplane. As the captain had a contact tower regarding the emergency situation, the controller just realized that the DC8 and not the B737 was in an emergency situation after all the confusion and gave a heading to intercept the final approach.
8) During the final stages of the approach to runway 34C, witnesses reported a significant increase of fire and smoke and the aircraft dived at high speed and angle and rolled to crash 2,875 meters short of the runway threshold. There were no survivors.

SAFETY NETS

1) The maintenance should be done according to procedure, for instance they should be aware that the recorded tire pressures indicated two(#1 & #4) were low and tried to repair it. Other than that, they should have changed the 5 tires instead of delaying it even though the project manager told them to go back because by the time they do the post-flight maintenance, they would be tired and not work effectively. There is power distance that should be addressed between the project managers and mechanics as well.

2) The nitrogen bottles shouldn't be empty in the first place and the support facility should have kept track of this and filled the nitrogen bottle. In addition, the flight engineer should not have signed the pre-flight check as having been completed on the maintenance release when in fact, there is need for nitrogen for the low tire. It was not following the procedures of pre-flight correctly. And the most important is, they should have not ignored the fact that the tire was flat and needed nitrogen just because they were running on time.
3) When they hear the oscillating sound and have the suspension that there might be an issue with the tire, they should not have ignored the sign and instead communicate the issue themselves and with the engineers in identifying the issue.
4) The flight crews should have situational awareness and pay close attention to flight instruments. Even though they can't see clearly the physical situation outside of the aircraft, the indication of flight instruments would tell them what was going on with the aircraft.
5) When the flight engineer saw the low pressure lights warning, they should have realized that there are huge issues they are facing and immediately should have requested an emergency landing instead of ignoring and telling the tower they had a slight issue. They didn't think ahead in solving the problem, therefore they have team resource management training and how they should think ahead about what is the right move when facing an issue. The communication between the captain and the tower also should be more clear, so there is no misunderstanding between them.
6) When facing the pressure situation, the flight crews should calm first, so they can think clearly before making a decision. The captain didn't identify his call sign which confused the tower which made the emergency procedure solution longer to be implemented. Clarifying our call sign is crucial especially in an emergency situation. After realizing they are losing most of the flight control, they should make a quick decision in landing the airplane instead of waiting for instructions from the control tower who was confused about their airplane. They should not stay longer on the air and follow emergency procedures right away.

7) In this situation, the best decision is to land right away and look for the best first and best field to land as they already lost all the flight control and not trying to go back to the airport which is quite a distance in return.
8) It is crucial to be aware of the situation around us whether it is in the cockpit, cabin when flying and ground. Follow the right procedure without skipping, or ignore them because it exists to provide the safety operation. The communication between flight crews, towers and people on the ground should also be effective. Lastly, the power distance between each role creates lack of communication, therefore it is crucial to speak up about the situation if we think it wasn't right.

5) Careers in Aviation and Aviation Management (20 Marks)

□ What is the job or career that you wish to pursue after graduation or in the future? Describe the importance of that job in aviation. **(150 words)**

After graduation, I would like to pursue a career in aviation specifically as a flight attendant or customer service representative either in the airport or airline companies. I have passion for aviation as well as helping others, thus I choose to pursue my dream in a job where I can combine both areas of my passion to work in the aviation industry where I can engage and communicate with others. I believe flight attendants and customer service representatives are crucial in aviation because as flight attendants, they keep passengers safe, ensuring that everyone follows security regulations and that the flight deck is secure. Flight attendants also try to make flights comfortable for passengers. Similarly, airline customer representatives are also important because they provide information and assistance to the flying public and also provide assistance to passengers in emergency situations such as weather events, security breaches, train failures, and security level changes. In addition, they also help customers with flight reservations, itinerary changes, baggage concerns and questions about customer loyalty programs. Therefore, I would love to pursue my career in these areas in aviation, then I will shift my areas of interest to the aviation management field when I have more experiences.

- What are the roles and responsibilities of the job that you want to pursue?

The roles and responsibilities of Flight attendant and customer services representatives are:

- **Flight Attendant**
  - Responsible for ensuring the safety, security, and comfort of airline passengers. The Flight Attendant provides customer service while creating a welcoming environment for passengers before, during, and at the conclusion of each flight.
  - Participates in pre-flight briefings to discuss flight details, weather, and service plans.
  - Performs pre-flight safety checks.
  - Prepares aircraft between flights, ensuring cabin areas meet cleanliness standards.
  - Ensures food, beverages, and other supplies are on board and sufficiently stocked.
  - Greets passengers, assists with prompt location of seat assignments, and ensures all carry-on luggage and personal items are properly stowed in overhead or under-seat storage.
  - Provides instruction on safety/emergency procedures; demonstrates the proper use of seat belts, oxygen masks, and flotation devices.
  - Delivers in-flight food and beverage services, collecting payment as required.
  - Answers passenger questions about flight information (time, service, aircraft details, weather, delays, etc.)
  - Responds to any in-flight emergencies by providing necessary assistance to passengers including administering emergency first aid and completing reports on any injuries or incidents.
  - Assists passengers with safe and efficient exit of the aircraft.
  - Prepares flight reports.

    - Maintains current awareness and knowledge of established airline safety and security guidelines.
    - Performs other related duties as assigned.
- **Airline Customer Service Representatives**
    - Demonstrate a refined level of Customer Service
    - Check-in passengers for flights at the ticket counter, assign seats, issue boarding passes and verify passenger identification and travel documents
    - Tag passenger bags to correct destinations
    - Board passengers onto flights, tag gate checked bags and verify travel documents
    - Make pre-boarding and general boarding announcements
    - Monitor carry-on luggage and operate jetways, canopies and aircraft doors
    - Assist all passengers with special needs including passengers in wheelchairs, unaccompanied minors, visual and hearing impaired passengers
    - Assist arriving passengers and oversee the Domestic and International Arrivals baggage area
    - Verify identification and direct connection passengers through the airport
    - Provide assistance to passengers whose baggage is mishandled or damaged
    - Maintain accurate records and update passenger files
    - Complete detailed and Accurate pre departure paperwork, including Weight and Balance.
    - Assist other CSR's where required in performing other functions
    - Actively participate in Porter's Safety Management System (SMS) including, reporting hazards and incidents encountered in daily operations; understand, comply and promote the Company Safety Policy

- Other Duties as assigned

□ Why do you want to pursue that job? Provide any statistics related to the job like salary, number of job available in the USA, racial diversification, etc. (Provide references) **(150 words)**

I want to pursue jobs as a flight attendant and airline customer service representative because I want to meet many different people from all over the world, improve my communication skills and self-confidence as well as other professional skills that I can use to provide the best and safe environment for people who travel. Some of the statistics related to these two jobs are:

- Flight Attendant
  - Salary: Average: $50,198/yr

Average Male: $57,928/yr Average Female: $47,774/yr

  - Number of Job available in the USA: 46,135 jobs
  - Estimated Job Growth: 17.3%
  - Racial diversification: White (non-hispanic): 62.5%

Black (non-hispanic): 13.4%

Asian: 6.71%

Others: 2.42%

  - Composition by sex: Male: 26.3k

Female: 84k

  - Age by sex: Average Male: 44.8

    Average Female: 46.1

  - Education Major: Business: 24%

Communications: 11.3%

Education: 10.2%

Transportation: 1.75%

- **Airline Customer Service Representatives**
  - Salary: Average : $26,000-$34,000/yr

Average Male: $30,978/yr Average Female: $30,142/yr

- Number of Jobs available: 27,306 jobs

Transportation: 45%

Technology: 11%

- Racial Diversification: White: 47.7%

Hispanic or Latino: 24.6% Asian: 11.1%

Black or African American: 9.2%

- Gender: Female: 59.1%

  Male: 40.9%

- Age: 40+ years: 62%

  30-40 years: 23%

  20-30 year: 14%

- Education: Bachelor: 36%

High school diploma: 26% Diploma: 7%

Other Degrees: 6%

□ Research and provide five best job searching (posting) websites for aviation jobs?

- NBAA jobs

Website: https://jobs.nbaa.org/

- JS Firm: Aviation Job Search

  Website:https://www.jsfirm.com/searchjobs?gclid=Cj0KCQjwpPKiBhDvARIsACn-gzBYD7zLgS2xriuyh383VddvhCihxrhbR3DAb4p-JnDmWAhvb8AP-DEaAtkDEALw_wcB

- Aviation Job Search

Website: https://www.aviationjobsearch.com/

- Aviation Jobs Me

Website: https://www.aviationjobs.me/

- Business Services Jobs/Flight jobs

Website: https://jobs.flightglobal.com/jobs/business-services-1/

- Indeed

Website:https://www.indeed.com/q-Aviation-l-St.-Louis,-MO-jobs.html?vjk=6bc65cf403984a52

References:

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- https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2019/ENVReport2019_pg177-181.pdf
- https://www.faa.gov/about/office_org/headquarters_offices/apl/eee/technology_saf_operations/cleen
- https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/media/2015_us_action_plan_final.pdf
- https://www.icao.int/environmental-protection/Pages/electric-aircraft.aspx
- https://www.shrm.org/ResourcesAndTools/tools-and-samples/job-descriptions/Pages/Flight-Attendant.aspx#:~:text=The%20 Flight%20 Attendant%20is%20 responsible,the%20conclusion%20of%20each%20flight.
- https://porter.rivs.com/careers/portercareers/40-40-52/
- https://datausa.io/profile/soc/flight-attendants https://www.zippia.com/airline-station-agent-jobs/demographics/

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Engagement and Productivity Certification

for the successful completion of the Engagement and Productivity Certification requirements

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Certificate of Completion

Presented to:

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for the successful completion of the Leadership and Management Certification requirements

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Completion Date: 2023-04-30

www.predictiveindex.com

Reflection on Guest Speakers - Tyler Lambert

I've known Nick and Abbi for a couple of years now, both being previous safety committee members. I keep in contact with them, speaking with Nick at least once a week. Consequently, it's interesting seeing a formalized presentation of what they've both told me about casually. Both professions they went into have their own quirks, and they did a great job showcasing just how diverse career paths can be when it comes to aviation management.

Nick's job is in a niche I considered. It may be a little cliche to say, but anything in sales is in my blood. My dad is a real estate agent, and I've grown up around that sort of dynamic, so it's familiar to me. However, after hearing Nick's description of just how hard of a job it is, I can safely say I won't be considering Nick's job as a potential career path. I appreciate how honest he was with us in the challenges associated with cargo charter sales, from the infinite problems that can occur during shipping, to the grind associated with building business relationships. I think the thing I'd find most frustrating working Nick's job is having to constantly sell a service to individuals who may not know the true value of what you're trying to sell them. However, I really do think the job has a lot of great benefits and can be a great opportunity to the right person, and being able to fly on so many amazing cargo jets all around the world must be extremely exciting!

Abbi's job sounds interesting, especially if you have family or a background in the military. Her presentation lined up very well with Nick's if you think about it. She's involved in sales just like he is, just in a different facet of the industry. She builds relationships with other companies on behalf of Collins to help acquire orders for the parts and tech manufactured by the company. On the other hand, Nick works with a sales broker company who may be indirectly involved in the transport of some of those parts or the machines that build those parts! It's fun to think about how everything is connected.

Thinking about it from the perspective of my job working at a Part 121 carrier, I also play a part in the greater aviation industry. For instance, Abbi may need to take a trip to a different city to build working relationships with potential customers, and she may end up flying on a GoJet aircraft in the process! After Collins makes a sale, there very well may be an oddly shaped machine or part that needs to get somewhere quickly for the manufacturing process, and, somewhere far upstream in the manufacturing process, the company Nick works for may be indirectly involved in that process.

Name: Jacob Flowers

HR Manager Task Activity

Task: *Complete Section-1 (20 Marks) & Section 2 (20 Marks)*

Section 1: Review your friend's resumes and grade them (***Do not grade your own resume***). Write down any comments on the resumes in the comment's column.

- Grade A - Excellent
- Grade B - Good
- Grade C - Average
- Grade D - Bad

Resumes	Grade (A, B, C, D)	Comments
Resume - 1	**C**	- This has all the right information; it just seems as if it needs better organization and cutting down details of jobs worked - I would find a way to bring this down to a page by combining some of the extracurriculars and creating borders between sections
Resume - 2	**B**	- Better separation of sections needed - Overall, really good that it is down to a page and the way everything is organized is good
Resume - 3	**C**	- I think the fonts needs to be changed, and information needs to be more centered, a bad print job would cut off the top information - Lots of good experience, just need to make sure the top

		has the most important information to grab the employer
Resume - 4	**B**	- I like the color and fonts, it's a unique choice and stands out among others. - I don't think the soccer experience is necessary here, and removing/condensing it would bring it down to a page
Resume - 5	**B**	- This a good looking, unique resume, I would remove some of the dead space at the top - I would play around with the fonts to see if minor adjustments make it look better
Resume - 6	**C**	- I think this resume would benefit from borders. - I'd recommend cutting down and condensing your experience, so the most relevant information sticks out
Resume - 7	**C**	- There is a bit of dead space and it ends up hurting the spacing of the resume - I like the template, it just needs to be more unique to you
Resume - 8	**B**	- A really unique resume, it does pop, the font and background compliment the just right amount of color and gradient.

		- Be mindful of how close of the paper is to the cutoff line if this were to be printed out
Resume - 9	**C**	- The concise nature of the resume is awesome, it just needs to be made unique - Find a way to cut the dead space and it will tighten the resume up even better
Resume - 10	**C**	- Find a way to highlight the military experience more, a lot of employers are looking for that in aviation and it makes it more unique - The length is really good, just need to find a way to make the resume more unique
Resume - 11	**B**	- A lot of really good organizing going on, but creating some space and downsizing a couple of sections would make it even better - Having your name at the top of the resume would help you stand out, I imagine it was removed for the sake of this project
Resume - 12	**N/A – My own Resume**	- I have been making continuous adjustments to the specifics of my resume, particularly on applications for jobs, this resume was specifically crafted

		for Procurement and Quality Specialist positions at aircraft manufacturers and FBOs. - I need to specialize my resume more and add in Some Graphic designs to make my Resume stand out more
Resume - 13	**B**	- From a graphic design perspective this is a really awesome resume, it grabs you, and has just the right amounts of differing graphics - Some things run off or cut off, I'd just take a closer look at the formatting
Resume - 14	**C**	- Cutting things down to just a page would be helpful and removing dead space. - I like the timeline idea, but I think it takes away from some of the other relevant experience
Resume - 15	**C**	- Reworking some of your experience would be good, including employer information and a timeline of your work experience - The key skills area could be expanded on, tie it into courses and projected completed at SLU
Resume 16	**C**	- I would try to condense this resume and cut down on

		some of the skills/combine them for work experience. - Bring your education section to the top of the paper, and maybe incorporate some of your skills into the descriptions

Section 2: Now, after grading your friend's resumes. Proofread your own resume and write down any changes you think should be made to your resume based on your experience from reviewing your friend's resumes. (***Do not grade your resume***)

Example:

- I believe I should change the font size in my resume.

Diversity in Aviation Article Summary

The article begins by discussing different percentages of underrepresented groups within the aviation industry (Johnston, 2022). All of these percentages for women, Black, African American, Asian, Hispanic, and Latino all fall between 1.5% on the low end and 6.1% on the high end. Aviation would like to take more conscious steps to make this disparity not as prevalent within the industry. This article discusses how the industry can approach including more diversity, equity, and inclusion with their respective spaces.

Women's groups are at the forefront of the fight to have more diversity within the aviation industry (Johnston, 2022). Organizations are now starting to provide content to help students from low-income backgrounds have access to STEM textbooks.

As time has progressed, there is a bigger emphasis being placed on equity versus equality (Johnston, 2022). Society is starting to notice that even if the same resources are available to everyone, they are still not being put to the best use. Equity takes into account everyone's different backgrounds and as this applies to aviation, we are able to give extra resources to the backgrounds mentioned above and help them make a way into the aviation industry. If we were to provide these resources for everyone, I think that the disparity in certain backgrounds being represented would persist.

Another aspect to this idea is inclusion, as the article mentions inclusion isn't just about letting other people into space but having them feel welcomed (Johnston, 2022). I mentioned this as one of my diversity ideas to have a mentoring program so that underrepresented individuals feel welcomed when they enter an organization. Inclusion is the final step, in my opinion, to opening up a space to people who originally did not dominate it. It's the step that shows that diversity is persisting. For example, if we were to count the amount of underrepresented people who were being hired, that would not account for turnover of those individuals. Instead, inclusion is the active thought of not just hiring these underrepresented

groups but making sure they stay around and are actually able to change the culture of the company they joined.

To conclude the article, the author gives suggestions as to how we can create a more diverse aviation industry (Johnston, 2022). These suggestions include things such as open communication, have information about the current climate of the organization, and always be willing to reevaluate your program to make it more diverse, equitable, and inclusive. These are intangible topics that may not change the aviation industry overnight but hopefully wakes up some people to the idea that things should be looked at through a DEI lens.

Reference

Johnston, M. (2022, September 29). Diversity, equity, and inclusion in aviation. California Aeronautical University. https://calaero.edu/diversity-equity-inclusion-dei-aviation/.

1. Research, identify, brainstorm, or develop FIVE ideas to increase the diversity in the aviation industry
    a United's Aviate Academy
        i. The first effort that has the intent of increasing diversity is United's Aviate Academy. They intend to train 5,000 pilots and have over half of them be women or people of color. This program will allow for various kinds of people to be able to develop their abilities as a pilot by not focusing on simply who can pay for pilot training but for everyone who has what it takes to become a pilot. Pilot training is offered at a reduced rate as well as offering people to get their PPL for free with the intent of completing the program.
    b Pilot Shortage Long Term Fixes
        i. Thinking about the current pilot shortage, we are going to need more people to become pilots in the future. One of the biggest barriers is that this space is reserved almost exclusively for white males. While this group makes up one of the majorities of the population, we could leverage much more by targeting groups such as women and people of color. This idea stems from the fact that if we want more diversity in aviation we should start by opening up the space to create a welcoming environment.
    c Value of Creating a Diverse Cockpit
        i. Everyone brings different ideas to the table and having a diverse cockpit allows for multiple perspectives to be heard in collaboration. Various perspectives also help when dealing with unforeseen scenarios as hopefully both crew members have different ideas about how to handle the situation and can come to the best answer together. With diversity, it allows for more creativity to be produced with people from different backgrounds.
    d Have a Mentoring Program
        i. For companies trying to improve diversity, they may think that just hiring people of different backgrounds will increase it. However, the aviation industry is an exclusive club and various people may not feel welcome. These organizations should create mentoring programs for underrepresented groups in aviation with other individuals already a part of the organization. This will allow for them to already know a welcoming

face and be able to share their experiences with. They will also be able to receive advice and encouragement from their mentor as they continue with their new hire journey.

- Targeting Younger Individuals
    i. The only reason I even know about aviation is because of the role my family played in the industry. For people who may not have the same opportunities, they see the airport as something mystical and unreachable. Reaching out to kids in grade school to show them they can be pilots too is an important outreach that should be used by schools and even airlines. For example, SLU will bring a simulator to grade schools and have current flight science students guide kids as they fly the simulation. It's a unique experience to offer them and could be the start of their very own aviation journey.

Midterm Questions (100 Marks) Due: 3/10/2023 (11.59 PM CST)

(Note: References must be included for each question. Use APA format for extra credit)

1) **Aviation Professional (20 Marks) (Min 300-500 words)**

I think that being a professional is important because these are the items that drive us to be good people throughout our careers. As discussed in class, there are so many facets that go along with being a professional. All of these traits go along with being a good and competent individual. Acting professionals go hand in hand with how people act in their personal lives whether they like it or not. If one wants to say that "a job is just a job", they do not realize that the actions they display during work hours are going to seep into their everyday lives.

Professionalism is required and important in aviation because the aviation industry is one that is lined with integrity and good natured people. There are many different dimensions of the aviation industry where people simply have to trust that their coworkers have the competence and skill to be able to complete a task. For example, pilots have to have inherent trust in their maintenance department. Pilots do not have the knowledge to be able to know if the mechanics did not do their job properly until it is too late. There are a wide variety of traits that professionals must possess. Many of these are outlined in the NBAA's article on personal and organizational professionalism. To highlight a few from the article, I would say the most critical ones are as follows: integrity, expertise, initiative, and team player (National Business Aviation Association, n.d.). I think these traits exemplify the heart of what it means to be a professional. A professional must be honest and forthcoming. A professional should know what they are talking about as well as be able to fill in gaps in other people's knowledge. A professional gets the ball rolling with new ideas and problem solves when need be. Lastly, a professional works in unity with other people on their team and wants everyone to be the best they can be. Overall, I would say that being a professional in aviation is of the utmost importance especially in an high-consequence industry that requires a lot of trust.

2) **International Aviation (20 Marks) (Min 300-500 words)**

ICAO was created on the 7th of December in 1977 (International Civil Aviation Authority, n.d.a). ICAO was first created to benefit civil aviation by developing the industry in a safe and well organized fashion. ICAO is an organization that works with each individual country so they can better develop their individual and personal practices within their civil aviation authority. There are five strategic objectives to ICAO. The first is safety (International Civil Aviation Authority, n.d.b). This objective wants to guarantee the safety of aviation on a global scale. The second is air navigation capacity and efficiency. This objective wants to maximize the potential of the world's airspace. This would be done through technology upgrades and as well as updating procedures. The third is security and facilitation. This objective tells the importance of ICAO as a leader in aviation security. Their role in this extends to security incidents at the country's borders. The fourth is the economic development of air transport. This objective would like to keep the industry as economically viable for years to come. They also do this by providing financial support to some areas of the industry. Lastly is environmental policies. Aviation is seen as a major environmental concern, and ICAO is at the forefront of this to combat the environmental impact of aviation globally. The FAA is seen as a global leader throughout the aviation industry (Federal Aviation Administration, n.d.a). The FAA, personally, engages themselves internationally by associating with international organizations. They work closely with these other organizations to establish world wide policies and procedures that are going to advance safety to the highest standard. The FAA also works with other organizations to solve global problems. All of this is done with the intention of furthering the aviation industry. Overall, ICAO is an important organization that is working to better the aviation industry on a global level. Through their strategic objectives, they show to care and root for the future of the aviation industry.

3) **Aviation & Airport Security (20 Marks) (Min 300-500 words)**

This paper outlined six threats to the aviation industry, and they are as follows: terrorists, criminals, hostile nation-states, insiders, foreign intelligence activities, and infectious disease ("National Strategy for Aviation Security", 2018). The three categories of emerging disruptive technologies or risks are cyber connectivity, increased dependence on radio frequencies, and a significant increase in unmanned aircraft systems. The four strategic objectives outlined in the document. The first is being able to protect the United States and its global companions throughout the aviation environment. The second is maximizing security while keeping a high level of safety along with balancing this with the United States' economic influence. The third is promoting flexibility, minimizing harm, and quickening recovery. Lastly, the fourth successfully captured attention at the international, domestic, and private sector level. Next the five specific strategic actions that will be used to achieve each of the strategic goals mentioned above include the following. The first is to widen awareness of the domestic level. The second is to proactively see threats and determine weak points that are threatening the aviation industry and are a result of the aviation industry. The third is to bolster the already multilayered security within aviation. The fourth is to guarantee the continuation and advance bounce back within the aviation environment. The last one is to intensify collaboration on an international scale. All of these strategies from the NSAS are used to further the development and safety of aviation within the United States but also look out for the interest of our global partnerships. The aviation ecosystem does not rely and develop solely from the United States' failures and success but by everyone around the world working together to make the aviation industry a reliable, safe, and efficient network to allow people to travel all over the globe.

Because of this international scale that aviation has, it is important to have such strategies in place to counteract possible threats from others who want to take advantage of the global reach of aviation.

4) **Diversity in Aviation (20 Marks) (Min 300-500 words)**

I think that the most important reason to increase diversity is to get different perspectives. It's great when people are alike and can easily agree on things, but that does not always allow for the best decision to be made. Different experiences and values can put a lot of perspective on certain scenarios and being able to get all this information can make the difference between making a great decision and one that could have been better. While the aviation industry is working hard to be able to allow for diversity into the industry, there are still lots of barriers for certain individuals. Luckily, some airlines have taken the initiative to start their own programs. For example, United's Aviate Academy has been at the forefront of wanting more diversity in aviation. The academy aims to add to diversity and even show that with the demographics of their first four classes. This includes having around 50% be women and between 70%-80% people of color (Vogel, 2022). After doing some research, I found another program called "Fly for the Culture". This program allows for young individuals to be mentored by a career pilot in their same culture. Not many people of color get to experience having someone in their same demographic be their mentors, and this program seems like an amazing opportunity to increase that (Fly for the Culture, n.d.). One of the main suggestions I have to increase diversity is having a good mentor. When a minority enters the industry, it can be hard to stay since there is such a set culture. If minorities are given mentors who are similar to them, that might promote a sense of belonging, and this is the same idea that is being promoted by "Fly for the Culture". I think this also extends to being able to target younger audiences and promote being a pilot at a young age. I think many people simply don't know a lot about aviation or even how to become a pilot. If we were to educate people more on this, I think there would be more varieties of people entering the industry instead of relying on individuals whose parents/grandparents, etc. were pilots during their careers. Overall, the issue of diversity is an important one for the aviation industry, but I am glad to see programs and initiatives that are looking to narrow that gap.

5) **Aviation Safety and Human Factors (20 Marks) (Min 300-500 words)**

The first FAA program I would like to discuss is the "Compliance Program" (Federal Aviation Administration, n.d.b). The main goal of this program is to correct issues and safety programs that stem from a lack of compliance with posted regulations and standards. The FAA wants to solve these issues as quickly as possible to get everyone back on the right track. The program aims to allow for an open stream of communication between the FAA and individuals and organizations. This program wants to focus on establishing a just safety culture that promotes the acceptance and disclosure of personal and organizational errors. The second program I would like to explain is the National Simulator Program (Federal Aviation Administration, n.d.c). The main goal of this program is to produce standards that will be used by every entity to determine the qualification of any certain simulator to actually be used for pilot certification. The standards for these simulators are posted in CFR 14 Part 60, and this program is involved with those regulations. This program is widespread to be able to make sure that high quality simulators are being used to train pilots. The program that will most relate to my future career is the simulator program. While the compliance program almost applies to every hands-on job in the industry, the simulator program will relate to me as I work with pilots to complete their recurrent training. My desire is not to be involved with the simulator training, but it will relate to how I chose to complete my job by getting an entire picture of pilot training. Understanding the simulator program will allow me to better prepare how I plan to lay out pilot training as people come into the organization. Overall, I think both of these programs, and other FAA programs and initiatives, are important to understand when entering a career in a highly regulated industry.

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Aviation Management – Data Collected in Support of Program Mission and Education Goals and SLO 2

Performance Indicator Rubric

Course: ASCI 4050 Human Factors

Course Instructor: Terrence Kelly

Semester Taught: Fall 2022

Number of Students in Course: 35

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Written Assignment #1 Average 77.5% - 27 of 35 (77.14%) scored above 70% Written Assignment #2 Average 76.4% 27 of 35 (77.14%) scored above a 70%	Benchmark Achieved
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	Homework #3 Average 96.7% - 34 of 35 (97.1%) scored above a 70% Written Paper Average 91.3% - 35 of 35 scored above a 70%	Benchmark Achieved
SLO 5: Apply knowledge of business principles in aviation-related areas.	Test #1 Composite Questions Question 26 – 24 of 35 (69%) students answered correctly Question 28 – 29 of 35 (83%) students answered correctly Question 29 – 11 of 35 (31%) students answered correctly Question 30 – 30 of 35 (86%) students answered correctly Question 31 – 26 of 35 (74%) students answered correctly Overall average 68.6% (scores divided by # of questions)	Benchmark Not Achieved
* I have rounded the values used in this assessment		

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.

Written Assignment #1 required students to respond to questions surrounding both ethical and professional considerations surrounding the human factors discipline. Appropriate decision making is fundamental to the professional, efficient, and safe operation of aircraft. 27 of 35 students (77.4%) scored above a 70%, consequently the benchmark was achieved. Written Assignment #2 required students to respond to questions aimed at identifying and solving problems in the high-consequence environment. Like Assignment #1, 27 of 35 students (77.4%) scored above a 70%; consequently, the benchmark was achieved. While I am pleased with the overall performance on these assignments, it should be noted they were optional (makeup when I was on travel). Many of the students who did not achieve a 70% score on the assignment, did not submit any work. Additionally, the grading for the assignment was not particularly rigorous. As a means of continuous improvement, I plan to make all assignments mandatory and assign a more rigorous grading scheme.

SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.
Homework #3 required students to respond to questions on how to work and communicate effectively (in both oral and written form) in the context of induvial differences/human factors, while working on diverse teams.34 of 35 students scored above a 70% on the homework, consequently the benchmark was achieved. Students were required to participate in a written paper assignment detailing the importance of some physiological aspects of human performance. The written paper was a group assignment. 35 of 35 students scored above a 70% on the written paper assignment. Historically, I have not included an oral presentation in the ASCI 4050 course. I used the Homework #3 assignment to reinforce effective oral communication and the written paper to reinforce effective written communication. The scores supporting the paper and homework assignment were strong, however I am not sure I am meeting the spirit of the “effective oral” communications skills with an assignment that requires students to discuss oral communication. I look forward to discussing the topic with my colleagues. As a means of continuous improvement, I am considering whether to assign the paper individually, rather than as a group project. As part of the final exam, I ask students to rate the performance of teammates (on the paper) to help me better understand the level of participation. In some cases, it was clear that individuals contributed at different levels. Consequently, I felt the assessment was not sufficiently granular. In the future, I plan to assign the paper individually as a means better assessing individual performance.

SLO 5: Apply knowledge of business principles in aviation-related areas.
I assessed SLO 5 using a composite of questions from test #1. The questions included in the assessment were not particularly well suited for assess students’ knowledge of business principles in aviation. I do not generally include business fundamentals in the ASCI 4050 Human Factors course. Nevertheless, I have attempted to make an assessment for the Fall 2022 semester with a plan to discuss removing SLO 5 (Aviation Management) from being tracked in this course. The questions assessed relate to the Tenerife accident, the Bhopal Disaster and the International Air Transport Associated (a representative group for commercial aviation). The assessment was conducted using a composite of five questions from test #1.The benchmark was not achieved as only 68.6% (24 of 35 students) answered the questions correctly. As a means of continuous improvement, I plan to accomplish one of two things. My preferred choice it to remove SLO 5 (for Aviation Management students) from the ASCI 4050 course. My second choice would be to add a new element to the course that provides a more-sophisticated approach to business principles in aviation-related areas as they relate to human factors. Removing SLO 5 from ASCI 4050 is preferred simply because the course (ASSCI 4050) is already short on time for covering the topics critical to understanding human factors. Adding a module on business principles would require the elimination of something more closely associated with the human performance. A case can be made to include a module on business principles in

human factors, but the such an addition would be best addressed in a two course human factors course sequence.

Performance Indicator Rubric

Course: ASCI 4050 Human Factors

Course Instructor: Terrence Kelly

Semester Taught: Fall 2022

Number of Students in Course: 35

FLIGHT SCIENCE CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Written Assignment #1 Average 77.5% - 27 of 35 (77.14%) scored above 70% Written Assignment #2 Average 76.4% 27 of 35 (77.14%) scored above a 70%	Benchmark Achieved
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	Test #1 Composite Questions Question 16 – 26 of 35 (74%) students answered correctly Question 17 – 35 of 25 (100%) students answered correctly Question 22 – 20 of 35 (57%) students answered correctly Question 23 – 22 of 35 (63%) students answered correctly Question 24 – 22 of 35 (63%) students answered correctly Question 25 – 24 of 35 (69%) students answered correctly Overall average 71% (scores divided by # of questions) Test #4 Composite Questions Question 20 - 32 of 35 (91%) students answered correctly Question 21 - 31 of 35 (89%) students answered correctly Question 25 - 32 of 35 (91%) students answered correctly Question 26 - 26 of 35 (74%) students answered correctly Question 29 - 35 of 35 (100%) students answered correctly Overall Average 89% (scores divided by # of questions)	Benchmark Achieved
SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.	Written Assignment #1 Average 77.5% - 27 of 35 (77.14%) scored above 70% Homework Assignment #3 Average 96.7% 34 of 35 students (94%) scored above a 70%	

	Test #1 Composite Questions Question 1 - 25 of 35 (71%) students answered correctly Question 2 - 27 of 35 (77%) students answered correctly Question 3 - 27 of 35 (77%) students answered correctly Question 4 - 34 of 35 (97%) students answered correctly Question 5 – 33 of 35 (94%) students answered correctly Overall Average 83% (scores divided by # of questions)	
* I have rounded the values used in this assessment.		

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.
Written Assignment #1 required students to respond to questions surrounding both ethical and professional considerations surrounding the human factors discipline. Appropriate decision making is fundamental to the professional, efficient, and safe operation of aircraft. 27 of 35 students (77.4%) scored above a 70%, consequently the benchmark was achieved. Written Assignment #2 required students to respond to questions aimed at identifying and solving problems in the high-consequence environment. Like Assignment #1, 27 of 35 students (77.4%) scored above a 70%; consequently, the benchmark was achieved. While I am pleased with the overall performance on these assignments, it should be noted they were optional (makeup when I was on travel). Most of the students who did not achieve a 70% score on the assignment, did not submit the work. Additionally, the grading for the assignment was not particularly rigorous. As a means of continuous improvement, I plan to make all assignments mandatory and assign a more rigorous grading scheme.

SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.
To assess SLO 2, I used a composite of test questions (from test #1 and test #4) that spoke to the history of human factors, some current issues in human factors and how understanding and insight on how human factors mitigation strategies might be applied to negative human factors situations in the future. The scores from test #1 are not particularly impressive. On average, 71% of students correctly answered across the six questions presented. While technically meeting the 70% criteria set by the department, the scores are lower that I would have expected. The scores from test #2 are better. On average, 89% of students correctly answered across the five questions. I do not believe the use of a composite of test questions is the best way to assess SLO 2. Effectively, the use of these questions is an indirect measure while a direct assessment might be more effective. As a means of continuous improvement, I plan to create an assignment (required) that more-specifically and directly addresses the elements of SLO 2. The assignment will likely take the form of a homework assignment given toward the end of the semester.

SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.

SLO 4 the aggregate of three distinct elements including integrity, lifelong learning, and the building of diverse teams. Written Assignment 1 required students to respond to questions on both professional and ethical consideration in the context of human factors. Professional and ethical

decision making is consistent with the practice of integrity. Homework #3 requires students to respond to questions that inquire about how to build and communicate in the context of multi-disciplinary diverse teams . Composite questions from Test #1 were evaluated as an assessment of the importance of life-long learning. These questions focused on the so-called Tenerife accident that occurred in 1977. My hope in reviewing the accident was to demonstrate to students the importance of learning lessons from the paste and applying those lessons in the present. The results of the assessment were good. The results of the written assignment 1 indicated an average score of 77.5% with 77.1% of (27 of 35) students scoring above a 70%. Results from homework #3 indicated an average score of 96.7% with 97% of students (34 of 35) scoring above a 70%. The composite questions evaluated from test # 1 indicated 83% of students (29 of 35) answered the questions correctly. While I am marginally pleased with student performance on SLO 4 I believe changes to the way I assess it will provide a better indication of whether students are achieving the outcome. As a means of continuous improvement, I plan to roll the multiple elements currently used to assess SLO 4 into a single, mandatory assignment that addresses the importance of integrity, lifelong learning and the building and sustaining of diverse teams.

Evidence is presented starting on the next page.

SLO 1: Conduct aviation operations in a professional, safe, and efficient manner assessment evidence.

ASCI 4050 Human Factors Assignment 1 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

Rather than having class, I have placed two assignments in the Modules folder in Canvas. One to cover Monday's class and the second to cover Wednesday's class. Rather than contributing to the homework average, each assignment has the potential to add 5-points to a test grade (for a total of 10-points).

The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

ASCI 4050 Human Factors Assignment 2 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

Rather than having class, I have placed two assignments in the Modules folder in Canvas. One to cover Monday's class and the second to cover Wednesday's class. Rather than contributing to the homework average, each assignment has the potential to add 5-points to a test grade (for a total of 10-points).

The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe how an understanding of human performance (human factors) will help you better identify problems in the high-consequence environment. (300 word minimum)

2. Describe how an understanding of human performance (human factors) will help you better solve problems in the high-consequence environment. (300 word minimum)

Assignment 1 Examples

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

1- The ethical considerations that the discipline of human factors consists of the right and wrong that humans are ought to do, in terms of rights, respect for people, beneficence, justice and fairness. To ensure that the human factor discipline meet those ethics standards, it must provide privacy and safety for those who are affected by the system. In addition, loyalty, compassion, and honesty are among the other moral values that are encouraged by ethical standards. Additionally, ethical standards cover rights such as privacy, the right to be free from harm, and the right to life. These standards are suitable ethical standards since they are based on consistent and solid justifications. Therefore, a human factors specialist should not possess any issues with normative ethics such as obligations, rights, injury prevention, privacy. However, what about when those ethical standers merge, in case of an injury and privacy are at odds with one another. For example, if a pilot suffers from mental problems such as depression and they are pressured to hide it from their employer and colleagues because it might risk losing their job. Thus, given the circumstances, the pilot might be aware that they are unsuitable to fly, but they are not obligated to say anything that would risk losing their job, and if the employer allowed them to fly with medications, it would risk the safety of flight. This example raises many questions regarding the ethical standards in human factors, such as would the human factors specialists create a system that notifies the employers if the pilot is visiting a psychiatrist or if there are any decline in their performance or their attitude with their coworkers. Those circumstances force the industry to create a system that would break the ethical code and invade the pilots' privacy which would add more pressure and stress to their work life.

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

This question is very open ended which caused me to ponder it and consider different ways to interpret it. I started by googling the words "human factors" "discipline" and "ethics", from which I read a few articles. In human factors we study how the human body can affect our ability to conduct safe flight. In some circumstances pilots may make potentially unethical piloting decisions due to constraints whether they be deadlines set by the employer or flying while fatigued.

Pilots have a responsibility and a moral duty to uphold safe flying habits and procedures relating to human factors and aviation in general. In my training at Parks College I learned to follow the IM SAFE checklist which helps pilots know if they are fit to fly on a personal level before they even preflight the aircraft.

Ilness- Am I feeling sick?

Mediation- have I taken medicine for the first time today?

Stress- is your personal life stressing you out?

Alcohol- Am I hungover? It is prohibited to drink within 8 hours of a flight

Fatigue- am I exhausted?

Emotion- emotionally stressed?

All these six personal evaluations will influence pilots to make the right on a go /nogo decision on a private or commercial level.

Another ethical consideration in human factors that happens every day is tight flight schedules. Commercial Pilots would not want to cancel a flight too often and put their career and income on the line. This means that the IM SAFE checklist may not be properly adhered to, or corners could be cut on procedures in order to make departure or arrival times. This is a ethical consideration that is a everyday risk. Pilots should always self-evaluate before a flight

Assignment 1 Examples (cont.)

1. Describe a few ethical considerations surrounding human factors discipline (300 word minimum)

When it comes to ethical factors in the context of human factors, I think the best way to begin is with the IMSAFE checklist. While it is always tempting to fly (because we all love flying) and especially for airline pilots who rely on their salary to support themselves and/or their families, we must not put the safety of our passengers in jeopardy if we, pilots, are unfit to operate an aircraft. It is essential that we systematically complete the IMSAFE checklist before making any further decisions about traveling airborne. Perhaps the most important element of this checklist is the last letter "E", which stands for external pressures. As I mentioned earlier in the response, Pilots may feel pressured into flying for several reasons ranging from angry passengers (for commercial pilots) to get thereitis as we sometimes call it around Parks. We must understand that it is dangerous and far too risky to neglect any factor that could impact our performance while operating an aircraft. The IMSAFE checklist serves to provide pilots with a methodical way of analyzing their own human factors. As mental health has become a much more relevant issue in recent years, it is important to know that this applies to everyone including pilots. There is an absolute plethora of things that could impact any human's mental health, which may be family-related or something external like being given bad news from a friend. Any of these things could severely impact the pilot's ability to proficiently operate the aircraft, and every pilot should be very conscious of the many factors that could affect their mental health. Every time I fly, I brief my copilot about limiting distractions especially during taxi, takeoff, and landing. Factors that affect your mental health are distractions and should be treated as so. Along with completing the IMSAFE checklist each pilot should complete a personal mental health analysis prior to flight as well.

Describe a few ethical considerations surrounding the human factors discipline

When faced with ethics in aviation, the first consideration that comes to mind is centered around aspects of ethics that may prevent us from making the right decision. A large part of ethics involves making a choice that will preserve the safety of those around you as well as to maintain a respectful aviation environment. A few moral principles that may govern whether we make the right or wrong choice as pilots is fear, guilt, and self-interest/ convenience to oneself.

When we find ourselves in a difficult situation as pilots, perhaps the weather is below our own personal minimums and ethically we know that the right thing to do to preserve our own safety and even our instructor's safety is to cancel the flight, fear of inconveniencing others may prevent us from acting ethically and remaining honest with ourselves and others. We may fear that our choice to make what we know is the right decision could potentially jeopardize the way others view us as pilots or result in negative consequences to us a pilot canceling a flight.

Similarly, guilt may prevent us from making the ethically right decision. Perhaps we have already canceled two flights this week, and by canceling a third flight, a feeling of guilt arises. This feeling might consist of embarrassment or negative feelings toward ourselves for having lower personal minimums than other pilots. This guilt may result in comparison and we may begin to doubt our decision making skills.

Finally, Self- interest and convenience may prevent pilots from acting ethically, particularly on solo flights. When flying alone on a VFR cross country, the student pilot is aware of the regulations and understands the importance of following them to maintain a safe environment for everyone in the air. When enroute this cross country, the pilot comes across a few clouds that they must descend away from in order to avoid them horizontally. The pilot knows they aren't allowed to fly within 2,000 feet horizontal distance from clouds in VFR flight, however the clouds are so few, they will only pass through them for roughly 10 seconds, and they will not affect the pilots line of sight.

As pilots, there are many times where we are faced with situations where we have the option to break a small rule that nobody will ever find out about to cater to our own convenience. In these situations, it is important to maintain honesty and integrity in order to not let our own self-interest govern our ethical decision making skills. When in the air, it is important to remain honest and fair for the sake of our own safety, but also for the safety of others. When it comes to ethics, there is nothing more important than making it a habit to practice safe and fair flying by following the regulations put in place for us.

Assignment 2 Examples

Describe a few professional considerations surrounding human factors

In my time in aviation, I have come to learn that those who work in the field are some of the most respectful and professional individuals I have met. Pilots, whether on the ground or in the air, are oftentimes always courteous toward one another and maintain a professional environment. Many times, in order to maintain safety and integrity in the aircraft, we rely on personal minimums, FAA regulations, and patience with ourselves and other pilots.

A large aspect of deciding whether or not to fly on a given day is centered around personal minimums and conditions that we are comfortable or not comfortable flying in. Going hand in hand with ethics, it is important to take other pilots' personal minimums into consideration and remain respectful and professional toward them and what they are personally comfortable in to aid in eliminating those feelings of fear or guilt when faced with a difficult decision to make surrounding flying. Remaining professional and respectful toward others' boundaries aids in maintaining those aviation ethics and in maintaining a safe environment where pilots can make the best decision for themselves and their crew without fear of judgment or fear of making the wrong decision.

Aviation is filled with rules and regulations, and from early on in our training we understand the importance of following them for our safety and for the safety of every person around us. Not only is it essential that we follow these rules in a professional manner that upholds the high standards set for pilots, but it is also essential that we respect the time needed for others' to follow these rules. There are many times where there may be an aircraft in front of you who is taking a longer time to get through their engine runup and go through their checklists to ensure that they are comfortable and ready for takeoff. Practicing patience is critical in aviation because when we are patient with other pilots, we are showing them our respect and that we care for their safety. When another pilot takes the time that they need to be comfortable with their aircraft, they will be safe,have the ability to make ethically correct decisions, which in turn allows us to be safe and make smart choices in the air.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

One professional consideration is avoiding stereotypes and assumptions about a person. Not only is it not professional to treat and communicate with someone who may have an intellectual disability, a person who uses a wheelchair, or treating a person differently because they are a female for example. This is regarding not only pilots but also those who work with the pilots and human factors specialists, like mechanics, the aerospace engineers, even the management, marketing, and other sides of the industry. Simply treating people with respect since this is a field that deals with people all the time, from various lifestyles, beginnings, and each person has gone through a different life with various cultures. This is a field that looks at how we, as humans, are similar to each other but also vastly different. You are meant to benefit the client or company you are working with while also doing good for the general populace and humanity.

Another professional consideration is you should know plenty and more than whoever you are working for or your client. Though using that knowledge and information to make the right decision, for example if asked to speak in court you provide credible data/research while being able to tell the value and limitations of it and your own capabilities. This also coincides with not misleading clients, organizations, and any business. For example a new researcher is looking at the UX design of a new flight simulator, while communicating with pilots you would treat each one with respect, understanding their capabilities and accurately applying your own capabilities while doing research and knowing when to ask for their recommendations with your own observations. This is even related to confidentiality, when taking down research doing so with the agreement of the participant. Unless it is public behavior, the pilots need to explicitly agree to the recording of any data. In the previous question there was mention of where the line of confidentiality for adapting technology to the user, like pilot to plane, user to phone, and so forth. Yet when in the preliminary development phase confidentiality is very important but what about after that.

Assignment 2 Examples (cont.)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

I believe that professional and ethical overlap quite a lot in aviation, in particular the concepts of fairness, honesty, and remaining non-biased. But professionalism in human factors goes beyond just behaving ethically, it also branches into the ideas of procedure, obligation, and legality. The simplest of all of those ideas is legality, to be a professional in anything requires that we follow the law, even when we disagree with it we must follow the law, though this does play a seemingly small role in human factors investigations it still vital that we follow them to the ledger to get the most out of the investigation.

Obligation is where professionalism gets complicated, above all else we must be obligated to the truth and the continued safety of air travel. Human Factors plays a massive role in the world of aviation in the end human beings are running and monitoring the systems in place to ensure safe, quick, and effective functioning of both general and professional aviation. As pilots we are obligated to many things, but as humans we are obligated to our human factors to monitoring our fellow pilots, ourselves, and to above all else the truth of our flaws. To ignore those obligations to the human factors involved in aviation would be to open ourselves and our passengers up to considerable risk some of which by the time we sense a problem it may be too late. This why our obligation to human factors is a constant in aviation one that only can be upheld in the system if all persons in the system are vigilant for the variety of symptoms that can display no matter how seemingly insignificant.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

Professionalism is an essential part of the global air transportation industry not only in regard to customer service, but decision making as well. Across the industry, professionalism includes doing everything correctly and procedurally, in turn, relating to human factors. Human factors directly correlate to the professional considerations within aviation because decision making is essential not only in the cockpit, but across multiple disciplines that go into making scheduled airlines service successful. Specifically, one professional consideration that surrounds human factors would be decision making, including, the pilot deciding whether they can safely complete the flight. I think that this question can closely relate to the previous because professional and ethical considerations can go hand in hand within the human factors discipline. This dilemma can tie into both ethical and professional considerations because as a pilot, you should know the limitations of yourself to conduct a flight, and as the pilot, if you know that you are not in a good position to fly, the safety of the passengers in influenced, therefore becoming an ethical situation. Continuing with this idea, not necessarily related to commercial aviation, but as student pilots, a consideration when flying in the IFR environment can be personal minimums. As a new instrument pilot, would you want to go fly on a low IFR day where you would break out on an approach at minimums as prescribed in the approach chart? A big part of professional considerations, relating to human factors, revolves around the idea of limitations as pilots. As a pilot, being a professional involves knowing the limitations of yourself and the aircraft that you are flying, and it comes down to decision making which influences the human factors chain, ultimately increasing the chances of an accident derived from human error. In all, professional considerations and ethical dilemmas in human factors are very closely related. In an essential industry such as air transport, it is essential to understand how you as the pilot function in the human factors tree in order to make both professional and ethical decisions.

SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment assessment evidence.

ASCI 4050 Human Factors Assignment 3 Name:_____

Hi everyone,

As a reminder, I am traveling on an accreditation visit next Monday, November 14th. Consequently, we will not have class. Rather than having class, I am giving this assignment in place of class. This assignment will contribute to your homework grade (15% of your total grade). This assignment must be uploaded to Canvas no later than Wednesday, November 16th by the end of the day.

In class, we discussed the notion of Individual Differences. In high-consequences operations we will engage people of diverse experience, backgrounds, and cultures. People are different and that difference is a strength. Diversity provides a distinct advantage to the team as diversity allows individuals to bring a different perspective and skillset to a problem.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

ASCI 4050 – Human Factors
Paper Assignment
Fall 2022

As a group of 3 (or 2), please prepare a paper indicating your collective thoughts on why an understanding of Human Factors is important in the aviation environment. Include a discussion of a few respiratory, visual, and hearing issues that are likely to influence human error and performance in both pilots and aviation managers.

The paper should be formatted in APA style and include:

- A minimum of five inline citations
- A minimum of five references
- Appropriate spelling, grammar and sentence mechanics
- A cover page (APA style) (1-page)
- An abstract (very short) (1-page)
- 5 -6 pages of content
- One reference page (1-page)
- Total length approximately 8-9 pages

The purpose of the assignment is to demonstrate your familiarity with several Human Factors hazards while utilizing the APA writing style (APA) and practicing parsimonious writing skills.

Here is a very basic rubric I will use to evaluate your papers.

Characteristics	More points ----------		-----------Less points
Length	8 to 9 Pages	6 to 7 pages	Less than 6 pages
APA	Good use of APA	Some use of APA	No use of APA
Citations	5 or more inline citations	Less than 5 inline citations	Less than 3 inline citations
Reference	5 or more references	Less than 5 references	Less than 3 references
Spelling Grammar & Sentence Mechanics	Strong use	Some use	Minimal use
Cover Page	Included and formatted properly	Included but not formatted properly	No cover page
Abstract	Concise but informative	Long or uninformative	No abstract
Essay Content	5 – 6 pages, strong content	Less than 5 or more than 6 pages or poor content	Less than 4 or more 7 pages of poor content
Essay Quality	Informative	Less than informative	Incoherent
Writing	Technical/university level	Weak university level	Not university level
Topic Appropriateness	Appropriate and comprehensive topics	Less than comprehensive or less than appropriate content	Weak content and/or inappropriate
Reference Page Formatting	All references are properly formatted (APA)	Some references are properly formatted (APA)	Few references are properly formatted (APA)

Papers must be saved in Microsoft Word and uploaded to Canvas no later than December 9th, 2022 at midnight.

Homework 3 Examples

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The first strategy I will employ is being open to all disciplines and cultures and their differences. People work better when they feel their similarities and differences are accepted, respected, and valued. It will be crucial to me that I embrace all the cultures and values of the diverse and multi-disciplinary teams and make an effort to make people feel comfortable and learn about their way of life for improved interactions. Another strategy I will use to reduce differences between multi-disciplinary and diverse teams for effective work is having good communication skills. Any team works better when there is open and honest communication. How everyone in the group communicates with each other will influence how well they work together and the team's productivity. There needs to be open communication across diverse and multi-disciplinary teams. This way, people can talk about difficult and complicated situations and issues. It is vital that team members are encouraged to communicate effectively and respectfully, as everyone needs to feel like their voice is being heard. Minimizing miscommunication will ensure that there is reduced conflict across the team. To achieve effective communication, people will need to learn how to listen attentively and seek clarification in case of any issue or misunderstanding. Different cultures and disciplines also have different communication styles, so I will accept, understand and respect how diverse people communicate to have an effective team. Further, I will try to avoid stereotyping and prejudice to work effectively with multi-disciplinary and diverse teams. When people are unfairly divided into groups and assigned unfair characteristics, it can affect how they work and interact with others. Therefore, I will accept that diverse people have different and unique working styles and preferences, which does not make them less important or productive. To work effectively, I will improve my conflict management skills. I will consider conflict management training for myself and the rest of the team. With good conflict management, the team will be able to work effectively.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Despite belonging to diverse expertise, disciplines, and backgrounds, teammates need to feel like they are part of the group or community. To achieve effective communication in a diverse group, I should be able to share and exchange ideas respectfully so that everyone can understand each other. I will be open and inclusive to other cultures to ensure effective communication. Every team member's language and communication culture must be respected. Communication needs to accommodate everyone's needs and not just the needs of those in the majority language. Openness and inclusivity in communication will help create trustworthy relationships where people feel comfortable enough to share their ideas with the rest of the team. To appreciate diversity, especially in communication, I will learn about the unique communication styles of diverse groups to promote effective communication. I will use clear and concise language to communicate effectively with people from diverse backgrounds. Keeping my language clear and straightforward ensures that no meaning is lost in interpretation and that my audience can receive the message exactly how I intended it to be received. Paraphrasing my words and asking the team if they understand my message will ensure the communication is clear and effective. Repeating the message help improve communication as I can clarify what I am saying and therefore eliminate misunderstandings. Body language is also very important in oral communication; therefore, I will make an effort to understand the differences in body language for each diverse group. Feedback is critical in ensuring effective communication. Providing and receiving constructive and honest feedback will be critical in my communication. Feedback will make people be sure that their voice is heard and respected and will therefore encourage people to communicate more openly. Most importantly, it can be challenging to know exactly how to communicate with people who are different from you in one way or the other. I will therefore take diversity training which will ensure that a diverse team can communicate effectively with each other

Homework 3 Examples (cont.)

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The importance of understanding individual differences within any environment, yet alone a high consequence one, is paramount when seeking to further know how a team functions as a whole. In looking at how to address the individuality of each member involved, I believe the most effective strategy in helping coordinate such forces would be communication. In many environments, co-workers will often work alongside each other, not only on their own projects but on one major task as a goal. For example, myself and my fellow interns at Garmin (a pretty small gap diversely) all have our separate functions whilst focusing on the same geographic area and working on the same geographic file. While we each have our own separate responsibilities regarding such, we all have to remain in clear communication with each other and other folks in the department to make sure that we are effectively doing our assigned work without overlapping or stepping onto anyone else's toes. In doing so, we help to promote a work environment that enables us each to assist each other when we have any issues or questions that may arise. This includes a larger portion of people, not only within our own offices, but that of Garmin's Corporate offices, as well as any remote employees as well. Our work environment is filled with hundreds of thousands of very diverse groups and skill sets that come together to help develop products in the name of a greater goal. It helps in managing any Human Resource issues(should they arise) and establishes a better understanding of who we are within a larger workforce. Communication is also paramount in highly-diverse things when everything is going right. Teams that communicate well with each other will not only improve productivity in the office, but it also stands to make a work environment more pleasant for everyone involved. In having a well-functioning team communicate, a door opens to a safer, friendlier, and more productive work environment.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Effective communication is paramount to a high-functioning team. Ensuring the development and implementation of this process is something that numerous companies have used worldwide in order to help the cohesive teamwork abound in their fields of work. Effective communication must first begin with respect, from co-worker to co-worker, and even from CEO to the lowest new-hires of an establishment. In garnering and fostering respect for one's peers (especially within a work environment) a person gains better understanding in how their co-workers might function differently from them. For example, in my previous field of work (largely customer service), my ability to understand how each of my managers (I was under four managers, two of which owned and operated the waterpark/campground) approached a situation in which a customer was being difficult. For some of my team-members, they largely avoided conflict in the way that they would place blame on another department, another worker, etc. (IE "BLANK didn't properly charge the golf-cart," etc. etc.) whilst others would directly place the blame on themselves (even if it was not directly related to them) so they could resolve an issue with a customer without interference. After having to work with a difficult employee, then, each of these individuals would gather to speak on the issue they were presented with, and (depending upon what type of mishap took place that day) would gather multiple departments as a whole to discuss new ways to prevent similar situations from happening again. In doing so, they fostered a relationship with their employees that would not only call out issues in the system, but also attempt to resolve them. How does this, then, relate to the individuality of each person involved? It gives everyone across departments, each with our own experience and backgrounds in numerous fields (technology, lifeguarding, customer service, food service, etc) an equal voice when speaking to our bosses. The respect established in each member of a team leads to a team that is highly communicative, and thus, a much more high-functioning one.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

There are a lot of strategies that I think I can employ to work effectively on a multi-disciplinary and diverse team. A couple of the strategies that I can implement is know your role in the company, be open minded, and be able to work as a team.

Starting with the first strategy of knowing your role in the company. This is important for one main reason the first being, so you don't fail in a project and not to waste any precious resources. This is most prominent in the aviation industry when things are being done by the proper people in the flight deck or on the ground. A perfect example would be in the Tenerife accident when the KLM pilot was doing the pre-checks and because the captain being that he was a higher up in the company he didn't know the proper flows and glanced and forgot crucial steps in the checklist that should have been done by the First Officer.

The second strategy that I can employ to work is to be open minded. This is self-explanatory but listen and be respectful of other people ideas. Being able to have meetings, discussions and brainstorming are key aspects to success. This can be found in aviation a lot of the time in flight training, but really any point in your pilot career. Humans aren't perfect so we are going to make mistakes and there is going to be someone there to critique your work so being able to be open to what they are teaching you is crucial so you can become a successful aviator.

The third strategy relates back to the first two strategies that I have briefed on and that is being able to work on a team. Working on a team is so crucial in aviation, no matter what side of aviation you are working on. In the airplane you need to be able to rely on your first officer or captain or flight instructor to help you fly the plane. In commercial aviation you can't do it all yourself you need someone flying the plane and then another person helping monitor and work the radios to allow your flights to be successful and more importantly safe for the passengers.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

In diverse teams, with members who have different levels of capabilities, knowledge, expertise, and backgrounds, I will keep in mind of these differences in my peers to ensure effective communication. I will express my ideas clearly and consciously so all members of the team are on the same page as me, and can understand the task at hand, and how I feel. I will advocate for myself and my ideas in team meetings through verbal communication, additionally, other modes of communication can be used like emails and professional messaging sites. I will consistently send out emails of important tasks or goals that I would like the team to meet as a whole. By using these written communication methods, I will enhance my verbal communication by having my ideas and goals known and able to look back on, them so I can keep myself accountable for them. I will ensure that the members of my team understand what I am trying to say by asking to follow-up questions and interacting with my peers. Since I might be discussing information that requires background knowledge, this is crucial to ensure that all members, no matter their skill set, understand what I am trying to communicate. Another part of communication is listening. Effective listening is very important in any team, and with diverse members, listening can help share ideas and enhance the team dynamic. Body language is another important factor for effective communication, and I will make sure my body language aligns with what I am trying to communicate. I want to be sure that I make proper eye contact and other appropriate body language so I convey the right message to the team member, in whom I am talking with. In conclusion, I will utilize effective communication techniques so that the diverse members of my team can understand me and feel heard.

Paper Examples

Human Factors in the Aviation Environment

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Department of Aviation Science, Saint Louis University

ASCI 4050: Human Factors

Professor Terrance Kelly

December 9, 2022

While understanding the numerous factors that impact a person's performance within a Human Factors system, it's also essential that we address a flaw within the human condition, preventative issues. In discussing these flaws of the human body, we are able to locate and address the most main problem of the human factors system: the human. Within this paper, we address "real life" examples of these systems in action, causing us to not only further notice the impact of aeromedical factors within a complex system like the ones in the aviation field through the lens of the pilot, passenger, and aeromedical crew, but also so that we can utilize the knowledge gathered from these instances to prevent similar events from taking place in the future. We discuss the effects of bright lights and how they affect our eyes which include our rods and cones. The study by Tony Wright about our hearing and altitudes. Lastly, about gravity and the effects it has on our respiratory system. We go in depth about what we have been taught throughout this course about human factors and how we have understood what has been discussed.

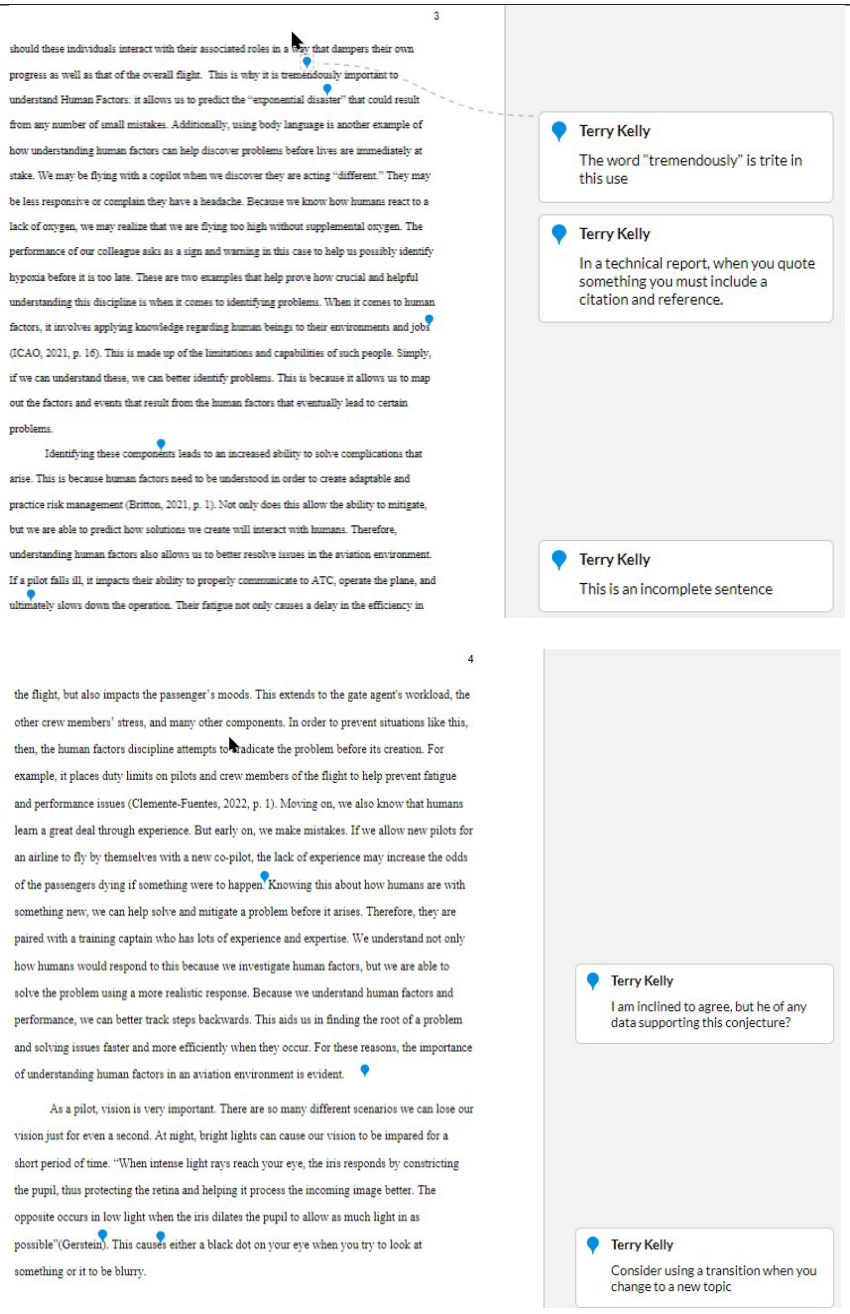
When it comes to the aviation environment, understanding human factors is critical. In fact, according to Boeing, human error contributes to 80 percent of aircraft accidents (Rankin, 2008, p. 1). With this knowledge, we as individuals, as well as a society, can become better at identifying problems through improving our awareness. In turn, this betters our ability to solve issues that arise–an imperative goal in a high-consequence setting. To begin, in this environment, there is very little room for error. For example, a pilot's overarching goal is, put simply, to get a plane and its occupants from one place to another in a safe and efficient manner. This task is broken up into smaller tasks, such as pre-flighting the plane, talking to ATC, engaging the autopilot, landing, etc. In delving into these smaller tasks there is one common denominator: the individuals performing these duties. This creates an exponentially huge potential for disaster,

Terry Kelly
I don't really understand the sentence.

Terry Kelly
Leave words like "lastly" out, they tend to be trite. It's one of the differences between technical and creative writing.

Terry Kelly
Always include the year any resource was published.

Paper Examples (cont.)



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should these individuals interact with their associated roles in a way that dampers their own progress as well as that of the overall flight. This is why it is tremendously important to understand Human Factors: it allows us to predict the "exponential disaster" that could result from any number of small mistakes. Additionally, using body language is another example of how understanding human factors can help discover problems before lives are immediately at stake. We may be flying with a copilot when we discover they are acting "different." They may be less responsive or complain they have a headache. Because we know how humans react to a lack of oxygen, we may realize that we are flying too high without supplemental oxygen. The performance of our colleague asks as a sign and warning in this case to help us possibly identify hypoxia before it is too late. These are two examples that help prove how crucial and helpful understanding this discipline is when it comes to identifying problems. When it comes to human factors, it involves applying knowledge regarding human beings to their environments and jobs (ICAO, 2021, p. 16). This is made up of the limitations and capabilities of such people. Simply, if we can understand these, we can better identify problems. This is because it allows us to map out the factors and events that result from the human factors that eventually lead to certain problems.

Identifying these components leads to an increased ability to solve complications that arise. This is because human factors need to be understood in order to create adaptable and practice risk management (Britton, 2021, p. 1). Not only does this allow the ability to mitigate, but we are able to predict how solutions we create will interact with humans. Therefore, understanding human factors also allows us to better resolve issues in the aviation environment. If a pilot falls ill, it impacts their ability to properly communicate to ATC, operate the plane, and ultimately slows down the operation. Their fatigue not only causes a delay in the efficiency in

Terry Kelly
The word "tremendously" is trite in this use

Terry Kelly
In a technical report, when you quote something you must include a citation and reference.

Terry Kelly
This is an incomplete sentence

4

the flight, but also impacts the passenger's moods. This extends to the gate agent's workload, the other crew members' stress, and many other components. In order to prevent situations like this, then, the human factors discipline attempts to eradicate the problem before its creation. For example, it places duty limits on pilots and crew members of the flight to help prevent fatigue and performance issues (Clemente-Fuentes, 2022, p. 1). Moving on, we also know that humans learn a great deal through experience. But early on, we make mistakes. If we allow new pilots for an airline to fly by themselves with a new co-pilot, the lack of experience may increase the odds of the passengers dying if something were to happen. Knowing this about how humans are with something new, we can help solve and mitigate a problem before it arises. Therefore, they are paired with a training captain who has lots of experience and expertise. We understand not only how humans would respond to this because we investigate human factors, but we are able to solve the problem using a more realistic response. Because we understand human factors and performance, we can better track steps backwards. This aids us in finding the root of a problem and solving issues faster and more efficiently when they occur. For these reasons, the importance of understanding human factors in an aviation environment is evident.

As a pilot, vision is very important. There are so many different scenarios we can lose our vision just for even a second. At night, bright lights can cause our vision to be impared for a short period of time. "When intense light rays reach your eye, the iris responds by constricting the pupil, thus protecting the retina and helping it process the incoming image better. The opposite occurs in low light when the iris dilates the pupil to allow as much light in as possible"(Gerstein). This causes either a black dot on your eye when you try to look at something or it to be blurry.

Terry Kelly
I am inclined to agree, but he of any data supporting this conjecture?

Terry Kelly
Consider using a transition when you change to a new topic

At night, many pilots use certain flashlights so their eyes do not get messed up. Most flashlights that are used have a red light on it. A red light is non glaring and doesn't affect how we see. They are in some cockpits as well. It makes it possible to read maps and charts. There are also dimmer yellow lights that are not as bright as a strong white light. The FAA informs us that we should not look directly at a bright light. "After the eyes are adapted to the darkness, avoid exposing them for more than one second to any bright white light as that causes temporary blindness"(FAA 10-2). This affects many pilots and can cause pilots to crash or fly off course leading to many other challenges. Our vision can be affected in many other ways. We all have different types of vision and how our eyes work, but with these effects, we all experience them. Our vision is so important. Vision is also affected when we directly enter darkness from a bright room called "dark adaptation"(Cooper). When a pilot is going to preflight and get ready to fly, they have to make sure their vision is adjusted so they see everything correctly and don't miss a step. Vision plays a huge role for pilots, because any error can cause a fatal accident.

In inspecting the numerous factors that affect a person's performance within a Human Factors system, it is also essential that we address a permanent imperfection within the human condition: medical complications. In discussing these imperative facets of the human body, we are able to identify and address the most central facet of the human factors system: the human. Within this paper, we address"real life" examples of these systems in action, causing us to not only further dissect the impact of aeromedical factors within a complex system (such as the ones found in these aeronautical settings) through the lens of pilot, passenger, and aeromedical crew, but also so that we can utilize the knowledge gathered from these instances to prevent similar events from taking place in the future.

Terry Kelly
"messed up" is a bit casual for a technical report

Terry Kelly
As well as what?

Terry Kelly
What does "and how our eyes work" mean in this context?

Terry Kelly
The word "huge" in this context is a bit informal for a technical report

Terry Kelly
Imperative facets?

From large-scale productions of "Top Gun" to those actually serving in the United States Armed Forces, military aviation has been a long-standing fascination of the American general public. Whether on-screen or in real life, military aviators have faced nearly impeccable odds: stress, high-performance expectations, numerous (and often extreme) levels of danger, and even the physical complications involved with piloting some of the fastest, deadliest, and overall most aerodynamic planes throughout history.

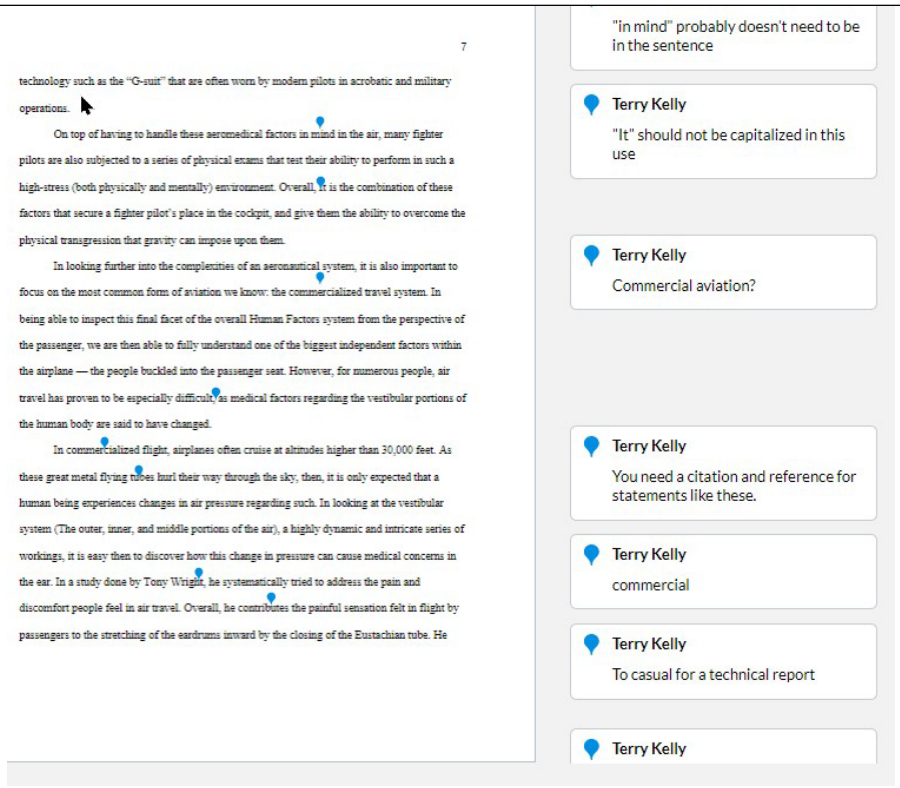
So, how does a human body adjust to the high-intensity environment within the cockpit of an F-15? From the moment every fighter pilot (or person in general) is born, we are faced with one persistent force: gravity. In flight, however, this force is largely accelerated. In an effect known as "pulling G's" (named for the gravity-like force imposed on the human body throughout high-speed acrobatic flight), pilots are able to make extreme acceleration and decelerations in flight that are much more excessive than the 1G their bodies are accustomed to on the ground.

So what physiological impact does this have on a fighter pilot, or, more specifically, their lungs. Depending on the type of G-force the pilot is experiencing, the heart and cardiovascular system are required to respond quickly and efficiently to keep blood flowing to the brain in order to maintain consciousness. ("Acceleration in Aviation; G Force", Faa.gov). In specifically addressing the lungs, a fighter pilot has to train so that the force of the weight does not stop them from breathing and receiving that mandatory blood-oxygen flow to their brain. The pilot must also be sure to have the property recovery time between pulling an appropriate amount of G's, as the lungs also have a necessary "recovery rate" in order to help redirect the body into maintaining a once-again homeostatic environment. There have also been numerous advances in

Terry Kelly
What do you mean by "impeccable" in this context

Terry Kelly
It may be accelerated.

Terry Kelly
Faa should be FAA. Include the year of any publication in the citation.



7

technology such as the "G-suit" that are often worn by modern pilots in acrobatic and military operations.

On top of having to handle these aeromedical factors in mind in the air, many fighter pilots are also subjected to a series of physical exams that test their ability to perform in such a high-stress (both physically and mentally) environment. Overall, it is the combination of these factors that secure a fighter pilot's place in the cockpit, and give them the ability to overcome the physical transgression that gravity can impose upon them.

In looking further into the complexities of an aeronautical system, it is also important to focus on the most common form of aviation we know: the commercialized travel system. In being able to inspect this final facet of the overall Human Factors system from the perspective of the passenger, we are then able to fully understand one of the biggest independent factors within the airplane — the people buckled into the passenger seat. However, for numerous people, air travel has proven to be especially difficult, as medical factors regarding the vestibular portions of the human body are said to have changed.

In commercialized flight, airplanes often cruise at altitudes higher than 30,000 feet. As these great metal flying tubes hurl their way through the sky, then, it is only expected that a human being experiences changes in air pressure regarding such. In looking at the vestibular system (The outer, inner, and middle portions of the air), a highly dynamic and intricate series of workings, it is easy then to discover how this change in pressure can cause medical concerns in the ear. In a study done by Tony Wright, he systematically tried to address the pain and discomfort people feel in air travel. Overall, he contributes the painful sensation felt in flight by passengers to the stretching of the eardrums inward by the closing of the Eustachian tube. He

"in mind" probably doesn't need to be in the sentence

Terry Kelly
"It" should not be capitalized in this use

Terry Kelly
Commercial aviation?

Terry Kelly
You need a citation and reference for statements like these.

Terry Kelly
commercial

Terry Kelly
To casual for a technical report

Terry Kelly

8

states specifically that it is the "critical closing pressure" ("Middle Ear Pain and Trauma During Air Travel, Tony Wright) in the eardrum that causes such pain.

Overall, Professor Wright found that this pain can not be avoided completely, however, most individuals, after a few different experiences with air travel, are able to better accommodate for it through FDA-approved medicine. This part of the human factors system, while not as critical to the flight as the physiology of the pilot, is an extremely important facet of the overall ecosystem of the flight world.

In discussing these factors, we hope to not only have summarized and presented examples of Human Factors (including the niche of aeromedical portions of human factors) but to have also utilized and expressed this knowledge so as to emphasize the importance of every individual as well as their roles in the Human Factors system.

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Human Factors Short Paper

Parks College of engineering, aviation, and technology

Sebastian Conklin, Marisa Warren, and Jack Liu

ASCI 4050: Human Factors

Dr. Terry Kelly

December 9, 2022

Abstract

As we have learned in this class, about 80% of aircraft accidents are a result of human factors. It is a fact that as humans, we are not perfect and make mistakes. Flying, however, is a high-consequence environment, making it essential to understand our personal limitations as pilots, perhaps even more so than understanding the limitations of our aircraft. By diving deeply into aircraft systems during flight training, we can prepare for an emergency, should one occur. In many cases, we must make an emergency landing or divert to another airport due to a malfunction with our aircraft. It is less natural to think that our bodies could malfunction in the same way a machine does, this is the reason we learn human factors - to understand how our bodies work and are able to identify any bodily malfunctions.

Throughout this course, we focused on the respiratory, visual, and vestibular systems. We dove deeply into the respiratory system learning the biological process of breathing in detail, gathered a thorough understanding of how the human eyes work, and studied the vestibular system to understand the biological foundation of spatial disorientation. Each of these human factors issues that we discussed can confuse the pilot in command; each of these issues can lead to a fatal aircraft accident despite a perfectly functioning aircraft. Without an understanding of human factors, we become very vulnerable to pilot error as a result of our own misperceptions. It is essential for pilots to understand how our ability to perceive can be misled or deceived, and that knowledge can only come from understanding the biological processes that lead us to it. In understanding the respiratory system, we learn what causes hypoxia and how to detect its presence in experiencing symptoms. We learn about the human eye to understand visual illusions, the blind spot, and other misperceptions. Lastly, understanding the vestibular system teaches us the causes of spatial disorientation.

Terry Kelly
Excellent opening

Terry Kelly
I hope it's not too many

The first system I would like to discuss is the respiratory system. The respiratory system enables the exchange of gases between the air and our blood bringing oxygen to our blood cells, which are then carried to all parts of the body. In greater detail, air is drawn into the lungs in order to extract oxygen from the air. Oxygen travels through tiny blood vessels in the lungs called alveoli. The alveoli allow oxygen molecules to enter the blood. The oxygen molecules are then distributed to all the cells in the body. When oxygen is metabolized by the body, carbon dioxide is released into the blood. Carbon dioxide waste is carried back to the lungs, where it is exhaled back into the air.

The biggest human factors issue that stems from our respiratory system is hypoxia. According to the Federal Aviation Administration (FAA), "hypoxia is just one of the physiological problems that can impair pilots if they are not aware of the effects of decreased oxygen pressure at altitude" (Boshers, 2015). There are many different kinds of hypoxia. Hypoxic hypoxia is a result of a lack of sufficient oxygen in the air for humans. When there is a lack of oxygen, humans begin to experience hypoxic hypoxia, which is recognized through a variety of symptoms. Simply put, hypoxic hypoxia occurs when the cabin altitude is too high for humans to breathe. In this case, it is an example of a human limitation that occurs when the aircraft can still operate normally. Although a human might experience hypoxia at a high altitude, the plane should be able to fly as it always does (assuming the altitude is below the maximum ceiling and there is ample fuel). This is true for almost all human factors issues we have studied, as well as for all other kinds of hypoxia. If a person loses circulation in a limb (stagnant hypoxia), if their body is physically unable to absorb enough oxygen (histotoxic hypoxia), or if their body cannot carry the oxygen throughout the body (anemic hypoxia), the aircraft should still operate normally. Nonetheless, an unconscious pilot could unintentionally fly

Terry Kelly
When writing a technical report, try to write in the third person

Terry Kelly
Good details, well-written

Terry Kelly
Good use of the quote

the aircraft into the ground, resulting in a horribly tragic event. It is essential to recognize that hm:::!a.n limnli.tiom cm ad::o tr.l:z::<f= ;. F ctr.rii a.m. . Loo.kin5 ·imd our general aviation capabilities, military pilots especially have to be aware of respiratory human factors. Due to the excessive stress they experience when pulling high G-forces, they are trained to master the correct methods of pressurized breathing and anti-stress movements. This requires 3.II. ='i. fim:herin -depmm::id oi i:f:!=r - ?: i:hm u=ha•t! leamell thi..: semester but proves why all pilots must have a thorough understanding of human factors.

The two main functions of the ear are hearing and balance. There are three main parts of our ear: first is the outer ear, which is the visible part consisting of ridged cartilage and skin. Secondly, the middle ear, which transfers sound vibrations from your eardrum to the inner ear via three tiny bones, which are called the ossicles. Also, this section of the ear aids in equalizing the air pressure in our ears. The last section is the inner ear. Within the inner ear, there are two parts: the cochlea and the semicircular canal. They are responsible for sending sound and balance information to the brain through electrical impulses, respectively.

Humans perceive sound when sound waves enter the ear canal and vibrate the eardrum. Ile ,ihra'licm pa::: =! t::,,: teE-o!:iclE:i?l.th.;iti:1:£-: i!ndr ..adia;the:l!ll-::rar where the vibrations are turned into neural signals. The nerve fibers in our brain translate that into sound. In regards to balance, there are fluid and hair-like sensors in our semicircular canals. The fluid moves around as we change our orientation and the hairs deliver that information to our br:.1Ul.:..

Being around operating airplanes and helicopters is extremely noisy. There are a magnitude of effects on the ear due to noise exposure, one being noise-induced hearing loss (.xHL). The ?A.An.ot tr.3I "'Ed ro lmd,rr-=3lfy cn OOd3 fi:ra.=11.on

tl= h.arizoctta!p = of tl:. hE3d:!=1.7 .=:= \ n:J:E= ro l-::i :ai.drigbm a-c0D.'"tml.! =P=Ed, iul'hile tl:. sub - !:::sl:£Jd EI -r.d or.:::;='13! l KCJ::ui:; mipp:ll:g afte'" l .5 r::rim:.a: afnltiUm.l?- mcccrol OO?iD'lla:!ori:l.=id l!:lmEl!:>=.cn, coopt=rl Vi!th aaior...;: :mcha:. :!!:drur.r.i!tg,ca.nall fmpl'o';.-eth e stability of the vestibular system. If the Eustachian tube cannot be adjusted and opened quickly during the dive, jump, and rapid descent, the pressure inside and outside the tympanic cavity will not be b31lr.cEd. Thi::t::1:::: - mE: fnt- - u:!:.ome O::i:!! n-il d aerobatic stunts. Positive and negative air pressure will cause congestion and edema of the t!!.lli.. :c:LE:!!:lbt:ui.=!CllfE 8.:!'CX,l!:,,":m.i :.r.:l ar,: mJ! tm ial l:l:3tta3.. !n = ...-ere CE it!!:13. y ='i.=!!b:: - • im!!. nti::b w::!l!::DI a::i...ly a:E::..a th e

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L ·, I .nlld like rot:ill:abo!:l \ H ro pei:cEi;,-e ;::i.gm be:mE:e of photons traveling through the atmosphere. For further context, photons are essentially light. The light reflects off of other objects and is then directed to our eyes where it enters through our pupili. ThE,lr "Il.e pan: ,;:if ll".I! lr..'ii g:i.=i :l:CO , df:.ar-s dE p:i:;r] OD rbe amount of light it is receiving. If the eye is receiving too much light the pupil will become :::r.J..311€:!a!Ldifri:3'Ec:i;, 3.m:;,F- of lighr.i!:=PIV] l4 g:-:l.} ill c:fmi:' l:i.gtn: that enters the eye is reflected off of the retina, which is located on the interior perimeter of the eye. The light in the retina is eventually directed to the optic nerve where the perception of vision is tra!Grcin=rlro ttE m::i..:r: rl:.!m :::.:!!.".>.'a.l

As we have already discussed, are senses are not perfect. Alicja from flight time explains it perfectly explaining that "we are governed by the messages our body is sending to our brain" (Alicja, 2013). There are many illusions that may occur while acting as a pilot in command,

• Terry Kelly

Nice job discussing d i ffe rent forms of hypoxia

• Terry Kelly

Try to wr it e a t ransition w hen moving to a new section

• Terry Kelly

Again, w ell writt en,

' Te rry Ke yll

T ry to write in third person in a t echnira l repor t

Illfil<liYi.!..l'JEiam, s!fil : =:II aE |-:and spot in your eye all contribute to deceiving your perception. When approaching a runway on final, the runway could appear further beneath the plane than it truly is (wider runway), or closer to the plane than it truly is (narrower runway). E!.e;p 2:t i:i:-eiy, ti:= = "' illnti.:11:E _- - _ = rumi. :;;_ Toe pil ot n:.u,-t be ec.tirely , f.mn i:I.1::i1dr9> ;;---?'!E: - .:: :ftl:c is ;,:E-ir.eil by his/her perception and believes they are lower than they truly are they could flare too early stalling the plane not far above the runway; and if they believe they higher than they truly are they may not flare at all, which could cause a prop strike. While these examples provide dangers during landing, there are also altitude illusions pilots may experience when spotting another plane in the sky. As we discussed in class, you could accidentally perceive an aircraft at an altitude above you even though you are flying at the same altitude, and as p.m!Ei fly -. er to each other the plane will appear to descend from its higher altitude to your altitude. Falling 'i,ictimta IUI iil.lu:fun liB::tti:.. oo r-=. i::i. ly crash, or (if you are lucky) a frightening near miss. While these human factors examples result from a misperception, another human factors problem that comes from the biological construction of the human eye is the blind spot. Due to an area in your field of vision that corresponds to a part of your retina that is blocked by the optic nerve, your eye creates a blind spot by using surrounding details to interpolate what exists in that blind spot. Your eye working along with your brain essentially tries to fill in the blank to match what the surrounding environment looks like.

This paper would be incomplete without mentioning spatial disorientation. Spatial da:l ..!1:ll-!• comes from a lack of visual references confusing the i?:tt0 is ill oOlll.e other!=a fli an mfttrd tl!;;nh:E. ::n order to avoid sp <llil!lriE!r,t. rtlDn, fu ,; pilot mlli"1 r,, - n tll-= c:.dicmfum I r - s 5:= the instruments inside the cockpit. However, it is not

always that easy to do when your senses are telling you something different than what you actually feel. 37% of general aviation accidents are due to spatial disorientation and 80% of th,o.e art: tl:.ral Tl!cs:: -Illtfng Cl rh-: di:Zlll;."ii:on of a n... a:!i:!ri pcx: :i:E l:y fil -th -:l C63o f fil=- A.ccord:i.n::!oo iim,SKJ:1:r.rri, E:m.r=!Jb:ef31 :fun.o:imt.in.E

-r,""E,i:, hwar ":l'a'.!!"' (S KYl:r-'). ff lmi!l!!!od::.3- 11arroc5E!l.::sdsaEE:aiintmE: paper, spatial disorientation can cause an accident when both the plane and the pilot are operating normally, not just the plane. The vestibular system has 3 semicircular canals, which are all filled with fluid. The purpose of these canals is to determine pitch, yaw, and roll !!!:0l.l:l:i!!=.-!!.E Mllc:h :E ::f;,.:, ifu:i:l!!Di-e:rtnm: e:;ir:f! a;nal Sp-atisl di.:ori O!I. from a biological view occurs when the plane is in one motion for an elongated period of time.

TIE 11:irid r. in co"..:::?r.i:!i p;Ei!::m:i!:!l cz:rl nd;: . 1E'P'.Jm:fr.: E h!B returned to equilibrium. For example, if a plane is in a turn for a period of about 7 seconds or too: , the equilibrim:l will ra::omd:::""}'!E !rilal!m!..

..!Jl of mF:e i::.7J.e. i:fuuu rne !lild2..:3d di:ae-ed in ilflE ::.re Dl..lILaD malfunctions that can cause a plane to crash. By studying these issues, we learn how to identify our O'rit'.Lbooi.Wy -:tia!E cm::mlt!la!lro --a:;a n Ct ll E lletro

Terry Kelly

Make sure to include the year in any ci tat ion

say that we must understand our bodies in the same way we understand our aircraft. Without an

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SLO 1: Conduct aviation operations in a professional, safe, and efficient manner assessment evidence.

ASCI 4050 Human Factors Assignment 1 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

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The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

ASCI 4050 Human Factors Assignment 2 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

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The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe how an understanding of human performance (human factors) will help you better identify problems in the high-consequence environment. (300 word minimum)

2. Describe how an understanding of human performance (human factors) will help you better solve problems in the high-consequence environment. (300 word minimum)

Assignment 1 Examples

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

1- The ethical considerations that the discipline of human factors consists of the right and wrong that humans are ought to do, in terms of rights, respect for people, beneficence, justice and fairness. To ensure that the human factor discipline meet those ethics standards, it must provide privacy and safety for those who are affected by the system. In addition, loyalty, compassion, and honesty are among the other moral values that are encouraged by ethical standards. Additionally, ethical standards cover rights such as privacy, the right to be free from harm, and the right to life. These standards are suitable ethical standards since they are based on consistent and solid justifications. Therefore, a human factors specialist should not possess any issues with normative ethics such as obligations, rights, injury prevention, privacy. However, what about when those ethical standers merge, in case of an injury and privacy are at odds with one another. For example, if a pilot suffers from mental problems such as depression and they are pressured to hide it from their employer and colleagues because it might risk losing their job. Thus, given the circumstances, the pilot might be aware that they are unsuitable to fly, but they are not obligated to say anything that would risk losing their job, and if the employer allowed them to fly with medications, it would risk the safety of flight. This example raises many questions regarding the ethical standards in human factors, such as would the human factors specialists create a system that notifies the employers if the pilot is visiting a psychiatrist or if there are any decline in their performance or their attitude with their coworkers. Those circumstances force the industry to create a system that would break the ethical code and invade the pilots' privacy which would add more pressure and stress to their work life.

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Pilots have a responsibility and a moral duty to uphold safe flying habits and procedures relating to human factors and aviation in general. In my training at Parks College I learned to follow the IM SAFE checklist which helps pilots know if they are fit to fly on a personal level before they even preflight the aircraft.

Ilness- Am I feeling sick?

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Assignment 1 Examples (cont.)

1. Describe a few ethical considerations surrounding human factors discipline (300 word minimum)

When it comes to ethical factors in the context of human factors, I think the best way to begin is with the IMSAFE checklist. While it is always tempting to fly (because we all love flying) and especially for airline pilots who rely on their salary to support themselves and/or their families, we must not put the safety of our passengers in jeopardy if we, pilots, are unfit to operate an aircraft. It is essential that we systematically complete the IMSAFE checklist before making any further decisions about traveling airborne. Perhaps the most important element of this checklist is the last letter "E", which stands for external pressures. As I mentioned earlier in the response, Pilots may feel pressured into flying for several reasons ranging from angry passengers (for commercial pilots) to get thereitis as we sometimes call it around Parks. We must understand that it is dangerous and far too risky to neglect any factor that could impact our performance while operating an aircraft. The IMSAFE checklist serves to provide pilots with a methodical way of analyzing their own human factors. As mental health has become a much more relevant issue in recent years, it is important to know that this applies to everyone including pilots. There is an absolute plethora of things that could impact any human's mental health, which may be family-related or something external like being given bad news from a friend. Any of these things could severely impact the pilot's ability to proficiently operate the aircraft, and every pilot should be very conscious of the many factors that could affect their mental health. Every time I fly, I brief my copilot about limiting distractions especially during taxi, takeoff, and landing. Factors that affect your mental health are distractions and should be treated as so. Along with completing the IMSAFE checklist each pilot should complete a personal mental health analysis prior to flight as well.

Describe a few ethical considerations surrounding the human factors discipline

When faced with ethics in aviation, the first consideration that comes to mind is centered around aspects of ethics that may prevent us from making the right decision. A large part of ethics involves making a choice that will preserve the safety of those around you as well as to maintain a respectful aviation environment. A few moral principles that may govern whether we make the right or wrong choice as pilots is fear, guilt, and self-interest/ convenience to oneself.

When we find ourselves in a difficult situation as pilots, perhaps the weather is below our own personal minimums and ethically we know that the right thing to do to preserve our own safety and even our instructor's safety is to cancel the flight, fear of inconveniencing others may prevent us from acting ethically and remaining honest with ourselves and others. We may fear that our choice to make what we know is the right decision could potentially jeopardize the way others view us as pilots or result in negative consequences to us a pilot canceling a flight.

Similarly, guilt may prevent us from making the ethically right decision. Perhaps we have already canceled two flights this week, and by canceling a third flight, a feeling of guilt arises. This feeling might consist of embarrassment or negative feelings toward ourselves for having lower personal minimums than other pilots. This guilt may result in comparison and we may begin to doubt our decision making skills.

Finally, Self- interest and convenience may prevent pilots from acting ethically, particularly on solo flights. When flying alone on a VFR cross country, the student pilot is aware of the regulations and understands the importance of following them to maintain a safe environment for everyone in the air. When enroute this cross country, the pilot comes across a few clouds that they must descend away from in order to avoid them horizontally. The pilot knows they aren't allowed to fly within 2,000 feet horizontal distance from clouds in VFR flight, however the clouds are so few, they will only pass through them for roughly 10 seconds, and they will not affect the pilots line of sight.

As pilots, there are many times where we are faced with situations where we have the option to break a small rule that nobody will ever find out about to cater to our own convenience. In these situations, it is important to maintain honesty and integrity in order to not let our own self-interest govern our ethical decision making skills. When in the air, it is important to remain honest and fair for the sake of our own safety, but also for the safety of others. When it comes to ethics, there is nothing more important than making it a habit to practice safe and fair flying by following the regulations put in place for us.

Assignment 2 Examples

Describe a few professional considerations surrounding human factors

In my time in aviation, I have come to learn that those who work in the field are some of the most respectful and professional individuals I have met. Pilots, whether on the ground or in the air, are oftentimes always courteous toward one another and maintain a professional environment. Many times, in order to maintain safety and integrity in the aircraft, we rely on personal minimums, FAA regulations, and patience with ourselves and other pilots.

A large aspect of deciding whether or not to fly on a given day is centered around personal minimums and conditions that we are comfortable or not comfortable flying in. Going hand in hand with ethics, it is important to take other pilots' personal minimums into consideration and remain respectful and professional toward them and what they are personally comfortable in to aid in eliminating those feelings of fear or guilt when faced with a difficult decision to make surrounding flying. Remaining professional and respectful toward others' boundaries aids in maintaining those aviation ethics and in maintaining a safe environment where pilots can make the best decision for themselves and their crew without fear of judgment or fear of making the wrong decision.

Aviation is filled with rules and regulations, and from early on in our training we understand the importance of following them for our safety and for the safety of every person around us. Not only is it essential that we follow these rules in a professional manner that upholds the high standards set for pilots, but it is also essential that we respect the time needed for others' to follow these rules. There are many times where there may be an aircraft in front of you who is taking a longer time to get through their engine runup and go through their checklists to ensure that they are comfortable and ready for takeoff. Practicing patience is critical in aviation because when we are patient with other pilots, we are showing them our respect and that we care for their safety. When another pilot takes the time that they need to be comfortable with their aircraft, they will be safe,have the ability to make ethically correct decisions, which in turn allows us to be safe and make smart choices in the air.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

One professional consideration is avoiding stereotypes and assumptions about a person. Not only is it not professional to treat and communicate with someone who may have an intellectual disability, a person who uses a wheelchair, or treating a person differently because they are a female for example. This is regarding not only pilots but also those who work with the pilots and human factors specialists, like mechanics, the aerospace engineers, even the management, marketing, and other sides of the industry. Simply treating people with respect since this is a field that deals with people all the time, from various lifestyles, beginnings, and each person has gone through a different life with various cultures. This is a field that looks at how we, as humans, are similar to each other but also vastly different. You are meant to benefit the client or company you are working with while also doing good for the general populace and humanity.

Another professional consideration is you should know plenty and more than whoever you are working for or your client. Though using that knowledge and information to make the right decision, for example if asked to speak in court you provide credible data/research while being able to tell the value and limitations of it and your own capabilities. This also coincides with not misleading clients, organizations, and any business. For example a new researcher is looking at the UX design of a new flight simulator, while communicating with pilots you would treat each one with respect, understanding their capabilities and accurately applying your own capabilities while doing research and knowing when to ask for their recommendations with your own observations. This is even related to confidentiality, when taking down research doing so with the agreement of the participant. Unless it is public behavior, the pilots need to explicitly agree to the recording of any data. In the previous question there was mention of where the line of confidentiality for adapting technology to the user, like pilot to plane, user to phone, and so forth. Yet when in the preliminary development phase confidentiality is very important but what about after that.

Assignment 2 Examples (cont.)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

I believe that professional and ethical overlap quite a lot in aviation, in particular the concepts of fairness, honesty, and remaining non-biased. But professionalism in human factors goes beyond just behaving ethically, it also branches into the ideas of procedure, obligation, and legality. The simplest of all of those ideas is legality, to be a professional in anything requires that we follow the law, even when we disagree with it we must follow the law, though this does play a seemingly small role in human factors investigations it still vital that we follow them to the ledger to get the most out of the investigation.

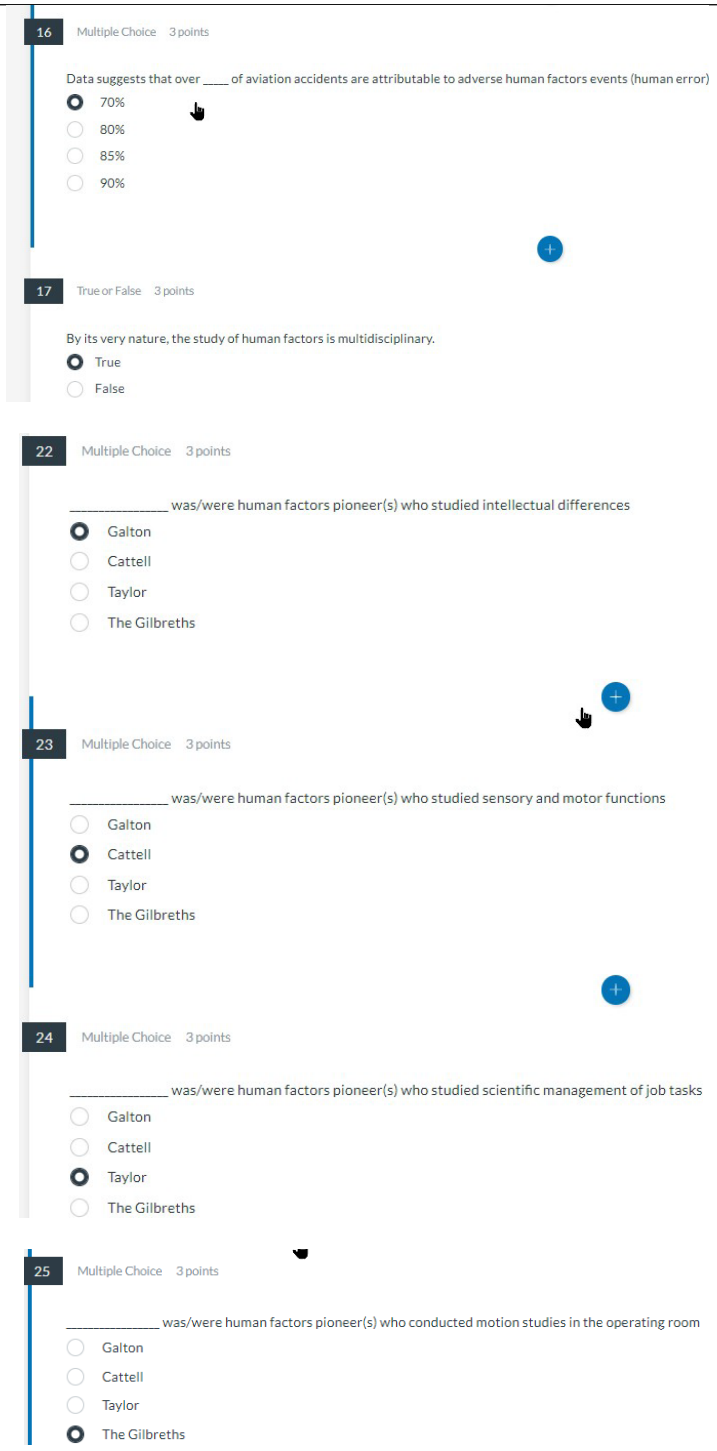
Obligation is where professionalism gets complicated, above all else we must be obligated to the truth and the continued safety of air travel. Human Factors plays a massive role in the world of aviation in the end human beings are running and monitoring the systems in place to ensure safe, quick, and effective functioning of both general and professional aviation. As pilots we are obligated to many things, but as humans we are obligated to our human factors to monitoring our fellow pilots, ourselves, and to above all else the truth of our flaws. To ignore those obligations to the human factors involved in aviation would be to open ourselves and our passengers up to considerable risk some of which by the time we sense a problem it may be too late. This why our obligation to human factors is a constant in aviation one that only can be upheld in the system if all persons in the system are vigilant for the variety of symptoms that can display no matter how seemingly insignificant.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

Professionalism is an essential part of the global air transportation industry not only in regard to customer service, but decision making as well. Across the industry, professionalism includes doing everything correctly and procedurally, in turn, relating to human factors. Human factors directly correlate to the professional considerations within aviation because decision making is essential not only in the cockpit, but across multiple disciplines that go into making scheduled airlines service successful. Specifically, one professional consideration that surrounds human factors would be decision making, including, the pilot deciding whether they can safely complete the flight. I think that this question can closely relate to the previous because professional and ethical considerations can go hand in hand within the human factors discipline. This dilemma can tie into both ethical and professional considerations because as a pilot, you should know the limitations of yourself to conduct a flight, and as the pilot, if you know that you are not in a good position to fly, the safety of the passengers in influenced, therefore becoming an ethical situation. Continuing with this idea, not necessarily related to commercial aviation, but as student pilots, a consideration when flying in the IFR environment can be personal minimums. As a new instrument pilot, would you want to go fly on a low IFR day where you would break out on an approach at minimums as prescribed in the approach chart? A big part of professional considerations, relating to human factors, revolves around the idea of limitations as pilots. As a pilot, being a professional involves knowing the limitations of yourself and the aircraft that you are flying, and it comes down to decision making which influences the human factors chain, ultimately increasing the chances of an accident derived from human error. In all, professional considerations and ethical dilemmas in human factors are very closely related. In an essential industry such as air transport, it is essential to understand how you as the pilot function in the human factors tree in order to make both professional and ethical decisions.

SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.

SLO 2 Test 1 Questions



16 Multiple Choice 3 points

Data suggests that over ____ of aviation accidents are attributable to adverse human factors events (human error)

- (●) 70%
- ( ) 80%
- ( ) 85%
- ( ) 90%

17 True or False 3 points

By its very nature, the study of human factors is multidisciplinary.

- (●) True
- ( ) False

22 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who studied intellectual differences

- (●) Galton
- ( ) Cattell
- ( ) Taylor
- ( ) The Gilbreths

23 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who studied sensory and motor functions

- ( ) Galton
- (●) Cattell
- ( ) Taylor
- ( ) The Gilbreths

24 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who studied scientific management of job tasks

- ( ) Galton
- ( ) Cattell
- (●) Taylor
- ( ) The Gilbreths

25 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who conducted motion studies in the operating room

- ( ) Galton
- ( ) Cattell
- ( ) Taylor
- (●) The Gilbreths

SLO 2 Test 4 Questions

20 Multiple Choice 1 point

Generally speaking, _____ aircraft produce a higher frequency

- (●) Small gas turbine engines
- ( ) Large gas turbine engines
- ( ) Small piston engines
- ( ) Large pistone engines

21 Multiple Choice 1 point

Conductive deafness is most closely associated with?

- (●) Eardrum perforation
- ( ) Loud noises
- ( ) Age

25 True or False 1 point

Spatial disorientation is exacerbated by fatigue.

- (●) True
- ( ) False

26 Multiple Choice 1 point

Somtogravic illusions are generally associated with?

- ( ) The semi-circular canals
- (●) The otolith organ

29 Multiple Choice 1 point

Somatogravic illusions generally involve?

- ( ) Turning operations
- (●) Linear operations

SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.

SLO 4 Assignment 1 Evidence

ASCI 4050 Human Factors Assignment 1 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

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The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

ASCI 4050 Human Factors Assignment 3 Name:_____

Hi everyone,

As a reminder, I am traveling on an accreditation visit next Monday, November 14th. Consequently, we will not have class. Rather than having class, I am giving this assignment in place of class. This assignment will contribute to your homework grade (15% of your total grade). This assignment must be uploaded to Canvas no later than Wednesday, November 16th by the end of the day.

In class, we discussed the notion of Individual Differences. In high-consequences operations we will engage people of diverse experience, backgrounds, and cultures. People are different and that difference is a strength. Diversity provides a distinct advantage to the team as diversity allows individuals to bring a different perspective and skillset to a problem.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

SLO 4 Assignment 1 Examples (cont.)

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

1- The ethical considerations that the discipline of human factors consists of the right and wrong that humans are ought to do, in terms of rights, respect for people, beneficence, justice and fairness. To ensure that the human factor discipline meet those ethics standards, it must provide privacy and safety for those who are affected by the system. In addition, loyalty, compassion, and honesty are among the other moral values that are encouraged by ethical standards. Additionally, ethical standards cover rights such as privacy, the right to be free from harm, and the right to life. These standards are suitable ethical standards since they are based on consistent and solid justifications. Therefore, a human factors specialist should not possess any issues with normative ethics such as obligations, rights, injury prevention, privacy. However, what about when those ethical standers merge, in case of an injury and privacy are at odds with one another. For example, if a pilot suffers from mental problems such as depression and they are pressured to hide it from their employer and colleagues because it might risk losing their job. Thus, given the circumstances, the pilot might be aware that they are unsuitable to fly, but they are not obligated to say anything that would risk losing their job, and if the employer allowed them to fly with medications, it would risk the safety of flight. This example raises many questions regarding the ethical standards in human factors, such as would the human factors specialists create a system that notifies the employers if the pilot is visiting a psychiatrist or if there are any decline in their performance or their attitude with their coworkers. Those circumstances force the industry to create a system that would break the ethical code and invade the pilots' privacy which would add more pressure and stress to their work life.

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Another ethical consideration in human factors that happens every day is tight flight schedules. Commercial Pilots would not want to cancel a flight too often and put their career and income on the line. This means that the IM SAFE checklist may not be properly adhered to, or corners could be cut on procedures in order to make departure or arrival times. This is a ethical consideration that is a everyday risk. Pilots should always self-evaluate before a flight

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Similarly, guilt may prevent us from making the ethically right decision. Perhaps we have already canceled two flights this week, and by canceling a third flight, a feeling of guilt arises. This feeling might consist of embarrassment or negative feelings toward ourselves for having lower personal minimums than other pilots. This guilt may result in comparison and we may begin to doubt our decision making skills.

Finally, Self- interest and convenience may prevent pilots from acting ethically, particularly on solo flights. When flying alone on a VFR cross country, the student pilot is aware of the regulations and understands the importance of following them to maintain a safe environment for everyone in the air. When enroute this cross country, the pilot comes across a few clouds that they must descend away from in order to avoid them horizontally. The pilot knows they aren't allowed to fly within 2,000 feet horizontal distance from clouds in VFR flight, however the clouds are so few, they will only pass through them for roughly 10 seconds, and they will not affect the pilots line of sight.

As pilots, there are many times where we are faced with situations where we have the option to break a small rule that nobody will ever find out about to cater to our own convenience. In these situations, it is important to maintain honesty and integrity in order to not let our own self-interest govern our ethical decision making skills. When in the air, it is important to remain honest and fair for the sake of our own safety, but also for the safety of others. When it comes to ethics, there is nothing more important than making it a habit to practice safe and fair flying by following the regulations put in place for us.

SLO 4 Homework 3 Examples

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The first strategy I will employ is being open to all disciplines and cultures and their differences. People work better when they feel their similarities and differences are accepted, respected, and valued. It will be crucial to me that I embrace all the cultures and values of the diverse and multi-disciplinary teams and make an effort to make people feel comfortable and learn about their way of life for improved interactions. Another strategy I will use to reduce differences between multi-disciplinary and diverse teams for effective work is having good communication skills. Any team works better when there is open and honest communication. How everyone in the group communicates with each other will influence how well they work together and the team's productivity. There needs to be open communication across diverse and multi-disciplinary teams. This way, people can talk about difficult and complicated situations and issues. It is vital that team members are encouraged to communicate effectively and respectfully, as everyone needs to feel like their voice is being heard. Minimizing miscommunication will ensure that there is reduced conflict across the team. To achieve effective communication, people will need to learn how to listen attentively and seek clarification in case of any issue or misunderstanding. Different cultures and disciplines also have different communication styles, so I will accept, understand and respect how diverse people communicate to have an effective team. Further, I will try to avoid stereotyping and prejudice to work effectively with multi-disciplinary and diverse teams. When people are unfairly divided into groups and assigned unfair characteristics, it can affect how they work and interact with others. Therefore, I will accept that diverse people have different and unique working styles and preferences, which does not make them less important or productive. To work effectively, I will improve my conflict management skills. I will consider conflict management training for myself and the rest of the team. With good conflict management, the team will be able to work effectively.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Despite belonging to diverse expertise, disciplines, and backgrounds, teammates need to feel like they are part of the group or community. To achieve effective communication in a diverse group, I should be able to share and exchange ideas respectfully so that everyone can understand each other. I will be open and inclusive to other cultures to ensure effective communication. Every team member's language and communication culture must be respected. Communication needs to accommodate everyone's needs and not just the needs of those in the majority language. Openness and inclusivity in communication will help create trustworthy relationships where people feel comfortable enough to share their ideas with the rest of the team. To appreciate diversity, especially in communication, I will learn about the unique communication styles of diverse groups to promote effective communication. I will use clear and concise language to communicate effectively with people from diverse backgrounds. Keeping my language clear and straightforward ensures that no meaning is lost in interpretation and that my audience can receive the message exactly how I intended it to be received. Paraphrasing my words and asking the team if they understand my message will ensure the communication is clear and effective. Repeating the message help improve communication as I can clarify what I am saying and therefore eliminate misunderstandings. Body language is also very important in oral communication; therefore, I will make an effort to understand the differences in body language for each diverse group. Feedback is critical in ensuring effective communication. Providing and receiving constructive and honest feedback will be critical in my communication. Feedback will make people be sure that their voice is heard and respected and will therefore encourage people to communicate more openly. Most importantly, it can be challenging to know exactly how to communicate with people who are different from you in one way or the other. I will therefore take diversity training which will ensure that a diverse team can communicate effectively with each other

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The importance of understanding individual differences within any environment, yet alone a high consequence one, is paramount when seeking to further know how a team functions as a whole. In looking at how to address the individuality of each member involved, I believe the most effective strategy in helping coordinate such forces would be communication. In many environments, co-workers will often work alongside each other, not only on their own projects but on one major task as a goal. For example, myself and my fellow interns at Garmin (a pretty small gap diversely) all have our separate functions whilst focusing on the same geographic area and working on the same geographic file. While we each have our own separate responsibilities regarding such, we all have to remain in clear communication with each other and other folks in the department to make sure that we are effectively doing our assigned work without overlapping or stepping onto anyone else's toes. In doing so, we help to promote a work environment that enables us each to assist each other when we have any issues or questions that may arise. This includes a larger portion of people, not only within our own offices, but that of Garmin's Corporate offices, as well as any remote employees as well. Our work environment is filled with hundreds of thousands of very diverse groups and skill sets that come together to help develop products in the name of a greater goal. It helps in managing any Human Resource issues(should they arise) and establishes a better understanding of who we are within a larger workforce. Communication is also paramount in highly-diverse things when everything is going right. Teams that communicate well with each other will not only improve productivity in the office, but it also stands to make a work environment more pleasant for everyone involved. In having a well-functioning team communicate, a door opens to a safer, friendlier, and more productive work environment.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Effective communication is paramount to a high-functioning team. Ensuring the development and implementation of this process is something that numerous companies have used worldwide in order to help the cohesive teamwork abound in their fields of work. Effective communication must first begin with respect, from co-worker to co-worker, and even from CEO to the lowest new-hires of an establishment. In garnering and fostering respect for one's peers (especially within a work environment) a person gains better understanding in how their co-workers might function differently from them. For example, in my previous field of work (largely customer service), my ability to understand how each of my managers (I was under four managers, two of which owned and operated the waterpark/campground) approached a situation in which a customer was being difficult. For some of my team-members, they largely avoided conflict in the way that they would place blame on another department, another worker, etc. (IE "BLANK didn't properly charge the golf-cart," etc. etc.) whilst others would directly place the blame on themselves (even if it was not directly related to them) so they could resolve an issue with a customer without interference. After having to work with a difficult employee, then, each of these individuals would gather to speak on the issue they were presented with, and (depending upon what type of mishap took place that day) would gather multiple departments as a whole to discuss new ways to prevent similar situations from happening again. In doing so, they fostered a relationship with their employees that would not only call out issues in the system, but also attempt to resolve them. How does this, then, relate to the individuality of each person involved? It gives everyone across departments, each with our own experience and backgrounds in numerous fields (technology, lifeguarding, customer service, food service, etc) an equal voice when speaking to our bosses. The respect established in each member of a team leads to a team that is highly communicative, and thus, a much more high-functioning one.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

There are a lot of strategies that I think I can employ to work effectively on a multi-disciplinary and diverse team. A couple of the strategies that I can implement is know your role in the company, be open minded, and be able to work as a team.

Starting with the first strategy of knowing your role in the company. This is important for one main reason the first being, so you don't fail in a project and not to waste any precious resources. This is most prominent in the aviation industry when things are being done by the proper people in the flight deck or on the ground. A perfect example would be in the Tenerife accident when the KLM pilot was doing the pre-checks and because the captain being that he was a higher up in the company he didn't know the proper flows and glanced and forgot crucial steps in the checklist that should have been done by the First Officer.

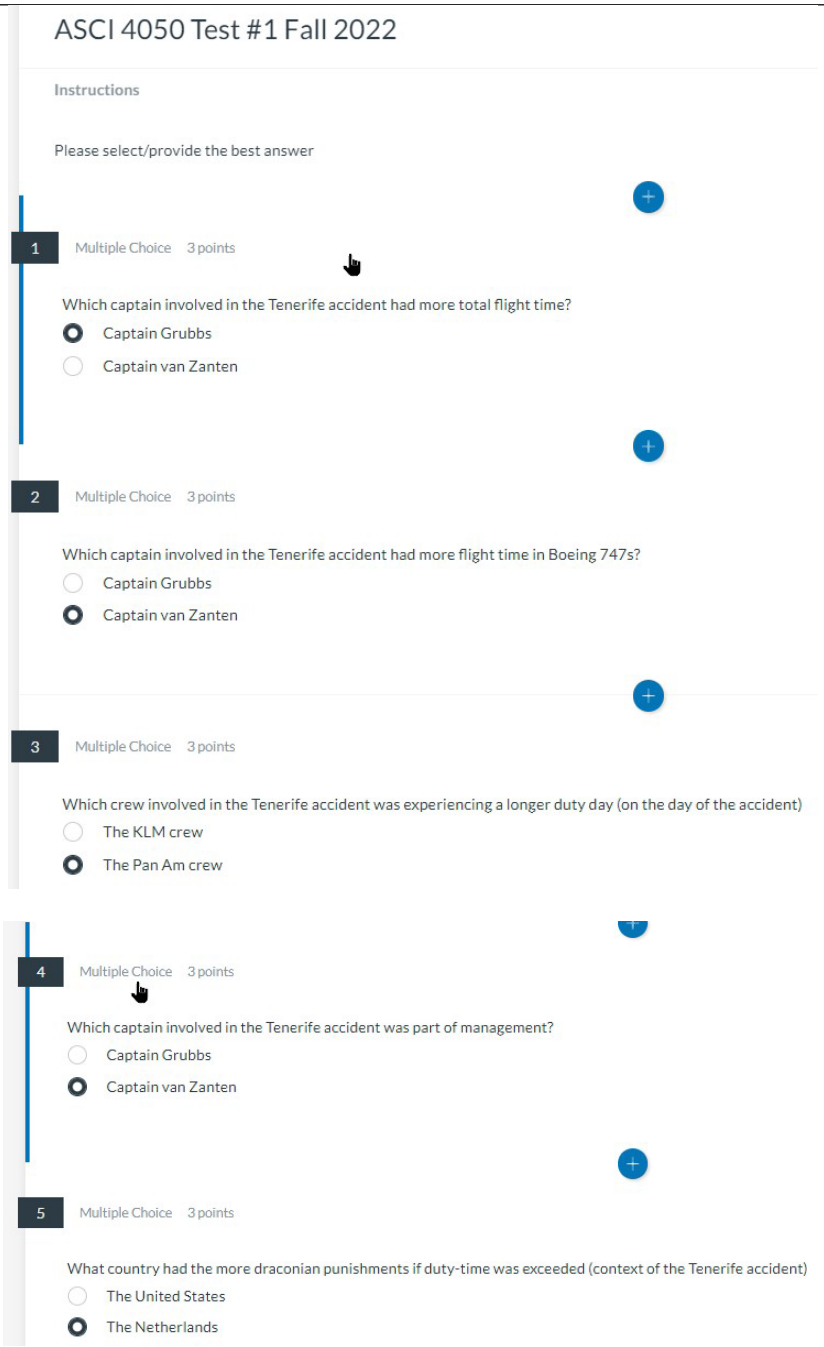
The second strategy that I can employ to work is to be open minded. This is self-explanatory but listen and be respectful of other people ideas. Being able to have meetings, discussions and brainstorming are key aspects to success. This can be found in aviation a lot of the time in flight training, but really any point in your pilot career. Humans aren't perfect so we are going to make mistakes and there is going to be someone there to critique your work so being able to be open to what they are teaching you is crucial so you can become a successful aviator.

The third strategy relates back to the first two strategies that I have briefed on and that is being able to work on a team. Working on a team is so crucial in aviation, no matter what side of aviation you are working on. In the airplane you need to be able to rely on your first officer or captain or flight instructor to help you fly the plane. In commercial aviation you can't do it all yourself you need someone flying the plane and then another person helping monitor and work the radios to allow your flights to be successful and more importantly safe for the passengers.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

In diverse teams, with members who have different levels of capabilities, knowledge, expertise, and backgrounds, I will keep in mind of these differences in my peers to ensure effective communication. I will express my ideas clearly and consciously so all members of the team are on the same page as me, and can understand the task at hand, and how I feel. I will advocate for myself and my ideas in team meetings through verbal communication, additionally, other modes of communication can be used like emails and professional messaging sites. I will consistently send out emails of important tasks or goals that I would like the team to meet as a whole. By using these written communication methods, I will enhance my verbal communication by having my ideas and goals known and able to look back on, them so I can keep myself accountable for them. I will ensure that the members of my team understand what I am trying to say by asking to follow-up questions and interacting with my peers. Since I might be discussing information that requires background knowledge, this is crucial to ensure that all members, no matter their skill set, understand what I am trying to communicate. Another part of communication is listening. Effective listening is very important in any team, and with diverse members, listening can help share ideas and enhance the team dynamic. Body language is another important factor for effective communication, and I will make sure my body language aligns with what I am trying to communicate. I want to be sure that I make proper eye contact and other appropriate body language so I convey the right message to the team member, in whom I am talking with. In conclusion, I will utilize effective communication techniques so that the diverse members of my team can understand me and feel heard.

SLO 4 Test #1 Questions



ASCI 4050 Test #1 Fall 2022

Instructions

Please select/provide the best answer

1 Multiple Choice 3 points

Which captain involved in the Tenerife accident had more total flight time?

- (●) Captain Grubbs
- ( ) Captain van Zanten

2 Multiple Choice 3 points

Which captain involved in the Tenerife accident had more flight time in Boeing 747s?

- ( ) Captain Grubbs
- (●) Captain van Zanten

3 Multiple Choice 3 points

Which crew involved in the Tenerife accident was experiencing a longer duty day (on the day of the accident)

- ( ) The KLM crew
- (●) The Pan Am crew

4 Multiple Choice 3 points

Which captain involved in the Tenerife accident was part of management?

- ( ) Captain Grubbs
- (●) Captain van Zanten

5 Multiple Choice 3 points

What country had the more draconian punishments if duty-time was exceeded (context of the Tenerife accident)

- ( ) The United States
- (●) The Netherlands

Performance Indicator Rubric

Course: ASCI 4250 Professional Ethics and Standards Course Instructor:____Jan McCall_____

Semester Taught:_____Fall 2020_____ Number of Students in Course:___47____

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	98%	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

**Attach description of assignment used for assessment and samples of student work.*

DISCUSSION BOARD ASSIGNMENT

Learning Module 2: Ethical issues in AVN Maintenance, Outsourcing, and Whistleblowers

LM2 Q2: Outsourcing (20 points)

Due 18 SEP

All students should **choose two of the three questions** below to answer.

Then, do a little internet searching and see what you can offer the class but be sure to provide a weblink or APA citation and reference. You may use 1-2 paragraphs or bullet points to list your answers (10 pts x 2 questions = 20 points).

1. What are some of the key differences in FAA regulatory oversight of domestic and foreign outsourced airline maintenance?
2. Chapter 6 provides a union perspective on outsourcing maintenance. Claiming the union protection provided to mechanics ensures safety compared to outsourced non-union labor; how would a non-union mechanic, such as Delta, compare to an outsourced mechanic?
3. Other than saving money, are there other benefits to outsourcing maintenance?

Student Response to Discussion Board Question: LM2 Q2

Question 1: No matter the intention of the FAA, they have been falling behind in oversight over both domestic and foreign outsourced maintenance, and the agency is aware of the issues (Federal Aviation Administration, p. iii). According to Jin (2021), the FAA struggles to hire and retain aviation safety inspectors (Jin, p. 49) as a result of the numerous nuances of government work: inflexible bureaucracy, lack of funding, and government shutdowns leaving employees without a paycheck (Jin, p. 38) It is no wonder potential inspectors defect to other forms of employment, likely in the private sector. The lack of inspectors leaves all MROs with a lack of government oversight including domestic repair stations, but especially foreign ones, relying on each air carrier's Continuing Analysis and Surveillance System. Stakeholders can rest assured that certified domestic repair stations (certified under 14 CFR 145) are required to hold an FAA certificate, maintain a drug and alcohol testing system, and must employ certified mechanics (certified under 14 CFR 65 Subpart D). A myriad of inspections and reports are required on an at-least annual basis. Foreign, off-shore repair stations are subject to less scrutiny than their domestic counterparts: the only parallel is they are required to hold an FAA certificate (if they are certified) that can be renewed every 1-2 years. (Jin, p. 42) Due to the lack of FAA funding for travel, inspectors often cannot reach far-flung repair stations, let alone make follow-up visits on discrepancies flagged on previous visits. In one instance, an inspector was expected to cover 165 certified foreign repair stations when his colleague took sick leave (Jin, p. 49) The FAA is not required to visit any non-certified repair stations, no matter where they are

located on our globe.

Question 2: Delta is unique and accompanied by declining competition using a similar business model. Delta TechOps is certified by the FAA plus many foreign aviation regulatory agencies (Delta TechOps) and is subject to the requirements of a domestic repair station (Jin, p. 42) They must employ certified mechanics and supervisory personnel certified under 14 CFR 65. The repair station certification requires the facility to maintain and use a repair station manual which indicates duties of each position employed by the certificate holder (14 CFR 145.209) The mechanics, as a result of their own certifications as maintenance technicians, must abide by the policies and procedures outlined in their employer's manual (14 CFR 65.81, 14 CFR 65.95).

In contrast, a mechanic working for an outsourced repair station may not hold an FAA certification. If they work in a foreign country that requires a mechanic certificate, they may be certified under that country's regulatory agency. It is possible that the country does not have such a requirement for mechanics to hold that certification (Hoppe, p. 67.) There is hardly an official method to tell if that uncertified mechanic has the skills and knowledge necessary to complete a repair properly. The outsourced mechanic is likely working for a contractor who is willing to pay the bottom dollar. This discrepancy in pay between in-house and outsourced mechanics puts the latter at a disadvantage: their employer is more willing to take advantage of them with long hours and irregular shifts, plus coercion to sign off on an improperly completed repair (Hoppe, p. 67, Jin, p. 41.) In all, there is less accountability when looking at outsourced mechanics compared to in-house mechanics.

Performance Indicator Rubric

Course: ASCI 4450 Aviation Law

Course Instructor: Hoover

Semester Taught: Fall 2022

Number of Students in Course: 46

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner. Submit one assigned administrative law case brief. Quiz 5; Question 4 Quiz 6; Question 11 Quiz 7; Question 7 MidTerm; Question 7	Case Brief: 100%. Student scores on the case briefs ranged from 98% to 100%. Quiz 5 Q 4: 50% Quiz 6 Q 11: 54% Quiz 7 Q 7: 87% Midterm Q 7: 39%	Case Brief: Yes. All students scored well above a minimum of 70%. Quiz 5 Q 4: No Quiz 6 Q 11: No Quiz 7 Q 7: Yes Midterm Q 7: No

ASSESSMENT TECHNIQUES/ACTIVITES USED:

Case Briefs / Administrative Law

This class used real cases to illustrate important concepts needed for understanding law in the field of aviation. These were real life disputes and the students learned about the law by picking up various pieces of it from what the cases told them. Most cases in this course took place in National Transportation Safety Board (NTSB) Administrative Law Judges' (ALJ) hearings, federal and state appeals courts, and the U.S. Supreme Court. There will be an examination of civil and criminal cases. Each of the 46 students was assigned an administrative law case involving the FAA, NTSB or DOT.

Why did the students examine these cases? The U.S. has inherited from England a legal system that is largely judge-focused. The judges have made

the law what it is through their written opinions. To understand that law, the class studied the actual decisions that the judges have written. An objective was to look at the law the way that judges do and study actual cases and controversies, just like the judges. For example, a pilot has a beef

with the Federal Aviation Administration's (FAA) action to suspend her pilot's certificate for several months and wishes to contest this with a lawyer in front of an NTSB administrative law judge in a formal court hearing. In another example, the DOT assesses a civil penalty in the thousands of dollars against a regional air carrier for violating a denied boarding regulation. These real cases and disputes historically have been the primary source of law. Common law generally means law that has developed from adjudicated cases. It is sometimes referred to as case law.

A second reason the class studied these selected cases is that it can be hard for an aviation student to understand a particular Federal Aviation Regulation (FAR) or legal rule, and the merits as a matter of policy, without applying the rule in the real world. Some rules are a bit ambiguous, others are quite specific and easy to understand the spirit and intent behind them. There is the need to understand real-life applications of a rule before a student can understand what the rule really means. These rules have both strengths and weaknesses. By studying cases, a student can learn *to conduct aviation operations in a professional, safe, and efficient manner*. It helps the student to think of specific factual situations that reveal the strengths and weaknesses of a particular aviation-related rule. Hopefully, as future leaders in this industry, they can take that skill to help develop better rules as participants in aviation operations.

At the end of each case brief, the student was required to reflect on the court's opinion and the *application of the case* to the individual student writing the brief and on members of the aviation class which was composed of aviation management majors and professional pilot majors. What are the implications to aviation professionals? How does this case impact activities in aviation? How may we apply this case to our activities in aviation?

Eight quizzes were administered in the course. With 46 students enrolled--and at least 12 of the students being international--a different approach was taken to the assessment process. The quiz questions were issued on paper and each student answered the questions privately and individually. Then all students were permitted to work within groups to negotiate what that group believed to be the correct answer. The group responses were recorded on a separate answer sheet and five points was awarded to the group if they got the correct response on the first try. Any subsequent attempts for the correct response was awarded three points, one point or zero points. This process was to encourage students to collaborate, debate, find evidence, and negotiate for what they believed to be the correct responses. It helped the international students and all students enjoyed the process through reduction of testing stressors. However, the downside results in grade inflation.

EVIDENCE:

Example Quiz Questions Relevant to Learning Outcome (SLO 1)

Conduct aviation operations in a professional, safe, and efficient manner.

Quiz 5; Question 4
Of the following, which ***one*** best represents a potential legal enforcement action that may be taken by the FAA.

a. A flight school is discovered to have a flaw in its operations manual which may lead to unsafe aircraft operations in the training environment.
b. A student pilot made a mistake in the traffic pattern, during touch-and-gos, which was inadvertent on her part.
c. A piloted aircraft was observed by an Illinois State Highway Patrol officer making passes over a rural corn field in a sparsely populated area.
d. Matters involving competence of holders of certificates may require retraining.
e. During a ramp inspection, an FAA Safety Inspector saw a pilot make a mistake during his preflight and did an on-the-spot counseling correction.

Quiz 5; Question 4: With "C" being the correct response, one half of the class responded with "A" or "D"

Quiz 6; Question 11
Some of you in this class will become pilots for a large, major air carrier. Others may work in the customer service unit of the airline. Consider the following statements and identify those that are true and accurate by circling the letter or letters.

a. As the *Al-Watan* case discusses, there are safety-related circumstances in which discrimination is lawful and this not infrequently presents uncomfortable issues of racial, ethnic, and gender-based profiling.
b. The pilot in command of the aircraft is the final authority as to the operation of that aircraft (14 CFR 91.3), including any decision to refuse to transport a passenger provided that pilot follows the airline's required security protocol.
c. COVID-19 is a respiratory illness. Airlines may refuse transportation because of a communicable disease if the passenger's condition poses a direct threat to the health or safety of others. (ACAA in 14 CFR Part 382)
d. The Department of Transportation has set the minimum limit of air carrier liability for provable direct or consequential damages resulting from the disappearance of, damage to, or delay in delivery of a passenger's baggage to an amount less than $2,500 per passenger.
e. Air carriers owe a common law duty of care to their passengers, who, as customers, are business invitees.
f. The Captain holds the ultimate decision-making authority on a passenger's removal from a flight.
g. 49 U.S.C. Section 44902 of the Federal Aviation Act, provides that an air carrier "may refuse to transport a passenger or property the carrier decides is, or might be, inimical to safety."

Quiz 6; Question 11: 23 of 46 students were able to identify the six correct responses (A-B-C-E-F-G) to this question

Quiz 7; Question 7

Scenario. You failed to perform an adequate preflight inspection, attempted to take off on almost empty fuel tanks, and fuel starvation caused the engine to quit on takeoff. But when it did, you were able to abort the takeoff without damaging the aircraft or harming its occupants or anyone else.

a. You could be successfully sued for negligence in that you failed to use care.
b. You could not successfully be sued for negligence. (there was no injury) However, the FAA may suspend or revoke you pilot certificate for careless operation under 14 CFR §91.13, inadequate preflight action under 14 CFR §91.103, or your lack of the care,judgment, and responsibility required of the holder of a pilot certificate.
c. Neither the FAA nor a plaintiff's lawyer will take any civil action against you. You have done no wrong and cannot be held liable for this incident.
d. This is a clear-cut case of intentional tort committed by you, the pilot. You could be successfully sued.

Quiz 7; Question 7: 87 percent of the 46 students responded with the correct letter "B"

Midterm Exam; Question 7

As a result of reviewing several cases in both administrative and criminal law (FAA and DOT/OIG), you have noticed a trend in sanctions and penalties. Which of the choices best reflect this trend?

a. Very few FAA enforcement cases are settled. Most all end up in court; that is, at hearing before the NTSB or on appeal.
b. A study of FAA sanctions would seem to indicate that falsification of documents, records and applications leads to letters of warning to most offenders.
c. There appears to be a great deal of focus on prosecuting those certificated airmen who err in the completion of the application for renewal of the airman medical certificate.

Midterm Exam; Question 7: Only 39 percent of the 46 class members correctly responded with answer "C." The majority of students responded to "B" and a minority of eight students responded to "A."

Case Brief Rubric

The students were assessed using a Case Brief rubric. Students followed the format presented in the rubric. Points earned were up to 84 as a perfect score.

Example Case Briefs from NTSB ALJ and DOT Consent Orders databases

Many administrative law cases assigned to students who are certificate holders involved appeal hearings before the NTSB administrative law judges or full Board. Here is a student example brief that involves a mechanic's falsification of an aircraft record.

Aviation Management majors in the course were assigned Consent Orders issued by the Department of Transportation. Here is a student example of an alleged discrimination case against a Delta pilot in command with a subsequent $50,000 civil penalty against the air carrier.

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

RECOMMENDATIONS (based on the results):

Pending review by the department faculty

**Attach description of assignment used for assessment and samples of student work.*

Performance Indicator Rubric

Course: ASCI 4650 Economics of Air Transportation Course Instructor:_____BRUCE HOOVER_____

Semester Taught:_____SPRING 2023_____ Number of Students in Course:____14____

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	**Assessment Results: (Indicate what % of class achieved a minimum 70%)**	**Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")**
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Not applicable to this course	
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	**Airline (simulation) Management Audit Report** A management audit report 100% of the class achieved a 70% or higher Reliably Blue Air: Three students **96** Aviation Managers Association: Three students **91** SkyPass Airways: Four students **88** FlexJet: Four students **79**	Airline (simulation) Management Audit Report. Benchmark achieved: Y**es** 100% of the class scored a minimum 70%. The 80% benchmark was met as all 14 enrolled students scored above the 70% minimum.
SLO 5: Apply knowledge of business principles in aviation-related areas.	**Online Airline Simulation decisions** 71% of the total enrolled students achieved a minimum of 70% or higher. Only one airline team of four students was unable to achieve a final score of at least 70%. Reliably Blue Air: 727 points (**73%**) Aviation Managers Association: 918.7 (**92%**) Skypass Airways: 584.5 points (**59%**) FlexJet: 774.5 points (**78%**)	Benchmark achieved: **No** 71% of the enrolled students achieved the benchmark. Four of the 14 enrolled students were unable to meet the benchmark.

EVIDENCE

SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.

From the syllabus: “Your airline team will make a brief presentation to the ASCI 4650 class and any guests who may be in attendance. You will conduct the audit from the perspective of an **outside consultant firm** your airline has contracted and you must be objective in your report findings. **Objectivity and honesty**—be brutally frank—are hallmarks of a good external audit. Any attempt to “whitewash” or omit critical points will be dealt with unkindly by the instructor. ***There are several methods of approaching this assignment and your team is encouraged to be creative. Keep in mind you are part of a consulting firm. Your report may follow any creative format appropriate for an outside consulting firm report. Any records, charts, graphs, etc., are welcome if they enhance the presentation.*** Handouts to class members are appropriate if they, too, enhance the presentation.”

The Management Audit Content Guide (below) provided the airline simulation teams with guidance on suggested content reflecting the economic principles and characteristics of the airline industry.

The four airline teams prepared a report of their airline management decisions and the results of those operational, economic, and financial decisions during the semester.

The following are example audit reports submitted by three (of four) teams in the spring of 2023:

SLO 5: Apply knowledge of business principles in aviation-related areas.

Each student participated in an airline simulation where each member was part of an executive team of a small airline firm. Each team met to **formulate their firm level strategy** and submit ongoing (weekly) decisions concerning critical issues facing the firm. Decisions were due online on the Airline Simulation site on a weekly basis by each team leader.

The airline simulation activities were integrated into the classroom learning experience. The group project required collaborative work and everyone was expected to carry an equal share of the work load within each airline team.

Airline Simulation – Learning Objectives

- Experience strategy formulation and implementation in a dynamic (ever-changing and competitive) environment
- Learn about group and organizational processes (team work)
- Understand the financial implications of air carrier operational, marketing and management decisions
- Improve decision-making skills under ambiguous circumstances and time pressure
- Experience the fun and challenges of running a small air carrier business

From the Syllabus: “You will have to make weekly decisions and submit these decisions on the Airline Interpretive Simulations website. Each airline team will be graded on the quarterly (each decision period) performance measures for that period. For example, cumulative net income of the airline may be weighted as 10% of the quarterly score. Depending on how well the airline is managed by the team, these quarterly scores will vary from 60 to 90 points of a possible 100 points on the performance measures (reliability, yield, load factor, social performance, etc.). This is a competitive simulation based on teamwork, analysis of data and good business decisions for the strategies you have decided upon for your particular airline. There will be only one airline (team) winner at the end of the simulation.”

This sheet contains the decision-making schedule.

This sheet is a track of the four airlines progress through the semester.

2023-airline sim quarterly

This sheet provides the final operational, economic, and financial metrics results of the four airline management teams.

Course Assessment (Intended Use of Results)

The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

2022 recommendations by the instructor:

1. Reduce the final grade weight of the management audit oral and written presentation from 30 percent to a lower value. This activity was the most-heavily weighted in the syllabus.
    a. 2023 response: The weighted grade for the management audit report was reduced to 20 percent of the total final course grade. This was a much better balance with other assessments within the course. A peer team member evaluation instrument was added as 10 percent of the final grade.
2. Consider a different textbook. Students expressed some frustration with the textbook's lack of flow, editing errors and some chapters at a graduate level.
    a. 2023 response: The instructor evaluated three possible textbooks and considered each of them to be at the freshman/sophomore level. The textbook choice remained the same.
3. Give consideration as to how the "airline management teams" are to be constructed. This spring 2022 session involved a random drawing of numbers to see what students would be on each (of four) team. Is it better to let the students form their management team? Would this process result in achieving all the assessment values such as the benchmark?
    a. 2023 response: The instructor, again, utilized a random drawing for the determination of team members.

2023 recommendations by the instructor:

There are no recommendations made by the instructor.

Aviation Management – Data Collected in Support of Student Learning Objective Goals and SLO 2

Performance Indicator Rubric

Course: ASCI 4050 Human Factors

Course Instructor: Terrence Kelly

Semester Taught: Fall 2022

Number of Students in Course: 35

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Written Assignment #1 Average 77.5% - 27 of 35 (77.14%) scored above 70% Written Assignment #2 Average 76.4% 27 of 35 (77.14%) scored above a 70%	Benchmark Achieved
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	Homework #3 Average 96.7% - 34 of 35 (97.1%) scored above a 70% Written Paper Average 91.3% - 35 of 35 scored above a 70%	Benchmark Achieved
SLO 5: Apply knowledge of business principles in aviation-related areas.	Test #1 Composite Questions Question 26 – 24 of 35 (69%) students answered correctly Question 28 – 29 of 35 (83%) students answered correctly Question 29 – 11 of 35 (31%) students answered correctly Question 30 – 30 of 35 (86%) students answered correctly Question 31 – 26 of 35 (74%) students answered correctly Overall average 68.6% (scores divided by # of questions)	Benchmark Not Achieved
* I have rounded the values used in this assessment		

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.

Written Assignment #1 required students to respond to questions surrounding both ethical and professional considerations surrounding the human factors discipline. Appropriate decision making is fundamental to the professional, efficient, and safe operation of aircraft. 27 of 35 students (77.4%) scored above a 70%, consequently the benchmark was achieved. Written Assignment #2 required students to respond to questions aimed at identifying and solving problems in the high-consequence environment. Like Assignment #1, 27 of 35 students (77.4%) scored above a 70%; consequently, the benchmark was achieved. While I am pleased with the overall performance on these assignments, it should be noted they were optional (makeup when I was on travel). Many of the students who did not achieve a 70% score on the assignment, did not submit any work. Additionally, the grading for the assignment was not particularly rigorous. As a means of continuous improvement, I plan to make all assignments mandatory and assign a more rigorous grading scheme.

SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.
Homework #3 required students to respond to questions on how to work and communicate effectively (in both oral and written form) in the context of induvial differences/human factors, while working on diverse teams.34 of 35 students scored above a 70% on the homework, consequently the benchmark was achieved. Students were required to participate in a written paper assignment detailing the importance of some physiological aspects of human performance. The written paper was a group assignment. 35 of 35 students scored above a 70% on the written paper assignment. Historically, I have not included an oral presentation in the ASCI 4050 course. I used the Homework #3 assignment to reinforce effective oral communication and the written paper to reinforce effective written communication. The scores supporting the paper and homework assignment were strong, however I am not sure I am meeting the spirit of the “effective oral” communications skills with an assignment that requires students to discuss oral communication. I look forward to discussing the topic with my colleagues. As a means of continuous improvement, I am considering whether to assign the paper individually, rather than as a group project. As part of the final exam, I ask students to rate the performance of teammates (on the paper) to help me better understand the level of participation. In some cases, it was clear that individuals contributed at different levels. Consequently, I felt the assessment was not sufficiently granular. In the future, I plan to assign the paper individually as a means better assessing individual performance.

SLO 5: Apply knowledge of business principles in aviation-related areas.
I assessed SLO 5 using a composite of questions from test #1. The questions included in the assessment were not particularly well suited for assess students’ knowledge of business principles in aviation. I do not generally include business fundamentals in the ASCI 4050 Human Factors course. Nevertheless, I have attempted to make an assessment for the Fall 2022 semester with a plan to discuss removing SLO 5 (Aviation Management) from being tracked in this course. The questions assessed relate to the Tenerife accident, the Bhopal Disaster and the International Air Transport Associated (a representative group for commercial aviation). The assessment was conducted using a composite of five questions from

test #1.The benchmark was not achieved as only 68.6% (24 of 35 students) answered the questions correctly. As a means of continuous improvement, I plan to accomplish one of two things. My preferred choice it to remove SLO 5 (for Aviation Management students) from the ASCI 4050 course. My second choice would be to add a new element to the course that provides a more-sophisticated approach to business principles in aviation-related areas as they relate to human factors. Removing SLO 5 from ASCI 4050 is preferred simply because the course (ASSCI 4050) is already short on time for covering the topics critical to understanding human factors. Adding a module on business principles would require the elimination of something more closely associated with the human performance. A case can be made to include a module on business principles in human factors, but the such an addition would be best addressed in a two course human factors course sequence.

Performance Indicator Rubric

Course: ASCI 4050 Human Factors

Course Instructor: Terrence Kelly

Semester Taught: Fall 2022

Number of Students in Course: 35

FLIGHT SCIENCE CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Written Assignment #1 Average 77.5% - 27 of 35 (77.14%) scored above 70% Written Assignment #2 Average 76.4% 27 of 35 (77.14%) scored above a 70%	Benchmark Achieved
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	Test #1 Composite Questions Question 16 – 26 of 35 (74%) students answered correctly Question 17 – 35 of 25 (100%) students answered correctly Question 22 – 20 of 35 (57%) students answered correctly Question 23 – 22 of 35 (63%) students answered correctly Question 24 – 22 of 35 (63%) students answered correctly Question 25 – 24 of 35 (69%) students answered correctly Overall average 71% (scores divided by # of questions) Test #4 Composite Questions Question 20 - 32 of 35 (91%) students answered correctly Question 21 - 31 of 35 (89%) students answered correctly Question 25 - 32 of 35 (91%) students answered correctly Question 26 - 26 of 35 (74%) students answered correctly Question 29 - 35 of 35 (100%) students answered correctly Overall Average 89% (scores divided by # of questions)	Benchmark Achieved
SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.	Written Assignment #1 Average 77.5% - 27 of 35 (77.14%) scored above 70% Homework Assignment #3 Average 96.7% 34 of 35 students (94%) scored above a 70%	

	Test #1 Composite Questions Question 1 - 25 of 35 (71%) students answered correctly Question 2 - 27 of 35 (77%) students answered correctly Question 3 - 27 of 35 (77%) students answered correctly Question 4 - 34 of 35 (97%) students answered correctly Question 5 – 33 of 35 (94%) students answered correctly Overall Average 83% (scores divided by # of questions)	
* I have rounded the values used in this assessment.		

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.
Written Assignment #1 required students to respond to questions surrounding both ethical and professional considerations surrounding the human factors discipline. Appropriate decision making is fundamental to the professional, efficient, and safe operation of aircraft. 27 of 35 students (77.4%) scored above a 70%, consequently the benchmark was achieved. Written Assignment #2 required students to respond to questions aimed at identifying and solving problems in the high-consequence environment. Like Assignment #1, 27 of 35 students (77.4%) scored above a 70%; consequently, the benchmark was achieved. While I am pleased with the overall performance on these assignments, it should be noted they were optional (makeup when I was on travel). Most of the students who did not achieve a 70% score on the assignment, did not submit the work. Additionally, the grading for the assignment was not particularly rigorous. As a means of continuous improvement, I plan to make all assignments mandatory and assign a more rigorous grading scheme.

SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.
To assess SLO 2, I used a composite of test questions (from test #1 and test #4) that spoke to the history of human factors, some current issues in human factors and how understanding and insight on how human factors mitigation strategies might be applied to negative human factors situations in the future. The scores from test #1 are not particularly impressive. On average, 71% of students correctly answered across the six questions presented. While technically meeting the 70% criteria set by the department, the scores are lower that I would have expected. The scores from test #2 are better. On average, 89% of students correctly answered across the five questions. I do not believe the use of a composite of test questions is the best way to assess SLO 2. Effectively, the use of these questions is an indirect measure while a direct assessment might be more effective. As a means of continuous improvement, I plan to create an assignment (required) that more-specifically and directly addresses the elements of SLO 2. The assignment will likely take the form of a homework assignment given toward the end of the semester.

SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.

SLO 4 the aggregate of three distinct elements including integrity, lifelong learning, and the building of diverse teams. Written Assignment 1 required students to respond to questions on both professional and ethical consideration in the context of human factors. Professional and ethical

decision making is consistent with the practice of integrity. Homework #3 requires students to respond to questions that inquire about how to build and communicate in the context of multi-disciplinary diverse teams . Composite questions from Test #1 were evaluated as an assessment of the importance of life-long learning. These questions focused on the so-called Tenerife accident that occurred in 1977. My hope in reviewing the accident was to demonstrate to students the importance of learning lessons from the paste and applying those lessons in the present. The results of the assessment were good. The results of the written assignment 1 indicated an average score of 77.5% with 77.1% of (27 of 35) students scoring above a 70%. Results from homework #3 indicated an average score of 96.7% with 97% of students (34 of 35) scoring above a 70%. The composite questions evaluated from test # 1 indicated 83% of students (29 of 35) answered the questions correctly. While I am marginally pleased with student performance on SLO 4 I believe changes to the way I assess it will provide a better indication of whether students are achieving the outcome. As a means of continuous improvement, I plan to roll the multiple elements currently used to assess SLO 4 into a single, mandatory assignment that addresses the importance of integrity, lifelong learning and the building and sustaining of diverse teams.

Evidence is presented starting on the next page.

SLO 1: Conduct aviation operations in a professional, safe, and efficient manner assessment evidence.

ASCI 4050 Human Factors Assignment 1 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

Rather than having class, I have placed two assignments in the Modules folder in Canvas. One to cover Monday's class and the second to cover Wednesday's class. Rather than contributing to the homework average, each assignment has the potential to add 5-points to a test grade (for a total of 10-points).

The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

ASCI 4050 Human Factors Assignment 2 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

Rather than having class, I have placed two assignments in the Modules folder in Canvas. One to cover Monday's class and the second to cover Wednesday's class. Rather than contributing to the homework average, each assignment has the potential to add 5-points to a test grade (for a total of 10-points).

The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe how an understanding of human performance (human factors) will help you better identify problems in the high-consequence environment. (300 word minimum)

2. Describe how an understanding of human performance (human factors) will help you better solve problems in the high-consequence environment. (300 word minimum)

Assignment 1 Examples

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

1- The ethical considerations that the discipline of human factors consists of the right and wrong that humans are ought to do, in terms of rights, respect for people, beneficence, justice and fairness. To ensure that the human factor discipline meet those ethics standards, it must provide privacy and safety for those who are affected by the system. In addition, loyalty, compassion, and honesty are among the other moral values that are encouraged by ethical standards. Additionally, ethical standards cover rights such as privacy, the right to be free from harm, and the right to life. These standards are suitable ethical standards since they are based on consistent and solid justifications. Therefore, a human factors specialist should not possess any issues with normative ethics such as obligations, rights, injury prevention, privacy. However, what about when those ethical standers merge, in case of an injury and privacy are at odds with one another. For example, if a pilot suffers from mental problems such as depression and they are pressured to hide it from their employer and colleagues because it might risk losing their job. Thus, given the circumstances, the pilot might be aware that they are unsuitable to fly, but they are not obligated to say anything that would risk losing their job, and if the employer allowed them to fly with medications, it would risk the safety of flight. This example raises many questions regarding the ethical standards in human factors, such as would the human factors specialists create a system that notifies the employers if the pilot is visiting a psychiatrist or if there are any decline in their performance or their attitude with their coworkers. Those circumstances force the industry to create a system that would break the ethical code and invade the pilots' privacy which would add more pressure and stress to their work life.

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

This question is very open ended which caused me to ponder it and consider different ways to interpret it. I started by googling the words "human factors" "discipline" and "ethics", from which I read a few articles. In human factors we study how the human body can affect our ability to conduct safe flight. In some circumstances pilots may make potentially unethical piloting decisions due to constraints whether they be deadlines set by the employer or flying while fatigued.

Pilots have a responsibility and a moral duty to uphold safe flying habits and procedures relating to human factors and aviation in general. In my training at Parks College I learned to follow the IM SAFE checklist which helps pilots know if they are fit to fly on a personal level before they even preflight the aircraft.

Ilness- Am I feeling sick?

Mediation- have I taken medicine for the first time today?

Stress- is your personal life stressing you out?

Alcohol- Am I hungover? It is prohibited to drink within 8 hours of a flight

Fatigue- am I exhausted?

Emotion- emotionally stressed?

All these six personal evaluations will influence pilots to make the right on a go /nogo decision on a private or commercial level.

Another ethical consideration in human factors that happens every day is tight flight schedules. Commercial Pilots would not want to cancel a flight too often and put their career and income on the line. This means that the IM SAFE checklist may not be properly adhered to, or corners could be cut on procedures in order to make departure or arrival times. This is a ethical consideration that is a everyday risk. Pilots should always self-evaluate before a flight

Assignment 1 Examples (cont.)

1. Describe a few ethical considerations surrounding human factors discipline (300 word minimum)

When it comes to ethical factors in the context of human factors, I think the best way to begin is with the IMSAFE checklist. While it is always tempting to fly (because we all love flying) and especially for airline pilots who rely on their salary to support themselves and/or their families, we must not put the safety of our passengers in jeopardy if we, pilots, are unfit to operate an aircraft. It is essential that we systematically complete the IMSAFE checklist before making any further decisions about traveling airborne. Perhaps the most important element of this checklist is the last letter "E", which stands for external pressures. As I mentioned earlier in the response, Pilots may feel pressured into flying for several reasons ranging from angry passengers (for commercial pilots) to get thereitis as we sometimes call it around Parks. We must understand that it is dangerous and far too risky to neglect any factor that could impact our performance while operating an aircraft. The IMSAFE checklist serves to provide pilots with a methodical way of analyzing their own human factors. As mental health has become a much more relevant issue in recent years, it is important to know that this applies to everyone including pilots. There is an absolute plethora of things that could impact any human's mental health, which may be family-related or something external like being given bad news from a friend. Any of these things could severely impact the pilot's ability to proficiently operate the aircraft, and every pilot should be very conscious of the many factors that could affect their mental health. Every time I fly, I brief my copilot about limiting distractions especially during taxi, takeoff, and landing. Factors that affect your mental health are distractions and should be treated as so. Along with completing the IMSAFE checklist each pilot should complete a personal mental health analysis prior to flight as well.

Describe a few ethical considerations surrounding the human factors discipline

When faced with ethics in aviation, the first consideration that comes to mind is centered around aspects of ethics that may prevent us from making the right decision. A large part of ethics involves making a choice that will preserve the safety of those around you as well as to maintain a respectful aviation environment. A few moral principles that may govern whether we make the right or wrong choice as pilots is fear, guilt, and self-interest/ convenience to oneself.

When we find ourselves in a difficult situation as pilots, perhaps the weather is below our own personal minimums and ethically we know that the right thing to do to preserve our own safety and even our instructor's safety is to cancel the flight, fear of inconveniencing others may prevent us from acting ethically and remaining honest with ourselves and others. We may fear that our choice to make what we know is the right decision could potentially jeopardize the way others view us as pilots or result in negative consequences to us a pilot canceling a flight.

Similarly, guilt may prevent us from making the ethically right decision. Perhaps we have already canceled two flights this week, and by canceling a third flight, a feeling of guilt arises. This feeling might consist of embarrassment or negative feelings toward ourselves for having lower personal minimums than other pilots. This guilt may result in comparison and we may begin to doubt our decision making skills.

Finally, Self- interest and convenience may prevent pilots from acting ethically, particularly on solo flights. When flying alone on a VFR cross country, the student pilot is aware of the regulations and understands the importance of following them to maintain a safe environment for everyone in the air. When enroute this cross country, the pilot comes across a few clouds that they must descend away from in order to avoid them horizontally. The pilot knows they aren't allowed to fly within 2,000 feet horizontal distance from clouds in VFR flight, however the clouds are so few, they will only pass through them for roughly 10 seconds, and they will not affect the pilots line of sight.

As pilots, there are many times where we are faced with situations where we have the option to break a small rule that nobody will ever find out about to cater to our own convenience. In these situations, it is important to maintain honesty and integrity in order to not let our own self-interest govern our ethical decision making skills. When in the air, it is important to remain honest and fair for the sake of our own safety, but also for the safety of others. When it comes to ethics, there is nothing more important than making it a habit to practice safe and fair flying by following the regulations put in place for us.

Assignment 2 Examples

Describe a few professional considerations surrounding human factors

In my time in aviation, I have come to learn that those who work in the field are some of the most respectful and professional individuals I have met. Pilots, whether on the ground or in the air, are oftentimes always courteous toward one another and maintain a professional environment. Many times, in order to maintain safety and integrity in the aircraft, we rely on personal minimums, FAA regulations, and patience with ourselves and other pilots.

A large aspect of deciding whether or not to fly on a given day is centered around personal minimums and conditions that we are comfortable or not comfortable flying in. Going hand in hand with ethics, it is important to take other pilots' personal minimums into consideration and remain respectful and professional toward them and what they are personally comfortable in to aid in eliminating those feelings of fear or guilt when faced with a difficult decision to make surrounding flying. Remaining professional and respectful toward others' boundaries aids in maintaining those aviation ethics and in maintaining a safe environment where pilots can make the best decision for themselves and their crew without fear of judgment or fear of making the wrong decision.

Aviation is filled with rules and regulations, and from early on in our training we understand the importance of following them for our safety and for the safety of every person around us. Not only is it essential that we follow these rules in a professional manner that upholds the high standards set for pilots, but it is also essential that we respect the time needed for others' to follow these rules. There are many times where there may be an aircraft in front of you who is taking a longer time to get through their engine runup and go through their checklists to ensure that they are comfortable and ready for takeoff. Practicing patience is critical in aviation because when we are patient with other pilots, we are showing them our respect and that we care for their safety. When another pilot takes the time that they need to be comfortable with their aircraft, they will be safe,have the ability to make ethically correct decisions, which in turn allows us to be safe and make smart choices in the air.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

One professional consideration is avoiding stereotypes and assumptions about a person. Not only is it not professional to treat and communicate with someone who may have an intellectual disability, a person who uses a wheelchair, or treating a person differently because they are a female for example. This is regarding not only pilots but also those who work with the pilots and human factors specialists, like mechanics, the aerospace engineers, even the management, marketing, and other sides of the industry. Simply treating people with respect since this is a field that deals with people all the time, from various lifestyles, beginnings, and each person has gone through a different life with various cultures. This is a field that looks at how we, as humans, are similar to each other but also vastly different. You are meant to benefit the client or company you are working with while also doing good for the general populace and humanity.

Another professional consideration is you should know plenty and more than whoever you are working for or your client. Though using that knowledge and information to make the right decision, for example if asked to speak in court you provide credible data/research while being able to tell the value and limitations of it and your own capabilities. This also coincides with not misleading clients, organizations, and any business. For example a new researcher is looking at the UX design of a new flight simulator, while communicating with pilots you would treat each one with respect, understanding their capabilities and accurately applying your own capabilities while doing research and knowing when to ask for their recommendations with your own observations. This is even related to confidentiality, when taking down research doing so with the agreement of the participant. Unless it is public behavior, the pilots need to explicitly agree to the recording of any data. In the previous question there was mention of where the line of confidentiality for adapting technology to the user, like pilot to plane, user to phone, and so forth. Yet when in the preliminary development phase confidentiality is very important but what about after that.

Assignment 2 Examples (cont.)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

I believe that professional and ethical overlap quite a lot in aviation, in particular the concepts of fairness, honesty, and remaining non-biased. But professionalism in human factors goes beyond just behaving ethically, it also branches into the ideas of procedure, obligation, and legality. The simplest of all of those ideas is legality, to be a professional in anything requires that we follow the law, even when we disagree with it we must follow the law, though this does play a seemingly small role in human factors investigations it still vital that we follow them to the ledger to get the most out of the investigation.

Obligation is where professionalism gets complicated, above all else we must be obligated to the truth and the continued safety of air travel. Human Factors plays a massive role in the world of aviation in the end human beings are running and monitoring the systems in place to ensure safe, quick, and effective functioning of both general and professional aviation. As pilots we are obligated to many things, but as humans we are obligated to our human factors to monitoring our fellow pilots, ourselves, and to above all else the truth of our flaws. To ignore those obligations to the human factors involved in aviation would be to open ourselves and our passengers up to considerable risk some of which by the time we sense a problem it may be too late. This why our obligation to human factors is a constant in aviation one that only can be upheld in the system if all persons in the system are vigilant for the variety of symptoms that can display no matter how seemingly insignificant.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

Professionalism is an essential part of the global air transportation industry not only in regard to customer service, but decision making as well. Across the industry, professionalism includes doing everything correctly and procedurally, in turn, relating to human factors. Human factors directly correlate to the professional considerations within aviation because decision making is essential not only in the cockpit, but across multiple disciplines that go into making scheduled airlines service successful. Specifically, one professional consideration that surrounds human factors would be decision making, including, the pilot deciding whether they can safely complete the flight. I think that this question can closely relate to the previous because professional and ethical considerations can go hand in hand within the human factors discipline. This dilemma can tie into both ethical and professional considerations because as a pilot, you should know the limitations of yourself to conduct a flight, and as the pilot, if you know that you are not in a good position to fly, the safety of the passengers in influenced, therefore becoming an ethical situation. Continuing with this idea, not necessarily related to commercial aviation, but as student pilots, a consideration when flying in the IFR environment can be personal minimums. As a new instrument pilot, would you want to go fly on a low IFR day where you would break out on an approach at minimums as prescribed in the approach chart? A big part of professional considerations, relating to human factors, revolves around the idea of limitations as pilots. As a pilot, being a professional involves knowing the limitations of yourself and the aircraft that you are flying, and it comes down to decision making which influences the human factors chain, ultimately increasing the chances of an accident derived from human error. In all, professional considerations and ethical dilemmas in human factors are very closely related. In an essential industry such as air transport, it is essential to understand how you as the pilot function in the human factors tree in order to make both professional and ethical decisions.

SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment assessment evidence.

ASCI 4050 Human Factors Assignment 3 Name:_____

Hi everyone,

As a reminder, I am traveling on an accreditation visit next Monday, November 14th. Consequently, we will not have class. Rather than having class, I am giving this assignment in place of class. This assignment will contribute to your homework grade (15% of your total grade). This assignment must be uploaded to Canvas no later than Wednesday, November 16th by the end of the day.

In class, we discussed the notion of Individual Differences. In high-consequences operations we will engage people of diverse experience, backgrounds, and cultures. People are different and that difference is a strength. Diversity provides a distinct advantage to the team as diversity allows individuals to bring a different perspective and skillset to a problem.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

ASCI 4050 – Human Factors
Paper Assignment
Fall 2022

As a group of 3 (or 2), please prepare a paper indicating your collective thoughts on why an understanding of Human Factors is important in the aviation environment. Include a discussion of a few respiratory, visual, and hearing issues that are likely to influence human error and performance in both pilots and aviation managers.

The paper should be formatted in APA style and include:

- A minimum of five inline citations
- A minimum of five references
- Appropriate spelling, grammar and sentence mechanics
- A cover page (APA style) (1-page)
- An abstract (very short) (1-page)
- 5 -6 pages of content
- One reference page (1-page)
- Total length approximately 8-9 pages

The purpose of the assignment is to demonstrate your familiarity with several Human Factors hazards while utilizing the APA writing style (APA) and practicing parsimonious writing skills.

Here is a very basic rubric I will use to evaluate your papers.

Characteristics	More points ----------		-----------Less points
Length	8 to 9 Pages	6 to 7 pages	Less than 6 pages
APA	Good use of APA	Some use of APA	No use of APA
Citations	5 or more inline citations	Less than 5 inline citations	Less than 3 inline citations
Reference	5 or more references	Less than 5 references	Less than 3 references
Spelling Grammar & Sentence Mechanics	Strong use	Some use	Minimal use
Cover Page	Included and formatted properly	Included but not formatted properly	No cover page
Abstract	Concise but informative	Long or uninformative	No abstract
Essay Content	5 – 6 pages, strong content	Less than 5 or more than 6 pages or poor content	Less than 4 or more 7 pages of poor content
Essay Quality	Informative	Less than informative	Incoherent
Writing	Technical/university level	Weak university level	Not university level
Topic Appropriateness	Appropriate and comprehensive topics	Less than comprehensive or less than appropriate content	Weak content and/or inappropriate
Reference Page Formatting	All references are properly formatted (APA)	Some references are properly formatted (APA)	Few references are properly formatted (APA)

Papers must be saved in Microsoft Word and uploaded to Canvas no later than December 9th, 2022 at midnight.

Homework 3 Examples

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The first strategy I will employ is being open to all disciplines and cultures and their differences. People work better when they feel their similarities and differences are accepted, respected, and valued. It will be crucial to me that I embrace all the cultures and values of the diverse and multi-disciplinary teams and make an effort to make people feel comfortable and learn about their way of life for improved interactions. Another strategy I will use to reduce differences between multi-disciplinary and diverse teams for effective work is having good communication skills. Any team works better when there is open and honest communication. How everyone in the group communicates with each other will influence how well they work together and the team's productivity. There needs to be open communication across diverse and multi-disciplinary teams. This way, people can talk about difficult and complicated situations and issues. It is vital that team members are encouraged to communicate effectively and respectfully, as everyone needs to feel like their voice is being heard. Minimizing miscommunication will ensure that there is reduced conflict across the team. To achieve effective communication, people will need to learn how to listen attentively and seek clarification in case of any issue or misunderstanding. Different cultures and disciplines also have different communication styles, so I will accept, understand and respect how diverse people communicate to have an effective team. Further, I will try to avoid stereotyping and prejudice to work effectively with multi-disciplinary and diverse teams. When people are unfairly divided into groups and assigned unfair characteristics, it can affect how they work and interact with others. Therefore, I will accept that diverse people have different and unique working styles and preferences, which does not make them less important or productive. To work effectively, I will improve my conflict management skills. I will consider conflict management training for myself and the rest of the team. With good conflict management, the team will be able to work effectively.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Despite belonging to diverse expertise, disciplines, and backgrounds, teammates need to feel like they are part of the group or community. To achieve effective communication in a diverse group, I should be able to share and exchange ideas respectfully so that everyone can understand each other. I will be open and inclusive to other cultures to ensure effective communication. Every team member's language and communication culture must be respected. Communication needs to accommodate everyone's needs and not just the needs of those in the majority language. Openness and inclusivity in communication will help create trustworthy relationships where people feel comfortable enough to share their ideas with the rest of the team. To appreciate diversity, especially in communication, I will learn about the unique communication styles of diverse groups to promote effective communication. I will use clear and concise language to communicate effectively with people from diverse backgrounds. Keeping my language clear and straightforward ensures that no meaning is lost in interpretation and that my audience can receive the message exactly how I intended it to be received. Paraphrasing my words and asking the team if they understand my message will ensure the communication is clear and effective. Repeating the message help improve communication as I can clarify what I am saying and therefore eliminate misunderstandings. Body language is also very important in oral communication; therefore, I will make an effort to understand the differences in body language for each diverse group. Feedback is critical in ensuring effective communication. Providing and receiving constructive and honest feedback will be critical in my communication. Feedback will make people be sure that their voice is heard and respected and will therefore encourage people to communicate more openly. Most importantly, it can be challenging to know exactly how to communicate with people who are different from you in one way or the other. I will therefore take diversity training which will ensure that a diverse team can communicate effectively with each other

Homework 3 Examples (cont.)

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The importance of understanding individual differences within any environment, yet alone a high consequence one, is paramount when seeking to further know how a team functions as a whole. In looking at how to address the individuality of each member involved, I believe the most effective strategy in helping coordinate such forces would be communication. In many environments, co-workers will often work alongside each other, not only on their own projects but on one major task as a goal. For example, myself and my fellow interns at Garmin (a pretty small gap diversely) all have our separate functions whilst focusing on the same geographic area and working on the same geographic file. While we each have our own separate responsibilities regarding such, we all have to remain in clear communication with each other and other folks in the department to make sure that we are effectively doing our assigned work without overlapping or stepping onto anyone else's toes. In doing so, we help to promote a work environment that enables us each to assist each other when we have any issues or questions that may arise. This includes a larger portion of people, not only within our own offices, but that of Garmin's Corporate offices, as well as any remote employees as well. Our work environment is filled with hundreds of thousands of very diverse groups and skill sets that come together to help develop products in the name of a greater goal. It helps in managing any Human Resource issues(should they arise) and establishes a better understanding of who we are within a larger workforce. Communication is also paramount in highly-diverse things when everything is going right. Teams that communicate well with each other will not only improve productivity in the office, but it also stands to make a work environment more pleasant for everyone involved. In having a well-functioning team communicate, a door opens to a safer, friendlier, and more productive work environment.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Effective communication is paramount to a high-functioning team. Ensuring the development and implementation of this process is something that numerous companies have used worldwide in order to help the cohesive teamwork abound in their fields of work. Effective communication must first begin with respect, from co-worker to co-worker, and even from CEO to the lowest new-hires of an establishment. In garnering and fostering respect for one's peers (especially within a work environment) a person gains better understanding in how their co-workers might function differently from them. For example, in my previous field of work (largely customer service), my ability to understand how each of my managers (I was under four managers, two of which owned and operated the waterpark/campground) approached a situation in which a customer was being difficult. For some of my team-members, they largely avoided conflict in the way that they would place blame on another department, another worker, etc. (IE "BLANK didn't properly charge the golf-cart," etc. etc.) whilst others would directly place the blame on themselves (even if it was not directly related to them) so they could resolve an issue with a customer without interference. After having to work with a difficult employee, then, each of these individuals would gather to speak on the issue they were presented with, and (depending upon what type of mishap took place that day) would gather multiple departments as a whole to discuss new ways to prevent similar situations from happening again. In doing so, they fostered a relationship with their employees that would not only call out issues in the system, but also attempt to resolve them. How does this, then, relate to the individuality of each person involved? It gives everyone across departments, each with our own experience and backgrounds in numerous fields (technology, lifeguarding, customer service, food service, etc) an equal voice when speaking to our bosses. The respect established in each member of a team leads to a team that is highly communicative, and thus, a much more high-functioning one.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

There are a lot of strategies that I think I can employ to work effectively on a multi-disciplinary and diverse team. A couple of the strategies that I can implement is know your role in the company, be open minded, and be able to work as a team.

Starting with the first strategy of knowing your role in the company. This is important for one main reason the first being, so you don't fail in a project and not to waste any precious resources. This is most prominent in the aviation industry when things are being done by the proper people in the flight deck or on the ground. A perfect example would be in the Tenerife accident when the KLM pilot was doing the pre-checks and because the captain being that he was a higher up in the company he didn't know the proper flows and glanced and forgot crucial steps in the checklist that should have been done by the First Officer.

The second strategy that I can employ to work is to be open minded. This is self-explanatory but listen and be respectful of other people ideas. Being able to have meetings, discussions and brainstorming are key aspects to success. This can be found in aviation a lot of the time in flight training, but really any point in your pilot career. Humans aren't perfect so we are going to make mistakes and there is going to be someone there to critique your work so being able to be open to what they are teaching you is crucial so you can become a successful aviator.

The third strategy relates back to the first two strategies that I have briefed on and that is being able to work on a team. Working on a team is so crucial in aviation, no matter what side of aviation you are working on. In the airplane you need to be able to rely on your first officer or captain or flight instructor to help you fly the plane. In commercial aviation you can't do it all yourself you need someone flying the plane and then another person helping monitor and work the radios to allow your flights to be successful and more importantly safe for the passengers.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

In diverse teams, with members who have different levels of capabilities, knowledge, expertise, and backgrounds, I will keep in mind of these differences in my peers to ensure effective communication. I will express my ideas clearly and consciously so all members of the team are on the same page as me, and can understand the task at hand, and how I feel. I will advocate for myself and my ideas in team meetings through verbal communication, additionally, other modes of communication can be used like emails and professional messaging sites. I will consistently send out emails of important tasks or goals that I would like the team to meet as a whole. By using these written communication methods, I will enhance my verbal communication by having my ideas and goals known and able to look back on, them so I can keep myself accountable for them. I will ensure that the members of my team understand what I am trying to say by asking to follow-up questions and interacting with my peers. Since I might be discussing information that requires background knowledge, this is crucial to ensure that all members, no matter their skill set, understand what I am trying to communicate. Another part of communication is listening. Effective listening is very important in any team, and with diverse members, listening can help share ideas and enhance the team dynamic. Body language is another important factor for effective communication, and I will make sure my body language aligns with what I am trying to communicate. I want to be sure that I make proper eye contact and other appropriate body language so I convey the right message to the team member, in whom I am talking with. In conclusion, I will utilize effective communication techniques so that the diverse members of my team can understand me and feel heard.

Paper Examples

Human Factors in the Aviation Environment

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Department of Aviation Science, Saint Louis University

ASCI 4050: Human Factors

Professor Terrance Kelly

December 9, 2022

While understanding the numerous factors that impact a person's performance within a Human Factors system, it's also essential that we address a flaw within the human condition, preventative issues. In discussing these flaws of the human body, we are able to locate and address the most main problem of the human factors system: the human. Within this paper, we address "real life" examples of these systems in action, causing us to not only further notice the impact of aeromedical factors within a complex system like the ones in the aviation field through the lens of the pilot, passenger, and aeromedical crew, but also so that we can utilize the knowledge gathered from these instances to prevent similar events from taking place in the future. We discuss the effects of bright lights and how they affect our eyes which include our rods and cones. The study by Tony Wright about our hearing and altitudes. Lastly, about gravity and the effects it has on our respiratory system. We go in depth about what we have been taught throughout this course about human factors and how we have understood what has been discussed.

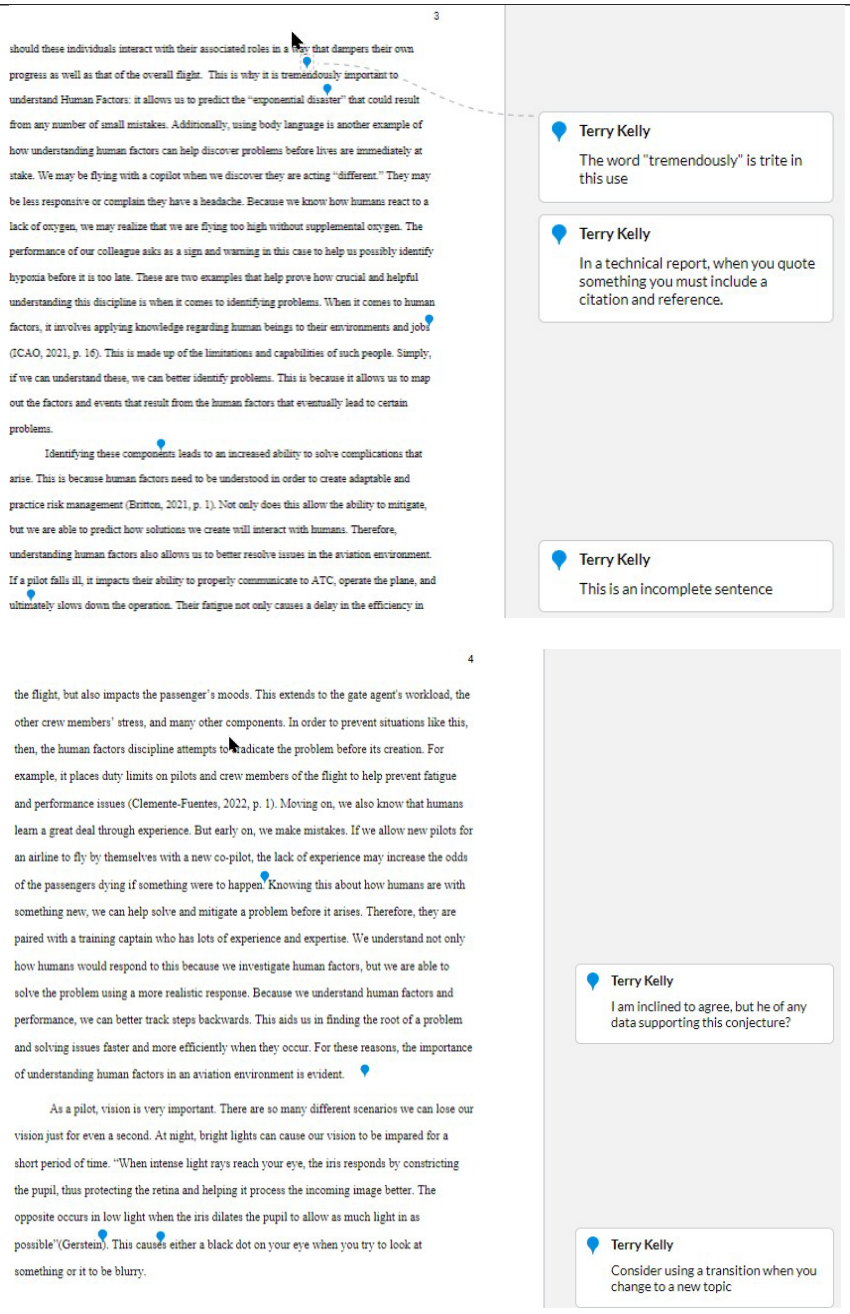
When it comes to the aviation environment, understanding human factors is critical. In fact, according to Boeing, human error contributes to 80 percent of aircraft accidents (Rankin, 2008, p. 1). With this knowledge, we as individuals, as well as a society, can become better at identifying problems through improving our awareness. In turn, this betters our ability to solve issues that arise–an imperative goal in a high-consequence setting. To begin, in this environment, there is very little room for error. For example, a pilot's overarching goal is, put simply, to get a plane and its occupants from one place to another in a safe and efficient manner. This task is broken up into smaller tasks, such as pre-flighting the plane, talking to ATC, engaging the autopilot, landing, etc. In delving into these smaller tasks there is one common denominator: the individuals performing these duties. This creates an exponentially huge potential for disaster,

Terry Kelly
I don't really understand the sentence.

Terry Kelly
Leave words like "lastly" out, they tend to be trite. It's one of the differences between technical and creative writing.

Terry Kelly
Always include the year any resource was published.

Paper Examples (cont.)



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should these individuals interact with their associated roles in a way that dampers their own progress as well as that of the overall flight. This is why it is tremendously important to understand Human Factors: it allows us to predict the "exponential disaster" that could result from any number of small mistakes. Additionally, using body language is another example of how understanding human factors can help discover problems before lives are immediately at stake. We may be flying with a copilot when we discover they are acting "different." They may be less responsive or complain they have a headache. Because we know how humans react to a lack of oxygen, we may realize that we are flying too high without supplemental oxygen. The performance of our colleague asks as a sign and warning in this case to help us possibly identify hypoxia before it is too late. These are two examples that help prove how crucial and helpful understanding this discipline is when it comes to identifying problems. When it comes to human factors, it involves applying knowledge regarding human beings to their environments and jobs (ICAO, 2021, p. 16). This is made up of the limitations and capabilities of such people. Simply, if we can understand these, we can better identify problems. This is because it allows us to map out the factors and events that result from the human factors that eventually lead to certain problems.

Identifying these components leads to an increased ability to solve complications that arise. This is because human factors need to be understood in order to create adaptable and practice risk management (Britton, 2021, p. 1). Not only does this allow the ability to mitigate, but we are able to predict how solutions we create will interact with humans. Therefore, understanding human factors also allows us to better resolve issues in the aviation environment. If a pilot falls ill, it impacts their ability to properly communicate to ATC, operate the plane, and ultimately slows down the operation. Their fatigue not only causes a delay in the efficiency in

Terry Kelly
The word "tremendously" is trite in this use

Terry Kelly
In a technical report, when you quote something you must include a citation and reference.

Terry Kelly
This is an incomplete sentence

4

the flight, but also impacts the passenger's moods. This extends to the gate agent's workload, the other crew members' stress, and many other components. In order to prevent situations like this, then, the human factors discipline attempts to eradicate the problem before its creation. For example, it places duty limits on pilots and crew members of the flight to help prevent fatigue and performance issues (Clemente-Fuentes, 2022, p. 1). Moving on, we also know that humans learn a great deal through experience. But early on, we make mistakes. If we allow new pilots for an airline to fly by themselves with a new co-pilot, the lack of experience may increase the odds of the passengers dying if something were to happen. Knowing this about how humans are with something new, we can help solve and mitigate a problem before it arises. Therefore, they are paired with a training captain who has lots of experience and expertise. We understand not only how humans would respond to this because we investigate human factors, but we are able to solve the problem using a more realistic response. Because we understand human factors and performance, we can better track steps backwards. This aids us in finding the root of a problem and solving issues faster and more efficiently when they occur. For these reasons, the importance of understanding human factors in an aviation environment is evident.

As a pilot, vision is very important. There are so many different scenarios we can lose our vision just for even a second. At night, bright lights can cause our vision to be impared for a short period of time. "When intense light rays reach your eye, the iris responds by constricting the pupil, thus protecting the retina and helping it process the incoming image better. The opposite occurs in low light when the iris dilates the pupil to allow as much light in as possible"(Gerstein). This causes either a black dot on your eye when you try to look at something or it to be blurry.

Terry Kelly
I am inclined to agree, but he of any data supporting this conjecture?

Terry Kelly
Consider using a transition when you change to a new topic

At night, many pilots use certain flashlights so their eyes do not get messed up. Most flashlights that are used have a red light on it. A red light is non glaring and doesn't affect how we see. They are in some cockpits as well. It makes it possible to read maps and charts. There are also dimmer yellow lights that are not as bright as a strong white light. The FAA informs us that we should not look directly at a bright light. "After the eyes are adapted to the darkness, avoid exposing them for more than one second to any bright white light as that causes temporary blindness"(FAA 10-2). This affects many pilots and can cause pilots to crash or fly off course leading to many other challenges. Our vision can be affected in many other ways. We all have different types of vision and how our eyes work, but with these effects, we all experience them. Our vision is so important. Vision is also affected when we directly enter darkness from a bright room called "dark adaptation"(Cooper). When a pilot is going to preflight and get ready to fly, they have to make sure their vision is adjusted so they see everything correctly and don't miss a step. Vision plays a huge role for pilots, because any error can cause a fatal accident.

In inspecting the numerous factors that affect a person's performance within a Human Factors system, it is also essential that we address a permanent imperfection within the human condition: medical complications. In discussing these imperative facets of the human body, we are able to identify and address the most central facet of the human factors system: the human. Within this paper, we address"real life" examples of these systems in action, causing us to not only further dissect the impact of aeromedical factors within a complex system (such as the ones found in these aeronautical settings) through the lens of pilot, passenger, and aeromedical crew, but also so that we can utilize the knowledge gathered from these instances to prevent similar events from taking place in the future.

Terry Kelly
"messed up" is a bit casual for a technical report

Terry Kelly
As well as what?

Terry Kelly
What does "and how our eyes work" mean in this context?

Terry Kelly
The word "huge" in this context is a bit informal for a technical report

Terry Kelly
Imperative facets?

From large-scale productions of "Top Gun" to those actually serving in the United States Armed Forces, military aviation has been a long-standing fascination of the American general public. Whether on-screen or in real life, military aviators have faced nearly impeccable odds: stress, high-performance expectations, numerous (and often extreme) levels of danger, and even the physical complications involved with piloting some of the fastest, deadliest, and overall most aerodynamic planes throughout history.

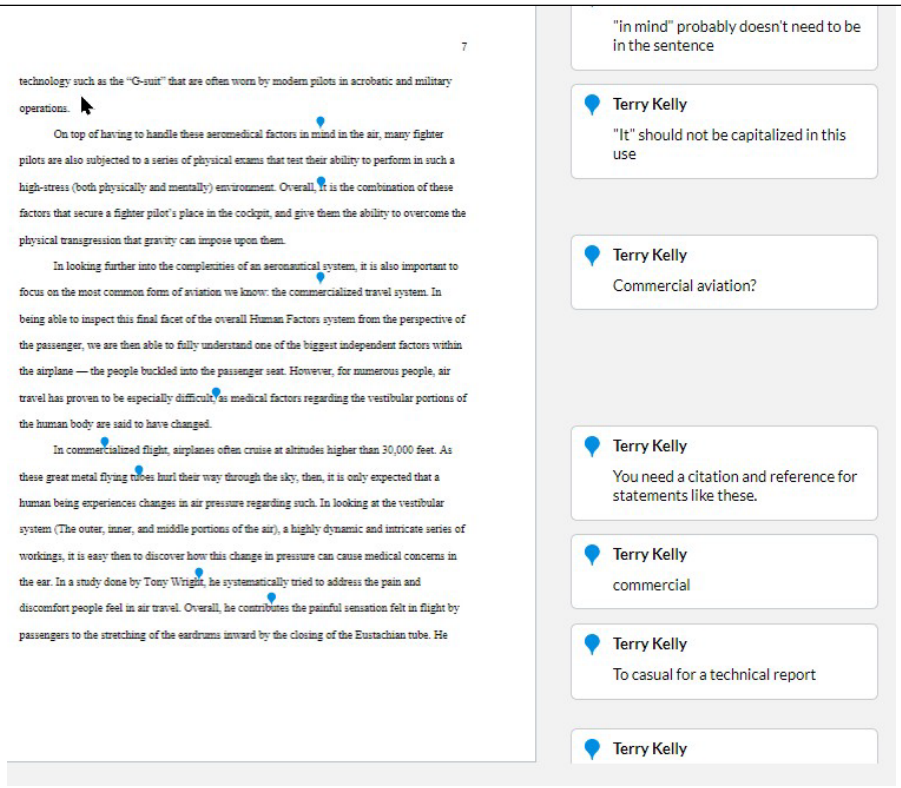
So, how does a human body adjust to the high-intensity environment within the cockpit of an F-15? From the moment every fighter pilot (or person in general) is born, we are faced with one persistent force: gravity. In flight, however, this force is largely accelerated. In an effect known as "pulling G's" (named for the gravity-like force imposed on the human body throughout high-speed acrobatic flight), pilots are able to make extreme acceleration and decelerations in flight that are much more excessive than the 1G their bodies are accustomed to on the ground.

So what physiological impact does this have on a fighter pilot, or, more specifically, their lungs. Depending on the type of G-force the pilot is experiencing, the heart and cardiovascular system are required to respond quickly and efficiently to keep blood flowing to the brain in order to maintain consciousness. ("Acceleration in Aviation; G Force", Faa.gov). In specifically addressing the lungs, a fighter pilot has to train so that the force of the weight does not stop them from breathing and receiving that mandatory blood-oxygen flow to their brain. The pilot must also be sure to have the property recovery time between pulling an appropriate amount of G's, as the lungs also have a necessary "recovery rate" in order to help redirect the body into maintaining a once-again homeostatic environment. There have also been numerous advances in

Terry Kelly
What do you mean by "impeccable" in this context

Terry Kelly
It may be accelerated.

Terry Kelly
Faa should be FAA. Include the year of any publication in the citation.



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technology such as the "G-suit" that are often worn by modern pilots in acrobatic and military operations.

On top of having to handle these aeromedical factors in mind in the air, many fighter pilots are also subjected to a series of physical exams that test their ability to perform in such a high-stress (both physically and mentally) environment. Overall, it is the combination of these factors that secure a fighter pilot's place in the cockpit, and give them the ability to overcome the physical transgression that gravity can impose upon them.

In looking further into the complexities of an aeronautical system, it is also important to focus on the most common form of aviation we know: the commercialized travel system. In being able to inspect this final facet of the overall Human Factors system from the perspective of the passenger, we are then able to fully understand one of the biggest independent factors within the airplane — the people buckled into the passenger seat. However, for numerous people, air travel has proven to be especially difficult as medical factors regarding the vestibular portions of the human body are said to have changed.

In commercialized flight, airplanes often cruise at altitudes higher than 30,000 feet. As these great metal flying tubes hurl their way through the sky, then, it is only expected that a human being experiences changes in air pressure regarding such. In looking at the vestibular system (The outer, inner, and middle portions of the air), a highly dynamic and intricate series of workings, it is easy then to discover how this change in pressure can cause medical concerns in the ear. In a study done by Tony Wright, he systematically tried to address the pain and discomfort people feel in air travel. Overall, he contributes the painful sensation felt in flight by passengers to the stretching of the eardrums inward by the closing of the Eustachian tube. He

"in mind" probably doesn't need to be in the sentence

Terry Kelly
"It" should not be capitalized in this use

Terry Kelly
Commercial aviation?

Terry Kelly
You need a citation and reference for statements like these.

Terry Kelly
commercial

Terry Kelly
To casual for a technical report

Terry Kelly

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states specifically that it is the "critical closing pressure" ("Middle Ear Pain and Trauma During Air Travel, Tony Wright) in the eardrum that causes such pain.

Overall, Professor Wright found that this pain can not be avoided completely, however, most individuals, after a few different experiences with air travel, are able to better accommodate for it through FDA-approved medicine. This part of the human factors system, while not as critical to the flight as the physiology of the pilot, is an extremely important facet of the overall ecosystem of the flight world.

In discussing these factors, we hope to not only have summarized and presented examples of Human Factors (including the niche of aeromedical portions of human factors) but to have also utilized and expressed this knowledge so as to emphasize the importance of every individual as well as their roles in the Human Factors system.

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Human Factors Short Paper

Parks College of engineering, aviation, and technology

Sebastian Conklin, Marisa Warren, and Jack Liu

ASCI 4050: Human Factors

Dr. Terry Kelly

December 9, 2022

Abstract

As we have learned in this class, about 80% of aircraft accidents are a result of human factors. It is a fact that as humans, we are not perfect and make mistakes. Flying, however, is a high-consequence environment, making it essential to understand our personal limitations as pilots, perhaps even more so than understanding the limitations of our aircraft. By diving deeply into aircraft systems during flight training, we can prepare for an emergency, should one occur. In many cases, we must make an emergency landing or divert to another airport due to a malfunction with our aircraft. It is less natural to think that our bodies could malfunction in the same way a machine does, this is the reason we learn human factors - to understand how our bodies work and are able to identify any bodily malfunctions.

Throughout this course, we focused on the respiratory, visual, and vestibular systems. We dove deeply into the respiratory system learning the biological process of breathing in detail, gathered a thorough understanding of how the human eyes work, and studied the vestibular system to understand the biological foundation of spatial disorientation. Each of these human factors issues that we discussed can confuse the pilot in command; each of these issues can lead to a fatal aircraft accident despite a perfectly functioning aircraft. Without an understanding of human factors, we become very vulnerable to pilot error as a result of our own misperceptions. It is essential for pilots to understand how our ability to perceive can be misled or deceived, and that knowledge can only come from understanding the biological processes that lead us to it. In understanding the respiratory system, we learn what causes hypoxia and how to detect its presence in experiencing symptoms. We learn about the human eye to understand visual illusions, the blind spot, and other misperceptions. Lastly, understanding the vestibular system teaches us the causes of spatial disorientation.

Terry Kelly
Excellent opening

Terry Kelly
I hope it's not too many

The first system I would like to discuss is the respiratory system. The respiratory system enables the exchange of gases between the air and our blood bringing oxygen to our blood cells, which are then carried to all parts of the body. In greater detail, air is drawn into the lungs in order to extract oxygen from the air. Oxygen travels through tiny blood vessels in the lungs called alveoli. The alveoli allow oxygen molecules to enter the blood. The oxygen molecules are then distributed to all the cells in the body. When oxygen is metabolized by the body, carbon dioxide is released into the blood. Carbon dioxide waste is carried back to the lungs, where it is exhaled back into the air.

The biggest human factors issue that stems from our respiratory system is hypoxia. According to the Federal Aviation Administration (FAA), "hypoxia is just one of the physiological problems that can impair pilots if they are not aware of the effects of decreased oxygen pressure at altitude" (Boshers, 2015). There are many different kinds of hypoxia. Hypoxic hypoxia is a result of a lack of sufficient oxygen in the air for humans. When there is a lack of oxygen, humans begin to experience hypoxic hypoxia, which is recognized through a variety of symptoms. Simply put, hypoxic hypoxia occurs when the cabin altitude is too high for humans to breathe. In this case, it is an example of a human limitation that occurs when the aircraft can still operate normally. Although a human might experience hypoxia at a high altitude, the plane should be able to fly as it always does (assuming the altitude is below the maximum ceiling and there is ample fuel). This is true for almost all human factors issues we have studied, as well as for all other kinds of hypoxia. If a person loses circulation in a limb (stagnant hypoxia), if their body is physically unable to absorb enough oxygen (histotoxic hypoxia), or if their body cannot carry the oxygen throughout the body (anemic hypoxia), the aircraft should still operate normally. Nonetheless, an unconscious pilot could unintentionally fly

Terry Kelly
When writing a technical report, try to write in the third person

Terry Kelly
Good details, well-written

Terry Kelly
Good use of the quote

the aircraft into the ground, resulting in a horribly tragic event. It is essential to recognize that human limitations can lead to such tragedies, just as aircraft limitations can. Looking beyond our general aviation capabilities, military pilots especially have to be aware of respiratory human factors. Due to the excessive stress they experience when pulling high G-forces, they are trained to master the correct methods of pressurized breathing and anti-stress movements. This requires an even further in-depth understanding of the respiratory system than we have learned this semester but proves why all pilots must have a thorough understanding of human factors.

The two main functions of the ear are hearing and balance. There are three main parts of our ear: first is the outer ear, which is the visible part consisting of ridged cartilage and skin. Secondly, the middle ear, which transfers sound vibrations from your eardrum to the inner ear via three tiny bones, which are called the ossicles. Also, this section of the ear aids in equalizing the air pressure in our ears. The last section is the inner ear. Within the inner ear, there are two parts: the cochlea and the semicircular canal. They are responsible for sending sound and balance information to the brain through electrical impulses, respectively.

Humans perceive sound when sound waves enter the ear canal and vibrate the eardrum. The vibration passes from the eardrum to the ossicles in the middle ear and reaches the inner ear where the vibrations are turned into neural signals. The nerve fibers in our brain translate that into sound. In regards to balance, there are fluid and hair-like sensors in our semicircular canals. The fluid moves around as we change our orientation and the hairs deliver that information to our br[illegible]

Being around operating airplanes and helicopters is extremely noisy. There are a magnitude of effects on the ear due to noise exposure, one being noise-induced hearing loss (NIHL). The FAA noted that "unprotected exposure to loud, steady noise over 90 dB for a short

- Terry Kelly
  Nice job discussing d i ffe rent forms of hypoxia

- Terry Kelly
  Try to write a transition when moving to a new section

[illegible]
[illegible]
stopping after 1.5 minutes of rotation. Learning to control muscle contraction and movement, coupled with actions such as turning, crawling, sitting, standing, and running, can all improve the stability of the vestibular system. If the Eustachian tube cannot be adjusted and opened quickly during the dive, jump, and rapid descent, the pressure inside and outside the tympanic cavity will not be balanced. This is especially true for military pilots who are often performing wild aerobatic stunts. Positive and negative air pressure will cause congestion and edema of the mucous membrane in the middle ear cavity, and tinnitus and tingling are still trivial matters. In [illegible] the [illegible]

[illegible] of photons traveling through the atmosphere. For further context, photons are essentially light. The light reflects off of other objects and is then directed to our eyes where it enters through our pupils. The Iris, the part of your eye that gives it color, dilates the pupil depending on the amount of light it is receiving. If the eye is receiving too much light the pupil will become smaller and if there is a little amount of light the pupil becomes bigger. All of the light that enters the eye is reflected off of the retina, which is located on the interior perimeter of the eye. The light in the retina is eventually directed to the optic nerve where the perception of vision is transmitted to the brain through neural signals.

As we have already discussed, are senses are not perfect. Alicja from flight time explains it perfectly explaining that "we are governed by the messages our body is sending to our brain" (Alicja, 2013). There are many illusions that may occur while acting as a pilot in command,

- Terry Kelly
  Again, w ell writt en,

- Te rry Ke yll
  T ry t o write in third person in a t echnira l repor t

runway illusions, altitude illusions, and a blind spot in your eye all contribute to deceiving your perception. When approaching a runway on final, the runway could appear further beneath the plane than it truly is (wider runway), or closer to the plane than it truly is (narrower runway). E!.e;p 2:t ii!--eiy, ti:.= = ''' illnti.:11:E _- - _ = rumi. :;;, Toe pilot n:.u,-t be ec.tirely f.mn i:1.1::i1dr9>;;---?'!F; - .:: :ftl:c is ;,:E-ir.eil by his/her perception and believes they are lower than they truly are they could flare too early stalling the plane not far above the runway; and if they believe they higher than they truly are they may not flare at all, which could cause a prop strike. While these examples provide dangers during landing, there are also altitude illusions pilots may experience when spotting another plane in the sky. As we discussed in class, you could accidentally perceive an aircraft at an altitude above you even though you are flying at the same altitude, and as both planes fly closer to each other the plane will appear to descend from its higher altitude to your altitude. Falling victim to an illusion like this could result in a deadly crash, or (if you are lucky) a frightening near miss. While these human factors examples result from a misperception, another human factors problem that comes from the biological construction of the human eye is the blind spot. Due to an area in your field of vision that corresponds to a part of your retina that is blocked by the optic nerve, your eye creates a blind spot by using surrounding details to interpolate what exists in that blind spot. Your eye working along with your brain essentially tries to fill in the blank to match what the surrounding environment looks like.

This paper would be incomplete without mentioning spatial disorientation. Spatial disorientation comes from a lack of visual references confusing the pilot into thinking he is in oOlll.e other!=a fli an mfttrd tl!;;nh:E. ::n order to avoid spatial disorientation, the pilot must r,, - n tll-= c:.dicmfum I r s 5:= the instruments inside the cockpit. However, it is not always that easy to do when your senses are telling you something different than what you actually feel. 37% of general aviation accidents are due to spatial disorientation and 80% of those accidents are fatal. These accidents are the epitome of human limitations resulting in the di:Ill;,"ionof a n... a:!i:!ri pct: :i:E l:y fil - th l C63o f fil =- A.ccord:i.n::!oo iim,SKJ:I:r.rri, E :m.r=!Jb:ef 31 :fun.o:imt.in.E -r,'"E,i:, hwar "':l'a'.!!"'(SKYl:r- '). ff lmi!l!!!od:::.3- 11arroc5E!l.::sdsaEE:aiintmE: paper, spatial disorientation can cause an accident when both the plane and the pilot are operating normally, not just the plane. The vestibular system has 3 semicircular canals, which are all filled with fluid. The purpose of these canals is to determine pitch, yaw, and roll movements which are perceived as the fluid moves throughout each canal. Spatial disorientation from a biological view occurs when the plane is in one motion for an elongated period of time. The fluid remains in a constant position in the canal tricking the pilot into thinking he has returned to equilibrium. For example, if a plane is in a turn for a period of about 7 seconds or longer, the equilibrium feeling will return despite remaining in a turn.

All of these issues that we have learned in class and discussed in this paper are human malfunctions that can cause a plane to crash. By studying these issues, we learn how to identify our own bodily malfunctions and control them to prevent any accidents or mishaps. It is best to say that we must understand our bodies in the same way we understand our aircraft. Without an understanding of human factors we lose the ability to prevent 80% of aircraft accidents.

Terry Kelly

Make sure to include the year in any ci tat ion

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SLO 1: Conduct aviation operations in a professional, safe, and efficient manner assessment evidence.

ASCI 4050 Human Factors Assignment 1 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

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The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

ASCI 4050 Human Factors Assignment 2 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

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The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe how an understanding of human performance (human factors) will help you better identify problems in the high-consequence environment. (300 word minimum)

2. Describe how an understanding of human performance (human factors) will help you better solve problems in the high-consequence environment. (300 word minimum)

Assignment 1 Examples

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

1- The ethical considerations that the discipline of human factors consists of the right and wrong that humans are ought to do, in terms of rights, respect for people, beneficence, justice and fairness. To ensure that the human factor discipline meet those ethics standards, it must provide privacy and safety for those who are affected by the system. In addition, loyalty, compassion, and honesty are among the other moral values that are encouraged by ethical standards. Additionally, ethical standards cover rights such as privacy, the right to be free from harm, and the right to life. These standards are suitable ethical standards since they are based on consistent and solid justifications. Therefore, a human factors specialist should not possess any issues with normative ethics such as obligations, rights, injury prevention, privacy. However, what about when those ethical standers merge, in case of an injury and privacy are at odds with one another. For example, if a pilot suffers from mental problems such as depression and they are pressured to hide it from their employer and colleagues because it might risk losing their job. Thus, given the circumstances, the pilot might be aware that they are unsuitable to fly, but they are not obligated to say anything that would risk losing their job, and if the employer allowed them to fly with medications, it would risk the safety of flight. This example raises many questions regarding the ethical standards in human factors, such as would the human factors specialists create a system that notifies the employers if the pilot is visiting a psychiatrist or if there are any decline in their performance or their attitude with their coworkers. Those circumstances force the industry to create a system that would break the ethical code and invade the pilots' privacy which would add more pressure and stress to their work life.

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Pilots have a responsibility and a moral duty to uphold safe flying habits and procedures relating to human factors and aviation in general. In my training at Parks College I learned to follow the IM SAFE checklist which helps pilots know if they are fit to fly on a personal level before they even preflight the aircraft.

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All these six personal evaluations will influence pilots to make the right on a go /nogo decision on a private or commercial level.

Another ethical consideration in human factors that happens every day is tight flight schedules. Commercial Pilots would not want to cancel a flight too often and put their career and income on the line. This means that the IM SAFE checklist may not be properly adhered to, or corners could be cut on procedures in order to make departure or arrival times. This is a ethical consideration that is a everyday risk. Pilots should always self-evaluate before a flight

Assignment 1 Examples (cont.)

1. Describe a few ethical considerations surrounding human factors discipline (300 word minimum)

When it comes to ethical factors in the context of human factors, I think the best way to begin is with the IMSAFE checklist. While it is always tempting to fly (because we all love flying) and especially for airline pilots who rely on their salary to support themselves and/or their families, we must not put the safety of our passengers in jeopardy if we, pilots, are unfit to operate an aircraft. It is essential that we systematically complete the IMSAFE checklist before making any further decisions about traveling airborne. Perhaps the most important element of this checklist is the last letter "E", which stands for external pressures. As I mentioned earlier in the response, Pilots may feel pressured into flying for several reasons ranging from angry passengers (for commercial pilots) to get thereitis as we sometimes call it around Parks. We must understand that it is dangerous and far too risky to neglect any factor that could impact our performance while operating an aircraft. The IMSAFE checklist serves to provide pilots with a methodical way of analyzing their own human factors. As mental health has become a much more relevant issue in recent years, it is important to know that this applies to everyone including pilots. There is an absolute plethora of things that could impact any human's mental health, which may be family-related or something external like being given bad news from a friend. Any of these things could severely impact the pilot's ability to proficiently operate the aircraft, and every pilot should be very conscious of the many factors that could affect their mental health. Every time I fly, I brief my copilot about limiting distractions especially during taxi, takeoff, and landing. Factors that affect your mental health are distractions and should be treated as so. Along with completing the IMSAFE checklist each pilot should complete a personal mental health analysis prior to flight as well.

Describe a few ethical considerations surrounding the human factors discipline

When faced with ethics in aviation, the first consideration that comes to mind is centered around aspects of ethics that may prevent us from making the right decision. A large part of ethics involves making a choice that will preserve the safety of those around you as well as to maintain a respectful aviation environment. A few moral principles that may govern whether we make the right or wrong choice as pilots is fear, guilt, and self-interest/ convenience to oneself.

When we find ourselves in a difficult situation as pilots, perhaps the weather is below our own personal minimums and ethically we know that the right thing to do to preserve our own safety and even our instructor's safety is to cancel the flight, fear of inconveniencing others may prevent us from acting ethically and remaining honest with ourselves and others. We may fear that our choice to make what we know is the right decision could potentially jeopardize the way others view us as pilots or result in negative consequences to us a pilot canceling a flight.

Similarly, guilt may prevent us from making the ethically right decision. Perhaps we have already canceled two flights this week, and by canceling a third flight, a feeling of guilt arises. This feeling might consist of embarrassment or negative feelings toward ourselves for having lower personal minimums than other pilots. This guilt may result in comparison and we may begin to doubt our decision making skills.

Finally, Self- interest and convenience may prevent pilots from acting ethically, particularly on solo flights. When flying alone on a VFR cross country, the student pilot is aware of the regulations and understands the importance of following them to maintain a safe environment for everyone in the air. When enroute this cross country, the pilot comes across a few clouds that they must descend away from in order to avoid them horizontally. The pilot knows they aren't allowed to fly within 2,000 feet horizontal distance from clouds in VFR flight, however the clouds are so few, they will only pass through them for roughly 10 seconds, and they will not affect the pilots line of sight.

As pilots, there are many times where we are faced with situations where we have the option to break a small rule that nobody will ever find out about to cater to our own convenience. In these situations, it is important to maintain honesty and integrity in order to not let our own self-interest govern our ethical decision making skills. When in the air, it is important to remain honest and fair for the sake of our own safety, but also for the safety of others. When it comes to ethics, there is nothing more important than making it a habit to practice safe and fair flying by following the regulations put in place for us.

Assignment 2 Examples

Describe a few professional considerations surrounding human factors

In my time in aviation, I have come to learn that those who work in the field are some of the most respectful and professional individuals I have met. Pilots, whether on the ground or in the air, are oftentimes always courteous toward one another and maintain a professional environment. Many times, in order to maintain safety and integrity in the aircraft, we rely on personal minimums, FAA regulations, and patience with ourselves and other pilots.

A large aspect of deciding whether or not to fly on a given day is centered around personal minimums and conditions that we are comfortable or not comfortable flying in. Going hand in hand with ethics, it is important to take other pilots' personal minimums into consideration and remain respectful and professional toward them and what they are personally comfortable in to aid in eliminating those feelings of fear or guilt when faced with a difficult decision to make surrounding flying. Remaining professional and respectful toward others' boundaries aids in maintaining those aviation ethics and in maintaining a safe environment where pilots can make the best decision for themselves and their crew without fear of judgment or fear of making the wrong decision.

Aviation is filled with rules and regulations, and from early on in our training we understand the importance of following them for our safety and for the safety of every person around us. Not only is it essential that we follow these rules in a professional manner that upholds the high standards set for pilots, but it is also essential that we respect the time needed for others' to follow these rules. There are many times where there may be an aircraft in front of you who is taking a longer time to get through their engine runup and go through their checklists to ensure that they are comfortable and ready for takeoff. Practicing patience is critical in aviation because when we are patient with other pilots, we are showing them our respect and that we care for their safety. When another pilot takes the time that they need to be comfortable with their aircraft, they will be safe,have the ability to make ethically correct decisions, which in turn allows us to be safe and make smart choices in the air.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

One professional consideration is avoiding stereotypes and assumptions about a person. Not only is it not professional to treat and communicate with someone who may have an intellectual disability, a person who uses a wheelchair, or treating a person differently because they are a female for example. This is regarding not only pilots but also those who work with the pilots and human factors specialists, like mechanics, the aerospace engineers, even the management, marketing, and other sides of the industry. Simply treating people with respect since this is a field that deals with people all the time, from various lifestyles, beginnings, and each person has gone through a different life with various cultures. This is a field that looks at how we, as humans, are similar to each other but also vastly different. You are meant to benefit the client or company you are working with while also doing good for the general populace and humanity.

Another professional consideration is you should know plenty and more than whoever you are working for or your client. Though using that knowledge and information to make the right decision, for example if asked to speak in court you provide credible data/research while being able to tell the value and limitations of it and your own capabilities. This also coincides with not misleading clients, organizations, and any business. For example a new researcher is looking at the UX design of a new flight simulator, while communicating with pilots you would treat each one with respect, understanding their capabilities and accurately applying your own capabilities while doing research and knowing when to ask for their recommendations with your own observations. This is even related to confidentiality, when taking down research doing so with the agreement of the participant. Unless it is public behavior, the pilots need to explicitly agree to the recording of any data. In the previous question there was mention of where the line of confidentiality for adapting technology to the user, like pilot to plane, user to phone, and so forth. Yet when in the preliminary development phase confidentiality is very important but what about after that.

Assignment 2 Examples (cont.)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

I believe that professional and ethical overlap quite a lot in aviation, in particular the concepts of fairness, honesty, and remaining non-biased. But professionalism in human factors goes beyond just behaving ethically, it also branches into the ideas of procedure, obligation, and legality. The simplest of all of those ideas is legality, to be a professional in anything requires that we follow the law, even when we disagree with it we must follow the law, though this does play a seemingly small role in human factors investigations it still vital that we follow them to the ledger to get the most out of the investigation.

Obligation is where professionalism gets complicated, above all else we must be obligated to the truth and the continued safety of air travel. Human Factors plays a massive role in the world of aviation in the end human beings are running and monitoring the systems in place to ensure safe, quick, and effective functioning of both general and professional aviation. As pilots we are obligated to many things, but as humans we are obligated to our human factors to monitoring our fellow pilots, ourselves, and to above all else the truth of our flaws. To ignore those obligations to the human factors involved in aviation would be to open ourselves and our passengers up to considerable risk some of which by the time we sense a problem it may be too late. This why our obligation to human factors is a constant in aviation one that only can be upheld in the system if all persons in the system are vigilant for the variety of symptoms that can display no matter how seemingly insignificant.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

Professionalism is an essential part of the global air transportation industry not only in regard to customer service, but decision making as well. Across the industry, professionalism includes doing everything correctly and procedurally, in turn, relating to human factors. Human factors directly correlate to the professional considerations within aviation because decision making is essential not only in the cockpit, but across multiple disciplines that go into making scheduled airlines service successful. Specifically, one professional consideration that surrounds human factors would be decision making, including, the pilot deciding whether they can safely complete the flight. I think that this question can closely relate to the previous because professional and ethical considerations can go hand in hand within the human factors discipline. This dilemma can tie into both ethical and professional considerations because as a pilot, you should know the limitations of yourself to conduct a flight, and as the pilot, if you know that you are not in a good position to fly, the safety of the passengers in influenced, therefore becoming an ethical situation. Continuing with this idea, not necessarily related to commercial aviation, but as student pilots, a consideration when flying in the IFR environment can be personal minimums. As a new instrument pilot, would you want to go fly on a low IFR day where you would break out on an approach at minimums as prescribed in the approach chart? A big part of professional considerations, relating to human factors, revolves around the idea of limitations as pilots. As a pilot, being a professional involves knowing the limitations of yourself and the aircraft that you are flying, and it comes down to decision making which influences the human factors chain, ultimately increasing the chances of an accident derived from human error. In all, professional considerations and ethical dilemmas in human factors are very closely related. In an essential industry such as air transport, it is essential to understand how you as the pilot function in the human factors tree in order to make both professional and ethical decisions.

SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.

SLO 2 Test 1 Questions

16 Multiple Choice 3 points

Data suggests that over ____ of aviation accidents are attributable to adverse human factors events (human error)

- (●) 70%
- ( ) 80%
- ( ) 85%
- ( ) 90%

17 True or False 3 points

By its very nature, the study of human factors is multidisciplinary.

- (●) True
- ( ) False

22 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who studied intellectual differences

- (●) Galton
- ( ) Cattell
- ( ) Taylor
- ( ) The Gilbreths

23 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who studied sensory and motor functions

- ( ) Galton
- (●) Cattell
- ( ) Taylor
- ( ) The Gilbreths

24 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who studied scientific management of job tasks

- ( ) Galton
- ( ) Cattell
- (●) Taylor
- ( ) The Gilbreths

25 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who conducted motion studies in the operating room

- ( ) Galton
- ( ) Cattell
- ( ) Taylor
- (●) The Gilbreths

SLO 2 Test 4 Questions

20 Multiple Choice 1 point

Generally speaking, _____ aircraft produce a higher frequency

- (●) Small gas turbine engines
- ( ) Large gas turbine engines
- ( ) Small piston engines
- ( ) Large pistone engines

21 Multiple Choice 1 point

Conductive deafness is most closely associated with?

- (●) Eardrum perforation
- ( ) Loud noises
- ( ) Age

25 True or False 1 point

Spatial disorientation is exacerbated by fatigue.

- (●) True
- ( ) False

26 Multiple Choice 1 point

Somtogravic illusions are generally associated with?

- ( ) The semi-circular canals
- (●) The otolith organ

29 Multiple Choice 1 point

Somatogravic illusions generally involve?

- ( ) Turning operations
- (●) Linear operations

SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.

SLO 4 Assignment 1 Evidence

ASCI 4050 Human Factors Assignment 1 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

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The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

ASCI 4050 Human Factors Assignment 3 Name:_____

Hi everyone,

As a reminder, I am traveling on an accreditation visit next Monday, November 14th. Consequently, we will not have class. Rather than having class, I am giving this assignment in place of class. This assignment will contribute to your homework grade (15% of your total grade). This assignment must be uploaded to Canvas no later than Wednesday, November 16th by the end of the day.

In class, we discussed the notion of Individual Differences. In high-consequences operations we will engage people of diverse experience, backgrounds, and cultures. People are different and that difference is a strength. Diversity provides a distinct advantage to the team as diversity allows individuals to bring a different perspective and skillset to a problem.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

SLO 4 Assignment 1 Examples (cont.)

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

1- The ethical considerations that the discipline of human factors consists of the right and wrong that humans are ought to do, in terms of rights, respect for people, beneficence, justice and fairness. To ensure that the human factor discipline meet those ethics standards, it must provide privacy and safety for those who are affected by the system. In addition, loyalty, compassion, and honesty are among the other moral values that are encouraged by ethical standards. Additionally, ethical standards cover rights such as privacy, the right to be free from harm, and the right to life. These standards are suitable ethical standards since they are based on consistent and solid justifications. Therefore, a human factors specialist should not possess any issues with normative ethics such as obligations, rights, injury prevention, privacy. However, what about when those ethical standers merge, in case of an injury and privacy are at odds with one another. For example, if a pilot suffers from mental problems such as depression and they are pressured to hide it from their employer and colleagues because it might risk losing their job. Thus, given the circumstances, the pilot might be aware that they are unsuitable to fly, but they are not obligated to say anything that would risk losing their job, and if the employer allowed them to fly with medications, it would risk the safety of flight. This example raises many questions regarding the ethical standards in human factors, such as would the human factors specialists create a system that notifies the employers if the pilot is visiting a psychiatrist or if there are any decline in their performance or their attitude with their coworkers. Those circumstances force the industry to create a system that would break the ethical code and invade the pilots' privacy which would add more pressure and stress to their work life.

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Another ethical consideration in human factors that happens every day is tight flight schedules. Commercial Pilots would not want to cancel a flight too often and put their career and income on the line. This means that the IM SAFE checklist may not be properly adhered to, or corners could be cut on procedures in order to make departure or arrival times. This is a ethical consideration that is a everyday risk. Pilots should always self-evaluate before a flight

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Similarly, guilt may prevent us from making the ethically right decision. Perhaps we have already canceled two flights this week, and by canceling a third flight, a feeling of guilt arises. This feeling might consist of embarrassment or negative feelings toward ourselves for having lower personal minimums than other pilots. This guilt may result in comparison and we may begin to doubt our decision making skills.

Finally, Self- interest and convenience may prevent pilots from acting ethically, particularly on solo flights. When flying alone on a VFR cross country, the student pilot is aware of the regulations and understands the importance of following them to maintain a safe environment for everyone in the air. When enroute this cross country, the pilot comes across a few clouds that they must descend away from in order to avoid them horizontally. The pilot knows they aren't allowed to fly within 2,000 feet horizontal distance from clouds in VFR flight, however the clouds are so few, they will only pass through them for roughly 10 seconds, and they will not affect the pilots line of sight.

As pilots, there are many times where we are faced with situations where we have the option to break a small rule that nobody will ever find out about to cater to our own convenience. In these situations, it is important to maintain honesty and integrity in order to not let our own self-interest govern our ethical decision making skills. When in the air, it is important to remain honest and fair for the sake of our own safety, but also for the safety of others. When it comes to ethics, there is nothing more important than making it a habit to practice safe and fair flying by following the regulations put in place for us.

SLO 4 Homework 3 Examples

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The first strategy I will employ is being open to all disciplines and cultures and their differences. People work better when they feel their similarities and differences are accepted, respected, and valued. It will be crucial to me that I embrace all the cultures and values of the diverse and multi-disciplinary teams and make an effort to make people feel comfortable and learn about their way of life for improved interactions. Another strategy I will use to reduce differences between multi-disciplinary and diverse teams for effective work is having good communication skills. Any team works better when there is open and honest communication. How everyone in the group communicates with each other will influence how well they work together and the team's productivity. There needs to be open communication across diverse and multi-disciplinary teams. This way, people can talk about difficult and complicated situations and issues. It is vital that team members are encouraged to communicate effectively and respectfully, as everyone needs to feel like their voice is being heard. Minimizing miscommunication will ensure that there is reduced conflict across the team. To achieve effective communication, people will need to learn how to listen attentively and seek clarification in case of any issue or misunderstanding. Different cultures and disciplines also have different communication styles, so I will accept, understand and respect how diverse people communicate to have an effective team. Further, I will try to avoid stereotyping and prejudice to work effectively with multi-disciplinary and diverse teams. When people are unfairly divided into groups and assigned unfair characteristics, it can affect how they work and interact with others. Therefore, I will accept that diverse people have different and unique working styles and preferences, which does not make them less important or productive. To work effectively, I will improve my conflict management skills. I will consider conflict management training for myself and the rest of the team. With good conflict management, the team will be able to work effectively.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Despite belonging to diverse expertise, disciplines, and backgrounds, teammates need to feel like they are part of the group or community. To achieve effective communication in a diverse group, I should be able to share and exchange ideas respectfully so that everyone can understand each other. I will be open and inclusive to other cultures to ensure effective communication. Every team member's language and communication culture must be respected. Communication needs to accommodate everyone's needs and not just the needs of those in the majority language. Openness and inclusivity in communication will help create trustworthy relationships where people feel comfortable enough to share their ideas with the rest of the team. To appreciate diversity, especially in communication, I will learn about the unique communication styles of diverse groups to promote effective communication. I will use clear and concise language to communicate effectively with people from diverse backgrounds. Keeping my language clear and straightforward ensures that no meaning is lost in interpretation and that my audience can receive the message exactly how I intended it to be received. Paraphrasing my words and asking the team if they understand my message will ensure the communication is clear and effective. Repeating the message help improve communication as I can clarify what I am saying and therefore eliminate misunderstandings. Body language is also very important in oral communication; therefore, I will make an effort to understand the differences in body language for each diverse group. Feedback is critical in ensuring effective communication. Providing and receiving constructive and honest feedback will be critical in my communication. Feedback will make people be sure that their voice is heard and respected and will therefore encourage people to communicate more openly. Most importantly, it can be challenging to know exactly how to communicate with people who are different from you in one way or the other. I will therefore take diversity training which will ensure that a diverse team can communicate effectively with each other

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The importance of understanding individual differences within any environment, yet alone a high consequence one, is paramount when seeking to further know how a team functions as a whole. In looking at how to address the individuality of each member involved, I believe the most effective strategy in helping coordinate such forces would be communication. In many environments, co-workers will often work alongside each other, not only on their own projects but on one major task as a goal. For example, myself and my fellow interns at Garmin (a pretty small gap diversely) all have our separate functions whilst focusing on the same geographic area and working on the same geographic file. While we each have our own separate responsibilities regarding such, we all have to remain in clear communication with each other and other folks in the department to make sure that we are effectively doing our assigned work without overlapping or stepping onto anyone else's toes. In doing so, we help to promote a work environment that enables us each to assist each other when we have any issues or questions that may arise. This includes a larger portion of people, not only within our own offices, but that of Garmin's Corporate offices, as well as any remote employees as well. Our work environment is filled with hundreds of thousands of very diverse groups and skill sets that come together to help develop products in the name of a greater goal. It helps in managing any Human Resource issues(should they arise) and establishes a better understanding of who we are within a larger workforce. Communication is also paramount in highly-diverse things when everything is going right. Teams that communicate well with each other will not only improve productivity in the office, but it also stands to make a work environment more pleasant for everyone involved. In having a well-functioning team communicate, a door opens to a safer, friendlier, and more productive work environment.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Effective communication is paramount to a high-functioning team. Ensuring the development and implementation of this process is something that numerous companies have used worldwide in order to help the cohesive teamwork abound in their fields of work. Effective communication must first begin with respect, from co-worker to co-worker, and even from CEO to the lowest new-hires of an establishment. In garnering and fostering respect for one's peers (especially within a work environment) a person gains better understanding in how their co-workers might function differently from them. For example, in my previous field of work (largely customer service), my ability to understand how each of my managers (I was under four managers, two of which owned and operated the waterpark/campground) approached a situation in which a customer was being difficult. For some of my team-members, they largely avoided conflict in the way that they would place blame on another department, another worker, etc. (IE "BLANK didn't properly charge the golf-cart," etc. etc.) whilst others would directly place the blame on themselves (even if it was not directly related to them) so they could resolve an issue with a customer without interference. After having to work with a difficult employee, then, each of these individuals would gather to speak on the issue they were presented with, and (depending upon what type of mishap took place that day) would gather multiple departments as a whole to discuss new ways to prevent similar situations from happening again. In doing so, they fostered a relationship with their employees that would not only call out issues in the system, but also attempt to resolve them. How does this, then, relate to the individuality of each person involved? It gives everyone across departments, each with our own experience and backgrounds in numerous fields (technology, lifeguarding, customer service, food service, etc) an equal voice when speaking to our bosses. The respect established in each member of a team leads to a team that is highly communicative, and thus, a much more high-functioning one.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

There are a lot of strategies that I think I can employ to work effectively on a multi-disciplinary and diverse team. A couple of the strategies that I can implement is know your role in the company, be open minded, and be able to work as a team.

Starting with the first strategy of knowing your role in the company. This is important for one main reason the first being, so you don't fail in a project and not to waste any precious resources. This is most prominent in the aviation industry when things are being done by the proper people in the flight deck or on the ground. A perfect example would be in the Tenerife accident when the KLM pilot was doing the pre-checks and because the captain being that he was a higher up in the company he didn't know the proper flows and glanced and forgot crucial steps in the checklist that should have been done by the First Officer.

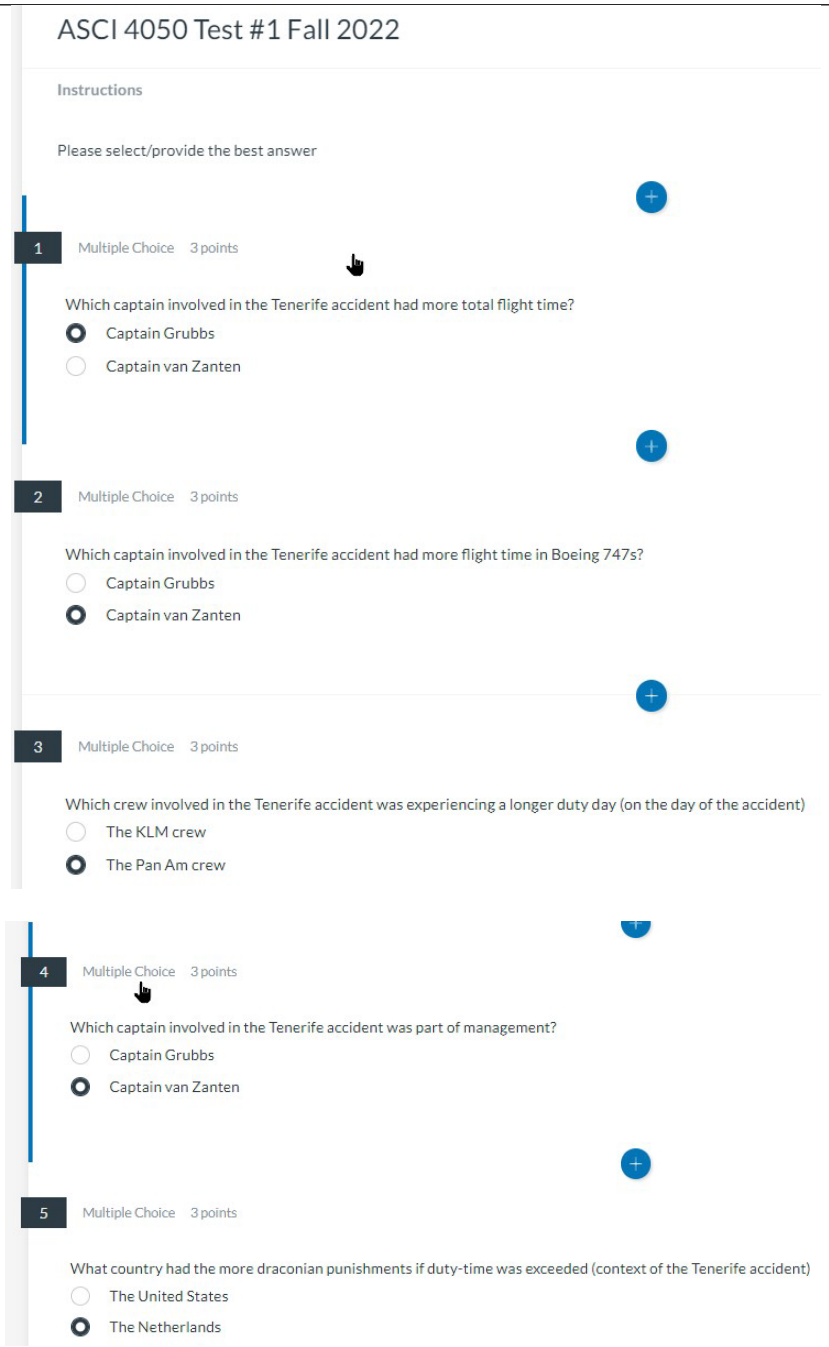
The second strategy that I can employ to work is to be open minded. This is self-explanatory but listen and be respectful of other people ideas. Being able to have meetings, discussions and brainstorming are key aspects to success. This can be found in aviation a lot of the time in flight training, but really any point in your pilot career. Humans aren't perfect so we are going to make mistakes and there is going to be someone there to critique your work so being able to be open to what they are teaching you is crucial so you can become a successful aviator.

The third strategy relates back to the first two strategies that I have briefed on and that is being able to work on a team. Working on a team is so crucial in aviation, no matter what side of aviation you are working on. In the airplane you need to be able to rely on your first officer or captain or flight instructor to help you fly the plane. In commercial aviation you can't do it all yourself you need someone flying the plane and then another person helping monitor and work the radios to allow your flights to be successful and more importantly safe for the passengers.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

In diverse teams, with members who have different levels of capabilities, knowledge, expertise, and backgrounds, I will keep in mind of these differences in my peers to ensure effective communication. I will express my ideas clearly and consciously so all members of the team are on the same page as me, and can understand the task at hand, and how I feel. I will advocate for myself and my ideas in team meetings through verbal communication, additionally, other modes of communication can be used like emails and professional messaging sites. I will consistently send out emails of important tasks or goals that I would like the team to meet as a whole. By using these written communication methods, I will enhance my verbal communication by having my ideas and goals known and able to look back on, them so I can keep myself accountable for them. I will ensure that the members of my team understand what I am trying to say by asking to follow-up questions and interacting with my peers. Since I might be discussing information that requires background knowledge, this is crucial to ensure that all members, no matter their skill set, understand what I am trying to communicate. Another part of communication is listening. Effective listening is very important in any team, and with diverse members, listening can help share ideas and enhance the team dynamic. Body language is another important factor for effective communication, and I will make sure my body language aligns with what I am trying to communicate. I want to be sure that I make proper eye contact and other appropriate body language so I convey the right message to the team member, in whom I am talking with. In conclusion, I will utilize effective communication techniques so that the diverse members of my team can understand me and feel heard.

SLO 4 Test #1 Questions



ASCI 4050 Test #1 Fall 2022

Instructions

Please select/provide the best answer

1 Multiple Choice 3 points

Which captain involved in the Tenerife accident had more total flight time?

- (●) Captain Grubbs
- ( ) Captain van Zanten

2 Multiple Choice 3 points

Which captain involved in the Tenerife accident had more flight time in Boeing 747s?

- ( ) Captain Grubbs
- (●) Captain van Zanten

3 Multiple Choice 3 points

Which crew involved in the Tenerife accident was experiencing a longer duty day (on the day of the accident)

- ( ) The KLM crew
- (●) The Pan Am crew

4 Multiple Choice 3 points

Which captain involved in the Tenerife accident was part of management?

- ( ) Captain Grubbs
- (●) Captain van Zanten

5 Multiple Choice 3 points

What country had the more draconian punishments if duty-time was exceeded (context of the Tenerife accident)

- ( ) The United States
- (●) The Netherlands

Performance Indicator Rubric

Course: ASCI 4250 Professional Ethics and Standards Course Instructor:____Jan McCall_____

Semester Taught:_____Fall 2020_____ Number of Students in Course:___47____

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	98%	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

**Attach description of assignment used for assessment and samples of student work.*

DISCUSSION BOARD ASSIGNMENT

Learning Module 2: Ethical issues in AVN Maintenance, Outsourcing, and Whistleblowers

LM2 Q2: Outsourcing (20 points)

Due 18 SEP

All students should **choose two of the three questions** below to answer.

Then, do a little internet searching and see what you can offer the class but be sure to provide a weblink or APA citation and reference. You may use 1-2 paragraphs or bullet points to list your answers (10 pts x 2 questions = 20 points).

1. What are some of the key differences in FAA regulatory oversight of domestic and foreign outsourced airline maintenance?
2. Chapter 6 provides a union perspective on outsourcing maintenance. Claiming the union protection provided to mechanics ensures safety compared to outsourced non-union labor; how would a non-union mechanic, such as Delta, compare to an outsourced mechanic?
3. Other than saving money, are there other benefits to outsourcing maintenance?

Student Response to Discussion Board Question: LM2 Q2

Question 1: No matter the intention of the FAA, they have been falling behind in oversight over both domestic and foreign outsourced maintenance, and the agency is aware of the issues (Federal Aviation Administration, p. iii). According to Jin (2021), the FAA struggles to hire and retain aviation safety inspectors (Jin, p. 49) as a result of the numerous nuances of government work: inflexible bureaucracy, lack of funding, and government shutdowns leaving employees without a paycheck (Jin, p. 38) It is no wonder potential inspectors defect to other forms of employment, likely in the private sector. The lack of inspectors leaves all MROs with a lack of government oversight including domestic repair stations, but especially foreign ones, relying on each air carrier's Continuing Analysis and Surveillance System. Stakeholders can rest assured that certified domestic repair stations (certified under 14 CFR 145) are required to hold an FAA certificate, maintain a drug and alcohol testing system, and must employ certified mechanics (certified under 14 CFR 65 Subpart D). A myriad of inspections and reports are required on an at-least annual basis. Foreign, off-shore repair stations are subject to less scrutiny than their domestic counterparts: the only parallel is they are required to hold an FAA certificate (if they are certified) that can be renewed every 1-2 years. (Jin, p. 42) Due to the lack of FAA funding for travel, inspectors often cannot reach far-flung repair stations, let alone make follow-up visits on discrepancies flagged on previous visits. In one instance, an inspector was expected to cover 165 certified foreign repair stations when his colleague took sick leave (Jin, p. 49) The FAA is not required to visit any non-certified repair stations, no matter where they are

located on our globe.

Question 2: Delta is unique and accompanied by declining competition using a similar business model. Delta TechOps is certified by the FAA plus many foreign aviation regulatory agencies (Delta TechOps) and is subject to the requirements of a domestic repair station (Jin, p. 42) They must employ certified mechanics and supervisory personnel certified under 14 CFR 65. The repair station certification requires the facility to maintain and use a repair station manual which indicates duties of each position employed by the certificate holder (14 CFR 145.209) The mechanics, as a result of their own certifications as maintenance technicians, must abide by the policies and procedures outlined in their employer's manual (14 CFR 65.81, 14 CFR 65.95).

In contrast, a mechanic working for an outsourced repair station may not hold an FAA certification. If they work in a foreign country that requires a mechanic certificate, they may be certified under that country's regulatory agency. It is possible that the country does not have such a requirement for mechanics to hold that certification (Hoppe, p. 67.) There is hardly an official method to tell if that uncertified mechanic has the skills and knowledge necessary to complete a repair properly. The outsourced mechanic is likely working for a contractor who is willing to pay the bottom dollar. This discrepancy in pay between in-house and outsourced mechanics puts the latter at a disadvantage: their employer is more willing to take advantage of them with long hours and irregular shifts, plus coercion to sign off on an improperly completed repair (Hoppe, p. 67, Jin, p. 41.) In all, there is less accountability when looking at outsourced mechanics compared to in-house mechanics.

Performance Indicator Rubric

Course: ASCI 4450 Aviation Law

Course Instructor: Hoover

Semester Taught: Fall 2022

Number of Students in Course: 46

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner. Submit one assigned administrative law case brief. Quiz 5; Question 4 Quiz 6; Question 11 Quiz 7; Question 7 MidTerm; Question 7	Case Brief: 100%. Student scores on the case briefs ranged from 98% to 100%. Quiz 5 Q 4: 50% Quiz 6 Q 11: 54% Quiz 7 Q 7: 87% Midterm Q 7: 39%	Case Brief: Yes. All students scored well above a minimum of 70%. Quiz 5 Q 4: No Quiz 6 Q 11: No Quiz 7 Q 7: Yes Midterm Q 7: No

ASSESSMENT TECHNIQUES/ACTIVITES USED:

Case Briefs / Administrative Law

This class used real cases to illustrate important concepts needed for understanding law in the field of aviation. These were real life disputes and the students learned about the law by picking up various pieces of it from what the cases told them. Most cases in this course took place in National Transportation Safety Board (NTSB) Administrative Law Judges' (ALJ) hearings, federal and state appeals courts, and the U.S. Supreme Court. There will be an examination of civil and criminal cases. Each of the 46 students was assigned an administrative law case involving the FAA, NTSB or DOT.

Why did the students examine these cases? The U.S. has inherited from England a legal system that is largely judge-focused. The judges have made

the law what it is through their written opinions. To understand that law, the class studied the actual decisions that the judges have written. An objective was to look at the law the way that judges do and study actual cases and controversies, just like the judges. For example, a pilot has a beef

with the Federal Aviation Administration's (FAA) action to suspend her pilot's certificate for several months and wishes to contest this with a lawyer in front of an NTSB administrative law judge in a formal court hearing. In another example, the DOT assesses a civil penalty in the thousands of dollars against a regional air carrier for violating a denied boarding regulation. These real cases and disputes historically have been the primary source of law. Common law generally means law that has developed from adjudicated cases. It is sometimes referred to as case law.

A second reason the class studied these selected cases is that it can be hard for an aviation student to understand a particular Federal Aviation Regulation (FAR) or legal rule, and the merits as a matter of policy, without applying the rule in the real world. Some rules are a bit ambiguous, others are quite specific and easy to understand the spirit and intent behind them. There is the need to understand real-life applications of a rule before a student can understand what the rule really means. These rules have both strengths and weaknesses. By studying cases, a student can learn *to conduct aviation operations in a professional, safe, and efficient manner*. It helps the student to think of specific factual situations that reveal the strengths and weaknesses of a particular aviation-related rule. Hopefully, as future leaders in this industry, they can take that skill to help develop better rules as participants in aviation operations.

At the end of each case brief, the student was required to reflect on the court's opinion and the *application of the case* to the individual student writing the brief and on members of the aviation class which was composed of aviation management majors and professional pilot majors. What are the implications to aviation professionals? How does this case impact activities in aviation? How may we apply this case to our activities in aviation?

Eight quizzes were administered in the course. With 46 students enrolled--and at least 12 of the students being international--a different approach was taken to the assessment process. The quiz questions were issued on paper and each student answered the questions privately and individually. Then all students were permitted to work within groups to negotiate what that group believed to be the correct answer. The group responses were recorded on a separate answer sheet and five points was awarded to the group if they got the correct response on the first try. Any subsequent attempts for the correct response was awarded three points, one point or zero points. This process was to encourage students to collaborate, debate, find evidence, and negotiate for what they believed to be the correct responses. It helped the international students and all students enjoyed the process through reduction of testing stressors. However, the downside results in grade inflation.

EVIDENCE:

Example Quiz Questions Relevant to Learning Outcome (SLO 1)

Conduct aviation operations in a professional, safe, and efficient manner.

Quiz 5; Question 4
Of the following, which ***one*** best represents a potential legal enforcement action that may be taken by the FAA.

a. A flight school is discovered to have a flaw in its operations manual which may lead to unsafe aircraft operations in the training environment.
b. A student pilot made a mistake in the traffic pattern, during touch-and-gos, which was inadvertent on her part.
c. A piloted aircraft was observed by an Illinois State Highway Patrol officer making passes over a rural corn field in a sparsely populated area.
d. Matters involving competence of holders of certificates may require retraining.
e. During a ramp inspection, an FAA Safety Inspector saw a pilot make a mistake during his preflight and did an on-the-spot counseling correction.

Quiz 5; Question 4: With "C" being the correct response, one half of the class responded with "A" or "D"

Quiz 6; Question 11
Some of you in this class will become pilots for a large, major air carrier. Others may work in the customer service unit of the airline. Consider the following statements and identify those that are true and accurate by circling the letter or letters.

a. As the *Al-Watan* case discusses, there are safety-related circumstances in which discrimination is lawful and this not infrequently presents uncomfortable issues of racial, ethnic, and gender-based profiling.
b. The pilot in command of the aircraft is the final authority as to the operation of that aircraft (14 CFR 91.3), including any decision to refuse to transport a passenger provided that pilot follows the airline's required security protocol.
c. COVID-19 is a respiratory illness. Airlines may refuse transportation because of a communicable disease if the passenger's condition poses a direct threat to the health or safety of others. (ACAA in 14 CFR Part 382)
d. The Department of Transportation has set the minimum limit of air carrier liability for provable direct or consequential damages resulting from the disappearance of, damage to, or delay in delivery of a passenger's baggage to an amount less than $2,500 per passenger.
e. Air carriers owe a common law duty of care to their passengers, who, as customers, are business invitees.
f. The Captain holds the ultimate decision-making authority on a passenger's removal from a flight.
g. 49 U.S.C. Section 44902 of the Federal Aviation Act, provides that an air carrier "may refuse to transport a passenger or property the carrier decides is, or might be, inimical to safety."

Quiz 6; Question 11: 23 of 46 students were able to identify the six correct responses (A-B-C-E-F-G) to this question

Quiz 7; Question 7

Scenario. You failed to perform an adequate preflight inspection, attempted to take off on almost empty fuel tanks, and fuel starvation caused the engine to quit on takeoff. But when it did, you were able to abort the takeoff without damaging the aircraft or harming its occupants or anyone else.

a. You could be successfully sued for negligence in that you failed to use care.
b. You could not successfully be sued for negligence. (there was no injury) However, the FAA may suspend or revoke you pilot certificate for careless operation under 14 CFR §91.13, inadequate preflight action under 14 CFR §91.103, or your lack of the care,judgment, and responsibility required of the holder of a pilot certificate.
c. Neither the FAA nor a plaintiff's lawyer will take any civil action against you. You have done no wrong and cannot be held liable for this incident.
d. This is a clear-cut case of intentional tort committed by you, the pilot. You could be successfully sued.

Quiz 7; Question 7: 87 percent of the 46 students responded with the correct letter "B"

Midterm Exam; Question 7

As a result of reviewing several cases in both administrative and criminal law (FAA and DOT/OIG), you have noticed a trend in sanctions and penalties. Which of the choices best reflect this trend?

a. Very few FAA enforcement cases are settled. Most all end up in court; that is, at hearing before the NTSB or on appeal.
b. A study of FAA sanctions would seem to indicate that falsification of documents, records and applications leads to letters of warning to most offenders.
c. There appears to be a great deal of focus on prosecuting those certificated airmen who err in the completion of the application for renewal of the airman medical certificate.

Midterm Exam; Question 7: Only 39 percent of the 46 class members correctly responded with answer "C." The majority of students responded to "B" and a minority of eight students responded to "A."

Case Brief Rubric

The students were assessed using a Case Brief rubric. Students followed the format presented in the rubric. Points earned were up to 84 as a perfect score.

Example Case Briefs from NTSB ALJ and DOT Consent Orders databases

Many administrative law cases assigned to students who are certificate holders involved appeal hearings before the NTSB administrative law judges or full Board. Here is a student example brief that involves a mechanic's falsification of an aircraft record.

Aviation Management majors in the course were assigned Consent Orders issued by the Department of Transportation. Here is a student example of an alleged discrimination case against a Delta pilot in command with a subsequent $50,000 civil penalty against the air carrier.

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

RECOMMENDATIONS (based on the results):

Pending review by the department faculty

**Attach description of assignment used for assessment and samples of student work.*

Performance Indicator Rubric

Course: ASCI 4650 Economics of Air Transportation Course Instructor:_____BRUCE HOOVER_____

Semester Taught:_____SPRING 2023_____ Number of Students in Course:____14____

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	**Assessment Results: (Indicate what % of class achieved a minimum 70%)**	**Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")**
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Not applicable to this course	
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	**Airline (simulation) Management Audit Report** A management audit report 100% of the class achieved a 70% or higher Reliably Blue Air: Three students **96** Aviation Managers Association: Three students **91** SkyPass Airways: Four students **88** FlexJet: Four students **79**	Airline (simulation) Management Audit Report. Benchmark achieved: Y**es** 100% of the class scored a minimum 70%. The 80% benchmark was met as all 14 enrolled students scored above the 70% minimum.
SLO 5: Apply knowledge of business principles in aviation-related areas.	**Online Airline Simulation decisions** 71% of the total enrolled students achieved a minimum of 70% or higher. Only one airline team of four students was unable to achieve a final score of at least 70%. Reliably Blue Air: 727 points (**73%**) Aviation Managers Association: 918.7 (**92%**) Skypass Airways: 584.5 points (**59%**) FlexJet: 774.5 points (**78%**)	Benchmark achieved: **No** 71% of the enrolled students achieved the benchmark. Four of the 14 enrolled students were unable to meet the benchmark.

EVIDENCE

SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.

From the syllabus: “Your airline team will make a brief presentation to the ASCI 4650 class and any guests who may be in attendance. You will conduct the audit from the perspective of an **outside consultant firm** your airline has contracted and you must be objective in your report findings. **Objectivity and honesty**—be brutally frank—are hallmarks of a good external audit. Any attempt to “whitewash” or omit critical points will be dealt with unkindly by the instructor. ***There are several methods of approaching this assignment and your team is encouraged to be creative. Keep in mind you are part of a consulting firm. Your report may follow any creative format appropriate for an outside consulting firm report. Any records, charts, graphs, etc., are welcome if they enhance the presentation.*** Handouts to class members are appropriate if they, too, enhance the presentation.”

The Management Audit Content Guide (below) provided the airline simulation teams with guidance on suggested content reflecting the economic principles and characteristics of the airline industry.

The four airline teams prepared a report of their airline management decisions and the results of those operational, economic, and financial decisions during the semester.

The following are example audit reports submitted by three (of four) teams in the spring of 2023:

SLO 5: Apply knowledge of business principles in aviation-related areas.

Each student participated in an airline simulation where each member was part of an executive team of a small airline firm. Each team met to **formulate their firm level strategy** and submit ongoing (weekly) decisions concerning critical issues facing the firm. Decisions were due online on the Airline Simulation site on a weekly basis by each team leader.

The airline simulation activities were integrated into the classroom learning experience. The group project required collaborative work and everyone was expected to carry an equal share of the work load within each airline team.

Airline Simulation – Learning Objectives

- Experience strategy formulation and implementation in a dynamic (ever-changing and competitive) environment
- Learn about group and organizational processes (team work)
- Understand the financial implications of air carrier operational, marketing and management decisions
- Improve decision-making skills under ambiguous circumstances and time pressure
- Experience the fun and challenges of running a small air carrier business

From the Syllabus: “You will have to make weekly decisions and submit these decisions on the Airline Interpretive Simulations website. Each airline team will be graded on the quarterly (each decision period) performance measures for that period. For example, cumulative net income of the airline may be weighted as 10% of the quarterly score. Depending on how well the airline is managed by the team, these quarterly scores will vary from 60 to 90 points of a possible 100 points on the performance measures (reliability, yield, load factor, social performance, etc.). This is a competitive simulation based on teamwork, analysis of data and good business decisions for the strategies you have decided upon for your particular airline. There will be only one airline (team) winner at the end of the simulation.”

This sheet contains the decision-making schedule.

This sheet is a track of the four airlines progress through the semester.

This sheet provides the final operational, economic, and financial metrics results of the four airline management teams.

Course Assessment (Intended Use of Results)

The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

2022 recommendations by the instructor:

1. Reduce the final grade weight of the management audit oral and written presentation from 30 percent to a lower value. This activity was the most-heavily weighted in the syllabus.
    a. 2023 response: The weighted grade for the management audit report was reduced to 20 percent of the total final course grade. This was a much better balance with other assessments within the course. A peer team member evaluation instrument was added as 10 percent of the final grade.
2. Consider a different textbook. Students expressed some frustration with the textbook's lack of flow, editing errors and some chapters at a graduate level.
    a. 2023 response: The instructor evaluated three possible textbooks and considered each of them to be at the freshman/sophomore level. The textbook choice remained the same.
3. Give consideration as to how the "airline management teams" are to be constructed. This spring 2022 session involved a random drawing of numbers to see what students would be on each (of four) team. Is it better to let the students form their management team? Would this process result in achieving all the assessment values such as the benchmark?
    a. 2023 response: The instructor, again, utilized a random drawing for the determination of team members.

2023 recommendations by the instructor:

There are no recommendations made by the instructor.

Aviation Management – Data Collected in Support of Curriculum Goals and SLO 2

Performance Indicator Rubric

Course: ASCI 1300 Aviation Weather Course Instructor: Alec Albright

Semester Taught: Fall 2022 Number of Students in Course: 60

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	96%	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

**Attach description of assignment used for assessment and samples of student work.*

Performance Indicator Rubric

Course: ASCI 1300 Aviation Weather Course Instructor: Alec Albright

Semester Taught: Fall 2022 Number of Students in Course: 60

FLIGHT SCIENCE CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	96%	Yes
SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot.	96%	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

**Attach description of assignment used for assessment and samples of student work.*

[redacted]
Aviation Weather
10/10/2022

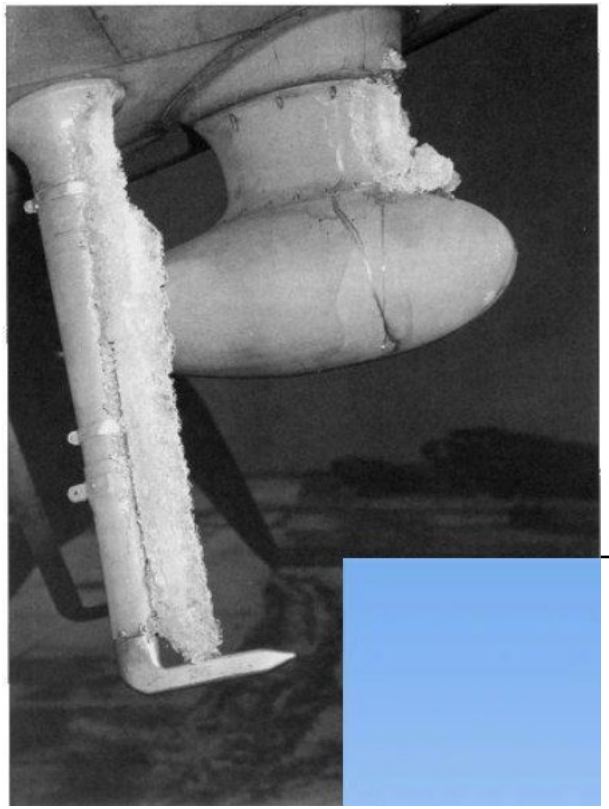
1. ASRS Report Number: 1786936
2. Date: February, 2021
3. Aircraft Type: Cessna 172
4. Summary: The pilot was flying at 7,000 feet when ATC requested that they fly at an even altitude. They requested to fly at 4,000 feet but changed their mind and stopped at 6,000 feet. This altitude was between two layers that eventually merged, and ice began to develop. The pilot lost airspeed indication and the stall horn began to sound. The pilot could not figure out what was happening because they were in the clouds, so they pushed the yoke forward. They then had to perform a recovery from a rapid descent and a 180-degree turn. Afterwards the ice melted, and the pilot continued on their course beneath the clouds.

ACN: 1786936

[redacted]

Skyhawk 172

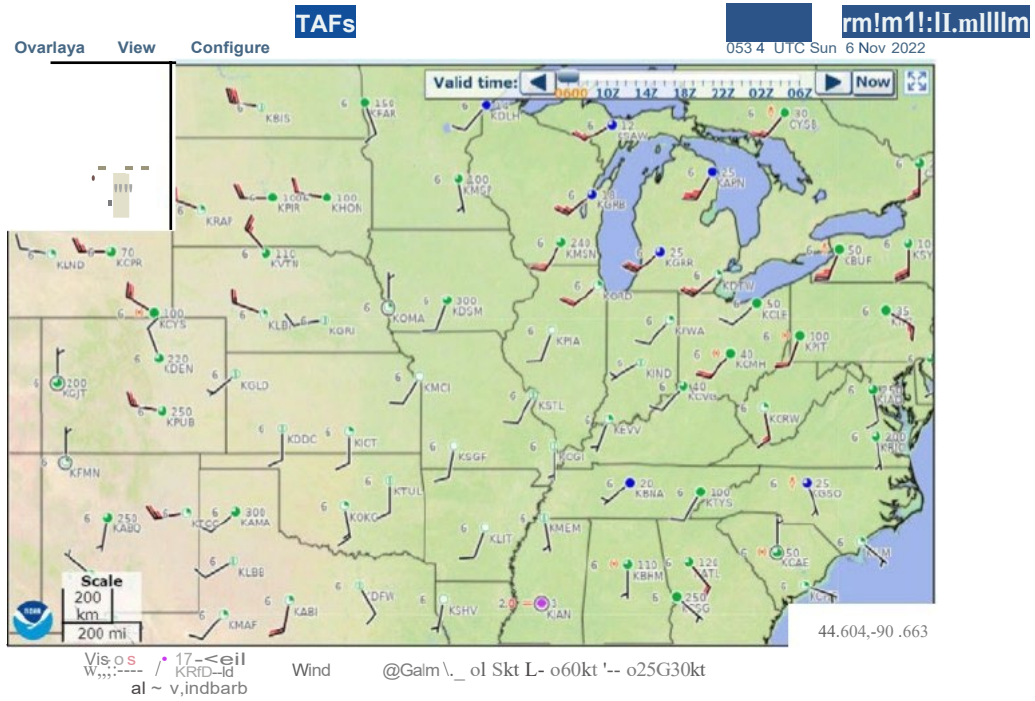
- IFR flight between layers at 7,000 feet
- Layers merged forcing the pilot into the clouds where icing developed

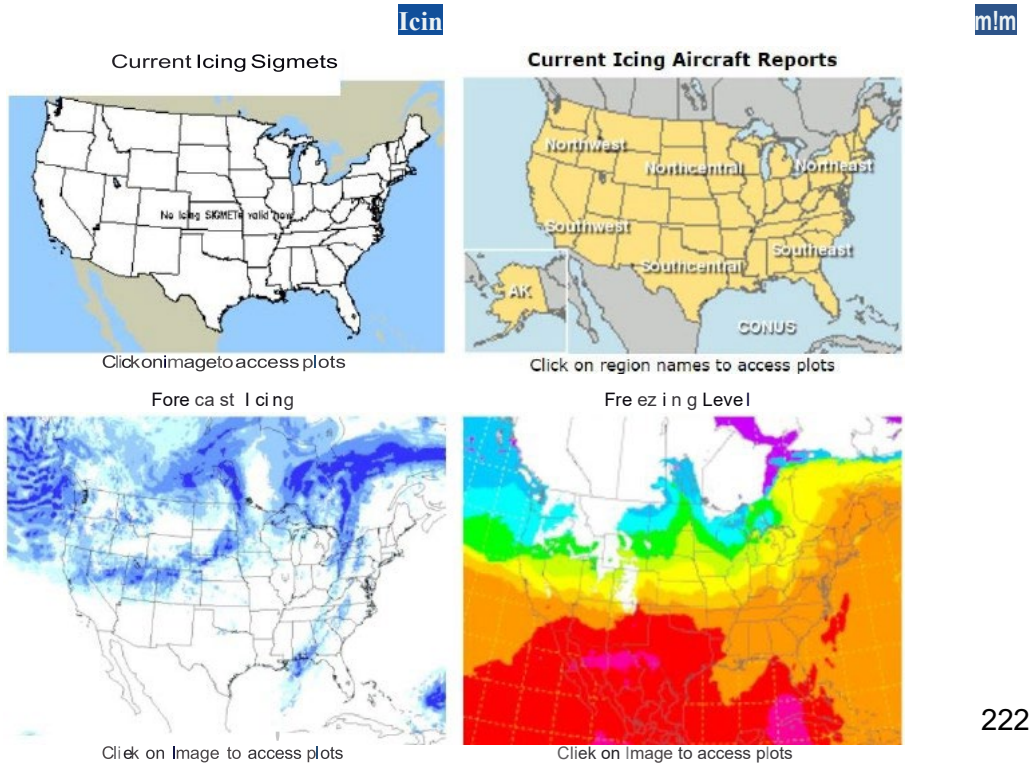


Pitot-static Icing caused the airspeed indicator to fail and indicated a false stall

- The pilot pushed the nose down to prevent this and was forced to recover from a rapid descent and turn 180-degrees

AWC Planning Tools





[redacted]

Aviation Weather

11/6/2022

ACN: 1786936

In ACN 1786936, during February of 2021, the pilot of a Cessna 172 was flying between two cloud layers when they merged and caused rime icing on the pitot-static system. Icing like this causes significant problems for pilots because the instruments required for IFR begin to fail.

While flying at 7,000 feet the pilot of ACN 1786936 was flying between layers when ATC requested that he fly at an even thousand instead. The pilot had the choice of up or down. The pilot chose to come down to 4,000 feet to stay below the freezing level. However, to avoid the clouds at 4,000 feet the pilot requested to stay at 6,000 feet which put them in between two layers of clouds. As the pilot continued on their course, the clouds merged and forced the pilot into them. Due to 6,000 feet being above the freezing level, rime ice began to form on the aircraft. This icing covered the pitot tube and the pilot's airspeed indicator failed. This caused the stall warning indication to appear. The pilot requested a descent to ATC on account of icing and began descending to 2,000 feet. Still, the pilot was unable to figure out what was happening, and just to be safe, they pushed forward on the yoke. When they finally realized no stall was occurring, they began a recovery from the rapid descent and performed a 180-degree turn. After activating the pitot heat the airspeed indicated came back online, and they continued on their previous course safely.

Icing such as the kind seen in this example can be extremely hazardous for any pilot, regardless of whether they are VFR or IFR. Not only can icing clog the pitot-static system and

render flight instruments useless until the icing is removed. It can also cause engine problems by covering the air intake. Secondary air helps counter this, but it can still cause a dangerous situation. On top of that icing on the wings will disrupt the laminar flow over the wings causing separation and potential stalling. Luckily pilots can predict icing and prevent it in many cases. For icing to occur there must be precipitation and below-freezing temperatures at the altitude that the pilot chose. Thus, pilots must avoid altitudes where both freezing temperatures and moisture are present.

In this ASRS Report, it seems that the pilot already knew the freezing levels and clearly knew of the precipitation, as they were actively avoiding it. However, as I stated above both below-freezing temperatures and precipitation are required for icing to accumulate. In this example, the pilot chose to stay above the freezing level but out of the clouds rather than descend into the clouds. The pilot would most likely not have run into any issues if they had descended to their original intended altitude of 4,000 feet. They would have been in the clouds for a longer time, but they would have avoided the freezing temperatures altogether. The best way to find out if your flight has a chance of icing is to use the tools provided by the Aviation Weather Center. On their website, pilots can find the Freezing Level Graphic as well as terminal aerodrome forecasts. These allow pilots to find both the chance of precipitation on their flight path as well as icing levels to prevent accidentally running into a hazardous situation.

Diligent flight planning could have prevented this pilot from running into hazardous icing. No matter the conditions that appear on the surface pilots should always check the weather to prevent situations like the one seen in this example.

Aviation Weather
Parks College of Engineering, Aviation and Technology
Fall 2022

Final Project: NASA ASRS Report Assessment

To complete this assignment, students will find a NASA ASRS report where the primary factor contributing to the error was Weather. Students will write a short report about why the incident occurred, the weather associated with the incident, how a pilot can anticipate the weather which caused the problem, and how to avoid such errors in the future. Students will also prepare a short presentation (2-4 minutes) on their report, and share this in class, in front of their colleagues.

Students who are attending the class remotely or from foreign countries will still be required to present their findings to the class. This can be accomplished over Zoom, and you will be able to share your screen with the rest of the class.

Students will conduct a search of the ASRS database. In conducting this search, students will select 'Weather' as the Primary Factor. Students will also use the ASRS search function to limit results to 'Part 91' Flight Rules. This will pull reports only from general aviation, and exclude those reports from airlines, charter operators, military flight operations, and other flight operations that are not directly relevant to the type of flying that students are currently engaged in.

Due Dates:

1. 10/20/22 11:59 PM CDT - submit your chosenASRS report, date of occurrence, aircraft type, and a short summary in a PDF document via Canvas
2. 11/6/22, 11:59 PM CDT - submit your completed assignment (short essay and powerpoint presentation) in PDF formats via Canvas

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Short Essay Format Requirements

1. Times New Roman, 12-pt., double spaced
2. Title should be the ACN, centered in **bold**, at the top of the page
3. 400-700 words

Short Essay Content Requirements

Answer the following questions:

1. What occurred? Provide a detailed description.
2. What was the weather phenomenon? Describe the weather occurrence using your knowledge of weather theory from our class.
3. How could this situation be avoided in the future? Use your knowledge of aviation weather products and preflight planning to describe how you might avoid this type of occurrence in the future.

As with any writing assignment, please consider proper grammar, punctuation and spelling. Please include a short introduction and conclusion at the beginning and end of your assignment.

Presentation Requirements:

1. 2-4 minute presentation
2. Create a short powerpoint presentation
3. Present your essay in an oral format to the class

Performance Indicator Rubric

Course: ASCI 1510 The Air Transportation System Course Instructor: Nancy Childrey, PhD

Semester Taught: Spring 2023 Number of Students in Course: 23

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	Discussion Post #14 Homework #4	Yes
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	Midterm Final	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

**Attach description of assignment used for assessment and samples of student work.*

Discussion Post 14: How are drones handled in airspace (for those outside of the US, please share with us how it's handled in your country)? And how do you think they should be handled?
How do you think airspace will be handled in 80 years when there are flying cars?

Example 1: Drones have become a problematic topic in the US within the past few years. Drones have become an affordable, fun, and creative way for people to film, and even have sporting events (drone racing). Problems come about when people start using them around the altitudes that are considered "low to the ground" for planes, around 0 to 1000ft or so. Drones are also hard to spot due to their small size. There are a couple of ways that the US handles drone operations,

- Categorization: Drones are categorized based on their weight, size, and intended use. Each category has specific regulations that must be followed, including where and how they can be flown.
- Registration: The FAA requires certain drones to be registered depending on their class.
- Restricted airspace: There are certain areas where drone flight is prohibited, such as airports, military bases, and other sensitive areas. These areas are marked as no-fly zones, and drone operators must ensure they do not fly in these areas.
- Communication: Drone operators must communicate with air traffic control (ATC) when flying in certain areas or under specific circumstances, such as when flying in controlled airspace or near airports.

I believe that AI will drastically improve the operations within airspace. I think that AI will help advise ATCs and help them make decisions that lead to efficiency and safety for everyone.

Example 2: The United Kingdom has a number of drone rules and regulations that must be followed. Laws there state that drones are not permitted to fly higher than 400 feet (120 meters), and the operator must maintain a line of sight with their drone at all times. Operators are also not allowed to operate their drones within a 5 km radius of an airport, and the drone must be a least 50 m away from any uninvolved persons at all times. If the drone weighs 250 grams or more, it must be operated at least 150 meters away from parks, industrial areas, residential zones, and other built-up locations.

Even if it's 80 years from now, I have my doubts about whether or not flying cars will be a thing then. I don't doubt that technology will eventually be able to get there, but it just seems like a regulatory and safety nightmare. The airspace would be insanely crowded and it doesn't seem like it'd be safe or practical, at least not with the ATC system we have in place now. Also, think about how many car crashes there are on the roads. If you crash in the air it's almost certainly going to be deadly. Not only would the flying car need to be a technical marvel itself, but so would future airspace management and regulations. I also think the qualifications for getting a "flying car driver's license" would be much more stringent than a normal driver's license.

Example 3

In Nigeria, drones are subject to specific regulations to ensure their safe and responsible use and are regulated by the Nigerian Civil Aviation Authority. The NCAA's Remotely Piloted Aircraft System (RPAS) Operator Certificate (ROC) is one major regulation that drone pilots must follow. Both commercial and non-commercial operations require the ROC, and operators must meet specific requirements, such as getting the proper insurance coverage, proving that they are familiar with drone operations, and following safety regulations. Restricted and prohibited areas, customs regulations, and other operational restrictions must also be followed.

I believe that in order to ensure safe, effective, and sustainable operations, the integration of flying cars into airspace in the future will likely call for an extensive plan involving regulatory frameworks, technological advancements, infrastructure development, training and licensing requirements, traffic control systems, safety and privacy measures, and environmental considerations.

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Homework #4: Discuss airport privatization: should St. Louis Lambert International Airport be privatized? If you cannot answer this question, what information do you need to make an informed decision? If privatization should not occur, what would need to happen so that it would work?

Example 1: In the United States the concept of airport privatization is remarkably foreign, although some airports have been privatized in the past the current list of US privatized airports is only one. Only two airports have even completed this process with one of them reverting back to privatization. I bring this up because it may be small sample size but before I could make any recommendation, I would want to do an in-depth look at how the currently privatized airport is functioning, and why the other airport reverted to a public state. Without those key details it will be hard to make an informed decision. As such I would have to say that the limited success of the APPP means that I could not recommend full privatization of Saint Louis Lambert International Airport.

That said even under the APPP there are more options for privatization than simply selling or leasing the entirety of the airport and its operations. One such example that I would recommend is “developer financing” which utilizes private investment and development on certain projects which can range from small to large. A good example of this would be Chicago O’Hare’s terminal 5. This method to me favorable because it allows for private investment which can mean renovation and updating for an airport. But this method also avoids what I would personally consider to be the greatest risk for privatization of airports. Aviation has long been considered one of the most dynamic economic forces, with great highs and even greater lows.

Privatization of airports puts at risk the loss of investors as the aviation environment changes for the worse. This is where Europe and the United States differ greatly. Europe is remarkably smaller than the United States and has also seen far greater success with privatization. While these two may seem disconnected I do not believe that they are, a failure of any one airport do to privatization, however temporary may mean that a flight from France to Germany must go through another city a few miles away and while that can greater affect the ATS of Europe it does not cripple the system, but with the United States far more spread out geography, the loss of a large investor in a private airport especially a major hub could set back air lines days and result in a cascade of problems. A public airport is given government subsidies to keep operations moving. These are not based off taxes in a local area or an investment firm or individual. Both of which can be volatile in nature.

While I fully believe that privatization of airports may be something I see within my lifetime and that systems may be put in place in order to ensure the security of airports (at least large ones) from failure; I do not see those securities being put in place in the current time. Until those assurances can be made, and the airports protected from the volatility of the economics of aviation, I do not believe St. Louis Lambert should be privatized fully. This does not stop the city of St. Louis from allowing partial privatization like they are doing already with management and service contracts. It also does not stop Lambert from taking the next step towards privatization which is developer financing and the DBFOM model.

Example 2: Airport privatization came into action in 1996 when Congress created the Airport Privatization Pilot Program. The Airport Privatization Pilot Program, which can be located in Section 149 of the Federal Aviation Reauthorization Act of 1996, increased “access to sources of private capital for airport development and to make airports more efficient, competitive, and financially viable” (Tang, 2017).

There has been a long debate within the city of St. Louis concerning the privatization of St. Louis International Airport. A bill produced by the Board of Aldermen President Lewis Reed proposed delegating the control of St. Louis Lambert International Airport to a private contractor within a fifty-year, $1.7 billion lease. St. Louis City has considered privatizing St. Louis Lambert International Airport, but in order to follow through with the action, the city must first ensure that the majority of the airlines are in agreement with privatization before beginning the process.

On top of gathering the popular vote from airlines, St. Louis City must also gain the popular vote from the city. I believe that St. Louis Lambert International Airport should not be privatized due to the high risk associated with the failure of the privatization process. If the privatization of St. Louis Lambert International Airport were to fail or the airport’s private operator decided to discontinue the privatization, taxpayers will be at stake. For example, Stewart International Airport in New York attempted, but failed privatization of the airport. Stewart International Airport’s private operator, National Express (NEG), discontinued the privatization, costing taxpayers $75 million to escape the privatization. St. Louis politicians and citizens against the privatization of St. Louis Lambert International Airport are concerned that as a city, we will find ourselves in a similar situation. Without privatization, St. Louis Lambert International Airport has been growing; Passenger traffic has been increasing, there has been an increase in flights, Southwest Airlines has become a significant hub at the airport, and bonds have been refinanced, saving the St. Louis City millions of dollars. A concern that myself and other St. Louis residents may have is that the process of privatization will bring a lack of transparency and decline the options for public opinion.

Midterm: The aviation industry went from an industry with demand to a saturated market in a matter of weeks due to COVID-19.

1. The importance of the air transportation system can be summed up in three ways. What are those ways, define and explain them, and use COVID-19 as an example of how the disease has impacted the air transportation system.
2. What are the roles of ICAO and IATA in the air transportation system? How have they helped guide the reaction to COVID-19 for consumers and the aviation industry?
3. What is TSA and what is their primary purpose? How has COVID-19 impacted security in the air transportation system?

Example 1: The air transportation system is arguably the most important global factor in achieving economic growth and global development. The air transportation system utilizes its three strengths – economic, social, and political factors – to promote global diversity and relations. Organizations within the aviation industry, such as the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA), collaborate to promote safe and effective operations within the air transportation system. Any significant global impact could hinder the safe and effective operations of the air transportation system, causing it to become saturated and less effective. In March 2020, the World Health Organization (WHO) officially classified COVID-19 as a pandemic. The effects of the COVID-19 pandemic significantly impacted the world, causing the aviation industry to experience adversity. The air transportation system had experienced a major downfall during the COVID-19 pandemic, but global efforts have continuously been made to prevail through the economic hardships. In order to overcome the adversity of the pandemic, the air transportation system has reflected on economic strategies, partnered organizations such as ICAO and IATA to aid the reaction to COVID-19, and utilized the Transportation Security Administration (TSA) to meet the security demand of traveling passengers and promote innovations during the period of hardship and recovery.

The Three Factors of the Air Transportation System

The three major parts of the air transportation system–economic, social, and political factors–influence the global economy, international travel and cultural exchange, and the political relationships between nations. The three factors of the air transportation system determine the flow and safety of aviation operations around the globe. Each factor, whether economic, social, or political, creates a strong foundation for global aviation and relationships.

The Economic Factor

The economic factor of the air transportation system allows for the continuous advancement of aircraft and airlines without a significant increase in passenger fares. The continuous improvement of the global economy has allowed the air transportation system to become an industry with high demand. In 2020, the COVID-19 pandemic struck the globe, and resulted in increased restrictions and a decline in air transportation demand. According to IATA, passenger revenue miles (PRM) decreased by 90% as of April 2020 and were at 75% in August 2020. Freight transportation declined about 30% year-on-year in April 2020 and was at 12% in August 2020 (“COVID-19 and the Aviation Industry,” 3). The quick hit that the air transportation system took had caused airlines to experience immense pressure,

leading to liquidity buffers. A study conducted by the Travel Association had predicted a 45% decline in industry revenues, resulting in a years' loss of $519 billion. The two main concerns that the aviation industry experienced during the pandemic were health-related

operating costs and the recovery costs of commercial aviation. The health and safety requirements brought about by COVID-19 required the aviation industry to implement enhanced disinfection techniques, temperature checks, and virus checks. The social distancing protocols were anticipated to cause a reduction in passengers by up to 50% (“COVID-19 and the Aviation Industry,” 3), which would have impacted the overall PRM. The slow recovery of commercial aviation had impacted the number of flights across the globe, which resulted in an economic decline. In September, 2020 the number of commercial flights was more than 40% under pre-pandemic levels (“COVID-19 and the Aviation Industry,” 3). COVID-19 prevented a significant amount of international travel, which was a big factor of the air transportation economy. International aviation had been the main source of aviation income for airports around the globe, therefore the aviation industry had to find a way to combat the hardships of the pandemic and aid the economic demands of the air transportation system. According to the Center for Aviation (CAPA), the air transportation system had anticipated a five to ten year recovery period in order to fully recover from the COVID-19 pandemic. To economically recover from the downfall caused by the pandemic, the air transportation system must adopt a multitude of actions; Some of these actions being to work with stakeholders, improve and share data for future operations, and adapt new innovations to present new economic growth opportunities.

The Social Factor

The social factor within the air transportation system allows people from different cultural backgrounds to travel around the globe. The spread of cultures around the world by aviation leads to trade, which can be linked to economic growth. The aviation industry provides transportation to remote locations, allowing for social inclusion. Lastly, air transportation provides timely emergency aid and relief around the world. During the COVID-19 pandemic, the social and economic aspects of the air transportation system went hand-in-hand. IATA had predicted tourism levels to decrease by 850 million to 1.1 billion international tourists, resulting in a total revenue loss of $910 billion to $1.2 trillion (“COVID-19 on Aviation,” 1). International travel had taken a plummet once the pandemic prevailed. A statement by the World Tourism Organization explained that “global tourism suffered its worst year on record in 2020, with international arrivals dropping by 74%.” The 74% decline in internal travel had cost the tourism industry a $1.3 trillion loss in export revenues (Patel, 2022). The long duration of the COVID-19 pandemic forced the aviation industry to learn how to adapt to the ongoing adversity regarding travel circumstances. It was important that the aviation industry reflect on aspects that would affect social travel such as fleet costs, the proper protocols for air transportation disruption, and aircraft recommission in order to combat the hardships brought about by the pandemic. The chief adventure officer for Steller, Richard Bangs had stated, "The next incarnation of tourism is on the way." "As we go out and redefine how we experience the world – with our senses re-attuned, our situational awareness reengaged – let it bring awakenings and inventions, the way we travelers have always risen to the greatest challenges." The aviation industry must learn to make instant changes and adapt to upcoming demand for travel as passengers begin to feel more confident about air transportation.

The Political Factor

The political factor within the air transportation system greatly influences international trade, tax regulations, and global competition. Political aviation is impacted by threats such as global conflict (war), terrorism, and outbreaks–such as the COVID-19 pandemic. COVID-19 resulted in multiple countries closing their borders, preventing foreign and political personnel from entering different

countries. One hundred eighty-nine countries, containing about 65% of the world population, completely closed their borders due to the pandemic (“Closed Borders,” 1). As COVID-19 continued, border closure eased, but countries still implemented travel bans and partial

closures. The United States implemented travel bans on China, Iran, and twenty-six European countries. The travel bans placed on countries impacted international relations, leading to a decline in global politics.

The Roles of ICAO and IATA

Though global politics experienced a downfall, many global organizations within the aviation industry continued to collaborate in order to improve the air transportation system during the pandemic. Many of these aviation organizations have helped to combat the adversity caused by the COVID-19 pandemic and guide consumers as well as the aviation industry. Two organizations that have played respective roles in aiding the air transportation system during the pandemic were ICAO and IATA. ICAO is a government association that was established to enhance the air transportation efforts and cooperation between multiple countries. The mission of ICAO is "to maintain an administrative and expert bureaucracy supporting diplomatic interactions, and to research new air transport policy and standardization innovations..."(Loh, 2022). IATA is a non-government organization that was established to promote trade amongst commercial industries around the globe. The mission of IATA is to formulate policies for aviation subjects in order to uphold the best interest for global airlines. IATA challenges "unreasonable rules and charges" (Loh, 2022) and holds rule makers accountable, pushing them to strive for “sensible regulation” (Loh, 2022). Since the COVID-19 pandemic, ICAO and IATA have made continuous efforts to help guide consumers as well as the aviation industry. ICAO put their best effort forward to keep the air transportation system up and running. ICAO collaborated with multiple organizations, such as IATA, to create new reports and recommendations in order to resume international air travel. ICAO also created a “COVID-19 Response and Recovery Platform.” The platform offered forecasts, guidance, resources, and tools that aided consumers and the aviation industry in combating the COVID-19 virus. IATA had teamed up with ICAO by encouraging government personnel to practice and enforce the guidelines set by ICAO. The Director General and CEO of IATA, Alexangre de Juniac stated: “The universal implementation of global standards has made aviation safe. A similar approach is critical in this crisis so that we can safely restore air connectivity as borders and economies re-open...” IATA held government workers to the standards set by ICAO, allowing the aviation industry to have a more effective recovery.

The Purpose of the TSA

Aside from ICAO and IATA, another vital organization within the air transport system is the Transportation Security Administration (TSA). TSA was established following the events of 9/11 in order to enhance the United States’ (U.S.) transportation security as well as uphold the freedoms guaranteed to individuals. TSA is stationed at airports around the United States and is responsible for screening all passengers' bags entering, remaining, or exiting the U.S. The COVID-19 pandemic had made a significant impact on the security system within the air transportation system by pushing the industry to implement new security procedures. Close- contact security checks, such as pat-downs, had become limited, crowd control technological measures, such as modern screening equipment and biometric scanning, had been put to use, and high standards for passengers to arrive prepared had been enforced. The security procedures implemented within the aviation industry as a result of COVID-19 has become strictly focused on the avoidance of physical contact. The pandemic had created a new security culture within the air transportation system: one in which allowed for safety and security innovation.

Facing the COVID-19 Pandemic

The COVID-19 pandemic had a significant impact on global operations, especially the air transportation system. The air transportation industry had experienced adversity economically, socially, and politically. In order to combat the hardships caused by the pandemic, organizations such as ICAO, IATA, and the TSA collaborated and implemented new innovations to prevail through the global hardships of COVID-19. Though the pandemic caused a significant downfall for the air transportation system, organizations within the aviation industry have been joining forces to create solutions, allowing the air transportation system to make a global come-back.

Example 2: Our air transportation system is arguably one of the most critical aspects of society today. Through the benefits that it brings, economies are able to flourish, people can see and experience the world, and countries and their economies have the ability to become closer than ever. With such an important system, it's critical that professionals are at the helm, guiding and leading the industry to operate safely and efficiently everyday. When threats come into play, and our air transportation system is put at risk, we begin to really appreciate it and the organizations and individuals who inform us, who keep us safe, and who guide the industry back to flourishment. The importance of the air transportation system can be summed up by the economical, social, and political effects that it has on our world. Airlines are drivers of the economy, there's no doubt about that. Having easy and unrestricted access in and out of a particular place allows growth and development to thrive. According to Airlines for America, commercial aviation contributes to over 5% of the US's total GDP. In other words, the air transportation system contributes more than $1.25 trillion to our economy (Airlines for America, 2023). In addition, there are countless jobs in our society that can be somehow tied back to the air transportation system. First, there are the direct jobs. These consist of airline and airport employees, etc., in other words, those who work directly with the air transportation system. Then there are indirect jobs which are fueled by the aviation industry, like tourism and rental car companies. These jobs aren't directly related to the air transportation system, but they are driven by the people that it transports. Finally, it also creates induced jobs. This could be in the form of a construction worker who is building a house for an airline employee moving to the community. The success of the air transportation system induces more jobs in the community because of the economic prosperity it brings. Another cool example that I discovered relating to aviation and induced jobs was when Kenya Airways began non- stop flights from Nairobi to New York–JFK, it reduced shipping times and freight costs enough to open up the North American market to Kenyan flowers. According to an Aviation Benefits Report, "In Kenya, over 100,000 jobs depend on the cut flower industry" and it "generates around USD 700 million in foreign exchange each year" (ACI, CANSO, et al., 2019). Having this air link creates, or induces, these jobs in Kenya. In fact, Airlines for America also estimates that commercial aviation drives and supports over 10 million jobs, just in the US alone, and over 65 million worldwide. (Airlines for America, 2023; ACI, CANSO, et al., 2019). In 2020, when COVID essentially shuttered the industry, it obviously affected airline employees, but it had a ripple effect across the entire economy. Not only did it also affect the indirect and induced jobs, but with people being unable to travel for business, it brought a good majority of economic growth to a halt. The importance of the air transportation system as it relates to our social world cannot be overlooked either. The whole mission and purpose of the airline industry is to connect people to the things that matter most to them. Delta even states that their mission is to connect "people to people, people to places, and people to potential," and for many years, United's purpose has been "Connecting People. Uniting the World." (Delta, 2022; United, n.d.) The air transportation system brings people together and unites us as a society. When COVID shut down international aviation, many really began to realize and remember how socially important aviation really is. With these critical links provided by aviation gone overnight, people were cut off from one another, and there are so many heartbreaking instances where loved ones were separated for years. Furthermore, by allowing us to see and experience different cultures and ways of life, the air transportation system allows us to overcome some of our differences, helping to conquer the hate and divisiveness that often divides us, and we can learn how our unique differences and shared experiences can actually bring us closer together.

Finally, the air transportation system has immense political effects on the world. Aviation allows for international trade to be more easily

facilitated between two countries. This in turn allows for those countries to forage better relationships. In an article titled Building Peace

and Prosperity Through International Trade, it suggests that “cross border trade is one of the key gauges and engines of national development” and that “nations with greater trading links and partnerships tend to have more harmonious foreign relations” (Pinto, n.d.). In the past few decades with the development of more fuel efficient, long-haul aircraft, it has allowed allied countries to be closer connected with the countries they have strong ties with, even if they may be far apart. Flights between two countries can also represent a warming of political relations between those countries, like when US airlines were able to resume flights to Cuba in 2016. Clearly, the air transportation system has profound effects on the world, economically, socially, and politically, and COVID made these effects especially clear. We are an interconnected society that relies on the air transportation system to effectively function. The International Civil Aviation Organization, or ICAO, fosters the planning and development of international air transport. According to their website, their mission is “to promote the safe and orderly development of civil aviation around the world” (U.S. Mission to the International Civil Aviation Organization, n.d.). They establish standards and recommended practices related to and required for aviation security, efficiency, regularity, safety, and environmental preservation. ICAO consists of 193 member states, almost the entire globe. In response to COVID-19, ICAO created the COVID-19

Response and Recovery Platform in order to “collate the forecasts, guidance, tools, and resources which are needed by national regulators pursuing pandemic responses” (International Civil Aviation Organization [ICAO], n.d.). They laid out standard and recommended practices along with framework and mitigation measures to help prevent the spreading of the disease and manage the public health risk while also strengthening confidence among the traveling public. Under the COVID-19 Response and Recovery Platform, they have categories relating to health and safety, operational measures, passenger facilitation measures, economic analysis and forecasts, as well as a Council Aviation Recovery Task Force (CART). CART includes a section on “Public Health Risk Mitigation Measures” as well as four additional modules relating to Airport Guidelines, Aircraft Guidelines, Crew Guidelines, and Cargo Guidelines (ICAO, n.d.). The International Air Transport Association, or IATA, is the trade association for the world’s airlines. They represent around 300 airlines in over 120 countries, accounting for 83% of global air traffic. IATA helps develop the global standards that airlines need in order to connect the world. Some of those include standards that simplify processes, increase safety, enhance passenger convenience, reduce costs, and help achieve sustainable goals. Their mission is “to represent, lead, and serve the airline industry” (International Air Transport Association [IATA], n.d.). As it relates to COVID-19, IATA published and continually updated guidance and information as it related to travel restrictions, mask usage, and cabin air quality, keeping everyone informed about the seemingly ever changing conditions (IATA, n.d.). Organizations like ICAO and IATA are critical to the safety, efficiency, and success of the air transportation system. As witnessed by the COVID-19 pandemic, they helped guide us all, airlines, aviation personnel, and the flying public included, through these uncertain times. The Transportation Security Administration, or TSA, is tasked with screening passengers and cargo to protect the US airline industry from security threats and acts of unlawful interference. They were created in the wake of the 9/11 attacks in an effort to ensure an event such as that never happens again. TSA’s mission is to “protect the nation's transportation systems to ensure freedom of movement for people and commerce” (Transportation Security Administration [TSA], n.d.).

As it relates to the COVID-19 pandemic, this drop in travel volume allowed for multiple changes as it relates to aviation security. According to an article by Securityinformed.com: As passenger traffic plummeted, the aviation community sought to explore the

potential of new technologies to make security checkpoints more contactless and flexible when the traffic numbers return. The

pandemic has seen an increase in touchless technology deployed in the screening area. Used for cabin baggage screening, Computed Tomography (CT) produces high-quality, 3-D images to enable a more thorough analysis of a bag's contents. (Anderson, n.d.)

Not only did the pandemic allow for an opportunity to make security checkpoints more hygienic, but this drop in passengers also allowed for new and innovative screening technologies to be tested and implemented. Just as 9/11 changed airport security, COVID-19 created another opportunity to create a safer and more secure environment. Changes were made and implemented so that passengers and aviation staff alike can continue to have confidence in the air transportation system during and after the pandemic.

Since the beginning of 2020, society has realized more than ever the criticality of the air transportation system to us, to our well-being, as well as to the success of society. As we've navigated this global crisis, we've gained a whole new appreciation for air travel, and it's the millions of aviation professionals around the globe who enable this freedom of movement. With these strong international organizations, the individuals behind them, and what we've learned from the pandemic, it is my hope that the air transportation system can be stronger, safer, and more resilient than ever before.

Final

You found the password to your old Bitcoin wallet and you decided to invest in the aviation industry.

A portion of the money will be used to build an airport. Discuss how you would determine the site selection of your airport (don't forget to take into account the natural environment!). What regulatory considerations must be taken into account? Describe how the operational environment impacts your airport. What terminal style would your airport have and what type of passengers would access your airport? Describe and defend your rationale for choosing what services you would want your airport to offer.

In addition to the airport, you also decide to start an airline carrier. As you build your airline, articulate what steps you would need to take to make sure your business is financially viable. What service quality indicators would be important to have? Describe and defend (think about route selections here!) the type of aircraft(s?) you would have in your fleet. What type of airport(s) would you want to be based out of? What organizations would you need to work with to ensure your airport is safe (think security and airspace for this question!)? For fun: what would you name your airline carrier?

Example 1:

Introduction

As I invest in the aviation industry, the focus of my investment will gravitate towards two main aspects: the construction of a new airport and the creation of an airline. Both factors contain precise requirements and considerations. When investing in the construction of a new airport, I will have to determine the site selection, specific regulatory considerations, the operational environment, terminal style and passenger types. All of these factors play a critical role in the successful development of an airport, therefore it is important to consider each aspect. As I also invest in creating a new airline, I will need to consider which service quality indicators would be important to have, which type of aircraft to have to my fleet, the type of airport I want my airline to be based out of, and which organizations I need to work with in order to ensure the safe and effective operations of my airline. All of these factors will help to ensure that my airline business is financially viable and is able to provide the best airline service that money can buy.

Airport Construction: Site Selection

The airline service created with my investment will be a small regional business airport that provides service throughout the midwest. The airport will be located in Northern Minnesota. Minnesota has a large number of pine trees and lakes; therefore, it is important to select the proper site, while also preserving the natural environment that will allow passengers to enjoy Minnesota's beauty. When selecting a site, I will have to consider terrain, lakes, vegetation and surrounding public facilities. I will select a flat terrain to ensure effective flight operations when taking off from and landing at the airport. Minnesita, "The land of 10,000 lakes," is known for its natural beauty, tall trees, and surrounding water, but when selecting a site for my airport, I will have to consider these natural factors. The selected airport site will be a clear space between pine trees and away from surrounding lakes. The clear space for the airport will allow for enough distance between the runway and vegetation so that afcat can safely and effectively clear the trees. This will allow passengers to be able to fly safely and comfortably, while also being able to experience the beauty of Northern Minnesota.

Airport Construction: Regulatory Considerations

The beautiful state of Minnesta holds a wide variety of environmental factors. Factors can vary from natural environment types,

public business environments, and large cities. When fundinging the construction of my new airport, I will have to consider a multitude of regulations due to the variety of environmental factors in Minnesota; one regulation being the Federal Aviation Administration's (FAA)

land use planning. When designing an airport, it is important to consider land compatibility. One compatibility factor is the use of land and effects of noise. When investing in the airport, I will have to consider the legislation put in place to control noise factors. A regulation that I will consider is the requirement of “Airport operators to ensure that actions are taken to establish and maintain compatible land uses around airports” (FAA, n.d.). I will consider other regulations by the FAA in order to properly “establish and maintain compatible land uses” when designing my airport. Compatible land use regulations I will consider are zoning regulations. Zoning regulations will allow me to understand specific land types that are not compatible with my airport design. The next regulations I will consider are subdivision regulations. Subdivision regulations will provide me with the proper framework to consider if noise pollution from the airport will negatively impact any local residents. The consideration of established public facilities is important when mapping an airport; therefore, I will utilize official map regulations to recognize where public businesses are located in relation to my airport site. Referring to map regulations will prevent my airport from interfering with day-to-day public facility operations and allow me to implement my own effective operational environment.

Airport Construction: Operational Environment

Implementing an effective airport operational environment is essential for proper investment use as well as the performance of safe and effective operations. In order to get the most out of my investment, I will be utilizing the Concept of Operations (CONOPS). The objective of CONOPS “is to cover end-to-end traceability between operational needs and system safety and performance requirements derived in future phases” (ADB Safegate, 2017). The utilization of CONOPS will allow my airport to maintain a safe and operationally effective environment. The implementation of CONOPS will also allow operations within my airport to properly flow, providing economic stability. The Concept of Operations has four aspects: Operational Environment, Concept of Air Traffic Control (ATC) Services, Operational Scenarios, and User/Operational Needs. The Operational Environment pillar of CONOPS focusses on airport structure, operational structure and layout, and the modern systems utilized by an airport. The Concept of ATC Services pillar describes approach and ground operations, runway models and separation regulations, an airport’s visibility procedures, and an in-depth description of standards and procedures for specific operations. The Operational Scenarios pillar utilizes the data obtained from other pillars to perform precision calculations to provide a proper number of materials needed for different operations. This allows for the enhancement of an airport’s environment. The User/Operational Needs provides a framework for how an airport should operate in order to effectively utilize and maintain the material gained from the Operational Scenarios pillar. The proper implementation of CONOPS will help create a successful airport operational environment, allowing my airport to provide quality service to terminal users and passengers.

Airport Construction: Terminal Style and Passenger Types

My airport will be utilized by business, leisure, and scheduled passengers. In order to provide the best possible service to my airport’s users and passengers, I must consider my audience. The regional airport I am investing in should have a modernized and stress-free terminal design, as a large number of business passengers will be utilizing my airport. The terminal will have a linear design to provide clear orientation for the passengers, provide lower baggage costs, and to allow passengers to walk directly from the terminal, through an airbridge, and onto the aircraft. The terminal style that I will implement within my airport is similar to the design of the Paine Field Airport located in Seattle, Washington. The mission of the Paine Field Airport is “Bringing civility back to the airport experience” (Paine Field Passenger Terminal, 2023). Terminal experiences can be stressful for a lot of passengers. It is extremely important that my terminal design implements a sense of stability and organization that will allow passengers to enjoy their experience. The simple, modern construction of my terminal will create an environment where business travelers are able to be productive and leisure travelers

are able to relax. Since the airport I am investing in will be a smaller, regional airport, the terminal design will display attention to detail and will be easily maintained. A detailed aspect of my terminal design will be large glass windows on the side of the terminal facing the

runway so that passengers can watch the aircraft operate and enjoy natural sunlight. The large windows will also provide passengers with a beautiful Northern Minnesota view of pine trees and nature. Another design feature will be workspace layouts. There will be quiet sections within the terminal with desks and additional material to provide a productive environment for business travelers. My regional airport terminal will also have a modern feel with wood decor, a variety of plants, tall ceilings, adjustable lighting, and fireplaces.

Airport Construction: Services

In addition to the modern, cozy design of my linear terminal, the airport I am investing in will provide a number of services to its passengers. There will be a parking lot on the backside of the terminal (the side opposite of the runway) where valet parking will be available. There will also be a small rental car service located in the parking lot. There will be a single restaurant with multiple dietary options, a small coffee shop, and a convenient store with a wide-range of selection. The airport will also offer complimentary coffee when passengers enter the terminal. In the linear airport terminal, airport personnel will be walking around, monitoring operations, answering questions, directing passengers, and ensuring people are having a productive and relaxing experience. To add to all of the previous services, my airport will have high-speed wi-fi to ensure travelers are able to work efficiently or contact their loved ones. My airport will provide passengers with carriers such as Southwest Airlines, American Airlines, and corporate business jets; such as my newest airline service creation: Beck's Corporate Aviation Co.

Airline Creation: Service Quality Indicators

Beck's Corporate Aviation Co. is my newest airline creation. In order to provide a finally viable airline, Beck's Beck's Corporate Aviation Co. will be an airline that provides the absolute best service quality to passengers. The better the service quality of my airline, the more frequent passenger satisfaction and use. My airline will exceed service quality expectations to provide safe, comfortable, affordable, and efficient service to the passengers of Beck's Corporate Aviation Co. An example of a service quality indicator that will be implemented in my airline is the use of modern and clean aircrafts that offer free wi-fi services to passengers. This factor is especially important, as a majority of Beck's Corporate Aviation Co. passengers will be business personnel. An additional service quality indicator that Beck's Corporate Aviation Co. will implement is the use of post-flight surveys. In order to persuade individuals to fill out the survey, an incentive of "Beck's Corporate Aviation Co. reward points" will be offered. Reward points can be cashed towards flight deals. The Beck's Corporate Aviation Co. survey will ask questions concerning safety, comfort, and efficiency. Each completed survey will be entered into a database to analyze and assess, allowing Beck's Corporate Aviation Co. management personnel to continuously improve the airline.

Airline Creation: Aircraft Types

Beck's Corporate Aviation Co. will hold true to their promise to continuously provide and improve safety, comfort, and efficiency by selecting the proper aircraft for its passengers. Beck's Corporate Aviation Co. will be operating throughout the midwestern region; through areas of fluctuating weather. It is important to select an aircraft for my airline that will provide passengers with safety and comfort, even when the midwestern weather does not display the best conditions. When determining an aircraft for Beck's Corporate Aviation Co., I decided to select a mid-size business jet that will travel at a significant cruising speed. As fluctuating weather is a common factor in our midwest routes, it is important to select a jet that can depart and land in a timely fashion to avoid issues presented by the weather. Beck's Corporate Aviation Co. will provide safe, comfortable, and efficient service to all of its passengers with the Boeing Business Jet 2. The 11,000 kilometer range and 473 knot cruising speed of the Boeing Business Jet 2 will allow the midwestern routes to be flown safely and efficiently. The Boeing Business Jet 2 will provide business passengers with luxurious comfort, amenities such as entertainment options, and enough space for 19 personnel.

Airline Creation: Airport

The amenities and services offered by Beck's Corporate Aviation Co. Boeing Business Jets will be based out of two midwest regional airports: Brainerd Lakes Regional Airport, Minnesota (BRD) and Columbia Regional Airport, Missouri (COU). The strategic placement of Beck's Corporate Aviation Co. aircraft in the northern and southern area of the Midwest allows business travelers to have better access to our aircraft services. BRD is a competitive selection for the placement of Beck's Corporate Aviation Co. Boeing Business Jets because it provides a less hectic service than flyinging out of major cities, such as the Twin Cities, Minoesita. The parking at BRD is free and there are a variety of rental car agencies offered at the airport. BRD also provides passengers with services such as a restaurant and wi-fi. The easy access and stress-reducing services offered by BRD is perfect for Beck's Corporate Aviation Co. business travelers. I also selected COU as an airport to base Beck's Corporate Aviation Co. out of. The new and improved terminal provided by COU is a great environment for Beck's Corporate Aviation Co. business travelers. The updated terminal will provide business travelers with a comfortable and productive environment where they are able to travel with ease.

Airline Creation: Organizations

In order to provide a safe and comfortable aviation environment, Beck's Corporate Aviation Co. will work with three main organizations to ensure the safety of our business travelers and the airport we operate out of. Beck's Corporate Aviation Co. will work with the Transportation Security Administration (TSA), the Air Traffic Organization (ATO) and the Airline Pilots Association (ALPA). TSA will provide the proper safety measures such as screening and baggage checks in order to keep Beck's Corporate Aviation Co. passengers safe. ATO, responsible for 17% of the world's airspace (FAA, n.d.) will allow for the safe and efficient travel of our Boeing Business Jet 2 aircraft through the National Airspace System (NAS). ATO will help to identify risks with the airscape before they become an issue to Beck's Corporate Aviation Co. flights. ALPA will ensure that our Boeing Business Jet 2 pilots are taken care of, allowing them to provide our passengers with quality service. ALPA will guarantee Beck's Corporate Aviation Co. airline the safety, security, and pilot assistance (APLA, 2023) we need to provide our passengers with the best airline service that money can buy.

Conclusion

Providing passengers with substantial service is the main focus of my two major investments: a new airport and a new airline. In order to provide quality service to passengers and users, the construction and design of my new airport and airline, Beck's Corporate Aviation Co., required detailed consideration along with a multitude of factors. When designing the airport, I had to consider site selection, specific regulatory considerations, the operational environment, terminal style and passenger types. When creating Beck's Corporate Aviation Co., I was required to consider the service quality indicators I would implement, which type of aircraft would provide the best properties for the specific operations of Beck's Corporate Aviation Co., the airports I wanted my airline to be based out of, and which organizations I needed to work with in order to ensure the safe and effective operations of my airline. All of the factors that go into designing an airport and developing an airline help to ensure that the aviation industry remains financially viable, operationally safe and effective, and continuous to provide quality service to all passengers.

Example 2: For this final paper assignment, I will create a fictional airline based on the current conditions in the US airline industry. That means, I will be taking into consideration the current competitive environment and real world factors. My first consideration is that I want my hub to be in a central location, that way my airline can take advantage of connecting passengers and so I'll be able to effectively utilize the hub-and-spoke model. I also want an airport that currently doesn't have much competition, as that can drive down yields and thus profit. Also, competing against another airline's fortress hub and trying to gain any reasonable footing, say against Delta in Atlanta, would be futile and unrealistic. Another consideration is I want a somewhat large city so I can take advantage of origin and destination passengers, along with the connecting passengers. It will also be important to have a city with some large companies to take advantage of corporate contracts. I also would prefer a location that is less susceptible to weather, as weather is often considered the great equalizer of the airline industry and it can wreak havoc on operations. I will be avoiding areas prone to severe storms, fog, or other conditions that could disrupt flight operations. Finally, it will be important to choose an airport with a large footprint to accommodate growth. There must be sufficient land available to accommodate the airport's facilities and future expansion needs.

With all this taken into consideration, my chosen location for my airport will be the Cincinnati/Northern Kentucky International Airport (CVG). First of all, Cincinnati is in a very central location, perfect for a hub-and-spoke operation. It is able to facilitate east-west connections, north-south connections, intra-midwest connections, and it is an efficient jumping off point to Europe for a large majority of the US. Going onto my second consideration, CVG currently doesn't have too much competition. No airline at CVG has a dominant market share, thus it will be easier to establish ourselves and gain market share. As of January 2023, the largest airlines were Delta with 24.49% market share, Allegiant with 14.32% market share, and Frontier with 12.54% market share (Bureau of Transportation Statistics [BTS], 2023). As you can see, market share is very fragmented, and there is only one legacy carrier in the top 3, who are typically the fiercest competitors. This makes it easier to gain traction than if one airline had 70-80% market share and could easily step on us and drive us out. In addition, the Cincinnati metro area is fairly large. The metro population of Cincinnati in 2021 consisted of 2,256,884 residents, not a number to shake a stick at. Furthermore, it's a growing region. Greater Cincinnati grew 5.6 percent in the last decade, and the Tri-State area gains thirty-three new residents every day (Planalp, 2023). Dayton, OH is also only an hour away, a metro area with over 800,000 people. CVG is also in the center of Indianapolis, Columbus, Louisville, and Lexington. These metro areas could also help feed the airport and its O&D passenger count. To put these population numbers into context as it comes to airport passengers, Charlotte, NC has a population of 2,701,046, and Charlotte Douglas International Airport (CLT) serves over 47.7 million passengers a year. Cincinnati/Northern Kentucky, on the other hand, saw only 7,573,416 passengers in 2022. That's only around 16% of the traffic at CLT for a metro area 83.5% of the size. CVG used to be busier back in the day, but I'll go into that later. It's also important to see what large companies have a presence in the area, as they can bring corporate contracts and high yielding business passengers. Cincinnati is the headquarters for multiple Fortune 500 companies, including Kroger, Proctor and Gamble, Western & Southern Financial Group, American Financial Group, and Cintas, among others. Even more recently in January 2023, GE announced it would move the headquarters for GE Aerospace to Evendale, a suburb of Cincinnati (Coolidge, 2023). Next topic I will cover is related to the natural environment. Obviously, it would be best to have an airport in a location free from as much bad weather as possible (thunderstorms, fog, wind, snowstorms, hurricanes, etc.) since that can negatively affect airport operations. According to Aceable, Dayton and Columbus, both within a stones throw of CVG, are ranked number two and three respectively for safest cities against natural disasters in the US. Other major cities like Miami, New York, and Dallas, while not only being extremely competitive, are susceptible to excessive weather. Miami, being in Florida, experiences numerous hurricanes and thunderstorms, New York battles

hurricanes and harsh winter storms, and Dallas suffers from being on the southern edge of Tornado Alley and thus is especially prone to severe storms that produce lightning, hail, strong winds, and of course, tornadoes (Aceable, n.d).

The next portion I want to talk about pertains to facilities, space, runways, etc. But before going into this, I think this is a good time to bring up Delta's past hub operations that once existed at CVG. In the 1990's and into the early 2000's, Delta had a massive fortress hub at the Cincinnati/Northern Kentucky International Airport. In 2005, they were operating over 650 flights per day, and in that same year the airport welcomed 22,778,785 passengers. At the time, it was one of the busiest airports in the country. Around this time, Delta was facing significant financial pressures due to rising fuel prices and increased competition from low-cost carriers. It was also just years after 9/11, the start of the global financial crisis, and Delta was in bankruptcy. In response, Delta undertook a restructuring plan to reduce costs, which included reducing the number of flights from CVG. The final nail in the coffin though, was Delta's merger with Northwest Airlines. When Delta merged with Northwest, they inherited Northwest's much larger hub in Detroit, which is just up the road from Cincinnati. Because it doesn't make sense to have two hubs so close together competing for the same traffic flows, the decline of CVG continued. However, because of Delta's retrenchment, there is a lot this airport has to offer. The airport sits on 7,000+ acres and has four major runways. In 2005, right before Delta began to pull out, CVG opened a new quarter of a billion dollar runway. Other runways were also extended to accommodate widebody transoceanic flights (WCPO 9, 2010). Another deciding factor in choosing CVG is because of its terminal design. Like I mentioned in previous homework assignments and discussion boards, I believe the linear/satellite model is superior in terms of its efficiency and convenience for both passengers and planes. Using this design will hopefully reduce ground delays for my airline. Funny enough, CVG already employs these designs, so no immediate changes would need to be made concerning terminal design. Currently, the airport has a headhouse with check-in and security, and an underground train that connects the headhouse to the two linear satellite concourses. Along with the train, I would ensure there are sufficient moving walkways in the concourses to minimize the amount people have to walk and to make getting around easier for those who might have a mobility issue. Like I mentioned before, CVG has a lot of space, so not only can I use these underutilized concourses that Delta largely abandoned, but there is room to easily extend these concourses in the future as passenger counts grow, with little disruptions to current operations. I would make sure there are plenty of shops and restaurants in the concourses in order to make the airport experience as enjoyable and stress free as possible. In addition, having more places travelers can spend money while waiting for their flights, the more money the airport will make. It's a win-win situation. Other amenities I would invest in would be airport lounges. These would be a great way to reward your most loyal and frequent travels, and provide them with an oasis before they have to get on the plane. This would also be an important consideration when trying to attract those high yielding business travelers.

Now, onto regulations. While this part may not be as fun, they are crucial to the operation. There are numerous regulatory considerations our airport will have to take into account. First and foremost, the airport must be certified. Airports must obtain certification from their country's civil aviation authority (CAA), which in this case would be the FAA, in order to operate. This would involve meeting certain safety and security standards and demonstrating compliance with various rules and regulations. Airports must also comply with safety regulations related to runway design and construction, airport lighting and markings, aircraft rescue and firefighting services, and emergency response planning. Being a top target for acts of terror, airports have strict security requirements they must abide by. They need to comply with regulations relating to passenger and baggage screening, access control, and perimeter security. With the environment being at the forefront of the public's mind, certain environmental regulations must also be met. They must comply with regulations related to noise, air, and water pollution and waste and wildlife management. If we want our airline to serve international destinations from our airport, we will need to comply with customs and border protection (CBP) regulations. International airports must be in compliance with customs and immigration regulations related to the screening of passengers and cargo entering and leaving the country. Thus, our airport will also need to have a CBP facility to process passengers, baggage, and cargo

arriving from international destinations. Finally, we must be in compliance with air traffic regulations, a topic we've been recently discussing in this course. Our airport must coordinate with air traffic control authorities to ensure that aircraft are safely separated and

guided during takeoff and landing (Federal Aviation Administration [FAA], n.d.). Overall, our airport will need to be in compliance with a wide variety of regulations, rules, and standards to ensure safe and efficient operations.

Now, time to start the airline itself! As mentioned earlier, I will be using Cincinnati/Northern Kentucky Airport to employ a hub-and-spoke model of air transportation. As a reminder, the hub-and-spoke model focuses on a central hub airport, with a large number of spokes, aka routes to different cities. The plane is more likely to be filled up with a hub-and-spoke model because you're able to take demand from all over and put everyone onto one flight. It also helps the hub airport as well. On a random day I checked, AA997 from Dallas/Fort Worth to Buenos Aires was booked to 222 passengers, however, only 55 of those passengers originated in Dallas (Information from internal company website). 167 passengers came from other cities, so it allows Dallas to be able to support a nonstop flight to Argentina. Not only does a hub-and-spoke model keep planes full, but it makes it easier for people to get where they need to be. In my case, the hub-and-spoke model will allow Cincinnati to sustain services to cities across the country and the globe. I will want my airline to strive for reliability, as misconnecting at the hub and getting to your destination late can taint a passengers view of your airline. My airline would operate planes from small regional jets like CRJs and ERJs, to mid-sized narrowbody aircraft like the B737 and A320, to large intercontinental widebodies like the B787 and A330. This way I can operate from all types of airports. The regional jets would allow my airline to serve smaller and nearby communities and cities like Cleveland, Knoxville, Memphis, Huntsville, etc. The narrowbody planes would be used to serve larger, further out destinations. Think of places like Austin, Orlando, Los Angeles, Seattle etc. These planes can also serve vacation destinations in the Caribbean like Cancún, Montego Bay, Punta Cana, etc. Finally, the widebodies will serve long-haul destinations. Some examples might include Honolulu, London, Paris, Tokyo, etc. I would want my airline to serve hundreds of destinations from Cincinnati, as network depth is critical with hub-and-spoke operations since it opens up exceptional amounts of possible connections. I would also work with international airlines and create partnerships and codeshare agreements to allow for onward connections at international destinations. For example, I might partner with Air France, and then passengers on my airline's flights to Paris will have hundreds of connection opportunities onward on Air France flights. This way, passengers are able to connect on both ends of the flight, which will increase the chances of it being full. Of course, the airline will have to work with the Transportation Security Administration (TSA) to ensure passengers and cargo are properly screened for threats. When it comes to airspace, the airline will work with the FAA, the primary regulator of U.S. airspace, and ATC. We will work closely with these organizations to ensure we are in compliance with all required regulations so that we run a safe, efficient, reliable, and well-respected air carrier.

After learning a multitude of topics throughout this course, I effectively applied that knowledge and thought critically about different operational, regulatory, and design aspects and environments to come up with a plan for my proposed airline. Starting and running an airline requires careful planning, analysis, and decision making in order for the operation to run safely and smoothly while also being profitable. As future leaders in the air transportation and airline industry, it is important that we know how to do this and can do it effectively in order to maximize profits. Who knows, one of us just might be the next leader for one of these airlines!

Performance Indicator Rubric

Course: ASCI 1850 Safety Management Systems

Course Instructor: Terrence Kelly

Semester Taught: Spring 2023

Number of Students in Course: 43

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Homework Assignment #1 – Safety and Professionalism Homework Average - 97% 96.2% of students scored above a 70%	Benchmark Achieved

Course Assessment (Intended Use of Results)

The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

Homework #1 was created specifically to speak to the importance conducting flight operations (and other high-consequence activities) in a professional, safe, and efficient manner. Student scores were quite strong for this assignment and overall, I am satisfied with performance. I do not anticipate any changes to the assignment itself. The course reaffirms the safety and professionalism components of the SLO continuously throughout the course. While efficiency is emphasized, the course is careful to avoid prioritizing "shortcuts" for efficiency's sake at the expense of increased risk.

Performance Indicator Rubric

Course: ASCI 1850 Safety Management Systems Course Instructor: Terrence Kelly

Semester Taught: Spring 2023 Number of Students in Course: 43

FLIGHT SCIENCE CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Homework Assignment #1 – Safety and Professionalism Average - 97% 96.2% of students achieved a score of 70% or higher	Benchmark Achieved
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	Homework Assignment #2 – SMS Fundamentals Average – 97% 100% of students achieved a score 70% or higher	Benchmark Achieved
SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot.	Homework Assignment #3 – Risk Matrices Average 95% of students achieved a 70% or higher	Benchmark Achieved

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

SLO 1 - The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

Homework #1 was created specifically to speak to the importance conducting flight operations (and other high-consequence activities) in a professional, safe, and efficient manner. Student scores were quite strong for this assignment and overall, I am satisfied with performance. I do not anticipate any changes to the assignment itself. The course reaffirms the safety and professionalism components of the SLO continuously throughout the course. While efficiency is emphasized, the course is careful to avoid prioritizing "shortcuts" for efficiency's sake at the expense of increased risk.

SLO 2 – Homework #2 seeks to emphasis regulatory paradigms surrounding safety prior to the creation and requirements surrounding SMS (in Part

121 operations). In terms of current issues, the course seeks to help students better understand the tension that may exist between safety and

business performance. Emerging opportunities are discussed in the context of SMS as a requirement for certificate holders other than Part 121 carriers. I am satisfied with student performance surrounding SLO 2, although the grading associated with the assignment is fairly generous.

SLO 3 – For SLO #3, I use a risk matrix to help students begin to understand how hazards are assessed in terms of their potential severity and likelihood. A key component (pillar) of SMS is the Safety Risk Management (SRM) process in determining what hazards need to be avoided or mitigated. Once again, I was satisfied with the class performance. I do not foresee changes to this assignment as developing risk analysis skills is critical in performing aviation related task in a safe manner.

Assignment Details

ASCI 1850 - Homework Assignment 1 - Name _____

Please respond to the following four questions. (AABI B & D)

1. Describe the importance of making both professional and ethical decisions as an aviation

professional. (300 words minimum)

2. How are professional ethics and safety related? (300 words minimum)

3. Describe the relationship between hazards, risks and safety. (300 words minimum)

4. Risk is determined by assessing the product of hazard probability and hazard severity. Discuss whether you would prefer qualitative or quantitative data. (300 word minimum)

ASCI 1850 Safety Management Systems – Homework # 2 Name:

Safety Management Systems Fundamentals

Please review the video linked below. The video is over a decade old but still provides good information.

Once you have reviewed the video, please respond to the following questions. This assignment should

be uploaded here no later than Friday, February 24th by the end of the day. The video is 35 minutes long

so watching the video and answering the question below will cover the two classes I will miss.

Here is a link to the video:

Safety Management Systems (SMS) Fundamentals: Basics - YouTube

Here are the questions:

1. What is meant by SMS not being a substitute for compliance?

2. What is ATOS/NPG as described in the video?

3. Briefly describe the model created by Dr. Malcolm Sparrow and discussed in the video.

4. Briefly describe system safety as described in the video.

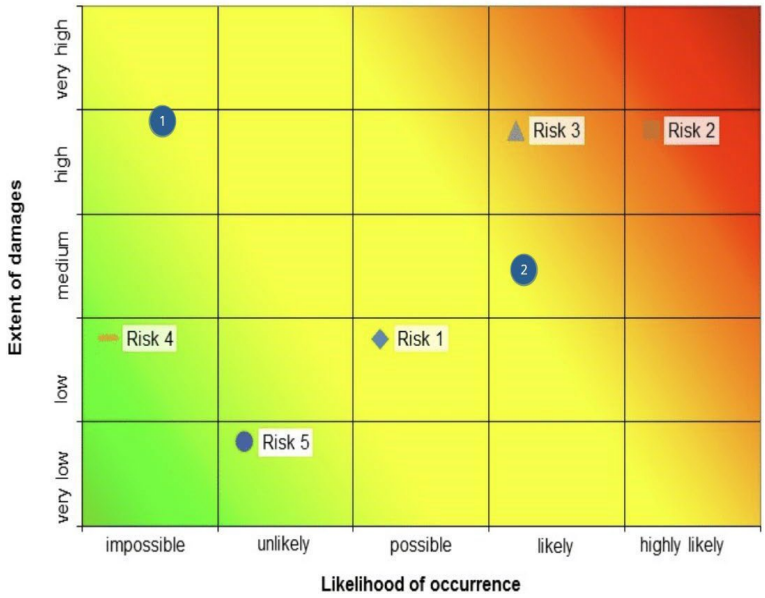
5. Differentiate between AVS SMS and AFS/Flight Standards and Service Provider SMS.

6. Briefly describe how FAA oversight has changed with the creation of SMS programs.

7. Describe the meaning of Title 49 USC 44702 as discussed in the video.

8. Briefly describe the four components of an “informed culture” as discussed in the video.

ASCI 1850 Risk Matrix Assignment Name: _____
Please respond to the five questions located below the risk matrix.



1. Explain the meaning of the terms used on the X-Axis
2. Explain the meaning of the terms on the Y-Axis.
3. Explain the changing color gradient used in the risk matrix.
4. Briefly describe the risks associated with the following data points in therisk matrix
Risk 1
Risk 2
Risk 3
Risk 4
Risk 5
5. Evaluating the two risks (the 1 & 2 inside the circles on the risk matrix), which presents less risk. Provide a detailed explanation on why.

Assignment Examples
Homework #1

ASCI 1850 - Homework Assignment 1 - Name Redacted

Please respond to the following four questions. (AABI B & D)

1. Describe the importance of making both professional and ethical decisions as an aviation professional. (300 words minimum)

It is crucial that everybody in the aviation industry maintains a level of professionalism and a healthy ethical mindset when conducting their work. Professionalism is extremely important to pilots because of the many standardized procedures and flows that they follow. If pilots decide to cut corners, only do some of the required procedures, or do not take it seriously, this could result in an incident that would harm more than just the pilot. Professionalism in aviation managers and other staff is important as it will allow safety and oversight on the aspects of safety that the pilots cannot control, such as the maintenance of these aircraft. A professional environment leads to a safer safety culture within the operation. Proactive hazard identification is essential and should be part of the professional atmosphere within an operation in order to make sure the operation is as safe as reasonably possible. Professionalism may be hard to follow for an individual if there is no safety culture

as there is social pressure to conform to the norm. That is why the norm in an operation should remain as professional as possible in order to prevent this. Ethical decisions are important in order to make sure the risks

are as low as reasonably possible within the operation. If one is not in the right mental mindset or prioritizes personal gain over safety, this could cause the hazards to rise which leads to more risks in the operation. For example, a pilot that suffers from mental illness may not have the capacity to fly the aircraft as their ethics may be distorted causing harm to not only the operation but to themselves. Since most operations are businesses and need to make money, the managers of the operation have to make sure to have the safest operation possible even if that means that the revenue of the operation will decrease.

2. How are professional ethics and safety related? (300 words minimum)

Professional ethics and safety are related because of the strict procedures that many operations have staff comply with. Professional ethics differs from personal ethics because in personal ethics, one person may believe that they want to conduct the safest operation as possible, but a professional ethics will make sure that everybody in the operation conducts the safest operation as possible. An aviation professional that does not have a set of professional ethics and does not take their professional life as seriously as they can cause more hazards to the entire operation. This is important because every person in the operation has to maintain professional ethical values or else it will make it hard to effectively complete the mission. Professional ethics includes the initiative of a company to include sources of identification hazards. These can include internal evaluation programs, safety occurrence trend analysis, information exchange amongst operators and service providers, line operator safety audits, and many more systems that create a better safety culture and ensure that professional ethics are maintained. This culture and professional ethics can be embedded in the aviation professionals of the operation through recruitment and training of new workers. Training is an essential part of maintaining professional ethics because it'll ensure everyone in the operation understands the companies' unique policies and procedures that allow for a professional ethical culture to emerge. When everybody understands the professional ethics involved, it sets a standard of safety that is followed by everybody, meaning that they all have a high standard of safety and of what type of risks are acceptable and hazards that may occur. If there is not a standard professional ethical culture, aviation professional may not know what risks are acceptable for the operation and may cause more hazards. It also will cause a more laid back environment which is not appropriate for an aviation operation where the lives of people are at risk.

3. Describe the relationship between hazards, risks and safety. (300 words minimum)

There is no such thing as an operation to be perfectly safe. Within an operation, there are bound to be hazards no matter the circumstance because there are hazards that the personnel are not even aware of. These hazards present risks to the operation. Trained aviation professionals within an operation determine whether these hazards are acceptable, mitigated, or rejected, depending on the severity of the hazards and if the experience of the personnel handling these hazards. This can be done through multiple steps starting with understanding the system, understanding the hazard, assessing the degree of risk involved, and finally determining the acceptability or intervention to these risks. By identifying and combating these hazards, we limit the number of risks in an operation which improves overall safety. The safety culture of an operation means that the hazards are identified and dealt with in the appropriate manner which ultimately lowers the risks. The safety culture can be improved through hazard scopes which include design factors, better procedures and practices, organizational factors, enforcing the regulations, etc. This shows how many opportunities there are to improve the safety of an operation but also shows how many hazards and potential hazards could arise.

4. Risk is determined by assessing the product of hazard probability and hazard severity. Discuss whether you would prefer qualitative or quantitative data. (300 word minimum)

I believe both qualitative and quantitative are essential in determining the hazard probability and hazard

severity. Quantitative data would allow for data that would show us numerical data and allow aviation professionals to come to their own conclusions about this data. Quantitative data can be clear, such as how

much pressure is allowed to be applied on the landing gear and how much is actually applied, but it may not be so obvious on how to apply this data in lowering the amount of risks in an operation. Quantitative data alone cannot be the only way to determine hazard identification because some factors cannot be written down numerically. The main thing that makes qualitative data triumph quantitative data is the ability to understand what the crew members were doing, which may be hard to translate numerically. An example of this is the cockpit voice recorder which allows for all the audio the pilots say to be played back when analyzing an incident. The dialogue between the crew can only be analyzed by other humans and can give valuable information about the risks and hazards that arose in that situation that may be impossible to spot in quantitative data. However, if I had to choose between the two I would choose quantitative data to lower the hazard probability because I believe it is easier to lower the risks of quantitative data because most mechanical issues can be found with quantitative data which I believe is an easier fix than for example a human factors hazard which may be harder to come up with a solution to.

ASCI 1850 - Homework Assignment 1 - Name Redacted

Please respond to the following four questions. (AABI B & D)

1. Describe the importance of making both professional and ethical decisions as an aviation professional. (300 words minimum)

Professional and ethical decisions are important for aviation professionals because the outcome of their decisions can affect a large number of people. Professional decisions or decisions that follow industry standards, laws, and regulations have such a large scope due to the nature of the aviation industry. For pilots the decisions they make while flying have an impact on hundreds of people who occupy the aircraft the pilots are flying. It is important in these circumstances to make professional decisions because the standards that government these decisions have been created to provide the best outcome and ultimately are best not only for the pilot but also the passengers and crew. Rogue decisions that circumvent these rules are often destructive in nature and should only be used in special circumstances that may require the pilot to deviate from the rules to ensure safety. In general aviation professionals are not judged by their ability to come up with new ideas and procedures on the spot but by their ability to trust other professionals' judgement which in essence is professional decision making. In addition to professional decisions, ethical decision which are based on respect for every individual is equally important. These decisions are like professional decisions in that they have a large scope. Often professional and ethical decisions are nearly identical because often the standards that judge professional decision are designed to be ethical in nature. However, this is not always the case, and in cases where ethical standards do not match professionals' ones, pilots must refer to the ethical standards. For instance, if a certain rule or regulation would put the pilot and passengers at an undue risk and breaking that rule would be objectively better and perhaps safer than the pilot should break that rule. This deferment to ethics must be done with caution and only done when absolutely necessary because this type of decision relies heavily on the soundness of a pilot's judgement.

2. How are professional ethics and safety related? (300 words minimum)

Professional ethics and safety are related heavily which is primarily because professional ethics largely determines the safety of any aviation operation. If an operator abides by professional ethics, then this means generally through their operation they will be promoting safety. For management, this can be applied by making company policies ethical. For example, this might mean that management should prioritize safety over most other things including flights being on time or even making money. Management should ensure that their policies value the lives of the people their company's aircraft are carrying. This could potentially be applied by not allowing flights to depart in certain weather conditions or delaying flights, so pilots have enough rest. While

this might hurt the company financially in some respect it is the ethical thing to do because it does not compromise the safety of the crew or passengers. Additionally, when determining the how to spend company

funds on safety companies might not choose certain “safety items” if the benefit of them does correspond with the price. An example of this might be a new technology that could be equipped on a plane to marginally improve the safety during flight. However, this technology would come at significant cost and would force the company to raise ticket prices. This might mean that people would choose fewer safe forms of travel and ultimately the decision to invest in this type of safety was not ethical. For pilots, the relation of professional ethics and safety is similar to that of management. For them it is critical that pilots be ethical in not deviating from the set rules and procedures unless absolutely necessary. It would be unethical for a pilot to do so without proper cause because deviating from procedures would also be deviating from the safest practice. This would ultimately unnecessarily endanger the passengers and as a result would be unethical to do.

3. Describe the relationship between hazards, risks and safety. (300 words minimum)

Hazard, risk, and safety all share a close relationship because these three concepts are interconnected in several ways. Hazard is the base term of the three and acts as a foundation for the definitions of the other two concepts. A hazard is essentially some condition that could lead to or contribute to an unplanned undesirable outcome. All hazards have two characteristics that are associated with them. The first is the probability that the hazard with operationalize or occur. The second characteristic is the severity of the hazard or what threat it would pose should it operationalize. Both of these characteristics can range from being high to low. Risk combines both the characteristics together and determines the future impact the hazard may pose. Risk is a hazards probability multiplied by the severity or magnitude of the hazard. This allows a better understanding of hazards as the risk they pose is more important than their severity or probability alone. For example, a hazard might be extremely probable, but the severity of that hazard might be so low that the overall risk is insignificant. Another example may be a hazard with very high severity but such a low probability that the overall risk is negligible.. The final concept safety is simply defined as the condition of being safe which means there are no hazards and thus no risk. However, this definition does not truly apply to the real world so ultimately safety is having risk being as low as reasonably possible. This ultimately means that in any operation the goal should be to eliminate all hazards that are present or if it not possible to eliminate them then to mitigate the hazards to an acceptable level. Some mitigation might not be realistically possible, but some risk is still allowable as long as any further mitigation would not make sense.

4. Risk is determined by assessing the product of hazard probability and hazard severity. Discuss whether you would prefer qualitative or quantitative data. (300 word minimum)

Describing risk is terms of hazard probability and hazard severity requires the use of both qualitative and quantitative data. Using only one method for both would not yield effective results in being able to truly understand what risk is acceptable and what is not. For hazard probability quantitative data works best to describe it. To properly be able to determine the likelihood of an event happening it is best to put it in terms of numbers rather than explaining through less concrete terms. Numbers for probability are completely objective and only have one meaning to them. While what level of risk may still be debated the value of each probability cannot be. This would not be the same for using qualitative data to describe probability. Words unlike numbers can be subjective in the definition and also connotation which is not helpful when trying to determine the likelihood of a hazard. Not only would the level of acceptable risk be debated but also the value of each probability would be too. Quantitative data is best for probability, but the same type of data would not be best for understanding a hazard severity. Quantitative would work to describe monetary damages as money lost can be best described by numbers, but money being lost is not the only or most important thing at risk. Human life and safety are much more important a number of moneys lost or gained. When attempting to describe the severity of a hazard on human life it is best not to use numbers. Numbers are objectifying which is excellent for

describing probability or money but for human injuries or death describing severity through numbers is dehumanizing. Ultimately this approach does not value each person individually which is why qualitative data

works best for severity. Combined together risk determination is then based on both types of data which allows a better decision to be made about the risk.

ASCI 1850 - Homework Assignment 1 - Name Redacted

Please respond to the following four questions. (AABI B & D)

1. Describe the importance of making both professional and ethical decisions as an aviation professional. (300 words minimum)

Making both ethical and professional decisions are important in the field of aviation. For anyone that works in the aviation industry, there are many rules and regulations set by the government. Along with government rules, many times there are limitations or standards that an aviation company (like an airline) may set just to be extra careful. There will be many times when an aviation professional must make decisions that abide with both government and industry criteria but must also align with their own ethical and moral principles. Any decision in the aviation industry can have very extensive consequences. Any decision can affect the safety of others as well as hurt the reputation of the company they work for.

Professional decisions are decisions that prioritize the security and safety of all crew, passengers as well as the aircraft itself. An instance of making a professional decision could be when a pilot must make a “go” or “no go” decision to proceed with a flight. A decision like this can happen because of a system on a plane not working properly or because of weather conditions possibly jeopardizing the flight operations. Another example of a professional decision having to be made could be when a pilot in an aircraft gives the safety briefing to all passengers in the aircraft before a flight. This is important because it is the flight crew’s responsibility to ensure that themselves as well as the aircraft and the passengers inside the aircraft are safe and secure. This goes for flight crews of all parts of aviation from general aviation all the way to the airlines.

Ethical decisions are decisions that have to do with how morals play into a decision. Ethical decisions are important because they have to do with your personal values. Some of these values can include being honest about your qualifications as a member of the flight crew, a pilot’s fitness to fly, being on time as well as just flat out being respectful to those you may encounter. An example of an ethical decision needing to be made could be when a flight instructor asks a mechanic to sign off on a plane being airworthy to fly when it is due for an inspection and realistically should be thoroughly inspected. The risk of the mechanic just signing off on the airworthiness of the plane could be that the plane is not airworthy and that there is something wrong with it that could endanger the safety of the flight instructor and their student.

2. How are professional ethics and safety related? (300 words minimum)

Professional ethics and safety are related because they both are significant parts of ensuring that any operation in the aviation industry occurs at a standard that is up to par with what is legally acceptable to the FAA. Professional ethics is basically a set of values that one sets for a business or themselves to base all their decisions off of. Safety is the concept of ensuring that all operations are performed with measures in place to prevent injury and harm to those who participate in said operations.

I would say that professional ethics is critical in guaranteeing that employees at a company are responsible and honest people that make decisions that display whatever company they may work for in a good light. Another quality that one should have at any company could be that they show common decency to both their colleagues as well as the people they will come across while they are working. With respect to companies in aviation, I would say that it is imperative that employees at these companies follow whatever rules are in place

because it helps to maintain a good rapport between the public and the company. I feel that if an employee at

an airline were to go against what the code of conduct stated, it would hurt the safety culture that their company is trying to promote.

I would say that safety is important because it is what maintains an aviation company's reputation and relationship with the public. Safety is the concept of mitigating the chance of accidents, injuries, and/or illnesses. I feel that professional ethics is part of safety because it helps in making sure that the concept of safety is applied and carried out into the companies' everyday operations. If the concepts of professional ethics and safety is not upheld to a proper standard, then major consequences can occur ranging from small insignificant accidents to serious catastrophes that can even include death.

3. Describe the relationship between hazards, risks, and safety. (300 words minimum)

Hazards, risks, and safety are all related to each other, and it is especially important that one understands how they each work and coincide with each other. A hazard is anything with the potential to cause harm or damage. Furthermore, a hazard is any condition, event, or circumstance that could prompt an accident. A hazard in aviation could be one of many things, ranging from weather related to human related. One example of a hazard in aviation could be that a plane is not properly grounded while it is being refueled which could lead to unintentional ignition of the fuel in the plane and an explosion occurring. A hazard becomes a risk when it is noticed but not mitigated.

Risk is the future impact of an unmitigated hazard. Risk refers to the probability/likelihood and severity that a person may be harmed or suffer adverse health effects because of exposure to an unmitigated hazard. Risk can also be seen as pure uncertainty. There are many levels of risk. Risk in aviation is a big deal because there are many factors involved ranging from human input to uncontrollable outside occurrences like weather. One good thing about risk in aviation is that since it can be measured by relating it to its hazards it is often able to be mitigated. Since the concept of risk can be mitigated, the concept of safety can come into play.

Safety is the state or the ability to mitigate harm, danger, or injury. Safety is basically the concept of noticing hazards and understanding their risks to a point where they can be mitigated. One way to promote safety in aviation is to make sure that people are trained and properly educated on how to mitigate risk. It is important to understand that with anything, and this includes the aviation industry, there is never really any true level of safety where one is totally protected from all harm. There will always be some form of risk when it comes to anything we do in life, especially when it comes to aviation.

4. Risk is determined by assessing the product of hazard probability and hazard severity. Discuss whether you would prefer qualitative or quantitative data. (300 word minimum)

Qualitative and quantitative data analysis are two types of data that a pilot or aviation professional would factor into a decision they could be making. These two types of data are types of risk assessments which is an important thing in aviation because if a pilot were to not assess the risks associated with whatever flight they wanted to go on, they could be putting both themselves and others on their flight in harm's way.

Qualitative data analysis is based off the judgement and opinions of people like subject matter experts and industry professionals to determine the likelihood and consequences of a hazard. Qualitative data is normally used when there is limited data available to someone. It gives someone a basic understanding of the risks and hazards associated with certain operations in the aviation industry. Normally it is to be used along with limited data to make the best and most informed possible.

Quantitative data analysis is based off the usage of numerical data to determine the possibility and consequences of a hazard. Quantitative data analysis is typically seen as a more accurate and precise way of

measuring hazards and risks in industries like aviation. I feel that because quantitative data often includes a

bigger abundance of information, it would be the preferred source for making decisions in the aviation industry specifically.

If I had to choose between quantitative and qualitative data, I would use quantitative data. The reason for this is because quantitative data seems to be more abundant, and it also seems to have a more impartial and more accurate pool of data. I feel that if I were to go to a person like a subject matter expert, then I would be getting a relatively reliable opinion that could still be a bit skewed. I feel that because quantitative data

ASCI 1850 - Homework Assignment 1 – Name: Redacted

Please respond to the following four questions. (AABI B & D)

1. Describe the importance of making both professional and ethical decisions as an aviation professional. (300 words minimum)

The process of making ethical and professional decisions is crucial for any professional working in the aviation industry. The safety of travelers, crew members, and everyone else associated with the aviation business are impacted by these choices. Without both of these processes together, flying together in team would not be nearly as efficient and people would lose trust in pilots and the industry. Professional choices ensure the well-organized and proficient operation of the aircraft, whether it is in operation in the air or on the ground. This is the pursuit of quality flight through discipline of making the right choices and continuous improvement of everyone in the crew without a demeaning or negative attitude. Aviation is what it is today because of people striving to always learn and adapt to every situation. Decisions like this keep morale boosted and have an instant impact on aviation safety. While making ethical choices show the careful thought process and the regard to make the right decision for the betterment of everyone involved. Following these procedures makes sure that safety of life is the number one priority in all of their operations as well as minimizing risk to all humans and the environment around them. Some of these ethical decisions could be honesty, fairness, privacy, or responsibility. These are a necessity to keep an authentic system that meets the regulations, avoids harming people, and being responsible for what they are needing to do. The combination of these traits is what makes an aviation professional credible as well as responsible when tasked with an assignment or duty. The high standards that are set for professional and ethical actions are required from every single person involved in aviation, from the plane creators to the pilots. That is why they create many processes and checklists to make sure the plane, pilots, and all the components that go into it are sufficient for flight.

2. How are professional ethics and safety related? (300 words minimum)

The relation of professional ethics and safety is intertwined in every aspect of aviation. These concepts are considered the most important features that determine quality air travel as well as the safety of the passengers, the crew, and the surrounding area.

In the aviation field, professional ethics are the moral guidelines that shape and drive the behavior in the cockpit as well as on the ground. This ensures that all personal behave in such a way that is respectful, honest, accountable, and in an uplifting manner towards passengers and their fellow peers. They ensure they always follow the specified regulations in each and every situation that may arise while in the plane. In order to maximize the protection of everyone on board they complete their designated task with efficiency.

The concept of safety is the ideal minimization of risks, or the freedom from the exposure of danger. In aviation, there is no such thing as being completely safe from all the risks that could arise. Therefore, it is all about risk management and being as close as you can to the impossible margin of complete safety. This is the primary concern of all the aviation professionals, as they are obligated to prioritize safety over all other

aspects, such as efficiency or time management.

Therefore, any conduct done by an aviation professional, if its good or bad, has an impact on the safety of the operation of their aircraft. Someone who is not professional or responsible while doing a task or process, not only puts themselves in danger but everyone around them. So, for someone to be as safe as reasonably possible they need to be very attentive and coherent. With the help of their team on the ground and in the air, they are able to ensure safety by observing what to come and keeping a strong understanding of their instruments and regulations.

3. Describe the relationship between hazards, risks, and safety. (300 words minimum)

Aviation will never be free from hazards and their associated risks. A hazard is often defined as a source of danger, weather it is considered real or perceived. It is also known as anything with the potential to cause harm to someone, the environment, or equipment. These types of problems include anything from technical malfunctions, weather conditions, human error, or natural disasters and a mix of everything in between. It is essential to look past the immediate conditions and anticipate what could be in the future. The recognition of a hazard is crucial in the risk management process.

A risk is the future impact of an unmitigated hazard. It refers to an uncertainty that was created by the hazard at hand. This is the result of the combination of the overall probability of the occurrence produced by a hazard and the severity of that effect. Once someone recognizes a hazard and its effect, they must begin their risk management process. Where they will either decide to accept, mitigate, or eliminate the hazard with deductive reasoning. An individual must know that their suitable level of risks corresponds with their limitations and capabilities.

Hazards and risks are constantly evaluated in order to obtain the highest level of safety that is possible for aviation processes. Safety is defined as the optimal minimization of risks, and there is no such thing as being completely safe in aviation or general life. Once hazards are identified and recognized, then they are assessed to determine what the risk is and where it will affect. After those are figured out, they can then decide the appropriate safety procedures to reduce the risks or evade them entirely. Aviation professionals and airlines repeat this process to ensure the safety of their flight operations, human life, and the environment around them.

4. Risk is determined by assessing the product of hazard probability and hazard severity. Discuss whether you would prefer qualitative or quantitative data. (300 word minimum)

I prefer the results of quantitative data as it relies on the numerical and measurable data that is produced from machinery. In my opinion, there are many benefits of quantitative data over qualitative data, such as the immediate recording once it happens and no personal bias or interpretation. Quantitative data is always collected in larger sample sizes, making it ideal to figure out issues in a system or multiple systems. Being able to compare data samples from other sources of technology gives it a much more applicable and relevant use. The data is also collected in large quantities, and it is consistent and standardized. This makes it much easier to analyze or associate with other data samples and systems. Another way it has more benefits than qualitative data, is it collects very precise and pristine data. Once collected it can then be measured with a very high degree of accuracy. This can give people and or businesses with the precise data an ability to make accurate predictions and conclusions. As well as using it for certain techniques, such as recognizing various data patterns or connections within the sample. After you consider all of these benefits that quantitative gives companies or ordinary analyzers, there is no shock as to why data is an important part of the future. It is a very advanced way to make strong and accurate evidence-based decisions. These decisions are especially useful in data rich environment such as aviation, where they save a set of data for every single input that a pilot makes. Whether it relates to the overall control of the airplane or the opening of a certain compartment. Since

they collect all of this data, they are able to solve problems and get a lot of answers from it if an accident does occur.

Assignment Examples

Homework #2

ASCI 1850 Safety Management Systems – Homework # 2 Name: Dalton Brand

Safety Management Systems Fundamentals

Please review the video linked below. The video is over a decade old but still provides good information. Once you have reviewed the video, please respond to the following questions. This assignment should be uploaded here no later than Friday, February 24th by the end of the day. The video is 35 minutes long so watching the video and answering the question below will cover the two classes I will miss.

Here is a link to the video:

Safety Management Systems (SMS) Fundamentals: Basics - YouTube

Here are the questions:

1. What is meant by SMS not being a substitute for compliance?

When it is stated that SMS is not a substitute for compliance it means that SMS is not supposed to take the place or usurp any of the Federal Aviation Regulations or policies. SMS also calls for regulatory compliance to be woven into safety management structure.

2. What is ATOS/NPG as described in the video?

ATOS and NPG are the FAA's oversight system. ATOS stands for Air Transportation Oversight System and NPG stands for The National Work Program Guidelines and both use a risk assessment process to determine the safety assurance objectives and are used to meet regulator responsibilities.

3. Briefly describe the model created by Dr. Malcolm Sparrow and discussed in the video.

The model created by Dr. Malcolm Sparrow uses regulation-based thinking and a Venn diagram to separate things that are regulatory and if violated become illegal and things that are non-regulatory but can cause harm. The overlap in the middle of the Venn diagram are things that are both regulatory and can cause harm.

4. Briefly describe system safety as described in the video.

System Safety is the application of special technical and managerial skills in a systematic, forward looking manner to identify and control hazards throughout the life cycle of a project, program, or activity. SMS adds an emphasis on management elements.

5. Differentiate between AVS SMS and AFS/Flight Standards and Service Provider SMS.

AVS SMS is a state safety program and applies SMS to the FAA's own internal process and is known as the "internal" SMS. AFS/Flight Standards is what is applied to service providers in the form of a SMS rule and is called the "external" SMS. Service providers SMS manages their own risks and monitors their own risk controls.

6. Briefly describe how FAA oversight has changed with the creation of SMS programs

The FAA's oversight has changed with the creation of SMS programs and has oversight processes to accomplish oversight. Currently the FAA uses NPG and ATOS and in the future will use the safety assurance system. Previously the FAA accomplished oversight by way of numerous direct inspections. Now the service operators increase their role in responsibly in managing their own risk.

7. Describe the meaning of Title 49 USC 44702 as discussed in the video.

Title 49 USC 44702 states that the duty of an air carrier is to provide service at the highest level of safety in the public interest, and also holds management accountable for doing so. Companies have an obligation to provide a useful and safe product or service to the public.

8. Briefly describe the four components of an "informed culture" as discussed in the video.

The four components of an "informed culture" are reporting, just, learning, and flexible. Reporting is defined as all personnel freely share critical safety information. Just states all employees must know what acceptable and unacceptable behavior is. Learning says that the company learns from mistakes and staff are updated on safety issues by management. Flexible states organizational willingness to change.

ASCI 1850 Safety Management Systems – Homework # 2 Name:

Safety Management Systems Fundamentals

Please review the video linked below. The video is over a decade old but still provides good information. Once you have reviewed the video, please respond to the following questions. This assignment should be uploaded here no later than Friday, February 24th by the end of the day. The video is 35 minutes long so watching the video and answering the question below will cover the two classes I will miss.

Here is a link to the video:

Safety Management Systems (SMS) Fundamentals: Basics - YouTube

Here are the questions:

1. What is meant by SMS not being a substitute for compliance?

SMS not being a substitute for compliance means that the SMS is not meant to override any of the already in place regulations surrounding aviation. This essentially means that all policy in an SMS system must be not violate any federal regulations. Any example of this could be a what amount of time of crew rest is acceptable it would not be able to make a rule for anything less than the already establish regulation.

2. What is ATOS/NPG as described in the video?

ATOS/NPG is the FAA's system of oversight to ensure that all operators who fall under the FAA's regulations are following the regulations. ATOA uses a risk assessment process to determine that what is being done or what equipment is being used by the operator falls in accordance with the regulations. Part of this is accomplished through test to ensure equipment meets regulatory safety minimums.

3. Briefly describe the model created by Dr. Malcolm Sparrow and discussed in the video.

Dr. Malcolm Sparrow's model for safety analyzes the FAA's historic approach to safety. The FAA previously had been mainly concerned with enforcing all of the rules that it imposes. However, Dr. Sparrow's model shows that not everything that is illegal is unsafe and causes harm and not everything that is unsafe or causes harm is illegal. Therefore in order to ensure that operations are safe, the aviation industry need to do more than just enforce regulation.

4. Briefly describe system safety as described in the video.

System safety is the application of management techniques and technical skills to identify hazards that may operationalize in a system and mitigate them. This is not just done once but is done throughout the entirety of the operation. In addition, system safety would also look at how the different system interface with each other to determine where hazards may arise. System safety also relies on management being reliable for safety so there is some responsibility in the operation when it comes to safety

5. Differentiate between AVS SMS and AFS/Flight Standards and Service Provider SMS.

AVS SMS is safety management system for the FAA itself. This is a system to manage safety for all the ways in which the FAA operates and all their internal processes. This also acts as an overarching model to be applied externally to other operators. This application from the FAA externally to service provide is the AFS/Flight Standards. The service providers SMS is not involved by the FAA and is the operator's own way of managing their own safety.

6. Briefly describe how FAA oversight has changed with the creation of SMS programs.

The FAA's oversight has changed with the creation of SMS because now the federal regulations are not the only thing nor the main thing that is managing safety for the aviation operations. While there is still some oversight in the form of "trust but verify," a larger part of the oversight of the operation is done by the operators safety management system. Now the FAA largely oversees the SMS of a operation primarily rather than focusing on the operation.

7. Describe the meaning of Title 49 USC 44702 as discussed in the video.

Title 49 USC 44702 state that an air carrier must provide their services with the highest level of safety as it is in the public interest. The duty of an air carrier is to provide a service but also do so safely. This causes the business to be forced to integrate safety into their business model as it essential to their businesses success

and making a profit. The hope is to create a balance between the production and protection which means there should be an equal focus on providing a quality service and also a safe one.

8. Briefly describe the four components of an “informed culture” as discussed in the video.

The four components of an informed culture are reporting, just, learning, and flexible. The reporting culture encourage employees to report hazards and freely share critical safety information. Just culture is employees knowing what types of behaviors acceptable and what types of behaviors are are unacceptable. In addition, there is an understand of what happens when those rules are violated. Learning culture stresses learning from de stakes that were made instead of issuing punishment for them. A flexible culture is one that is able to change to meet demands of the safety.

ASCI 1850 Safety Management Systems – Homework # 2 Name: Sehwan Park

Safety Management Systems Fundamentals

Please review the video linked below. The video is over a decade old but still provides good information. Once you have reviewed the video, please respond to the following questions. This assignment should be uploaded here no later than Friday, February 24th by the end of the day. The video is 35 minutes long so watching the video and answering the question below will cover the two classes I will miss.

Here is a link to the video:

Safety Management Systems (SMS) Fundamentals: Basics - YouTube

Here are the questions:

1. What is meant by SMS not being a substitute for compliance?

- In the video, “SMS not being a substitute for compliance” means that implementing a Safety Management System (SMS) in an organization does not automatically guarantee compliance with safety regulations and standards. Likewise, a safety management structure is created with regulatory compliance by SMS calls.

2. What is ATOS/NPG as described in the video?

- ATOS is the abbreviation for Air Transportation Oversight System and is a framework for regulatory oversight of aviation safety. ATOS’s purpose is to monitor and assess the safety performance of aviation organizations; also, it has processes for safety policy, safety risk management, safety assurance, and safety promotion.
- NPG comes from National Program Guidance, and it provides guidance on how to develop and implement a safety management system. By following the guidelines provided by NPG, aviation organizations can improve their safety performance and ensure compliance with safety regulations.

3. Briefly describe the model created by Dr. Malcolm Sparrow and discussed in the video.

- In August 2009, Dr. Malcolm Sparrow presented his model for safety management systems to the FAA managers’ meeting. His model challenged the traditional regulatory-based approach to safetymanagement. This approach involved identifying both regulatory and non-regulatory sources of harm, such as negative organizational culture or departmental conflicts. The overlap between regulatory and non-regulatory sources of harm indicated where the FAA and operators historically focused their resources to have safety objectives since it is regulatory and simultaneously can cause harm. By adopting an SMS approach that incorporates these principles, organizations can work to proactively identify and mitigate potential sources of harm, rather than simply responding to regulatory violations.

4. Briefly describe system safety as described in the video.

- The video explains that the term safety can be found within the consistent relationship between risk and practical definitions. In 1980, the US Supreme Court announced, “Safety is not the equivalent of risk-free.” The definition of safety is how well human beings are able to have freedom from harm, injury, detriment, damage, or degradation. As controlling both risk severity and likelihood, making risk lower can provide us practical definition in the aspect of safety. Therefore, safety represents the effectiveness of risk management, which is one of the core processes of a safety management system. In other words, system safety is an important component of safety management systems, providing a structured and proactive approach to managing safety risks in organizations.

5. Differentiate between AVS SMS and AFS/Flight Standards and Service Provider SMS.

- AVS SMS is included in aviation safety. Under the FAA aviation safety organization, AVS SMS applies SMS to the FAA zone, and it is also known as the internal SMS. It also works on safety oversight and regulatory compliance.
- AFS/Flight Standards refers to safety management systems used by aviation service providers, also called the external SMS. Moreover, it helps to work on safety performance, risk management, and continuous improvement within the organization.
- Service provider SMS is designed to be an integrated and systematic approach to managing safety risks within aviation service providers, and it is a key tool for ensuring safety in the aviation industry.

6. Briefly describe how FAA oversight has changed with the creation of SMS programs.

- SMS programs and service providers help to increase their responsibility for safety assurance by having risk controls. Relating to the SMS program, the video explains that as numerous service providers processes are developed, FAA oversight has changed a lot. In addition to changing FAA oversight, the video mentions that human beings are currently using ATOS/NPG, but in the future, Safety Assurance System (SAS) will be prevalent, including our own internal SMS processes. The implementation of SMS programs has resulted in a more comprehensive and proactive approach to safety management and has led to changes in the way the FAA oversees the aviation industry.

7. Describe the meaning of Title 49 USC 44702 as discussed in the video.

- The video explains that title 49 USC 44702 is important for the development and implementation of safety management systems in the aviation industry. They provide the legal obligation under public and provide service with the highest possible degree of safety in the public interest. Overall, title 49 USC 44702 is regarded as a key piece of legislation that integrates safety into business decisions and management for SMS.

8. Briefly describe the four components of an “informed culture” as discussed in the video.

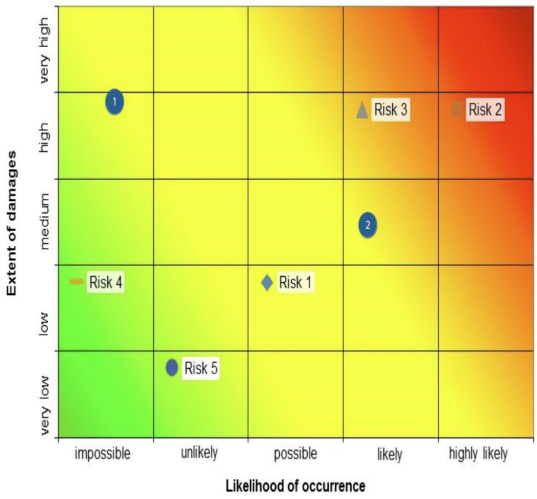
- 1) Reporting culture: the video points out, “all personnel freely share critical safety information.” and the reporting culture encourages employees to report hazards, incidents, and near misses, which can help identify potential safety risks before they face the actual risk.
- 2) Just culture: “employees must know what is acceptable & unacceptable behavior.” Just culture requires human beings to realize the organization like what can be acceptable and unacceptable; therefore, this culture informs that accidents and incidents can occur even when individuals are following established safety protocols.
- 3) Learning culture: the video explains that mistakes can make companies grow and staff can maintain safety by having management. Learning culture means using safety data to learn from past incidents and improve safety practices, rather than simply assigning blame or punishment.
- 4) Flexible culture: this culture respects human beings’ willingness to change. With the belief that willingness would influence all the reporting from analysis and organization on becoming more detailed or useless, flexible culture exists to adapt changeable willingness.

Assignment Examples

Homework #3

ASCI 1850 Risk Matrix Assignment Name: Redacted

Please respond to the five questions located below the risk matrix.



1. **Explain the meaning of the terms used on the X-Axis**

The terms on the X axis are talking about how likely an event is to occur. The frequency, so impossible means it is nearly impossible, or close to zero chances of an occurrence to happen. It goes up to unlikely (a low probability of it occurring), possible (a near 50/50 chance), likely and highly likely (high probability of occurrence).

2. **Explain the meaning of the terms on the Y-Axis.**

Extent of damage shows us the magnitude of a risk/event/occurrence. Very low damage shows us that not much destruction, harm or injury will occur in an event. Low and medium will have a slightly greater chance at harming someone or thing. High and very high means that risks will be harmful and at a great rate.

3. **Explain the changing color gradient used in the risk matrix.**

The color gradient is to show a more visual idea about the likelihood and magnitude of an event. The color is green, yellow, and red. Following the idea that events in the green area show a safer event due to being in a near impossible and minimal damaging event than when compared to an even in the red color gradient, signifying a much more dire risk. It moves from low risk to high risk.

4. **Briefly describe the risks associated with the following data points in the risk matrix**

Risk 1 – This risk is possible but has a low extent of damage. So, there is a good probability of the risk occurring but has a low magnitude. A low-risk danger that could happen somewhat frequently.

Risk 2 – Risk 2 has a very high likelihood of occurring, with a high extent of damage. The severity of the risk mixed with the high likely hood means there would be more importance placed on this risk due to the constant occurring danger.

Risk 3 – Risk 3 is a likely occurrence with a high extent of damage. It is not likely to appear 100% of the time, but there is a high probability of it occurring, with some severe damage.

Risk 4 – Risk 4 poses very little danger, in the sense that it is nearly impossible for the risk to occur, with a low extent of damage. Showing how even if it were to occur the actual magnitude or damage that would come from this event does not really exist.

Risk 5 – Risk 5 is an unlikely occurrence with very low extent of damage. It would pose no to little amounts of threat with an occurrence that has a low chance of happening. Being in the green showing how there is a higher chance of it occurring, the severity of the risk would be not too serious.

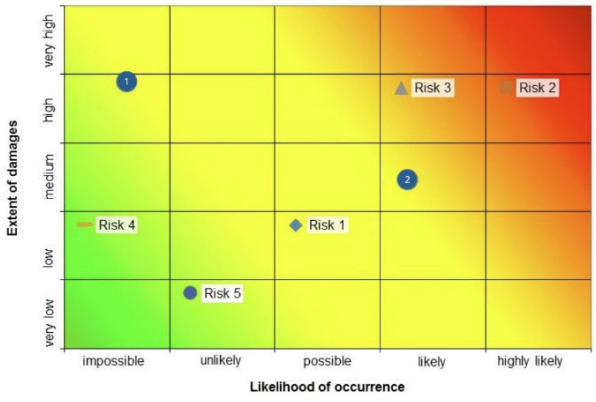
5. **Evaluating the two risks (the 1 & 2 inside the circles on the risk matrix), which presents less risk. Provide a detailed explanation on why.**

1 would present less risk because it would be impossible to occur. While there is a high severity regarding the damage this risk would have, if the chances are near 0 to ever occurring that when compared to risk 2, risk 1 is less of a risk. Risk 2 is much more likely to occur, with just slightly less extent of damage. Risk 2 has the probability of becoming a severe risk due to it possible becoming a highly likely hazards, with very severe consequences. This could be a person dyeing or becoming fatally injured, or a giant loss regarding machinery. Risk 1 just needs some policy work and consideration that could help it become an impossible risk with not damage if able to be avoided or controlled. Risk 2 seems to need more work and more consideration to ensure no one is harmed, making risk 2 more of a risk.

Risk 1 seems more like the example of a meteor hitting you in the street, it is a near impossible event that has some very drastic consequences. While risk 2 seems to be a crash happening on the interstate due to traffic. While there is a very high chance of that happening, but, if going at a slower velocity, does not hold too much risk of damage, besides a crushed hood and some minor injury. Risk 2 (car accident) is more of a risk than risk 1 (meteor strike).

ASCI 1850 Risk Matrix Assignment Name: Redacted

Please respond to the five questions located below the risk matrix.



1. Explain the meaning of the terms used on the X-Axis

The X-Axis represents the likelihood of a risk occurring. Another way of describing it would be the frequency, or how often, which ranges on this matrix from impossible to highly likely, with three in between. These are risks a pilot may face while they are flying. This particular matrix has impossible as a category, but in aviation, nothing is impossible.

2. Explain the meaning of the terms on the Y-Axis.

The Y-Axis represents how much damage, or severity, a risk could cause the environment and/or the aircraft, if it occurs. The categories are set at very low up to very high with three in between. Safety incidents can cost the company millions of dollars and loss of their passengers and crew.

3. Explain the changing color gradient used in the risk matrix.

The lower left corner of the matrix is green, which shows a risk to be impossible and causing very low damage if it were to occur. As points move to the right on the X-Axis and up on the Y-Axis, green fades to yellow showing the frequency and severity of a risk happening increases. When moving towards the ends of the Axes, the yellow fades to orange and red, the risk will be highly likely to occur and cause an extreme amount of damage. When a risk is falls in the green, it is considered acceptable and does not need review but are documented. The yellow/orange are risks undesirable and need to be assessed by appropriate management, mitigated to an acceptable level and documented. The red are severe and are unacceptable risks where operations need to stop.

4. Briefly describe the risks associated with the following data points in the risk matrix

   Risk 1- This risk is in the yellow being at possible frequency with a low severity of damage. It will require mitigation because it could cause minor injury, illness, loss, or damage.

   Risk 2- This risk is in the red category, so it is a “no go”! It is highly likely to occur and cause a catastrophic injury, illness, damage to the plane and surrounding areas, and loss of life.

   Risk 3- This risk is in the orange range, meaning it will likely occur causing a high amount of damage. Service providers will have to mitigate it to a certain acceptable level so that it will not affect safety.

   Risk 4- The data point is in the green, it will not have to be mitigated, is a “go” and the operations can continue. But the likelihood of this risk is impossible according to the matrix. In aviation we have learned that nothing is impossible. The aviation industry can lower risks to a certain level that will increase safety, but we cannot get rid of hazards/risks entirely.

   Risk 5- This risk is acceptable low risk and unlikely to occur and cause very low damage since it falls in the green. It does not need to be mitigated and is not restricted or limited and operations can continue as normal.

5. Evaluating the two risks (the 1 & 2 inside the circles on the risk matrix), which presents less risk. Provide a detailed explanation on why.

After evaluating the two risks, #1 presents less risk than #2. Risk #1 is in the yellow (barley past the green) and risk #2 is also yellow but almost to the red in the color gradient on the matrix, making it a higher risk. Risk #1 falls in the box categorized as impossible likelihood and high extent of damage. But if the likelihood is impossible, the amount of damage does not matter. I don’t think in aviation that anything is impossible, there is always risk, so the term on the X-

Axis should be labeled highly unlikely.

Performance Indicator Rubric

Course: ASCI 2750 Accident Investigation

Course Instructor: Terrence Kelly

Semester Taught: Spring 2023

Number of Students in Course: 36

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Homework Assignment #2 – Qantas Flight 32 Average 89.3% 97.2% of students scored above 70% Homework Assignment #3 – British Airways Flight 268 Average 85.51% 94% of students scored above 70%	Benchmark was achieved Benchmark was achieved

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

Homework Assignment #2 included a discussion Qantas Airways Flight 32. Flight 32 involved a significant engine failure (uncontained) that led to multiple system failures and airworthiness issues. The crew worked together to methodically address all adverse situations eventually resulting in a safe landing. Qantas Airways Flight 32 is a testament to the flight deck crew operating in a professional, efficient, and safe manner. Crew coordination and resource management were discussed in class as a model for flight crew activities. British Airways Flight 268 involved a wide-body aircraft flying from Los Angeles, California to the United Kingdom. The quad-engine aircraft experienced an engine failure after takeoff. The carrier and the crew made the decision to continue the transatlantic flight with a failed engine. Due to the requirement flying at a lower altitude, the fuel burn was higher than anticipated and aircraft had to make an emergency landing prior to reaching its destination. Homework assignment #2 and #3 provide the students a contrast between good decision-making and poor decision-making.

I was satisfied with student performance on these two assignments and plan to use them again in the future. That said, while in class discussion certainly supports the importance of professional, safe, efficient flight operations, the homework assignments themselves do not adequately support the SLO. Consequently, as a means of continuous improvement I will alter the language in the assignment to better reflect the SLO.

Assignment Details

ASCI 2750 Accident Investigation – Homework # 2 Name:

Qantas Flight 32

Please review the video linked below and respond to the questions provided.

Here is a link to the video:

This Airliner Was Doomed To Crash (But It Didn't) | Qantas 32 - YouTube

Here are the questions:

1. What is ECAM?

2. What are the four main issues the Qantas 32 crew faced after the engine failure?

3. Why was the evacuation of Qantas 32 delayed?

4. Investigation following the landing of Qantas 32 revealed the engine failure was caused by?

ASCI 2750 Accident Investigation – Homework # 3 Name:

British Airways Flight 268

Please review the video linked below and respond to the questions provided. The video has no conversation but I would like you to read the postings as it (the video) progresses. I have also provided a link to a report for your review.

This assignment should be uploaded to Canvas no later than Friday, February 24th by the end of the day

Here is a link to the video:

Low Fuel Over The Atlantic | British Airways Flight 268 - YouTube

Here is a link to the report:

British Airways Flight 268

Here are the questions:

1. Why did thew crew choose to continue the flight?

2. Do you think a decision like this could occur today? Why or why not?

3. Which do you consider a bigger problem, the engine failure or the fuel situation? Why?

4. Flight 268 did not violate regulations. Was the decision to continue the flight the right thing to do?

Examples of Student Work

ASCI 2750 Accident Investigation – Homework # 2 Name: Rhee Sung Min
Qantas Flight 32
Please review the video linked below and respond to the questions provided.
Here is a link to the video:
This Airliner Was Doomed To Crash (But It Didn't) | Qantas 32 - YouTube
Here are the questions:

1. What is ECAM?

ECAM stands for Electronic Centralized Aircraft Monitoring. It monitors the aircraft with the help of thousands of sensors to provide necessary information and warnings during the flight whether it is normal or abnormal to the pilot. It will also provide the appropriate checklists for the pilot in each flight procedure.

2. What are the four main issues the Qantas 32 crew faced after the engine failure?

The first issue they were facing was the fuel system. There was a rapid leak of fuel on the left wing, from 105 tons decreased to 93.9 tons in just 10 minutes. Even if they do have enough fuel to fly back to Singapore Changi Airport, the fuel was not able to reach the engines because several transfer pipes between fuel tanks were damaged after the explosion. Besides, both fuel quantity management computers, fuel pumps, and the jettison system failed as well.
a. Since there was a rapid leak of fuel on the left wing, the right wing is becoming relatively heavier, which further creates a roll force on the aircraft. When the ECAM notice the pilots to do an emergency fuel transfer from the outer tanks into the feed tanks, they were not able to transfer the fuel on the left wing, but only on the right wing. This further worsens the lateral imbalance, which may be a threat when the plane approach to final.
b. The ECAM also sent out an error in calculating the aircraft's center of gravity. This will be problematic as the aircraft's center of gravity must be within a specific limit to land. The second officer later calculated that the CG is within the acceptable limits for landing, which tells us that there are some faulty sensors in the ECAM.
c. Lastly, the hydraulic system was severely affected by the explosion. The aircraft was performing just 25% of the total hydraulic power. Pilots were concerned about it as it controls the most important aircraft components like flaps, rudders, and elevators. The ailerons specifically degraded down to 35%, which is more challenging for pilots to roll the aircraft. Furthermore, pilots may need to extend landing gear manually before landing.

3. Why was the evacuation of Qantas 32 delayed?

First, the fuel was still leaking on the white-hot brakes after the harsh landing. When the fire services arrived near the plane, they saw that engine 1 of the aircraft had not shut down. Even though the crew did shut down all the engines, it was still running. To make sure the aircraft won't start to fire, the fire crews started spraying water and foam all over the plane. To stop the engine, they spray foam directly into the core of the engine. After it is completely stopped and safe, they then start the evacuation procedures.

3. Investigation following the landing of Qantas 32 revealed the engine failure was caused by?

They found that in the engine, there is a fatigue crack in the oil stub feed pipe that led to the result of oil leakage. The oil was so hot that auto ignite and caused an internal oil fire in the engine. The fire then led to the intermediate pressure turbine disc moving rearward and created a surge in the engine. The intermediate turbine disc then fractured into 3 sections and exit at a very high speed, causing engine failure and damage to the aircraft systems. The root cause was later found that the oil stub feed pipe was misaligned, leading to a fatigue crack and engine failure.

ASCI 2750 Accident Investigation – Homework # 2 Name: Redacted
Qantas Flight 32
Please review the video linked below and respond to the questions provided.
Here is a link to the video:
This Airliner Was Doomed To Crash (But It Didn't) | Qantas 32 - YouTube
Here are the questions:

1. What is ECAM?

ECAM stands for electronic centralized aircraft monitoring and is a device in the A380 that continuously monitors sensors over the entire aircraft and provides the crew with the necessary information and warning signals from normal and abnormal flight. Because the aircraft was equipped with the ECAM, instead of having to do an after-takeoff checklist

on paper the first officer just needed to check the ECAM to ensure there were no problems.
2.What are the four main issues the Qantas 32 crew faced after the engine failure?

1- Fuel system. There was a rapid leak in the left wing which resulted in a loss of fuel. Additionally, much of the fuel that was left was unusable because some of the transfer pipes between fuel tanks were taken out in the explosion. The captain was also struggling to figure out the fuel display.
2- Lateral imbalance. Because the left wing was leaking fuel rapidly, the right-wing was becoming heavier causing a roll force and lateral imbalance. The plane started leaning towards the right.
3- Center of gravity- The ECAM produced an error when it tried to calculate the aircraft's longitudinal center of gravity. Therefore, the second officer had to din the paper graphs to calculate the center of gravity. He determined their center of gravity was in range for landing.
4- Hydraulics. There were 2 independent hydraulic systems on this aircraft. One was completely taken out by the engine explosion, and the other one needed to have 2 pumps turned off to engine 4. When taken out, this would mean that the aircraft would only be running on 25% of hydraulic power. The flight crew determined to turn off the two pumps, and the autopilot helped compensate for the less control by moving the working ailerons.

2. Why was the evacuation of Qantas 32 delayed?

Once the plane landed, it needed to be hosed down to prevent a fire from occurring due to the fuel leak and hot brake pads. The emergency services were unable to hose down the aircraft because the 1st engine was still running. Despite the crew turning off the engine it was still turning. Eventually, the emergency services hosed and foamed down the engines until they stopped. The passengers were unable to evacuate the plane until they knew there was no fire.

3. Investigation following the landing of Qantas 32 revealed the engine failure was caused by?

In the investigation it was found that the reason for the engine failure was due to a fatigue crack in the oil stub feed pipe in the engine. The crack led to a rapid leak of hot oil which auto-ignited, pushing the intermediate pressure turbine disc to the back which created a surge in the engine. This surge resulted in extra force being added to the disc and cracked the disc into 3 sections. These 3 sections exited at high speed, damaging other parts of the aircraft.

ASCI 2750 Accident Investigation – Homework # 2 Name: Redacted

Qantas Flight 32

Please review the video linked below and respond to the questions provided.

Here is a link to the video:

This Airliner Was Doomed To Crash (But It Didn't) | Qantas 32 - YouTube

Here are the questions:

1. What is ECAM?

ECAM is the electronic centralized aircraft monitor. It is a system that displays mission critical information to the pilots about the aircrafts systems. It has the added benefit of also giving the pilots recommended mitigation procedures and aircraft limitations after the failure. This is only found on Airbus aircraft.

2. What are the four main issues the Qantas 32 crew faced after the engine failure?

Fuel system
Lateral Imbalance
Center of Gravity
Hydraulic system(s)

3. Why was the evacuation of Qantas 32 delayed?

The evacuation was delayed because the pilots were unable to shut down the #1 engine. Fuel was leaking from the wing onto the ground near the hot brakes. The crew determined the safest place for everyone was on the plane until the brakes could be cooled and the engine could be shut down.

4. Investigation following the landing of Qantas 32 revealed the engine failure was caused by?

The cause of the engine failure was the Rolls Royce Trent 900 engines. There was cracking on an oil stub feed pipe in the engine that caused an oil leak, followed by an oil fire which caused the core IPT to explode. The cracking was caused by a slight misalignment of the stub feed pipe.

ASCI 2750 Accident Investigation – Homework # 2 Name: Redacted

British Airways Flight 268

Please review the video linked below and respond to the questions provided. The video has no conversation but I would like you to read the postings as it (the video) progresses. I have also provided a

link to a report for your review.
This assignment should be uploaded to Canvas no later than Friday, February 24th by the end of the day
Here is a link to the video:
Low Fuel Over The Atlantic | British Airways Flight 268 - YouTube
Here is a link to the report:
British Airways Flight 268
Here are the questions:
1. Why did thew crew choose to continue the flight?
There were multiple factors that led the crew to continue the flight. One of the main ones was that their headquarters in Heathrow recommended that it would be preferable to continue with the flight. They also considered that they would have 2.5 more tons of fuel required for reserve upon landing at Heathrow with an engine out. They also considered that if they lost another engine, their aircraft performance would still make it safe to continue. Their routing along the continental US allowed them to have any diversion airports in case something went wrong. With their present situation, it would not have justified to burn the fuel for 40 minutes just to land safely. The windmilling condition was normal for the number two engine during the time of the shutdown. The 747 QRH also didn't say that it was necessary to find the nearest suitable airfield for an engine surge. Finally, company policy said that they flight could continue to its destination if the aircraft was safe, in which the captain believed it was.
2. Do you think a decision like this could occur today? Why or why not?
I believe a decision could be made like this today, but I don't believe that it would occur for a distance as drastic as BAW268. I have watched videos from CitationMax on YouTube where he briefs what would happen if they experienced an engine failure after takeoff on short repositioning flights and he would continue the flight to his nearby destination. I also have heard of situations in the last few years where planes have been holding for an hour or so to avoid any other risks they may face during their long haul flight. I believe they may do this as a response to how this flight was operated.
3. Which do you consider a bigger problem, the engine failure or the fuel situation? Why?
I thought that it was impressive that they were able to fly "across the pond" with their engine situation, but I think the more concerning part of the incident was how the fuel was handled during their flight. It is apparent that the 747 can safely fly for an extended period on three engines; however, the fuel management is concerning because if the aircraft did crash, the root cause would be fuel starvation rather than the plane unable to fly on three engines. The fuel should have been the ha See you on the boys next to the house of SKIERS ndled better in
this situation. I think the safer option to avoid more potential risks in a flight like this was to land back at the originating airport.

ASCI 2750 Accident Investigation – Homework # 2 Name: Name Redacted

British Airways Flight 268

Please review the video linked below and respond to the questions provided. The video has no conversation but I would like you to read the postings as it (the video) progresses. I have also provided a link to a report for your review.
This assignment should be uploaded to Canvas no later than Friday, February 24th by the end of the day
Here is a link to the video:
Low Fuel Over The Atlantic | British Airways Flight 268 - YouTube
Here is a link to the report:
British Airways Flight 268
Here are the questions:

1. **Why did the crew choose to continue the flight?**

The plane would land with 7 tonnes of fuel, it was deemed safe to fly even with additional engine failure, routing showed multiple suitable diversion airfields, the situation didn't present justification for overweight

landing and it would take about 40 minutes to land, windmilling parameters were deemed normal, company policy said flight should be continued if plane was in safe condition, and the manufacturer's procedure regarding

engine limit/surge/stall didn't require the crew to land at a nearest airport. That is why they chose to continue the flight, the overall safety of the plane was deemed acceptable to continue the flight as long as the situation was monitored throughout the flight.

2. **Do you think a decision like this could occur today? Why or why not?**

I don't believe that a decision like this could occur today, I think there is too much social media that either way both decisions would be wrong. If a flight crew decides to continue with the flight and there are people who stream or start sending out false information because they do not know what is going on fully then the pilots would be in a drastic position of endangering the passengers lives, though flight 268 was deemed air worthy. If a flight crew were to stop the fight and land to ensure safety, they would undergo slander for stopping a flight that could have been done and there would still have been backlash. So in my opinion, I would hope this does not happen or could occur today, or not for long distance flights because of the fuel situation. Understandable the Boeing 747 can fly on one engine though there were other parameters that were also part of this whole equation that simply did not push safety first but customer satisfaction.

Interestingly enough, there was a recent event where a Boeing 777 plummeted 1,400 18 seconds right after take off from Kahului Airport and then climbing back to 33,000 ft. While there was no engine surge or severe loss of fuel, this accident proved to me that a similar accident like flight 268 could happen again. There is so much focus on cheap flights that are "reliable" and get you to your destination without any layovers or cancellations. That is where I believe lots of customer focus is on so something like a flight that has shown that it was able to make the leg from Los Angeles to London makes me believe that a decision like this would occur today.

3. **Which do you consider a bigger problem, the engine failure or the fuel situation? Why?**

The fuel situation, the engine failure, was supposedly common, since there were 389 surges between 1989 and May 2005. A plane with 4 engines, certifiable to fly with only 3, and in dire instances with only 2. Meaning with only engine 2 out due to surge, the fuel situation becomes a more critical factor than engine failure. Due to drag caused from flying at a low altitude over the Atlantic that was not a calculated factor in the fuel situation. So I believe that the fuel would have caused a bigger safety concern because if the fuel depleted faster than they imagine there would have been a loss of hundreds of lives in the ocean. Flight 268 did not even reach their original location, landing at Manchester airport due to the lack of usable fuel. So I think the plane was safer in regards to engine failure since this is something that is accounted for during engineering, fuel situations are up to decisions of management, pilots and air traffic controllers while in use.

4. **Flight 268 did not violate regulations. Was the decision to continue the flight the right thing to do?**

Technically, on paper it was the right decision, it seems illogical but if all parameters were within company policy, and assessed that there was just enough fuel to make it across to Europe, then yes. Though I think ethically there were questionable decisions made, in regards to not only human safety but also safety of the machine. The lives of the people were put into a slight safety risk, not to mention the aircraft was damaged and there was instruction from ATC to return to the airport. There was also a discovery that one of the eight flight data recording tools was erased. So I think there are questionable decisions since the FAA deemed this flight was not airworthy, though the CAA disagreed. The flight followed regulations and policies, nobody died or injured and the plane was repaired and continued to be used for sometime. There are discrepancies between right and wrong for various organizations, if the FAA and CAA can not agree on certain terms, as well as British Airways organizational considerations there is so more worry on future accidents and decisions like these where safety controversies are not allowed. All in all, taking into consideration everything, due to the training of the pilots, assessments done, as well as lack of violating regulations, the decision to continue the flight was right, though I think there were other variables that should have made the decision the wrong thing to

do.

ASCI 2750 Accident Investigation – Homework # 3 Name: Alex Sandoval
British Airways Flight 268
Please review the video linked below and respond to the questions provided. The video has no conversation but I would like you to read the postings as it (the video) progresses. I have also provided a link to a report for your review.
This assignment should be uploaded to Canvas no later than Friday, February 24th by the end of the day
Here is a link to the video:
Low Fuel Over The Atlantic | British Airways Flight 268 - YouTube
Here is a link to the report:
British Airways Flight 268
Here are the questions:
1. Why did the crew choose to continue the flight?
After speaking with the airline's base at Heathrow by radio, the captain of BA flight 268 had been advised that it would be preferable to continue the flight. The flight crew considered many factors that would ultimately decide for them to continue the flight. The first reason the crew continued the flight was because the fuel prediction indicated a landing at Heathrow with 7 tons of fuel which is above the minimum required (4.5 Tons). The captain had suspected that because the plane had sufficient fuel and performance to continue the flight safely with no indication of other abnormalities within the aircraft, an overweight landing in a nearby airport was not required. In addition, The QRH procedure for an engine surge does not require the pilots to consider landing at the nearest suitable airfield. It was also company policy that stated that the flight should continue to the destination if the aircraft is in safe condition, which the pilots found the state of the aircraft to be safe after engine no. 2 was shut down.
2. Do you think a decision like this could occur today? Why or why not?
After reviewing this accident, I think that a decision like this would not occur today simply because the risk of putting people's lives in danger is too high. Had this accident happened today, I believe that the pilots would be required to land immediately since there are many factors that can contribute to a catastrophe such as an additional engine failure or potentially running out of fuel. Overall, a decision like this would not occur today since the risk of an accident ,which puts people's life in danger, is too high.
3. Which do you consider a bigger problem, the engine failure or the fuel situation? Why?
Although both an engine failure and lack of fuel can be potentially harmful, in this accident, I consider the fuel situation to be a bigger problem. The reason why I believe this to be a bigger issue is because the 747 is able to operate with one engine completely shut down and is still considered airworthy, however considering that the flight is flying over the North Atlantic with very limited suitable airports to be able to land the 747 in the event of the plane running out of fuel, I believe that the airplane running out of fuel over the vast ocean can is a serious problem regarding safety especially if a worst case scenario happened where the crew would be forced to ditch the plane.
4. Flight 268 did not violate regulations. Was the decision to continue the flight the right thing to do?
From an ethical standpoint, I think that the decision to continue the flight was not the right thing to do since human lives are put in jeopardy considering that the crew of the aircraft made the decision to continue the flight over the Atlantic. In this situation, I think the risk was not worth the reward of getting the plane to land in its destination, hence why the crew decided to divert to

Manchester. The best option would have been to land the aircraft at least before making the crossover above the North Atlantic Ocean.

Performance Indicator Rubric

Course: ASCI 3050 Operations and Business Environment of Aviation Course Instructor: Amelia Preis

Semester Taught: Fall 2022 Number of Students in Course: 12

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Midterm Exam Question 7 – 100% Midterm Exam Question 18 – 83% Final Exam Question 2 – 100% Final Exam Question 15 – 92% Final Exam Question 19 – 75%	Yes
SLO 5: Apply knowledge of business principles in aviation-related areas.	Midterm Exam Question 2 – 75% Midterm Exam Question 24 – 83% Final Exam Question 11 – 92% Final Exam Question 16 – 83% Final Exam Question 18 – 83%	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

The current level of course content and presentation of materials is sufficient to achieve satisfactory outcomes. To better improve the online course experience for students and further improve outcomes, the instructor could incorporate a guest speaker from industry via recording. Doing so may ensure course topics are further cemented through real-world example. The instructor may also employ additional means of assessment (like individual journal entries or similar) to ensure course content is internalized by students.

**Attach description of assignment used for assessment and samples of student work.*

Midterm and Final Exams are attached.

Sample student responses:

Midterm Exam Question 18: Identify two of a flight department manager's ideal traits. In your own words, explain what each trait means and how that is demonstrated in a flight department?

Response: One ideal trait of a flight department manager is innovation. This means that the department manager will try to transform a flight department to work best with the company as a whole while also adhering to the values and mission statement of the company. An innovate manager will also being forth new ideas to create a better running department. Another ideal trait is marketing. Marketing is the action of promoting a product or service. A flight department manager will market the flight department in a way that appeals to excutives to stay in good standing with a company. A manager will also promote the department to others in the company to build connections with those that can advocate for the department if needed.

Final Exam Question 15: Discuss the role of culture within a flight department. How does the culture of a flight department affect its team of workers? As a future leader in the business aviation industry, how would you contribute to the culture of a flight department?

Response: The role of a culture in a flight department should be based around the safety of everyone that is involved in the organization, but at the same time striving for excellence and giving 110 percent effort day in and day out because the aviation industry is based on team work. The culture of the flight department is also able to impact the attitudes, beliefs and behaviors of those within the company. Company personnel because it can either bring all the employees together because everyone is working for a common goal, but at the same time it could draw everyone apart if there is someone on the team that has a bad attitude. Culture affects the team of workers a lot with the aviation industry built around working as a team and making sure everyone is on the same page. With this in mind though if someone has a bad attitude there is a good chance that it is going to bring everyone else in the group down so morale will be low. The roles could also be reversed and if everyone has a good attitude then it can improve the companies performance overall and make them successful. The responsibility of the flight department manager in maintaining the culture is to help out wherever possible. Which means if some has a bad attitude pulling them to the side one day and asking what needs to change in the company so we can have everyone working together and all being successful.

Final Exam Question 19: Discuss, in detail, one ethical challenge within business aviation today. Provide enough information to summarize the issue, varying viewpoints (as applicable), and where the issue may stand in the future.

Response: One ethical challenge is not only in the business aviation sector, but also in other industries like road transportation,

electricity, and shipping iron and steel products. The aviation sector in total only produces 895 millions tons of CO2 per year which equates to only 2 percent of the 42 billion tons total. With the business aviation industry producing even less than 2

percent, at around 0.6 percent and drops even further when just talking about greenhouse gas emissions at 0.2 percent. It is easy for activists for climate change to point fingers at the large turbine engines flying thousands of feet in the air at hundreds of miles per hour, but companies and organizations are doing all they can to reduce emissions. For example some of the biggest companies like Boeing and Textron Aviation are trying every day to redesign the wings and fuselage to make them more aerodynamic and in turn increase fuel efficiency and reduce fuel burn. Organizations such as the NBAA are working and increasing their ties with the Noise Abatement Program (NAP) to increase fuel efficiency and have formed ties with the International Civil Aviation Organization Committee on Environmental Protection to help raise awareness for this on-going issue. An initiative that has been started by the NBAA and other government organizations is researching and producing SAF (Sustainable Aviation Fuel). Which is a reduced carbon synthetic jet fuel made from feedstocks, biomasses, wastes and residues like steel mill gasses and captured CO2. With the addition of SAF it will reduce greenhouse gas emissions by 80 percent by 2050.

Midterm Exam Question 2: Company executives appreciate the convenience for one-time trips and the chance to explore what on-demand aviation services have to offer without committing to aircraft purchase. One downside is that they don't have too much control over the specific aircraft used each trip. Which type of operation does this statement best describe?

Aircraft charter
Fractional ownership
In-house aircraft
Management company

Midterm Exam Question 24: Respond, in your own words, to the question: Are budgets necessary in corporate flight departments?

Response: A budget is necessary for corporate flight departments, because they hold a department accountable for not overusing resources. A budget is also used to measure efficiency and productivity.

Final Exam Question 11: This ethical situation occurs when a person's private interest(s) interferes or appears to interfere with the company the professional is representing.

Full disclosure
Decision-making model
Moral evaluation
Conflict of interest

Final Exam Question 16: When evaluating pilots and employees within corporate flight departments, what are some characteristics or behaviors that should be considered and evaluated? How could a flight department manager make employee evaluations a more useful exercise in a corporate aviation department?

Response: Within a flight department, specifically a corporate flight department, employees can be broken down into different categories, such as a pilot and then a general employee. Pilots are pretty self-explanatory; they are the ones that fly the plane, but general employees can be broken down into crew scheduler, accountants, dispatch, maintenance and safety inspectors. I believe that it would be unjust to compare a line pilot and a crew scheduler under the same qualities and qualifications. For example, when looking for a well-rounded pilot, things the corporate flight department manage can look for are crew resource management, effective communication skills, safe and effective decision making and situational awareness skills. Compared to a general employee like a crew scheduler a flight department manager can be looking for things like, their ability to work in a team, problem solving and analytical skills, work ethic, and the desire to uphold and promote the flight department's mission values and culture. To make employee evaluations a more useful exercise instead of doing evaluations annually, you evaluate them quarterly. This can be beneficial because as a manager or chief pilot it allows you to track their performance in a more detailed manner. Incase the employee isn't doing well in quarter two and three, but did really well in quarter one of this year then you as a manager can pull them aside and see what is going on to see if there is anything you can do to support them, being as successful and and making sure they are performing to their fullest potential. As a manager if you did evaluations on a more regular basis and you notice that multiple employees or pilots are struggling in the same area maybe as a manager you would need to change or have a team-building or workshop to help improve the employees skills.

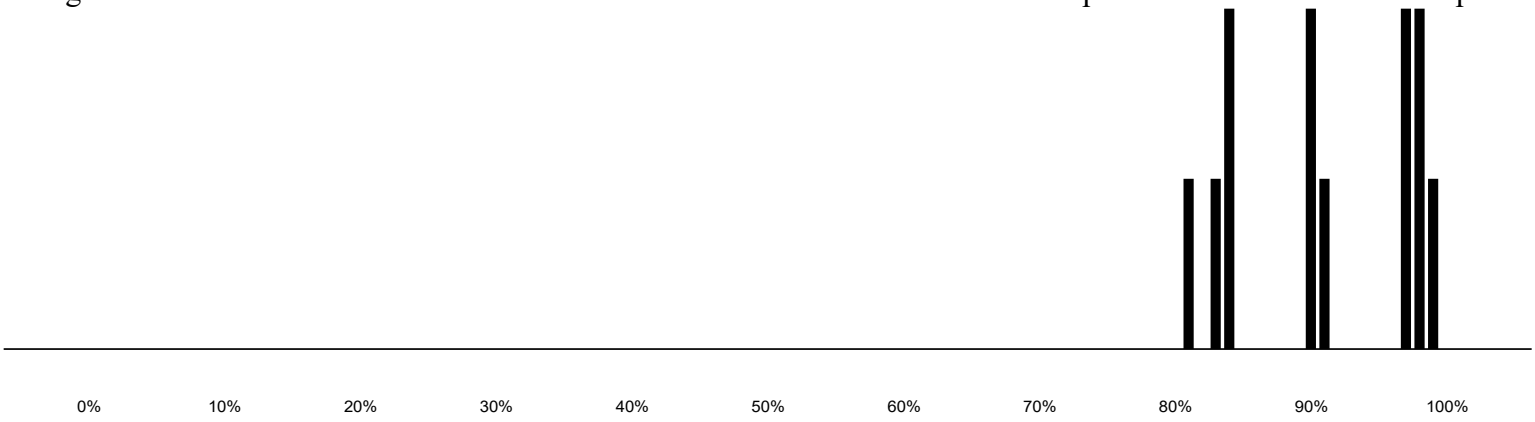
Final Exam Question 18: Why is it important for business aviation professionals to consider ethical decision making in their work? What are some scenarios where a strong sense of ethics could serve the professional well?

Response: It is important to consider ethical decision making because it can often be dangerous to work without morals. If a corporate pilot decides to not fully inspect the aircraft before flying, the results of this could be catastrophic. If an accountant in a corporate aviation department does not properly file the taxes of the department according to the regulatory code the department is under, there could be penalties against the department, not to mention it could be considered a federal crime. One scenario where a strong sense of ethics could serve a professional well is if an aircraft mechanic decides to tell the pilot in command to cancel a flight due to possibly minor maintenance issues with the aircraft. Even though this flight is for the CEO to go to discuss a business deal that would affect the trajectory of the company. If the mechanic knows that the flight could go, but at a small risk of engine failure, and still decides that safety is the priority and recommends that the flight be rescheduled, this is having a strong sense of ethics. Another scenario would be if a pilot overhears a passenger saying that they have drugs in their carryon and reports this to the police. Though discretion is a characteristic of corporate aviation, the pilot knows that the crew could get into trouble for knowingly flying with drugs on the plane. So, reporting this to the authorities is the ethical thing to do.

Quiz and Item Analysis

Midterm Exam

99%	82%	91%	12.826	01:36:11	0.51
High Score	Low Score	Mean Score	Standard Deviation	Mean Elapsed Time	Cronbach's Alpha



Data Last Updated: Jan 9, 2023

Item Analysis

Multiple Choice | 5 points possible

A company purchases a ⅛ share of a fleet of aircraft. The scheduling, staffing, flight planning, maintenance and insurance are handled by a provider. Which type of operation does this statement best describe?

0.83	0.33	1.00	4.17/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

Company executives appreciate the convenience for one-time trips and the chance to explore what on-demand aviation services have to offer without committing to aircraft purchase. One downside is that they don't have too much control over the specific aircraft used each trip. Which type of operation does this statement best describe?

0.75	0.50	1.00	3.75/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

Which of the following are not elements of execution?

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Answer | 5 points possible

Which of the following are skills that effective managers should utilize? (Select all that apply)

0.92	0.17	1.00	4.86/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

The aviation department manager or chief pilot must do what with an organization's vision?

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

Within a flight department, all personnel should be provided with a detailed_____to ensure that they understand what is expected of them and to coordinate their tasks with others in the department

0.92	0.17	1.00	4.58/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

This measure of performance asks the question "Is a given action being performed with minimum effort and resources?"

1.00	0.00	--	5.00/5 pts

Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

This performance measure asks the questions, "Is this product or service fulfilling the organization's mission adequately?"

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

True or False | 5 points possible

The most important aspect of feedback development is a means to measure progress, be it time, quality, quantity, or resources allocation.

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

True or False | 5 points possible

Operational plans should be used to create strategic plans.

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

True or False | 5 points possible

The flight department must keep a record of all flights made, providing at least the date, departure and arrival points, names of passengers, and whether the passengers were employees and whether they had a business purpose forthe flight.

0.92	0.17	1.00	4.58/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Fill in the Blank | 5 points possible

The NBAA defines_____as “aircraft owned or leased and operated by a corporation or business firm for the transportation of personnel or cargo in furtherance of the corporation’s or form’s business and which are flown by professional pilots receiving a direct salary or compensation for piloting."

0.91	0.20	1.00	4.55/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Fill in the Blank | 5 points possible

Goals must be_____so that progress towards them may be measured.

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 5 points possible

Define on-demand transportation in your own words.

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

Briefly describe two pros and two cons of a company owning business aircraft.

1.00	0.00	--	10.00/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

What is an aircraft use policy? Why is it used?

1.00	0.00	--	10.00/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

What is the difference between strategic and operational planning?

1.00	0.00	--	9.75/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

Identify two of a flight department manager's ideal traits. In your own words, explain what each trait means and how that is demonstrated in a flight department?

0.83	0.33	1.00	8.33/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

Explain why the flight department needs to be connected to the company (headquarters) it serves. How does the flight department manager reinforce that value?

0.50	0.33	--	7.58/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

What is a strategic plan?

0.75	0.17	--	9.00/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

Provide one reason why a report of information about the flight department would be needed.

0.83	0.33	1.00	8.33/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

Why might an audit be initiated in a flight department?

0.92	0.17	--	9.58/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

In your own words, what is a budget?

0.92	0.17	--	9.50/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

Respond, in your own words, to the question: Are budgets necessary in corporate flight departments?

0.58	-0.33	--	8.42/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

Identify and define the two types of costs that are associated with aircraft operation.

0.75 Difficult y Index Essay | 10 points possible

0.17	0.94	8
Discrimination Index	RPB	.00/10pts Mean Earned Score

Explain the differences and advantages/disadvantages of leasing versus purchasing an aircraft.

0.83	0.33	0.88	8.67/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 10 points possible

Summarize a new concept or term that you have learned so far in this course. What about it is compelling? How might you apply that knowledge to your future career?

1.00	0.00	--	10.00/10 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Fill in the Blank | 5 points possible

The NBAA defines as “aircraft owned or leased and operated by a corporation or business firm for the transportation of personnel or cargo in furtherance of the corporation’s or form’s business and which are flown by professional pilots receiving a direct salary or compensation for piloting."

1.00	--	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Fill in the Blank | 5 points possible

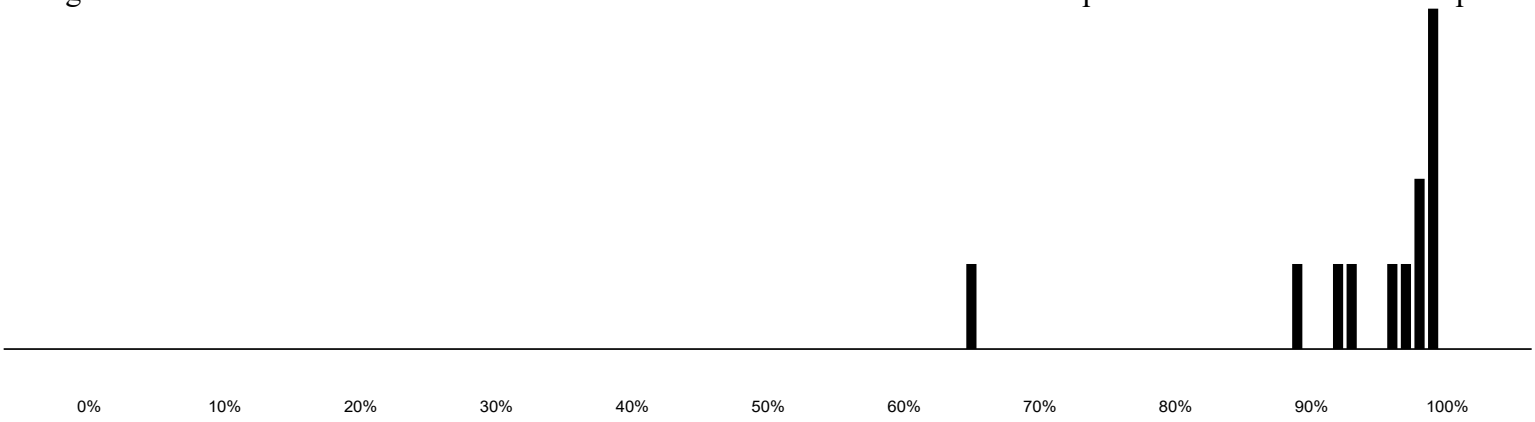
Goals must be so that progress towards them may be measured.

1.00	--	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Quiz and Item Analysis

Final Exam

100%	66%	94%	17.585	00:00	0.693
High Score	Low Score	Mean Score	Standard Deviation	Mean Elapsed Time	Cronbach's Alpha



Data Last Updated: Jan 9, 2023

Item Analysis

Multiple Choice | 5 points possible

Who can report a suspected or alleged violation of the FARs to the FAA?

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

Based on the reading, what would you recommend an airman do if served a Notice of Investigation?

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Answer | 5 points possible

Which of the following are potential FAA Enforcement Actions when an airmen has been found to have violated FARs? (select all that apply)

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

For minor violations of regulations, instead of legal enforcement action, the FAA will either send a warning notice or letter of correction. This is called a(n):

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

A more serious enforcement action, this is when the FAA suspends or revokes the airman's certificate:

1.00	Multiple Choice | 5	0.00	rimination Index
Difficulty Index	points possible	Disc	

-- RPB	5.0 0/5 pts Mean Earned Score		

The FAA may propose a fine for a regulatory violation. This enforcement action is called:

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

Often resulting from an accident, investigation or violation, the FAA can request an airman or other certificate holder be tested again on their qualifications. This enforcement action is called:

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

Within a Part 135 operation, the certificate holder may inform the FAA of an apparent inadvertent violation of FARs prior to the agency learning of the violation through other means. Doing so promptly reduces the chance that the company is faced with civil penalty oe other actions against its operating certificate. What is this self-reporting process called?

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

This document is a type of publication offered by the FAA to provide guidance about compliance with FARs.

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Multiple Choice | 5 points possible

This ethical situation occurs when a person's private interest(s) interferes or appears to interfere with the company the professional is representing.

0.92	0.17	1.00	4.58/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

True or False | 5 points possible

Corporate flight departments may operate under Part 91 or Part 135 regulations.

0.92	0.17	1.00	4.58/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

True or False | 5 points possible

An apparent FAR violation can not have been inadvertent for the FAA to accept a voluntary disclosure.

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

True or False | 5 points possible

To achieve the highest levels of safety performance, business aviation professionals must live by a moral code that doesn’t tolerate deceit, cheating or thievery.

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 20 points possible

Discuss the role of culture within a flight department. How does the culture of a flight department affect its team of workers? As a future leader in the business aviation industry, how would you contribute to the culture of a flight department?

0.92	Difficult	y	Index Essay | 20 points possible

0.17 Discrimination Index	1.00 RPB	18.75/20 pts Mean Earned Score

When evaluating pilots and employees within corporate flight departments, what are some characteristics or behaviors that should be considered and evaluated? How could a flight department manager make employee evaluations a more useful exercise in a corporate aviation department?

0.83 Difficulty Index	0.33 Discrimination Index	-- RPB	18.33/20 pts Mean Earned Score

Essay | 20 points possible

Discuss the role of FARs in the industry. How do regulations affect corporate flight department operations?

0.75	0.50	--	18.25/20 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 20 points possible

Why is it important for business aviation professionals to consider ethical decision making in their work? What are some scenarios where a strong sense of ethics could serve the professional well?

0.92	0.17	0.94	18.17/20 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 20 points possible

Discuss, in detail, one ethical challenge within business aviation today. Provide enough information to summarize the issue, varying viewpoints (as applicable), and where the issue may stand in the future.

0.75	0.50	0.90	16.67/20 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Essay | 20 points possible

Detail a concept from the course (week 1 - week 7) that you found particularly interesting or useful for your future career. How might you continue to learn about the business aviation industry through the rest of your college program and into your future career? Is there a concept you would have liked to explore further? Is there a means for you to further your knowledge about corporate and business aviation beyond just this course?

1.00	0.00	--	20.00 /20 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Fill in the Blank | 5 points possible

FAR is the abbreviation for .

1.00	0.00	--	5.00/5 pts
Difficulty Index	Discrimination Index	RPB	Mean Earned Score

Performance Indicator Rubric

Course: ASCI 3100 Air Carrier Operations Course Instructor: Ken Weinberg

Semester Taught: Spring 2023 Number of Students in Course: 34

FLIGHT SCIENCE CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	82	Y
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	88	Y
SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.	97	Y
SLO 5: An ability to apply the techniques, skills, and modern aviation tools to perform aviation related tasks of a professional pilot.	94	Y

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

The course just underwent a full review during the semester. I plan to go back and review the study time and will try to add more assessments built in to the presentations. There were weekly and at times daily updates on my work in the industry including a visit to United Airlines Aviate Program in Goodyear AZ. This content was posted to the students for them to read in addition to required curriculum.

**Attach description of assignment used for assessment and samples of student work.*

1.29.2023

TO
Board of Directors of Magis Air

FROM
Consultant Team 5

CC
Kenneth Weinburg

RE
Candidate Recommendation for Chief Pilot

Week #2 Findings

Selecting someone for a Chief Pilot position is important so all candidates should be considered based on their qualifications. Bob and Shirley both have great experience in the airline industry, but their different experiences certainly set them apart. Captain Bob has more hours, and has previous experience as a Chief Pilot, but he retired from that position after the previous airline had its air carrier certificate revoked. This is not a great sign especially because the cause was related to safety which is a priority for Magis. He also has experience with regional airlines as he was the training and standards manager at Eastsky Airlines. He has extensive experience flying a 747, but that is not what Magis flies, and 747's are being phased out of passenger operations. While this experience is good to have, 14 CFR 119.67 (b) says that to be a Chief Pilot the person must be an ATP and hold ratings for at least 1 of the airplanes used in the certificate holder's operations. Magis operates the EMB-175 which is a different type rating than the 747. Bob also retired 7 years ago, and if he hasn't flown in a 121 carrier since, he will not be adjusted to current operations.

Captain Shirley on the other hand, also has an ATP but has fewer hours than Captain Bob. However, her type rating on the EMB-175 and 5 years PIC more than make up for it. Referring back to 14 CFR 119.67 (b) that type rating she has qualifies her to be a Chief Pilot for that fleet. While she has never been in the position of Chief Pilot, she is well respected and has worked from the ground up. Fellow pilots would respect a Chief Pilot that has more experience in their aircraft, and someone who has worked hard to get to where they are. Captain Bob has been out of the industry for 7 years, and Captain Shirley is fresh and clearly a hard worker. Since this would be her first time, we need to look again at 14 CFR 119.67, but this time we need to look at paragraph (b)(1). This says that if someone is becoming a Chief Pilot for the first time, they need 3 years of experience within the last 6 as PIC of a large airplane under 121 or 135. She has experience in the exact plane that Magis flies she fits this requirement. Another thing to consider for a first time Chief Pilot is an experience rating worksheet. This worksheet needs FAA approval and Captain Shirley would need a minimum of 360 points to qualify. A good resource to get additional information on this would be in 8901.1 CHG 815 2-162 D2. In addition to just meeting the PIC requirements for her airline, it mentions that she was also a check airman. This is a title Captain Bob does not have and shows she can be trusted to train and check new Magis pilots. Her additional experience in the KC-46 is also helpful because it is the same airframe as the Boeing 767. Magis plans to expand their fleet and move to international operations, and if they decide to add Boeing 767's to their fleet, her experience will prove to be valuable.

When seriously considering both candidates I think the best decision for Magis would be to hire Captain Shirley. She has much more experience on the type Magis flies which Captain Bob does not. Having this experience on your company's airplanes is very important for a Chief Pilot. Captain Bob has not worked with an airline for 7 years, and the airline he previously worked for had its certificate revoked due to safety concerns. Captain Shirley's clear drive and motivation to keep climbing the company ladder has been apparent and noticed by her peers. This would make her more personable and relatable to the pilots under her. Magis needs someone with the drive and specific experience Captain Shirley has. I think she is a strong candidate and if she continues working as hard as she has in the past, she will be a great Chief Pilot.

Thank you,

Ben Niederer

Consultant Team 5 Member

Week 2 Discussion - Key Personnel item options

You are part of a team of consultants hired by the Board of Directors of Magis Air, a Part 121 air carrier that has operated regional jets as a partner airline for Span America Airlines a legacy major airline. Span America has had its air carrier certificate revoked by the FAA and ceased operations.

The Board of Directors of Magis has decided to fill the void left by Span America and would like to grow the airline. They are focused on being the best airline in the industry for employees, customers and the general public. They strive to design the airline with an eye for "quamplurimi et quam apptissimi", that is "as many as possible of the very best". Unlike Span America, safety and compliance are paramount for them and the foundation of their operation. As ethical executives they expect sound moral judgement in the guidance you will provide to them even if it seems to conflict with their initial proposals.

Over the next 8 weeks you will be consulting them on decisions that they post to your team. You must provide them with sound advice from the content covered in that week from lectures, the text book, online references, material learned from other courses outside this, life experiences and possibly guest speakers. Discuss that advice on the discussion board and then make your final recommendation to Magis Air in bold type.

Week 2: Required Personnel, Airline Organization, Operations Manuals

Issue:

Capt. Chuck Reliable has just retired and Magis Air needs to hire a new Chief Pilot. Nothing else has changed at Magis yet. They are down to

two options for candidates. Compare the two, make your recommendations and highlight any concerns you may have based on material covered in the text, lecture or other relevant information.

Option 1:

Captain Bob Bigwatch is a very experienced pilot who has an ATP rating and 15,000 hours with most of his time flying domestic, international and supplemental operations in the 747-400 for which he also holds a type rating. Some on the Board are very impressed by this because of the eventual hope to fly international long-haul flights. Although the current Magis fleet now consists of EMB 175 regional jets. Captain Bob was the former Chief Pilot at Wingingit Airlines for 10 years up until 7 years ago when he retired. This occurred shortly after Wingingit's air carrier certificate was revoked by the FAA for Safety Concerns regarding flight operations. Prior to Wingingit Airlines, Captain Bob was the manager of training and standards and Eastsky Airlines, a Part 121 air carrier that provided regional domestic service for Wingingit, as well as Span America Airlines. He is also a decorated, retired US Navy fighter pilot flying the F-18 Hornet.

Option 2:

Captain Shirley Ujest has an ATP rating and 9,000 hours, is type rated in the EMB-175 which is part of the Magis fleet, and for the last 5 years has experience as PIC of EMB-175. This would be her first time as a Chief Pilot. Captain Shirley is well respected by her fellow pilots at Magis having worked her way up from the bottom of seniority and proven to be an excellent pilot. She has been a check airman for Magis for two years. Captain Ujest is also a USAF ANG pilot, flying the KC-46 Pegaus as aircraft commander with the 157th Air Refueling Wing out of Pease ANGB.

Team 4 Consulting

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February 4th 2023

The Board of Directors of Magis Air,

Our team has reviewed and discussed this event, and we have reached the following conclusions and suggestions.

First of all, Magis needs to ground the aircraft involved. Although these errors were made by Flemco Tecknec, 14 CFR 121.363 (a) stipulates that the carrier Magis shall be mainly responsible for the airworthiness of its aircraft, including the fuselage, aircraft engine, propeller, equipment and parts, and emergency equipment and parts shall comply with its manual. Because Magis has realized that the parts may not come from an approved source. Therefore, the aircraft involved is no longer airworthy and it should be grounded immediately.

As for the action after the aircraft is grounded, magis can evaluate the cost and decide whether to retire the aircraft in advance. If it decides not to retire the aircraft in advance, magis needs to find out whether uncalibrated tools and/or illegal parts are used on the aircraft through the maintenance log of the lake chasing mechanic. If uncalibrated tools or illegal parts are not used, the aircraft may be put into service again. If uncalibrated tools or illegal parts are used, Magis should find another part 145 MRO audited by CASE to conduct independent inspection of Flemco Technik's work. If it is decided to retire the aircraft in advance and sell it to other airlines, the above procedures need to be repeated. After the aircraft recovers its airworthiness, it can be sold. At the same time, the maintenance records and airworthiness release of the aircraft shall be transferred to the buyer at the time of sale. Finally, magis can also scrap the aircraft in advance, which will depend on the remaining life of the aircraft and its assessment of economic costs.

For Flemco Tecknec, we recommend that Megis immediately terminate all relations with Flemco Tecknec and continue to cooperate with companies using counterfeit parts, which will cause more potential safety problems and affect the company's reliability in the public. And we suggest that magis seek legal action against Flemco. Because according to the provisions of CFR 121.368, each maintenance provider must perform all covered work in accordance with the maintenance manual of the certificate holder. Flemco Tecknec's use of counterfeit parts violates this provision, so magis can claim compensation from Flemco through legal channels.

In general, we recommend that Magis terminate its cooperation with Flemco and ground the aircraft involved. After the aircraft recovers its airworthiness, it is decided to sell it or continue flying. Magis must not conceal the information that the aircraft uses fake parts to sell the aircraft. At the same time, Magis should sue Flemco through legal channels to obtain compensation.

Team 4

2/19/2023

TO
Board of Directors, Magis Air

From
Consultant Team 5

CC
Kenneth Weinburg

RE
Transitioning to join IATA

RECIPIENT NAME

Greetings,

As Magis air consultants, we feel that a number of issues, such as crew scheduling, training, limits, rules, and more will change after studying the concerns that Magis air sent to us. For Magis to go to the next significant stage of the company, the board of directors will need to abide by new regulations. According to CFR 121.463, Magis will have to meet additional requirements for its dispatchers. beginning with the initial dispatcher training (Except that someone who has successfully completed similar training for another type of airplane in the same group merely has to complete the appropriate transition training.) Moreover, operational familiarization entails spending at least 5 hours watching operations included in CFR 121.463.
As far as selecting alternates for flag operations in accordance with 121.621, the ceiling must be at least 1,500 feet above the circling MDA if it as a circling approach required, at least 1,500 feet above the lowest published instrument approach minimum or 2,000 feet above the airport elevation, and the visibility at the airport must be at least 3 SM or 2 SM above the lowest applicable visibility minimums (whichever is greater). There is also a concern that the flight can be along a route approved without an alternate if the aircraft meets the fuel requirements of 121.641(b) or 121.645(c). The weather at the alternate airport must be suitable for the operations specified by the certificate holder. In essence, the standards for visibility and ceiling for alternate airports in flag operations are stricter than those for domestic operations, as stated in 121.619.
Diversion to an airport that Magis does not frequently utilize could result in a few problems. Fuel, maintenance, baggage, equipment, and passenger care would be a significant problem. Generally, airlines have their ground crew ready to take care of the aircraft waiting for them at the destination airport. But if an aircraft had to divert for any reason to an airport that they do not usually operate in, Alliances can be useful in such situation as they can take care of the aircraft and use their ground crew. In addition, Magis need to rent out a gate of there are passengers involved in the flight. The concerns that may encounter the crew from longer flights could be the necessity to use a new aircraft, which would necessitate new training. Due to this, pilots will need to undergo new type rating training after being removed from the current existing fleet which may take months to develop. Moreover, the rules for flying time and crew rest are extensively covered in 14 CFR 121.471. For example, it states that if a pilot is to fly for more than 8 hours during a period of 4 hours, they must have a rest period that is at least twice the number of hours flown since the preceding rest period at a or before the eight scheduled hours of duty. The rest period must be at least twice as long as the preceding rest period, but not less than 8 hours. The pilot must be relieved of all duty during this rest period. It also states that if flying more than 8

hours during 24 consecutive hours, the pilot must be given at least 18 hours of rest before being assigned to further duty.
High minimums captain basically indicates that some aircraft procedures and regulations have higher minimums since the pilot of the aircraft has less expertise flying the aircraft that they are operating. For example, a pilot who has not flown the kind of aircraft they will be flying for at least 100 hours as PIC. According to 14 CF 121.652, this increases the minimum ceiling and visibility criteria for landing by 100 feet and half a mile.
Ops Spec D.095 permits the certificate holder to replace a more specified MEL with an FAA-approved MMEL. The MMEL for the aircraft would then be used by aviation routers to route aircraft to maintenance facilities capable of complying with each of the repair categories.

Thank you,
Mohammed Alfawaz
Consultant Team 5 Member




2

Group Discussion: Week 5 Discussion

You are part of a team of consultants hired by the Board of Directors of Magis Air, a Part 121 air carrier that has operated regional jets as a partner airline for Span America Airlines a legacy major airline. Span America has had its air carrier certificate revoked by the FAA and ceased operations.

The Board of Directors of Magis has decided to fill the void left by Span America and would like to grow the airline. They are focused on being the best airline in the industry for employees, customers and the general public. They strive to design the airline with an eye for "quamplurimi et quam apptissimi", that is "as many as possible of the very best". Unlike Span America, safety and compliance are paramount for Magis and the foundation of their operation. As ethical executives they expect sound moral judgement in the guidance you will provide to them even if it seems to conflict with their initial proposals.

Over the next 8 weeks you will be consulting them on decisions that they post to your team. You must provide them with sound advice from the content covered in that week from lectures, the text book, online references, material learned from other courses outside this, life experiences and possibly guest speakers. Discuss that advice on the discussion board among your team during the week. Decide on your final recommendations and answers to the questions. Then, ONE teammember posts your final recommendation to Magis Air in a proper business response, before it is due. (I will review discussions to ensure everyone contributes fairly. Your team only needs one submission from a scribe.)

WEEK 5 - Operational Control

The Board at Magis has decided to follow your earlier advice regarding supplemental operations as well as joining IATA as part of their long-term strategy. Regardless of whether they expand or not they feel this can assist them in additional revenue significantly. Captain Shirley Ujest has been hired as the new Chief Pilot and is working with the Director of Operations on a strategy to train pilots for which they will reach out to you again in about a week. In the meantime, accomplishing the growth they expect will obviously require a new fleet, new routes and some significant changes to their Operations Center.

With this in mind they have the following questions:

1. What do they need to do to comply with 14 CFR 121.463 for this transition?
    1. What training do their dispatchers need?
2. For flight planning purposes how does flag operations differ when selecting alternates?

3. What might be some of the concerns with off-line alternate airports if they have to divert?
4. With these longer flights what concerns might crew scheduling now be faced with?
5. Changing fleets may result in "high minimums" captains. What does that mean? How might this impact planning purposes in relation to landing in bad weather?
6. Since Magis doesn't have line or base maintenance in every location that they fly to, how might aircraft routers be impacted when trying to comply with the repair categories A, B, C and D required in Ops Spec D.095 the approved minimum equipment list?

Week 6: Flight and Cabin Operations

Issue:

Recently at Magis a gate agent required a customer to gate check a bag that did not meet the size requirements in Magis' FAA approved Carry-On Baggage Program. The customer was a famous and influential politician from the airline's home district and an elite customer who voiced his displeasure. The Senior Flight Attendant and First Officer intervened and wanted to let the customer on with the bag because they determined there was room for the bag in the overhead bins so that it could be securely stowed. The gate agent explained that while there might be room the bag exceeded the approved size from Magis' FAA approved program.

What is the correct resolution to this issue that is safe and regulatorily compliant? Are there options? Cite your references in your response.

Follow up Policy Question

Post 9/11 at the creation of the TSA, the TSA established a requirement for carry-on baggage allowing only one carry on and a small personal item such as a purse or briefcase, which became known as 1+1. This was done to ensure efficiency in scanning and reduce the population of bags that could conceal weapons. If this restriction were to be lifted, Magis would have freedom to revise its carry-on baggage program. The program would still need FAA approval.

With this in mind if Magis were to consider revising their carry-on bag program from 1+1 and limiting the size to 9"x14"x22", what does your group suggest as a more effective way to manage carry-on bags?

1. Should they allow passengers to bring what they want until bins are full and too bad for late boarders?
2. Should they not allow any carry-on bags?
3. Should they charge for carry-on bags?
4. Should they be unlimited?

Consider the repercussions of your recommendation on safety as well as customer satisfaction and provide Magis leadership with options to select from and your recommended option.

Group Discussion: Week 7 Discussion

You are part of a team of consultants hired by the Board of Directors of Magis Air, a Part 121 air carrier that has operated regional jets as a partner airline for Span America Airlines a legacy major airline. Span America has had its air carrier certificate revoked by the FAA and ceased operations.

The Board of Directors of Magis has decided to fill the void left by Span America and would like to grow the airline. They are focused on being the best airline in the industry for employees, customers and the general public. They strive to design the airline with an eye for "quamplurimi et quam apptissimi", that is "as many as possible of the very best". Unlike Span America, safety and compliance are paramount for Magis and the foundation of their operation. As ethical executives they expect sound moral judgement in the guidance you will provide to them even if it seems to conflict with their initial proposals.

Over the next 8 weeks you will be consulting them on decisions that they post to your team. You must provide them with sound advice from the content covered in that week from lectures, the text book, online references, material learned from other courses outside this, life experiences and possibly guest speakers. Discuss that advice on the discussion board among your team during the week. Decide on your final recommendations and answers to the questions. Then, ONE teammember posts your final recommendation to Magis Air in a proper business response, before it is due. (I will review discussions to ensure everyone contributes fairly. Your team only needs one submission from a scribe.)

Magis leadership has decided that since they will be becoming a major airline they wish to become a "will carry" airline in regards to Hazmat/Dangerous Goods. They have several questions.

1. Which of their Ops Specs will be impacted by this change?
2. How will their Hazmat manual need to change?
3. How will this add to the pilot's training requirements if they now have to accept hazmat?
4. How will this benefit mechanics and storekeepers who need to move AOG parts that are considered hazmat?
5. The airplanes they plan to use don't have tie down points like military airplanes. Provide some options and recommendations. What is your team's recommendation for the best, most logical and cost efficient way to ensure they comply with 49CFR175.88 in regards to securing hazmat?

Performance Indicator Rubric

Course: ASCI 4050 Human Factors

Course Instructor: Terrence Kelly

Semester Taught: Fall 2022

Number of Students in Course: 35

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Written Assignment #1 Average 77.5% - 27 of 35 (77.14%) scored above 70% Written Assignment #2 Average 76.4% 27 of 35 (77.14%) scored above a 70%	Benchmark Achieved
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	Homework #3 Average 96.7% - 34 of 35 (97.1%) scored above a 70% Written Paper Average 91.3% - 35 of 35 scored above a 70%	Benchmark Achieved
SLO 5: Apply knowledge of business principles in aviation-related areas.	Test #1 Composite Questions Question 26 – 24 of 35 (69%) students answered correctly Question 28 – 29 of 35 (83%) students answered correctly Question 29 – 11 of 35 (31%) students answered correctly Question 30 – 30 of 35 (86%) students answered correctly Question 31 – 26 of 35 (74%) students answered correctly Overall average 68.6% (scores divided by # of questions)	Benchmark Not Achieved
* I have rounded the values used in this assessment		

Course Assessment (Intended Use of Results)

The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.

Written Assignment #1 required students to respond to questions surrounding both ethical and professional considerations surrounding the human factors discipline. Appropriate decision making is fundamental to the professional, efficient, and safe operation of aircraft. 27 of 35 students (77.4%) scored above a 70%, consequently the benchmark was achieved. Written Assignment #2 required students to respond to questions aimed at identifying and solving problems in the high-consequence environment. Like Assignment #1, 27 of 35 students (77.4%) scored above a 70%; consequently, the benchmark was achieved. While I am pleased with the overall performance on these assignments, it should be noted they were optional (makeup when I was on travel). Many of the students who did not achieve a 70% score on the assignment, did not submit any work. Additionally, the grading for the assignment was not particularly rigorous. As a means of continuous improvement, I plan to make all assignments mandatory and assign a more rigorous grading scheme.

SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.
Homework #3 required students to respond to questions on how to work and communicate effectively (in both oral and written form) in the context of induvial differences/human factors, while working on diverse teams.34 of 35 students scored above a 70% on the homework, consequently the benchmark was achieved. Students were required to participate in a written paper assignment detailing the importance of some physiological aspects of human performance. The written paper was a group assignment. 35 of 35 students scored above a 70% on the written paper assignment. Historically, I have not included an oral presentation in the ASCI 4050 course. I used the Homework #3 assignment to reinforce effective oral communication and the written paper to reinforce effective written communication. The scores supporting the paper and homework assignment were strong, however I am not sure I am meeting the spirit of the “effective oral” communications skills with an assignment that requires students to discuss oral communication. I look forward to discussing the topic with my colleagues. As a means of continuous improvement, I am considering whether to assign the paper individually, rather than as a group project. As part of the final exam, I ask students to rate the performance of teammates (on the paper) to help me better understand the level of participation. In some cases, it was clear that individuals contributed at different levels. Consequently, I felt the assessment was not sufficiently granular. In the future, I plan to assign the paper individually as a means better assessing individual performance.

SLO 5: Apply knowledge of business principles in aviation-related areas.
I assessed SLO 5 using a composite of questions from test #1. The questions included in the assessment were not particularly well suited for assess students’ knowledge of business principles in aviation. I do not generally include business fundamentals in the ASCI 4050 Human Factors course. Nevertheless, I have attempted to make an assessment for the Fall 2022 semester with a plan to discuss removing SLO 5 (Aviation Management) from being tracked in this course. The questions assessed relate to the Tenerife accident, the Bhopal Disaster and the International Air Transport Associated (a representative group for commercial aviation). The assessment was conducted using a composite of five questions from test #1.The benchmark was not achieved as only 68.6% (24 of 35 students) answered the questions correctly. As a means of continuous improvement, I plan to accomplish one of two things. My preferred choice it to remove SLO 5 (for Aviation Management students) from the ASCI 4050 course. My second choice would be to add a new element to the course that provides a more-sophisticated approach to business principles in aviation-related areas as they relate to human factors. Removing SLO 5 from ASCI 4050 is preferred simply because the course (ASSCI 4050) is already short on time for covering the topics critical to understanding human factors. Adding a module on business principles would require the elimination of something more closely associated with the human performance. A case can be made to include a module on business principles in

human factors, but the such an addition would be best addressed in a two course human factors course sequence.

Performance Indicator Rubric

Course: ASCI 4050 Human Factors

Course Instructor: Terrence Kelly

Semester Taught: Fall 2022

Number of Students in Course: 35

FLIGHT SCIENCE CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Written Assignment #1 Average 77.5% - 27 of 35 (77.14%) scored above 70% Written Assignment #2 Average 76.4% 27 of 35 (77.14%) scored above a 70%	Benchmark Achieved
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	Test #1 Composite Questions Question 16 – 26 of 35 (74%) students answered correctly Question 17 – 35 of 25 (100%) students answered correctly Question 22 – 20 of 35 (57%) students answered correctly Question 23 – 22 of 35 (63%) students answered correctly Question 24 – 22 of 35 (63%) students answered correctly Question 25 – 24 of 35 (69%) students answered correctly Overall average 71% (scores divided by # of questions) Test #4 Composite Questions Question 20 - 32 of 35 (91%) students answered correctly Question 21 - 31 of 35 (89%) students answered correctly Question 25 - 32 of 35 (91%) students answered correctly Question 26 - 26 of 35 (74%) students answered correctly Question 29 - 35 of 35 (100%) students answered correctly Overall Average 89% (scores divided by # of questions)	Benchmark Achieved
SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.	Written Assignment #1 Average 77.5% - 27 of 35 (77.14%) scored above 70% Homework Assignment #3 Average 96.7% 34 of 35 students (94%) scored above a 70%	

	Test #1 Composite Questions Question 1 - 25 of 35 (71%) students answered correctly Question 2 - 27 of 35 (77%) students answered correctly Question 3 - 27 of 35 (77%) students answered correctly Question 4 - 34 of 35 (97%) students answered correctly Question 5 – 33 of 35 (94%) students answered correctly Overall Average 83% (scores divided by # of questions)	
* I have rounded the values used in this assessment.		

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.
Written Assignment #1 required students to respond to questions surrounding both ethical and professional considerations surrounding the human factors discipline. Appropriate decision making is fundamental to the professional, efficient, and safe operation of aircraft. 27 of 35 students (77.4%) scored above a 70%, consequently the benchmark was achieved. Written Assignment #2 required students to respond to questions aimed at identifying and solving problems in the high-consequence environment. Like Assignment #1, 27 of 35 students (77.4%) scored above a 70%; consequently, the benchmark was achieved. While I am pleased with the overall performance on these assignments, it should be noted they were optional (makeup when I was on travel). Most of the students who did not achieve a 70% score on the assignment, did not submit the work. Additionally, the grading for the assignment was not particularly rigorous. As a means of continuous improvement, I plan to make all assignments mandatory and assign a more rigorous grading scheme.

SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.
To assess SLO 2, I used a composite of test questions (from test #1 and test #4) that spoke to the history of human factors, some current issues in human factors and how understanding and insight on how human factors mitigation strategies might be applied to negative human factors situations in the future. The scores from test #1 are not particularly impressive. On average, 71% of students correctly answered across the six questions presented. While technically meeting the 70% criteria set by the department, the scores are lower that I would have expected. The scores from test #2 are better. On average, 89% of students correctly answered across the five questions. I do not believe the use of a composite of test questions is the best way to assess SLO 2. Effectively, the use of these questions is an indirect measure while a direct assessment might be more effective. As a means of continuous improvement, I plan to create an assignment (required) that more-specifically and directly addresses the elements of SLO 2. The assignment will likely take the form of a homework assignment given toward the end of the semester.

SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.

SLO 4 the aggregate of three distinct elements including integrity, lifelong learning, and the building of diverse teams. Written Assignment 1 required students to respond to questions on both professional and ethical consideration in the context of human factors. Professional and ethical

decision making is consistent with the practice of integrity. Homework #3 requires students to respond to questions that inquire about how to build and communicate in the context of multi-disciplinary diverse teams . Composite questions from Test #1 were evaluated as an assessment of the importance of life-long learning. These questions focused on the so-called Tenerife accident that occurred in 1977. My hope in reviewing the accident was to demonstrate to students the importance of learning lessons from the paste and applying those lessons in the present. The results of the assessment were good. The results of the written assignment 1 indicated an average score of 77.5% with 77.1% of (27 of 35) students scoring above a 70%. Results from homework #3 indicated an average score of 96.7% with 97% of students (34 of 35) scoring above a 70%. The composite questions evaluated from test # 1 indicated 83% of students (29 of 35) answered the questions correctly. While I am marginally pleased with student performance on SLO 4 I believe changes to the way I assess it will provide a better indication of whether students are achieving the outcome. As a means of continuous improvement, I plan to roll the multiple elements currently used to assess SLO 4 into a single, mandatory assignment that addresses the importance of integrity, lifelong learning and the building and sustaining of diverse teams.

Evidence is presented starting on the next page.

SLO 1: Conduct aviation operations in a professional, safe, and efficient manner assessment evidence.

ASCI 4050 Human Factors Assignment 1 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

Rather than having class, I have placed two assignments in the Modules folder in Canvas. One to cover Monday's class and the second to cover Wednesday's class. Rather than contributing to the homework average, each assignment has the potential to add 5-points to a test grade (for a total of 10-points).

The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

ASCI 4050 Human Factors Assignment 2 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

Rather than having class, I have placed two assignments in the Modules folder in Canvas. One to cover Monday's class and the second to cover Wednesday's class. Rather than contributing to the homework average, each assignment has the potential to add 5-points to a test grade (for a total of 10-points).

The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe how an understanding of human performance (human factors) will help you better identify problems in the high-consequence environment. (300 word minimum)

2. Describe how an understanding of human performance (human factors) will help you better solve problems in the high-consequence environment. (300 word minimum)

Assignment 1 Examples

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

1- The ethical considerations that the discipline of human factors consists of the right and wrong that humans are ought to do, in terms of rights, respect for people, beneficence, justice and fairness. To ensure that the human factor discipline meet those ethics standards, it must provide privacy and safety for those who are affected by the system. In addition, loyalty, compassion, and honesty are among the other moral values that are encouraged by ethical standards. Additionally, ethical standards cover rights such as privacy, the right to be free from harm, and the right to life. These standards are suitable ethical standards since they are based on consistent and solid justifications. Therefore, a human factors specialist should not possess any issues with normative ethics such as obligations, rights, injury prevention, privacy. However, what about when those ethical standers merge, in case of an injury and privacy are at odds with one another. For example, if a pilot suffers from mental problems such as depression and they are pressured to hide it from their employer and colleagues because it might risk losing their job. Thus, given the circumstances, the pilot might be aware that they are unsuitable to fly, but they are not obligated to say anything that would risk losing their job, and if the employer allowed them to fly with medications, it would risk the safety of flight. This example raises many questions regarding the ethical standards in human factors, such as would the human factors specialists create a system that notifies the employers if the pilot is visiting a psychiatrist or if there are any decline in their performance or their attitude with their coworkers. Those circumstances force the industry to create a system that would break the ethical code and invade the pilots' privacy which would add more pressure and stress to their work life.

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

This question is very open ended which caused me to ponder it and consider different ways to interpret it. I started by googling the words "human factors" "discipline" and "ethics", from which I read a few articles. In human factors we study how the human body can affect our ability to conduct safe flight. In some circumstances pilots may make potentially unethical piloting decisions due to constraints whether they be deadlines set by the employer or flying while fatigued.

Pilots have a responsibility and a moral duty to uphold safe flying habits and procedures relating to human factors and aviation in general. In my training at Parks College I learned to follow the IM SAFE checklist which helps pilots know if they are fit to fly on a personal level before they even preflight the aircraft.

Ilness- Am I feeling sick?

Mediation- have I taken medicine for the first time today?

Stress- is your personal life stressing you out?

Alcohol- Am I hungover? It is prohibited to drink within 8 hours of a flight

Fatigue- am I exhausted?

Emotion- emotionally stressed?

All these six personal evaluations will influence pilots to make the right on a go /nogo decision on a private or commercial level.

Another ethical consideration in human factors that happens every day is tight flight schedules. Commercial Pilots would not want to cancel a flight too often and put their career and income on the line. This means that the IM SAFE checklist may not be properly adhered to, or corners could be cut on procedures in order to make departure or arrival times. This is a ethical consideration that is a everyday risk. Pilots should always self-evaluate before a flight

Assignment 1 Examples (cont.)

1. Describe a few ethical considerations surrounding human factors discipline (300 word minimum)

When it comes to ethical factors in the context of human factors, I think the best way to begin is with the IMSAFE checklist. While it is always tempting to fly (because we all love flying) and especially for airline pilots who rely on their salary to support themselves and/or their families, we must not put the safety of our passengers in jeopardy if we, pilots, are unfit to operate an aircraft. It is essential that we systematically complete the IMSAFE checklist before making any further decisions about traveling airborne. Perhaps the most important element of this checklist is the last letter "E", which stands for external pressures. As I mentioned earlier in the response, Pilots may feel pressured into flying for several reasons ranging from angry passengers (for commercial pilots) to get thereitis as we sometimes call it around Parks. We must understand that it is dangerous and far too risky to neglect any factor that could impact our performance while operating an aircraft. The IMSAFE checklist serves to provide pilots with a methodical way of analyzing their own human factors. As mental health has become a much more relevant issue in recent years, it is important to know that this applies to everyone including pilots. There is an absolute plethora of things that could impact any human's mental health, which may be family-related or something external like being given bad news from a friend. Any of these things could severely impact the pilot's ability to proficiently operate the aircraft, and every pilot should be very conscious of the many factors that could affect their mental health. Every time I fly, I brief my copilot about limiting distractions especially during taxi, takeoff, and landing. Factors that affect your mental health are distractions and should be treated as so. Along with completing the IMSAFE checklist each pilot should complete a personal mental health analysis prior to flight as well.

Describe a few ethical considerations surrounding the human factors discipline

When faced with ethics in aviation, the first consideration that comes to mind is centered around aspects of ethics that may prevent us from making the right decision. A large part of ethics involves making a choice that will preserve the safety of those around you as well as to maintain a respectful aviation environment. A few moral principles that may govern whether we make the right or wrong choice as pilots is fear, guilt, and self-interest/ convenience to oneself.

When we find ourselves in a difficult situation as pilots, perhaps the weather is below our own personal minimums and ethically we know that the right thing to do to preserve our own safety and even our instructor's safety is to cancel the flight, fear of inconveniencing others may prevent us from acting ethically and remaining honest with ourselves and others. We may fear that our choice to make what we know is the right decision could potentially jeopardize the way others view us as pilots or result in negative consequences to us a pilot canceling a flight.

Similarly, guilt may prevent us from making the ethically right decision. Perhaps we have already canceled two flights this week, and by canceling a third flight, a feeling of guilt arises. This feeling might consist of embarrassment or negative feelings toward ourselves for having lower personal minimums than other pilots. This guilt may result in comparison and we may begin to doubt our decision making skills.

Finally, Self- interest and convenience may prevent pilots from acting ethically, particularly on solo flights. When flying alone on a VFR cross country, the student pilot is aware of the regulations and understands the importance of following them to maintain a safe environment for everyone in the air. When enroute this cross country, the pilot comes across a few clouds that they must descend away from in order to avoid them horizontally. The pilot knows they aren't allowed to fly within 2,000 feet horizontal distance from clouds in VFR flight, however the clouds are so few, they will only pass through them for roughly 10 seconds, and they will not affect the pilots line of sight.

As pilots, there are many times where we are faced with situations where we have the option to break a small rule that nobody will ever find out about to cater to our own convenience. In these situations, it is important to maintain honesty and integrity in order to not let our own self-interest govern our ethical decision making skills. When in the air, it is important to remain honest and fair for the sake of our own safety, but also for the safety of others. When it comes to ethics, there is nothing more important than making it a habit to practice safe and fair flying by following the regulations put in place for us.

Assignment 2 Examples

Describe a few professional considerations surrounding human factors

In my time in aviation, I have come to learn that those who work in the field are some of the most respectful and professional individuals I have met. Pilots, whether on the ground or in the air, are oftentimes always courteous toward one another and maintain a professional environment. Many times, in order to maintain safety and integrity in the aircraft, we rely on personal minimums, FAA regulations, and patience with ourselves and other pilots.

A large aspect of deciding whether or not to fly on a given day is centered around personal minimums and conditions that we are comfortable or not comfortable flying in. Going hand in hand with ethics, it is important to take other pilots' personal minimums into consideration and remain respectful and professional toward them and what they are personally comfortable in to aid in eliminating those feelings of fear or guilt when faced with a difficult decision to make surrounding flying. Remaining professional and respectful toward others' boundaries aids in maintaining those aviation ethics and in maintaining a safe environment where pilots can make the best decision for themselves and their crew without fear of judgment or fear of making the wrong decision.

Aviation is filled with rules and regulations, and from early on in our training we understand the importance of following them for our safety and for the safety of every person around us. Not only is it essential that we follow these rules in a professional manner that upholds the high standards set for pilots, but it is also essential that we respect the time needed for others' to follow these rules. There are many times where there may be an aircraft in front of you who is taking a longer time to get through their engine runup and go through their checklists to ensure that they are comfortable and ready for takeoff. Practicing patience is critical in aviation because when we are patient with other pilots, we are showing them our respect and that we care for their safety. When another pilot takes the time that they need to be comfortable with their aircraft, they will be safe,have the ability to make ethically correct decisions, which in turn allows us to be safe and make smart choices in the air.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

One professional consideration is avoiding stereotypes and assumptions about a person. Not only is it not professional to treat and communicate with someone who may have an intellectual disability, a person who uses a wheelchair, or treating a person differently because they are a female for example. This is regarding not only pilots but also those who work with the pilots and human factors specialists, like mechanics, the aerospace engineers, even the management, marketing, and other sides of the industry. Simply treating people with respect since this is a field that deals with people all the time, from various lifestyles, beginnings, and each person has gone through a different life with various cultures. This is a field that looks at how we, as humans, are similar to each other but also vastly different. You are meant to benefit the client or company you are working with while also doing good for the general populace and humanity.

Another professional consideration is you should know plenty and more than whoever you are working for or your client. Though using that knowledge and information to make the right decision, for example if asked to speak in court you provide credible data/research while being able to tell the value and limitations of it and your own capabilities. This also coincides with not misleading clients, organizations, and any business. For example a new researcher is looking at the UX design of a new flight simulator, while communicating with pilots you would treat each one with respect, understanding their capabilities and accurately applying your own capabilities while doing research and knowing when to ask for their recommendations with your own observations. This is even related to confidentiality, when taking down research doing so with the agreement of the participant. Unless it is public behavior, the pilots need to explicitly agree to the recording of any data. In the previous question there was mention of where the line of confidentiality for adapting technology to the user, like pilot to plane, user to phone, and so forth. Yet when in the preliminary development phase confidentiality is very important but what about after that.

Assignment 2 Examples (cont.)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

I believe that professional and ethical overlap quite a lot in aviation, in particular the concepts of fairness, honesty, and remaining non-biased. But professionalism in human factors goes beyond just behaving ethically, it also branches into the ideas of procedure, obligation, and legality. The simplest of all of those ideas is legality, to be a professional in anything requires that we follow the law, even when we disagree with it we must follow the law, though this does play a seemingly small role in human factors investigations it still vital that we follow them to the ledger to get the most out of the investigation.

Obligation is where professionalism gets complicated, above all else we must be obligated to the truth and the continued safety of air travel. Human Factors plays a massive role in the world of aviation in the end human beings are running and monitoring the systems in place to ensure safe, quick, and effective functioning of both general and professional aviation. As pilots we are obligated to many things, but as humans we are obligated to our human factors to monitoring our fellow pilots, ourselves, and to above all else the truth of our flaws. To ignore those obligations to the human factors involved in aviation would be to open ourselves and our passengers up to considerable risk some of which by the time we sense a problem it may be too late. This why our obligation to human factors is a constant in aviation one that only can be upheld in the system if all persons in the system are vigilant for the variety of symptoms that can display no matter how seemingly insignificant.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

Professionalism is an essential part of the global air transportation industry not only in regard to customer service, but decision making as well. Across the industry, professionalism includes doing everything correctly and procedurally, in turn, relating to human factors. Human factors directly correlate to the professional considerations within aviation because decision making is essential not only in the cockpit, but across multiple disciplines that go into making scheduled airlines service successful. Specifically, one professional consideration that surrounds human factors would be decision making, including, the pilot deciding whether they can safely complete the flight. I think that this question can closely relate to the previous because professional and ethical considerations can go hand in hand within the human factors discipline. This dilemma can tie into both ethical and professional considerations because as a pilot, you should know the limitations of yourself to conduct a flight, and as the pilot, if you know that you are not in a good position to fly, the safety of the passengers in influenced, therefore becoming an ethical situation. Continuing with this idea, not necessarily related to commercial aviation, but as student pilots, a consideration when flying in the IFR environment can be personal minimums. As a new instrument pilot, would you want to go fly on a low IFR day where you would break out on an approach at minimums as prescribed in the approach chart? A big part of professional considerations, relating to human factors, revolves around the idea of limitations as pilots. As a pilot, being a professional involves knowing the limitations of yourself and the aircraft that you are flying, and it comes down to decision making which influences the human factors chain, ultimately increasing the chances of an accident derived from human error. In all, professional considerations and ethical dilemmas in human factors are very closely related. In an essential industry such as air transport, it is essential to understand how you as the pilot function in the human factors tree in order to make both professional and ethical decisions.

SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment assessment evidence.

ASCI 4050 Human Factors Assignment 3 Name:_____

Hi everyone,

As a reminder, I am traveling on an accreditation visit next Monday, November 14th. Consequently, we will not have class. Rather than having class, I am giving this assignment in place of class. This assignment will contribute to your homework grade (15% of your total grade). This assignment must be uploaded to Canvas no later than Wednesday, November 16th by the end of the day.

In class, we discussed the notion of Individual Differences. In high-consequences operations we will engage people of diverse experience, backgrounds, and cultures. People are different and that difference is a strength. Diversity provides a distinct advantage to the team as diversity allows individuals to bring a different perspective and skillset to a problem.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

ASCI 4050 – Human Factors
Paper Assignment
Fall 2022

As a group of 3 (or 2), please prepare a paper indicating your collective thoughts on why an understanding of Human Factors is important in the aviation environment. Include a discussion of a few respiratory, visual, and hearing issues that are likely to influence human error and performance in both pilots and aviation managers.

The paper should be formatted in APA style and include:

- A minimum of five inline citations
- A minimum of five references
- Appropriate spelling, grammar and sentence mechanics
- A cover page (APA style) (1-page)
- An abstract (very short) (1-page)
- 5 -6 pages of content
- One reference page (1-page)
- Total length approximately 8-9 pages

The purpose of the assignment is to demonstrate your familiarity with several Human Factors hazards while utilizing the APA writing style (APA) and practicing parsimonious writing skills.

Here is a very basic rubric I will use to evaluate your papers.

Characteristics	More points ----------		-----------Less points
Length	8 to 9 Pages	6 to 7 pages	Less than 6 pages
APA	Good use of APA	Some use of APA	No use of APA
Citations	5 or more inline citations	Less than 5 inline citations	Less than 3 inline citations
Reference	5 or more references	Less than 5 references	Less than 3 references
Spelling Grammar & Sentence Mechanics	Strong use	Some use	Minimal use
Cover Page	Included and formatted properly	Included but not formatted properly	No cover page
Abstract	Concise but informative	Long or uninformative	No abstract
Essay Content	5 – 6 pages, strong content	Less than 5 or more than 6 pages or poor content	Less than 4 or more 7 pages of poor content
Essay Quality	Informative	Less than informative	Incoherent
Writing	Technical/university level	Weak university level	Not university level
Topic Appropriateness	Appropriate and comprehensive topics	Less than comprehensive or less than appropriate content	Weak content and/or inappropriate
Reference Page Formatting	All references are properly formatted (APA)	Some references are properly formatted (APA)	Few references are properly formatted (APA)

Papers must be saved in Microsoft Word and uploaded to Canvas no later than December 9th, 2022 at midnight.

Homework 3 Examples

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The first strategy I will employ is being open to all disciplines and cultures and their differences. People work better when they feel their similarities and differences are accepted, respected, and valued. It will be crucial to me that I embrace all the cultures and values of the diverse and multi-disciplinary teams and make an effort to make people feel comfortable and learn about their way of life for improved interactions. Another strategy I will use to reduce differences between multi-disciplinary and diverse teams for effective work is having good communication skills. Any team works better when there is open and honest communication. How everyone in the group communicates with each other will influence how well they work together and the team's productivity. There needs to be open communication across diverse and multi-disciplinary teams. This way, people can talk about difficult and complicated situations and issues. It is vital that team members are encouraged to communicate effectively and respectfully, as everyone needs to feel like their voice is being heard. Minimizing miscommunication will ensure that there is reduced conflict across the team. To achieve effective communication, people will need to learn how to listen attentively and seek clarification in case of any issue or misunderstanding. Different cultures and disciplines also have different communication styles, so I will accept, understand and respect how diverse people communicate to have an effective team. Further, I will try to avoid stereotyping and prejudice to work effectively with multi-disciplinary and diverse teams. When people are unfairly divided into groups and assigned unfair characteristics, it can affect how they work and interact with others. Therefore, I will accept that diverse people have different and unique working styles and preferences, which does not make them less important or productive. To work effectively, I will improve my conflict management skills. I will consider conflict management training for myself and the rest of the team. With good conflict management, the team will be able to work effectively.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Despite belonging to diverse expertise, disciplines, and backgrounds, teammates need to feel like they are part of the group or community. To achieve effective communication in a diverse group, I should be able to share and exchange ideas respectfully so that everyone can understand each other. I will be open and inclusive to other cultures to ensure effective communication. Every team member's language and communication culture must be respected. Communication needs to accommodate everyone's needs and not just the needs of those in the majority language. Openness and inclusivity in communication will help create trustworthy relationships where people feel comfortable enough to share their ideas with the rest of the team. To appreciate diversity, especially in communication, I will learn about the unique communication styles of diverse groups to promote effective communication. I will use clear and concise language to communicate effectively with people from diverse backgrounds. Keeping my language clear and straightforward ensures that no meaning is lost in interpretation and that my audience can receive the message exactly how I intended it to be received. Paraphrasing my words and asking the team if they understand my message will ensure the communication is clear and effective. Repeating the message help improve communication as I can clarify what I am saying and therefore eliminate misunderstandings. Body language is also very important in oral communication; therefore, I will make an effort to understand the differences in body language for each diverse group. Feedback is critical in ensuring effective communication. Providing and receiving constructive and honest feedback will be critical in my communication. Feedback will make people be sure that their voice is heard and respected and will therefore encourage people to communicate more openly. Most importantly, it can be challenging to know exactly how to communicate with people who are different from you in one way or the other. I will therefore take diversity training which will ensure that a diverse team can communicate effectively with each other

Homework 3 Examples (cont.)

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The importance of understanding individual differences within any environment, yet alone a high consequence one, is paramount when seeking to further know how a team functions as a whole. In looking at how to address the individuality of each member involved, I believe the most effective strategy in helping coordinate such forces would be communication. In many environments, co-workers will often work alongside each other, not only on their own projects but on one major task as a goal. For example, myself and my fellow interns at Garmin (a pretty small gap diversely) all have our separate functions whilst focusing on the same geographic area and working on the same geographic file. While we each have our own separate responsibilities regarding such, we all have to remain in clear communication with each other and other folks in the department to make sure that we are effectively doing our assigned work without overlapping or stepping onto anyone else's toes. In doing so, we help to promote a work environment that enables us each to assist each other when we have any issues or questions that may arise. This includes a larger portion of people, not only within our own offices, but that of Garmin's Corporate offices, as well as any remote employees as well. Our work environment is filled with hundreds of thousands of very diverse groups and skill sets that come together to help develop products in the name of a greater goal. It helps in managing any Human Resource issues(should they arise) and establishes a better understanding of who we are within a larger workforce. Communication is also paramount in highly-diverse things when everything is going right. Teams that communicate well with each other will not only improve productivity in the office, but it also stands to make a work environment more pleasant for everyone involved. In having a well-functioning team communicate, a door opens to a safer, friendlier, and more productive work environment.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Effective communication is paramount to a high-functioning team. Ensuring the development and implementation of this process is something that numerous companies have used worldwide in order to help the cohesive teamwork abound in their fields of work. Effective communication must first begin with respect, from co-worker to co-worker, and even from CEO to the lowest new-hires of an establishment. In garnering and fostering respect for one's peers (especially within a work environment) a person gains better understanding in how their co-workers might function differently from them. For example, in my previous field of work (largely customer service), my ability to understand how each of my managers (I was under four managers, two of which owned and operated the waterpark/campground) approached a situation in which a customer was being difficult. For some of my team-members, they largely avoided conflict in the way that they would place blame on another department, another worker, etc. (IE "BLANK didn't properly charge the golf-cart," etc. etc.) whilst others would directly place the blame on themselves (even if it was not directly related to them) so they could resolve an issue with a customer without interference. After having to work with a difficult employee, then, each of these individuals would gather to speak on the issue they were presented with, and (depending upon what type of mishap took place that day) would gather multiple departments as a whole to discuss new ways to prevent similar situations from happening again. In doing so, they fostered a relationship with their employees that would not only call out issues in the system, but also attempt to resolve them. How does this, then, relate to the individuality of each person involved? It gives everyone across departments, each with our own experience and backgrounds in numerous fields (technology, lifeguarding, customer service, food service, etc) an equal voice when speaking to our bosses. The respect established in each member of a team leads to a team that is highly communicative, and thus, a much more high-functioning one.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

There are a lot of strategies that I think I can employ to work effectively on a multi-disciplinary and diverse team. A couple of the strategies that I can implement is know your role in the company, be open minded, and be able to work as a team.

Starting with the first strategy of knowing your role in the company. This is important for one main reason the first being, so you don't fail in a project and not to waste any precious resources. This is most prominent in the aviation industry when things are being done by the proper people in the flight deck or on the ground. A perfect example would be in the Tenerife accident when the KLM pilot was doing the pre-checks and because the captain being that he was a higher up in the company he didn't know the proper flows and glanced and forgot crucial steps in the checklist that should have been done by the First Officer.

The second strategy that I can employ to work is to be open minded. This is self-explanatory but listen and be respectful of other people ideas. Being able to have meetings, discussions and brainstorming are key aspects to success. This can be found in aviation a lot of the time in flight training, but really any point in your pilot career. Humans aren't perfect so we are going to make mistakes and there is going to be someone there to critique your work so being able to be open to what they are teaching you is crucial so you can become a successful aviator.

The third strategy relates back to the first two strategies that I have briefed on and that is being able to work on a team. Working on a team is so crucial in aviation, no matter what side of aviation you are working on. In the airplane you need to be able to rely on your first officer or captain or flight instructor to help you fly the plane. In commercial aviation you can't do it all yourself you need someone flying the plane and then another person helping monitor and work the radios to allow your flights to be successful and more importantly safe for the passengers.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

In diverse teams, with members who have different levels of capabilities, knowledge, expertise, and backgrounds, I will keep in mind of these differences in my peers to ensure effective communication. I will express my ideas clearly and consciously so all members of the team are on the same page as me, and can understand the task at hand, and how I feel. I will advocate for myself and my ideas in team meetings through verbal communication, additionally, other modes of communication can be used like emails and professional messaging sites. I will consistently send out emails of important tasks or goals that I would like the team to meet as a whole. By using these written communication methods, I will enhance my verbal communication by having my ideas and goals known and able to look back on, them so I can keep myself accountable for them. I will ensure that the members of my team understand what I am trying to say by asking to follow-up questions and interacting with my peers. Since I might be discussing information that requires background knowledge, this is crucial to ensure that all members, no matter their skill set, understand what I am trying to communicate. Another part of communication is listening. Effective listening is very important in any team, and with diverse members, listening can help share ideas and enhance the team dynamic. Body language is another important factor for effective communication, and I will make sure my body language aligns with what I am trying to communicate. I want to be sure that I make proper eye contact and other appropriate body language so I convey the right message to the team member, in whom I am talking with. In conclusion, I will utilize effective communication techniques so that the diverse members of my team can understand me and feel heard.

Paper Examples

Human Factors in the Aviation Environment

Savannah Baker, Noah Hanson, Mallory Machala

Department of Aviation Science, Saint Louis University

ASCI 4050: Human Factors

Professor Terrance Kelly

December 9, 2022

While understanding the numerous factors that impact a person's performance within a Human Factors system, it's also essential that we address a flaw within the human condition, preventative issues. In discussing these flaws of the human body, we are able to locate and address the most main problem of the human factors system: the human. Within this paper, we address "real life" examples of these systems in action, causing us to not only further notice the impact of aeromedical factors within a complex system like the ones in the aviation field through the lens of the pilot, passenger, and aeromedical crew, but also so that we can utilize the knowledge gathered from these instances to prevent similar events from taking place in the future. We discuss the effects of bright lights and how they affect our eyes which include our rods and cones. The study by Tony Wright about our hearing and altitudes. Lastly, about gravity and the effects it has on our respiratory system. We go in depth about what we have been taught throughout this course about human factors and how we have understood what has been discussed.

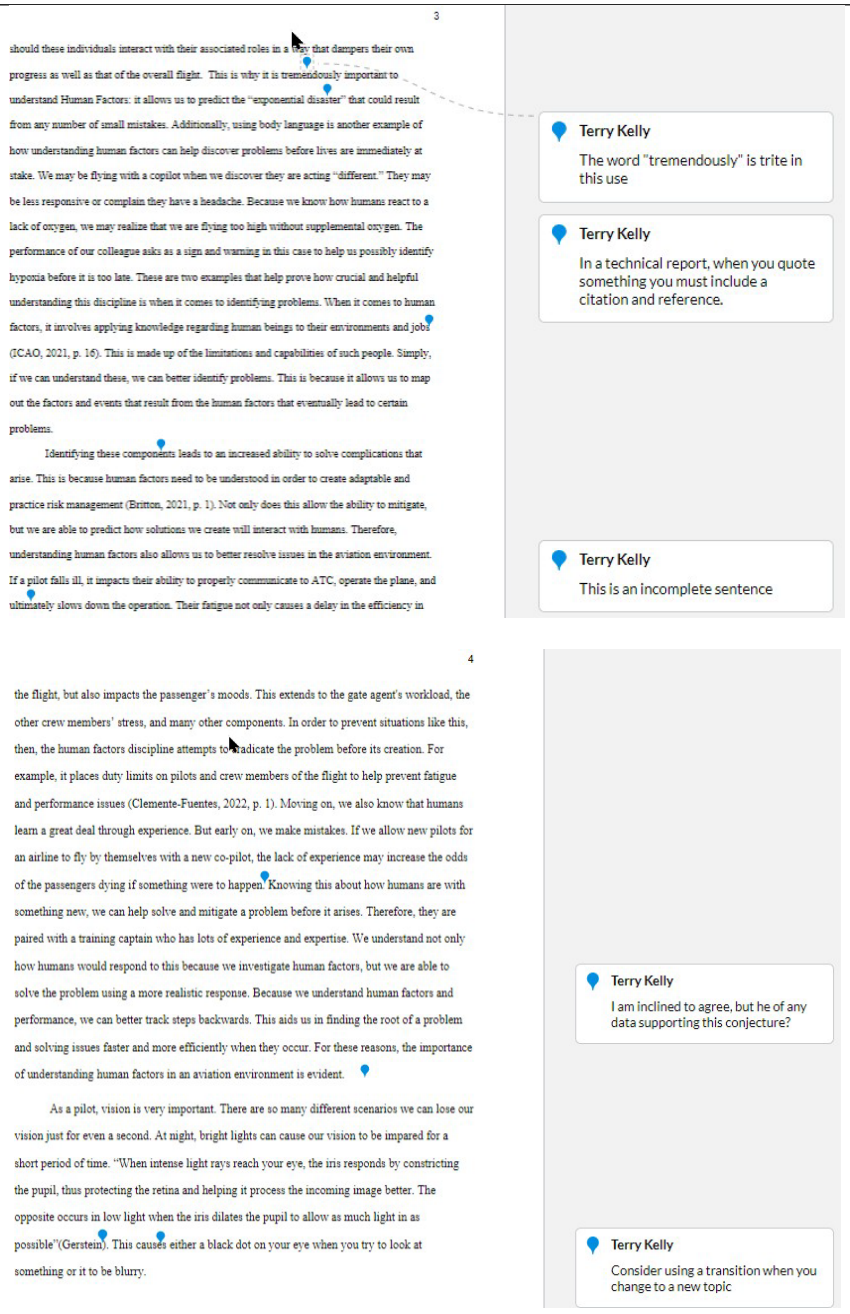
When it comes to the aviation environment, understanding human factors is critical. In fact, according to Boeing, human error contributes to 80 percent of aircraft accidents (Rankin, 2008, p. 1). With this knowledge, we as individuals, as well as a society, can become better at identifying problems through improving our awareness. In turn, this betters our ability to solve issues that arise–an imperative goal in a high-consequence setting. To begin, in this environment, there is very little room for error. For example, a pilot's overarching goal is, put simply, to get a plane and its occupants from one place to another in a safe and efficient manner. This task is broken up into smaller tasks, such as pre-flighting the plane, talking to ATC, engaging the autopilot, landing, etc. In delving into these smaller tasks there is one common denominator: the individuals performing these duties. This creates an exponentially huge potential for disaster,

Terry Kelly
I don't really understand the sentence.

Terry Kelly
Leave words like "lastly" out, they tend to be trite. It's one of the differences between technical and creative writing.

Terry Kelly
Always include the year any resource was published.

Paper Examples (cont.)



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should these individuals interact with their associated roles in a way that dampers their own progress as well as that of the overall flight. This is why it is tremendously important to understand Human Factors: it allows us to predict the "exponential disaster" that could result from any number of small mistakes. Additionally, using body language is another example of how understanding human factors can help discover problems before lives are immediately at stake. We may be flying with a copilot when we discover they are acting "different." They may be less responsive or complain they have a headache. Because we know how humans react to a lack of oxygen, we may realize that we are flying too high without supplemental oxygen. The performance of our colleague asks as a sign and warning in this case to help us possibly identify hypoxia before it is too late. These are two examples that help prove how crucial and helpful understanding this discipline is when it comes to identifying problems. When it comes to human factors, it involves applying knowledge regarding human beings to their environments and jobs (ICAO, 2021, p. 16). This is made up of the limitations and capabilities of such people. Simply, if we can understand these, we can better identify problems. This is because it allows us to map out the factors and events that result from the human factors that eventually lead to certain problems.

Identifying these components leads to an increased ability to solve complications that arise. This is because human factors need to be understood in order to create adaptable and practice risk management (Britton, 2021, p. 1). Not only does this allow the ability to mitigate, but we are able to predict how solutions we create will interact with humans. Therefore, understanding human factors also allows us to better resolve issues in the aviation environment. If a pilot falls ill, it impacts their ability to properly communicate to ATC, operate the plane, and ultimately slows down the operation. Their fatigue not only causes a delay in the efficiency in

Terry Kelly
The word "tremendously" is trite in this use

Terry Kelly
In a technical report, when you quote something you must include a citation and reference.

Terry Kelly
This is an incomplete sentence

4

the flight, but also impacts the passenger's moods. This extends to the gate agent's workload, the other crew members' stress, and many other components. In order to prevent situations like this, then, the human factors discipline attempts to eradicate the problem before its creation. For example, it places duty limits on pilots and crew members of the flight to help prevent fatigue and performance issues (Clemente-Fuentes, 2022, p. 1). Moving on, we also know that humans learn a great deal through experience. But early on, we make mistakes. If we allow new pilots for an airline to fly by themselves with a new co-pilot, the lack of experience may increase the odds of the passengers dying if something were to happen. Knowing this about how humans are with something new, we can help solve and mitigate a problem before it arises. Therefore, they are paired with a training captain who has lots of experience and expertise. We understand not only how humans would respond to this because we investigate human factors, but we are able to solve the problem using a more realistic response. Because we understand human factors and performance, we can better track steps backwards. This aids us in finding the root of a problem and solving issues faster and more efficiently when they occur. For these reasons, the importance of understanding human factors in an aviation environment is evident.

As a pilot, vision is very important. There are so many different scenarios we can lose our vision just for even a second. At night, bright lights can cause our vision to be impared for a short period of time. "When intense light rays reach your eye, the iris responds by constricting the pupil, thus protecting the retina and helping it process the incoming image better. The opposite occurs in low light when the iris dilates the pupil to allow as much light in as possible"(Gerstein). This causes either a black dot on your eye when you try to look at something or it to be blurry.

Terry Kelly
I am inclined to agree, but he of any data supporting this conjecture?

Terry Kelly
Consider using a transition when you change to a new topic

At night, many pilots use certain flashlights so their eyes do not get messed up. Most flashlights that are used have a red light on it. A red light is non glaring and doesn't affect how we see. They are in some cockpits as well. It makes it possible to read maps and charts. There are also dimmer yellow lights that are not as bright as a strong white light. The FAA informs us that we should not look directly at a bright light. "After the eyes are adapted to the darkness, avoid exposing them for more than one second to any bright white light as that causes temporary blindness"(FAA 10-2). This affects many pilots and can cause pilots to crash or fly off course leading to many other challenges. Our vision can be affected in many other ways. We all have different types of vision and how our eyes work, but with these effects, we all experience them. Our vision is so important. Vision is also affected when we directly enter darkness from a bright room called "dark adaptation"(Cooper). When a pilot is going to preflight and get ready to fly, they have to make sure their vision is adjusted so they see everything correctly and don't miss a step. Vision plays a huge role for pilots, because any error can cause a fatal accident.

In inspecting the numerous factors that affect a person's performance within a Human Factors system, it is also essential that we address a permanent imperfection within the human condition: medical complications. In discussing these imperative facets of the human body, we are able to identify and address the most central facet of the human factors system: the human. Within this paper, we address"real life" examples of these systems in action, causing us to not only further dissect the impact of aeromedical factors within a complex system (such as the ones found in these aeronautical settings) through the lens of pilot, passenger, and aeromedical crew, but also so that we can utilize the knowledge gathered from these instances to prevent similar events from taking place in the future.

Terry Kelly
"messed up" is a bit casual for a technical report

Terry Kelly
As well as what?

Terry Kelly
What does "and how our eyes work" mean in this context?

Terry Kelly
The word "huge" in this context is a bit informal for a technical report

Terry Kelly
Imperative facets?

From large-scale productions of "Top Gun" to those actually serving in the United States Armed Forces, military aviation has been a long-standing fascination of the American general public. Whether on-screen or in real life, military aviators have faced nearly impeccable odds: stress, high-performance expectations, numerous (and often extreme) levels of danger, and even the physical complications involved with piloting some of the fastest, deadliest, and overall most aerodynamic planes throughout history.

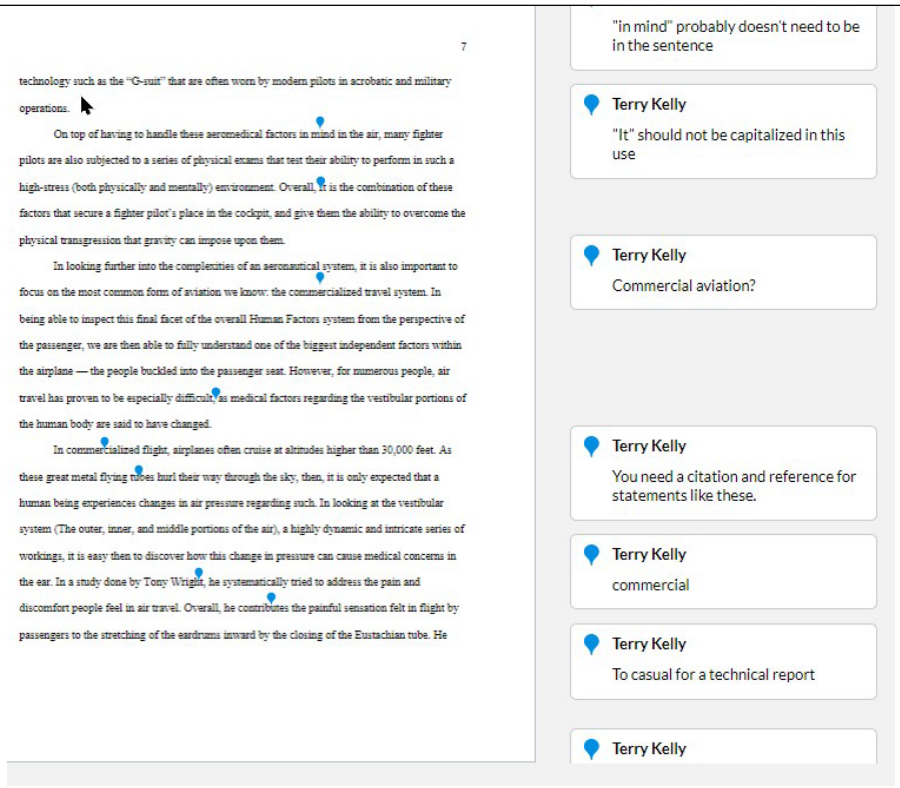
So, how does a human body adjust to the high-intensity environment within the cockpit of an F-15? From the moment every fighter pilot (or person in general) is born, we are faced with one persistent force: gravity. In flight, however, this force is largely accelerated. In an effect known as "pulling G's" (named for the gravity-like force imposed on the human body throughout high-speed acrobatic flight), pilots are able to make extreme acceleration and decelerations in flight that are much more excessive than the 1G their bodies are accustomed to on the ground.

So what physiological impact does this have on a fighter pilot, or, more specifically, their lungs. Depending on the type of G-force the pilot is experiencing, the heart and cardiovascular system are required to respond quickly and efficiently to keep blood flowing to the brain in order to maintain consciousness. ("Acceleration in Aviation; G Force", Faa.gov). In specifically addressing the lungs, a fighter pilot has to train so that the force of the weight does not stop them from breathing and receiving that mandatory blood-oxygen flow to their brain. The pilot must also be sure to have the property recovery time between pulling an appropriate amount of G's, as the lungs also have a necessary "recovery rate" in order to help redirect the body into maintaining a once-again homeostatic environment. There have also been numerous advances in

Terry Kelly
What do you mean by "impeccable" in this context

Terry Kelly
It may be accelerated.

Terry Kelly
Faa should be FAA. Include the year of any publication in the citation.



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technology such as the "G-suit" that are often worn by modern pilots in acrobatic and military operations.

On top of having to handle these aeromedical factors in mind in the air, many fighter pilots are also subjected to a series of physical exams that test their ability to perform in such a high-stress (both physically and mentally) environment. Overall, it is the combination of these factors that secure a fighter pilot's place in the cockpit, and give them the ability to overcome the physical transgression that gravity can impose upon them.

In looking further into the complexities of an aeronautical system, it is also important to focus on the most common form of aviation we know: the commercialized travel system. In being able to inspect this final facet of the overall Human Factors system from the perspective of the passenger, we are then able to fully understand one of the biggest independent factors within the airplane — the people buckled into the passenger seat. However, for numerous people, air travel has proven to be especially difficult, as medical factors regarding the vestibular portions of the human body are said to have changed.

In commercialized flight, airplanes often cruise at altitudes higher than 30,000 feet. As these great metal flying tubes hurl their way through the sky, then, it is only expected that a human being experiences changes in air pressure regarding such. In looking at the vestibular system (The outer, inner, and middle portions of the air), a highly dynamic and intricate series of workings, it is easy then to discover how this change in pressure can cause medical concerns in the ear. In a study done by Tony Wright, he systematically tried to address the pain and discomfort people feel in air travel. Overall, he contributes the painful sensation felt in flight by passengers to the stretching of the eardrums inward by the closing of the Eustachian tube. He

"in mind" probably doesn't need to be in the sentence

Terry Kelly
"It" should not be capitalized in this use

Terry Kelly
Commercial aviation?

Terry Kelly
You need a citation and reference for statements like these.

Terry Kelly
commercial

Terry Kelly
To casual for a technical report

Terry Kelly

8

states specifically that it is the "critical closing pressure" ("Middle Ear Pain and Trauma During Air Travel, Tony Wright) in the eardrum that causes such pain.

Overall, Professor Wright found that this pain can not be avoided completely, however, most individuals, after a few different experiences with air travel, are able to better accommodate for it through FDA-approved medicine. This part of the human factors system, while not as critical to the flight as the physiology of the pilot, is an extremely important facet of the overall ecosystem of the flight world.

In discussing these factors, we hope to not only have summarized and presented examples of Human Factors (including the niche of aeromedical portions of human factors) but to have also utilized and expressed this knowledge so as to emphasize the importance of every individual as well as their roles in the Human Factors system.

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Human Factors Short Paper

Parks College of engineering, aviation, and technology

Sebastian Conklin, Marisa Warren, and Jack Liu

ASCI 4050: Human Factors

Dr. Terry Kelly

December 9, 2022

Abstract

As we have learned in this class, about 80% of aircraft accidents are a result of human factors. It is a fact that as humans, we are not perfect and make mistakes. Flying, however, is a high-consequence environment, making it essential to understand our personal limitations as pilots, perhaps even more so than understanding the limitations of our aircraft. By diving deeply into aircraft systems during flight training, we can prepare for an emergency, should one occur. In many cases, we must make an emergency landing or divert to another airport due to a malfunction with our aircraft. It is less natural to think that our bodies could malfunction in the same way a machine does, this is the reason we learn human factors - to understand how our bodies work and are able to identify any bodily malfunctions.

Throughout this course, we focused on the respiratory, visual, and vestibular systems. We dove deeply into the respiratory system learning the biological process of breathing in detail, gathered a thorough understanding of how the human eyes work, and studied the vestibular system to understand the biological foundation of spatial disorientation. Each of these human factors issues that we discussed can confuse the pilot in command; each of these issues can lead to a fatal aircraft accident despite a perfectly functioning aircraft. Without an understanding of human factors, we become very vulnerable to pilot error as a result of our own misperceptions. It is essential for pilots to understand how our ability to perceive can be misled or deceived, and that knowledge can only come from understanding the biological processes that lead us to it. In understanding the respiratory system, we learn what causes hypoxia and how to detect its presence in experiencing symptoms. We learn about the human eye to understand visual illusions, the blind spot, and other misperceptions. Lastly, understanding the vestibular system teaches us the causes of spatial disorientation.

Terry Kelly
Excellent opening

Terry Kelly
I hope it's not too many

The first system I would like to discuss is the respiratory system. The respiratory system enables the exchange of gases between the air and our blood bringing oxygen to our blood cells, which are then carried to all parts of the body. In greater detail, air is drawn into the lungs in order to extract oxygen from the air. Oxygen travels through tiny blood vessels in the lungs called alveoli. The alveoli allow oxygen molecules to enter the blood. The oxygen molecules are then distributed to all the cells in the body. When oxygen is metabolized by the body, carbon dioxide is released into the blood. Carbon dioxide waste is carried back to the lungs, where it is exhaled back into the air.

The biggest human factors issue that stems from our respiratory system is hypoxia. According to the Federal Aviation Administration (FAA), "hypoxia is just one of the physiological problems that can impair pilots if they are not aware of the effects of decreased oxygen pressure at altitude" (Boshers, 2015). There are many different kinds of hypoxia. Hypoxic hypoxia is a result of a lack of sufficient oxygen in the air for humans. When there is a lack of oxygen, humans begin to experience hypoxic hypoxia, which is recognized through a variety of symptoms. Simply put, hypoxic hypoxia occurs when the cabin altitude is too high for humans to breathe. In this case, it is an example of a human limitation that occurs when the aircraft can still operate normally. Although a human might experience hypoxia at a high altitude, the plane should be able to fly as it always does (assuming the altitude is below the maximum ceiling and there is ample fuel). This is true for almost all human factors issues we have studied, as well as for all other kinds of hypoxia. If a person loses circulation in a limb (stagnant hypoxia), if their body is physically unable to absorb enough oxygen (histotoxic hypoxia), or if their body cannot carry the oxygen throughout the body (anemic hypoxia), the aircraft should still operate normally. Nonetheless, an unconscious pilot could unintentionally fly

Terry Kelly
When writing a technical report, try to write in the third person

Terry Kelly
Good details, well-written

Terry Kelly
Good use of the quote

the aircraft into the ground, resulting in a horribly tragic event. It is essential to recognize that

limnli.tiom cm

general aviation capabilities, military pilots especially have to be aware of respiratory human factors. Due to the excessive stress they experience when pulling high G-forces, they are trained to master the correct methods of pressurized breathing and anti-stress movements. This requires

semester but proves why all pilots must have a thorough understanding of human factors.

The two main functions of the ear are hearing and balance. There are three main parts of our ear: first is the outer ear, which is the visible part consisting of ridged cartilage and skin. Secondly, the middle ear, which transfers sound vibrations from your eardrum to the inner ear via three tiny bones, which are called the ossicles. Also, this section of the ear aids in equalizing the air pressure in our ears. The last section is the inner ear. Within the inner ear, there are two parts: the cochlea and the semicircular canal. They are responsible for sending sound and balance information to the brain through electrical impulses, respectively.

Humans perceive sound when sound waves enter the ear canal and vibrate the eardrum.

where the vibrations are turned into neural signals. The nerve fibers in our brain translate that into sound. In regards to balance, there are fluid and hair-like sensors in our semicircular canals. The fluid moves around as we change our orientation and the hairs deliver that information to

Being around operating airplanes and helicopters is extremely noisy. There are a magnitude of effects on the ear due to noise exposure, one being noise-induced hearing loss

stability of the vestibular system. If the Eustachian tube cannot be adjusted and opened quickly during the dive, jump, and rapid descent, the pressure inside and outside the tympanic cavity will

aerobatic stunts. Positive and negative air pressure will cause congestion and edema of the

photons traveling through the atmosphere. For further context, photons are essentially light. The light reflects off of other objects and is then directed to our eyes where it enters through our

amount of light it is receiving. If the eye is receiving too much light the pupil will become

enters the eye is reflected off of the retina, which is located on the interior perimeter of the eye.

The light in the retina is eventually directed to the optic nerve where the perception of vision is

As we have already discussed, are senses are not perfect. Alicja from flight time explains it perfectly explaining that "we are governed by the messages our body is sending to our brain" (Alicja, 2013). There are many illusions that may occur while acting as a pilot in command,

- Terry Kelly

  Nice job discussing d i ffe rent forms of hypoxia

- Terry Kelly

  Try to wr it e a t ransition w hen moving to a new section

- Terry Kelly

  Again, w ell writt en,

' Te rry Ke yll

T ry to write in third person in a t echnira l repor t

Illfil<liYi.!..l'JEiam, s!fil : =:II aE l-:and spot in your eye all contribute to deceiving your perception. When approaching a runway on final, the runway could appear further beneath the plane than it truly is (wider runway), or closer to the plane than it truly is (narrower runway). E!.e;p 2:t i:i:-eiy, tl:= = "' illnti.:11:E _ - _ = rumi. ::;_ Toe pil ot n:.u,-t be ec.tirely ... f.mn i:l.1::i1dr9> ::---?'!E: - .:: :ftl:c is ;,:E-ir.cil by his/her perception and believes they are lower than they truly are they could flare too early stalling the plane not far above the runway; and if they believe they higher than they truly are they may not flare at all, which could cause a prop strike. While these examples provide dangers during landing, there are also altitude illusions pilots may experience when spotting another plane in the sky. As we discussed in class, you could accidentally perceive an aircraft at an altitude above you even though you are flying at the same altitude, and as p.m!Ei fly -. er to each other the plane will appear to descend from its higher altitude to your altitude. Falling 'i,ictimta IUI iil.lu:fun liB::tti:.. oo r-=. i::i. ly crash, or (if you are lucky) a frightening near miss. While these human factors examples result from a misperception, another human factors problem that comes from the biological construction of the human eye is the blind spot. Due to an area in your field of vision that corresponds to a part of your retina that is blocked by the optic nerve, your eye creates a blind spot by using surrounding details to interpolate what exists in that blind spot. Your eye working along with your brain essentially tries to fill in the blank to match what the surrounding environment looks like.

This paper would be incomplete without mentioning spatial disorientation. Spatial da:l ..!1:ll-!• comes from a lack of visual references confusing the i?:tt0 is ill oOlll.e other!=a fli an mfttrd tl!;;nh: E. ::n order to avoid sp <llili!riE!r,t. rtlDn, fu ,; pilot mlli"1 r,, - n tll-= c:.dicmfum I r - s 5:= the instruments inside the cockpit. However, it is not always that easy to do when your senses are telling you something different than what you actually feel. 37% of general aviation accidents are due to spatial disorientation and 80% of th.o.e art: tl:.ral Tl!cs:: ... -=llltfng Cl rh-: di:7lll;."ii:on of a n... a:!i:!ri pex: :i:E l:y fil -th -:l C63o f fil=- A.ccord:i.n::!oo iim,SKJ:1:r.rri, E:m.r=!Jb:ef31 :fun.o:imt.in.E

-r,.""E;i:, hwar "':l'a'.!!"' (S KYl:r- '). ff lmi!l!!!od::.3- 11arroc5E!l.::sdsaEE:aiintmE: paper, spatial disorientation can cause an accident when both the plane and the pilot are operating normally, not just the plane. The vestibular system has 3 semicircular canals, which are all filled with fluid. The purpose of these canals is to determine pitch, yaw, and roll !!!:011:l:l:l!=.-!!.E Mllc:h :E ::f,,:, ifu:i:l!!Di-e:rtnm: e::ir:f! a;nal Sp-atisl di.:ori O!1. from a biological view occurs when the plane is in one motion for an elongated period of time.

TlE 11:irid r. in co"...:::?r.isl p;Ei!::m:i l!:l cz:rl m:i:. 1E'P'.Jm:fr.: E h!B returned to equilibrium. For example, if a plane is in a turn for a period of about 7 seconds or too: , the equilibrim:l will ra::omd:::""}'!E !rilal!m!.. ..!Jl of mF:θ i:.7Je. i:fuuu rne !lild2..:3d di:ae-ed iniflE ::.re D!..llLaD malfunctions that can cause a plane to crash. By studying these issues, we learn how to identify our O'i't'.Lbooi.Wy -:tia!E cm::mlt!la!lro --a:;a ii Gf ll E lletro

Terry Kelly

Make sure to include the year in any ci tat ion

say that we must understand our bodies in the same way we understand our aircraft. Without an

Ulllf, a, ofhm:!im:Slct.!!:iue l◊<.e rop;3 coiam:::raft a

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SLO 1: Conduct aviation operations in a professional, safe, and efficient manner assessment evidence.

ASCI 4050 Human Factors Assignment 1 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

Rather than having class, I have placed two assignments in the Modules folder in Canvas. One to cover Monday's class and the second to cover Wednesday's class. Rather than contributing to the homework average, each assignment has the potential to add 5-points to a test grade (for a total of 10-points).

The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

ASCI 4050 Human Factors Assignment 2 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

Rather than having class, I have placed two assignments in the Modules folder in Canvas. One to cover Monday's class and the second to cover Wednesday's class. Rather than contributing to the homework average, each assignment has the potential to add 5-points to a test grade (for a total of 10-points).

The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe how an understanding of human performance (human factors) will help you better identify problems in the high-consequence environment. (300 word minimum)

2. Describe how an understanding of human performance (human factors) will help you better solve problems in the high-consequence environment. (300 word minimum)

Assignment 1 Examples

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

1- The ethical considerations that the discipline of human factors consists of the right and wrong that humans are ought to do, in terms of rights, respect for people, beneficence, justice and fairness. To ensure that the human factor discipline meet those ethics standards, it must provide privacy and safety for those who are affected by the system. In addition, loyalty, compassion, and honesty are among the other moral values that are encouraged by ethical standards. Additionally, ethical standards cover rights such as privacy, the right to be free from harm, and the right to life. These standards are suitable ethical standards since they are based on consistent and solid justifications. Therefore, a human factors specialist should not possess any issues with normative ethics such as obligations, rights, injury prevention, privacy. However, what about when those ethical standers merge, in case of an injury and privacy are at odds with one another. For example, if a pilot suffers from mental problems such as depression and they are pressured to hide it from their employer and colleagues because it might risk losing their job. Thus, given the circumstances, the pilot might be aware that they are unsuitable to fly, but they are not obligated to say anything that would risk losing their job, and if the employer allowed them to fly with medications, it would risk the safety of flight. This example raises many questions regarding the ethical standards in human factors, such as would the human factors specialists create a system that notifies the employers if the pilot is visiting a psychiatrist or if there are any decline in their performance or their attitude with their coworkers. Those circumstances force the industry to create a system that would break the ethical code and invade the pilots' privacy which would add more pressure and stress to their work life.

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This question is very open ended which caused me to ponder it and consider different ways to interpret it. I started by googling the words "human factors" "discipline" and "ethics", from which I read a few articles. In human factors we study how the human body can affect our ability to conduct safe flight. In some circumstances pilots may make potentially unethical piloting decisions due to constraints whether they be deadlines set by the employer or flying while fatigued.

Pilots have a responsibility and a moral duty to uphold safe flying habits and procedures relating to human factors and aviation in general. In my training at Parks College I learned to follow the IM SAFE checklist which helps pilots know if they are fit to fly on a personal level before they even preflight the aircraft.

Illness- Am I feeling sick?

Mediation- have I taken medicine for the first time today?

Stress- is your personal life stressing you out?

Alcohol- Am I hungover? It is prohibited to drink within 8 hours of a flight

Fatigue- am I exhausted?

Emotion- emotionally stressed?

All these six personal evaluations will influence pilots to make the right on a go /nogo decision on a private or commercial level.

Another ethical consideration in human factors that happens every day is tight flight schedules. Commercial Pilots would not want to cancel a flight too often and put their career and income on the line. This means that the IM SAFE checklist may not be properly adhered to, or corners could be cut on procedures in order to make departure or arrival times. This is a ethical consideration that is a everyday risk. Pilots should always self-evaluate before a flight

Assignment 1 Examples (cont.)

1. Describe a few ethical considerations surrounding human factors discipline (300 word minimum)

When it comes to ethical factors in the context of human factors, I think the best way to begin is with the IMSAFE checklist. While it is always tempting to fly (because we all love flying) and especially for airline pilots who rely on their salary to support themselves and/or their families, we must not put the safety of our passengers in jeopardy if we, pilots, are unfit to operate an aircraft. It is essential that we systematically complete the IMSAFE checklist before making any further decisions about traveling airborne. Perhaps the most important element of this checklist is the last letter "E", which stands for external pressures. As I mentioned earlier in the response, Pilots may feel pressured into flying for several reasons ranging from angry passengers (for commercial pilots) to get thereitis as we sometimes call it around Parks. We must understand that it is dangerous and far too risky to neglect any factor that could impact our performance while operating an aircraft. The IMSAFE checklist serves to provide pilots with a methodical way of analyzing their own human factors. As mental health has become a much more relevant issue in recent years, it is important to know that this applies to everyone including pilots. There is an absolute plethora of things that could impact any human's mental health, which may be family-related or something external like being given bad news from a friend. Any of these things could severely impact the pilot's ability to proficiently operate the aircraft, and every pilot should be very conscious of the many factors that could affect their mental health. Every time I fly, I brief my copilot about limiting distractions especially during taxi, takeoff, and landing. Factors that affect your mental health are distractions and should be treated as so. Along with completing the IMSAFE checklist each pilot should complete a personal mental health analysis prior to flight as well.

Describe a few ethical considerations surrounding the human factors discipline

When faced with ethics in aviation, the first consideration that comes to mind is centered around aspects of ethics that may prevent us from making the right decision. A large part of ethics involves making a choice that will preserve the safety of those around you as well as to maintain a respectful aviation environment. A few moral principles that may govern whether we make the right or wrong choice as pilots is fear, guilt, and self-interest/ convenience to oneself.

When we find ourselves in a difficult situation as pilots, perhaps the weather is below our own personal minimums and ethically we know that the right thing to do to preserve our own safety and even our instructor's safety is to cancel the flight, fear of inconveniencing others may prevent us from acting ethically and remaining honest with ourselves and others. We may fear that our choice to make what we know is the right decision could potentially jeopardize the way others view us as pilots or result in negative consequences to us a pilot canceling a flight.

Similarly, guilt may prevent us from making the ethically right decision. Perhaps we have already canceled two flights this week, and by canceling a third flight, a feeling of guilt arises. This feeling might consist of embarrassment or negative feelings toward ourselves for having lower personal minimums than other pilots. This guilt may result in comparison and we may begin to doubt our decision making skills.

Finally, Self- interest and convenience may prevent pilots from acting ethically, particularly on solo flights. When flying alone on a VFR cross country, the student pilot is aware of the regulations and understands the importance of following them to maintain a safe environment for everyone in the air. When enroute this cross country, the pilot comes across a few clouds that they must descend away from in order to avoid them horizontally. The pilot knows they aren't allowed to fly within 2,000 feet horizontal distance from clouds in VFR flight, however the clouds are so few, they will only pass through them for roughly 10 seconds, and they will not affect the pilots line of sight.

As pilots, there are many times where we are faced with situations where we have the option to break a small rule that nobody will ever find out about to cater to our own convenience. In these situations, it is important to maintain honesty and integrity in order to not let our own self-interest govern our ethical decision making skills. When in the air, it is important to remain honest and fair for the sake of our own safety, but also for the safety of others. When it comes to ethics, there is nothing more important than making it a habit to practice safe and fair flying by following the regulations put in place for us.

Assignment 2 Examples

Describe a few professional considerations surrounding human factors

In my time in aviation, I have come to learn that those who work in the field are some of the most respectful and professional individuals I have met. Pilots, whether on the ground or in the air, are oftentimes always courteous toward one another and maintain a professional environment. Many times, in order to maintain safety and integrity in the aircraft, we rely on personal minimums, FAA regulations, and patience with ourselves and other pilots.

A large aspect of deciding whether or not to fly on a given day is centered around personal minimums and conditions that we are comfortable or not comfortable flying in. Going hand in hand with ethics, it is important to take other pilots' personal minimums into consideration and remain respectful and professional toward them and what they are personally comfortable in to aid in eliminating those feelings of fear or guilt when faced with a difficult decision to make surrounding flying. Remaining professional and respectful toward others' boundaries aids in maintaining those aviation ethics and in maintaining a safe environment where pilots can make the best decision for themselves and their crew without fear of judgment or fear of making the wrong decision.

Aviation is filled with rules and regulations, and from early on in our training we understand the importance of following them for our safety and for the safety of every person around us. Not only is it essential that we follow these rules in a professional manner that upholds the high standards set for pilots, but it is also essential that we respect the time needed for others' to follow these rules. There are many times where there may be an aircraft in front of you who is taking a longer time to get through their engine runup and go through their checklists to ensure that they are comfortable and ready for takeoff. Practicing patience is critical in aviation because when we are patient with other pilots, we are showing them our respect and that we care for their safety. When another pilot takes the time that they need to be comfortable with their aircraft, they will be safe,have the ability to make ethically correct decisions, which in turn allows us to be safe and make smart choices in the air.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

One professional consideration is avoiding stereotypes and assumptions about a person. Not only is it not professional to treat and communicate with someone who may have an intellectual disability, a person who uses a wheelchair, or treating a person differently because they are a female for example. This is regarding not only pilots but also those who work with the pilots and human factors specialists, like mechanics, the aerospace engineers, even the management, marketing, and other sides of the industry. Simply treating people with respect since this is a field that deals with people all the time, from various lifestyles, beginnings, and each person has gone through a different life with various cultures. This is a field that looks at how we, as humans, are similar to each other but also vastly different. You are meant to benefit the client or company you are working with while also doing good for the general populace and humanity.

Another professional consideration is you should know plenty and more than whoever you are working for or your client. Though using that knowledge and information to make the right decision, for example if asked to speak in court you provide credible data/research while being able to tell the value and limitations of it and your own capabilities. This also coincides with not misleading clients, organizations, and any business. For example a new researcher is looking at the UX design of a new flight simulator, while communicating with pilots you would treat each one with respect, understanding their capabilities and accurately applying your own capabilities while doing research and knowing when to ask for their recommendations with your own observations. This is even related to confidentiality, when taking down research doing so with the agreement of the participant. Unless it is public behavior, the pilots need to explicitly agree to the recording of any data. In the previous question there was mention of where the line of confidentiality for adapting technology to the user, like pilot to plane, user to phone, and so forth. Yet when in the preliminary development phase confidentiality is very important but what about after that.

Assignment 2 Examples (cont.)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

I believe that professional and ethical overlap quite a lot in aviation, in particular the concepts of fairness, honesty, and remaining non-biased. But professionalism in human factors goes beyond just behaving ethically, it also branches into the ideas of procedure, obligation, and legality. The simplest of all of those ideas is legality, to be a professional in anything requires that we follow the law, even when we disagree with it we must follow the law, though this does play a seemingly small role in human factors investigations it still vital that we follow them to the ledger to get the most out of the investigation.

Obligation is where professionalism gets complicated, above all else we must be obligated to the truth and the continued safety of air travel. Human Factors plays a massive role in the world of aviation in the end human beings are running and monitoring the systems in place to ensure safe, quick, and effective functioning of both general and professional aviation. As pilots we are obligated to many things, but as humans we are obligated to our human factors to monitoring our fellow pilots, ourselves, and to above all else the truth of our flaws. To ignore those obligations to the human factors involved in aviation would be to open ourselves and our passengers up to considerable risk some of which by the time we sense a problem it may be too late. This why our obligation to human factors is a constant in aviation one that only can be upheld in the system if all persons in the system are vigilant for the variety of symptoms that can display no matter how seemingly insignificant.

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

Professionalism is an essential part of the global air transportation industry not only in regard to customer service, but decision making as well. Across the industry, professionalism includes doing everything correctly and procedurally, in turn, relating to human factors. Human factors directly correlate to the professional considerations within aviation because decision making is essential not only in the cockpit, but across multiple disciplines that go into making scheduled airlines service successful. Specifically, one professional consideration that surrounds human factors would be decision making, including, the pilot deciding whether they can safely complete the flight. I think that this question can closely relate to the previous because professional and ethical considerations can go hand in hand within the human factors discipline. This dilemma can tie into both ethical and professional considerations because as a pilot, you should know the limitations of yourself to conduct a flight, and as the pilot, if you know that you are not in a good position to fly, the safety of the passengers in influenced, therefore becoming an ethical situation. Continuing with this idea, not necessarily related to commercial aviation, but as student pilots, a consideration when flying in the IFR environment can be personal minimums. As a new instrument pilot, would you want to go fly on a low IFR day where you would break out on an approach at minimums as prescribed in the approach chart? A big part of professional considerations, relating to human factors, revolves around the idea of limitations as pilots. As a pilot, being a professional involves knowing the limitations of yourself and the aircraft that you are flying, and it comes down to decision making which influences the human factors chain, ultimately increasing the chances of an accident derived from human error. In all, professional considerations and ethical dilemmas in human factors are very closely related. In an essential industry such as air transport, it is essential to understand how you as the pilot function in the human factors tree in order to make both professional and ethical decisions.

SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.

SLO 2 Test 1 Questions

16 Multiple Choice 3 points

Data suggests that over ____ of aviation accidents are attributable to adverse human factors events (human error)

- (●) 70%
- ( ) 80%
- ( ) 85%
- ( ) 90%

17 True or False 3 points

By its very nature, the study of human factors is multidisciplinary.

- (●) True
- ( ) False

22 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who studied intellectual differences

- (●) Galton
- ( ) Cattell
- ( ) Taylor
- ( ) The Gilbreths

23 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who studied sensory and motor functions

- ( ) Galton
- (●) Cattell
- ( ) Taylor
- ( ) The Gilbreths

24 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who studied scientific management of job tasks

- ( ) Galton
- ( ) Cattell
- (●) Taylor
- ( ) The Gilbreths

25 Multiple Choice 3 points

_____ was/were human factors pioneer(s) who conducted motion studies in the operating room

- ( ) Galton
- ( ) Cattell
- ( ) Taylor
- (●) The Gilbreths

SLO 2 Test 4 Questions

20 Multiple Choice 1 point

Generally speaking, _____ aircraft produce a higher frequency

- (●) Small gas turbine engines
- ( ) Large gas turbine engines
- ( ) Small piston engines
- ( ) Large pistone engines

21 Multiple Choice 1 point

Conductive deafness is most closely associated with?

- (●) Eardrum perforation
- ( ) Loud noises
- ( ) Age

25 True or False 1 point

Spatial disorientation is exacerbated by fatigue.

- (●) True
- ( ) False

26 Multiple Choice 1 point

Somtogravic illusions are generally associated with?

- ( ) The semi-circular canals
- (●) The otolith organ

29 Multiple Choice 1 point

Somatogravic illusions generally involve?

- ( ) Turning operations
- (●) Linear operations

SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.

SLO 4 Assignment 1 Evidence

ASCI 4050 Human Factors Assignment 1 Name:_____

Hi everyone,

As a reminder, I am traveling on university business next Monday, October 31st and Wednesday, November 2nd. Consequently, we will not have class.

Rather than having class, I have placed two assignments in the Modules folder in Canvas. One to cover Monday's class and the second to cover Wednesday's class. Rather than contributing to the homework average, each assignment has the potential to add 5-points to a test grade (for a total of 10-points).

The questions are purposefully vague as I want you to think about your own capabilities and limitations.

Please respond to the following questions

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

2. Describe a few professional considerations surrounding human factors. (300 word minimum)

ASCI 4050 Human Factors Assignment 3 Name:_____

Hi everyone,

As a reminder, I am traveling on an accreditation visit next Monday, November 14th. Consequently, we will not have class. Rather than having class, I am giving this assignment in place of class. This assignment will contribute to your homework grade (15% of your total grade). This assignment must be uploaded to Canvas no later than Wednesday, November 16th by the end of the day.

In class, we discussed the notion of Individual Differences. In high-consequences operations we will engage people of diverse experience, backgrounds, and cultures. People are different and that difference is a strength. Diversity provides a distinct advantage to the team as diversity allows individuals to bring a different perspective and skillset to a problem.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

SLO 4 Assignment 1 Examples (cont.)

1. Describe a few ethical considerations surrounding the human factors discipline (300 word minimum)

1- The ethical considerations that the discipline of human factors consists of the right and wrong that humans are ought to do, in terms of rights, respect for people, beneficence, justice and fairness. To ensure that the human factor discipline meet those ethics standards, it must provide privacy and safety for those who are affected by the system. In addition, loyalty, compassion, and honesty are among the other moral values that are encouraged by ethical standards. Additionally, ethical standards cover rights such as privacy, the right to be free from harm, and the right to life. These standards are suitable ethical standards since they are based on consistent and solid justifications. Therefore, a human factors specialist should not possess any issues with normative ethics such as obligations, rights, injury prevention, privacy. However, what about when those ethical standers merge, in case of an injury and privacy are at odds with one another. For example, if a pilot suffers from mental problems such as depression and they are pressured to hide it from their employer and colleagues because it might risk losing their job. Thus, given the circumstances, the pilot might be aware that they are unsuitable to fly, but they are not obligated to say anything that would risk losing their job, and if the employer allowed them to fly with medications, it would risk the safety of flight. This example raises many questions regarding the ethical standards in human factors, such as would the human factors specialists create a system that notifies the employers if the pilot is visiting a psychiatrist or if there are any decline in their performance or their attitude with their coworkers. Those circumstances force the industry to create a system that would break the ethical code and invade the pilots' privacy which would add more pressure and stress to their work life.

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Pilots have a responsibility and a moral duty to uphold safe flying habits and procedures relating to human factors and aviation in general. In my training at Parks College I learned to follow the IM SAFE checklist which helps pilots know if they are fit to fly on a personal level before they even preflight the aircraft.

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All these six personal evaluations will influence pilots to make the right on a go /nogo decision on a private or commercial level.

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When we find ourselves in a difficult situation as pilots, perhaps the weather is below our own personal minimums and ethically we know that the right thing to do to preserve our own safety and even our instructor's safety is to cancel the flight, fear of inconveniencing others may prevent us from acting ethically and remaining honest with ourselves and others. We may fear that our choice to make what we know is the right decision could potentially jeopardize the way others view us as pilots or result in negative consequences to us a pilot canceling a flight.

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Finally, Self- interest and convenience may prevent pilots from acting ethically, particularly on solo flights. When flying alone on a VFR cross country, the student pilot is aware of the regulations and understands the importance of following them to maintain a safe environment for everyone in the air. When enroute this cross country, the pilot comes across a few clouds that they must descend away from in order to avoid them horizontally. The pilot knows they aren't allowed to fly within 2,000 feet horizontal distance from clouds in VFR flight, however the clouds are so few, they will only pass through them for roughly 10 seconds, and they will not affect the pilots line of sight.

As pilots, there are many times where we are faced with situations where we have the option to break a small rule that nobody will ever find out about to cater to our own convenience. In these situations, it is important to maintain honesty and integrity in order to not let our own self-interest govern our ethical decision making skills. When in the air, it is important to remain honest and fair for the sake of our own safety, but also for the safety of others. When it comes to ethics, there is nothing more important than making it a habit to practice safe and fair flying by following the regulations put in place for us.

SLO 4 Homework 3 Examples

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The first strategy I will employ is being open to all disciplines and cultures and their differences. People work better when they feel their similarities and differences are accepted, respected, and valued. It will be crucial to me that I embrace all the cultures and values of the diverse and multi-disciplinary teams and make an effort to make people feel comfortable and learn about their way of life for improved interactions. Another strategy I will use to reduce differences between multi-disciplinary and diverse teams for effective work is having good communication skills. Any team works better when there is open and honest communication. How everyone in the group communicates with each other will influence how well they work together and the team's productivity. There needs to be open communication across diverse and multi-disciplinary teams. This way, people can talk about difficult and complicated situations and issues. It is vital that team members are encouraged to communicate effectively and respectfully, as everyone needs to feel like their voice is being heard. Minimizing miscommunication will ensure that there is reduced conflict across the team. To achieve effective communication, people will need to learn how to listen attentively and seek clarification in case of any issue or misunderstanding. Different cultures and disciplines also have different communication styles, so I will accept, understand and respect how diverse people communicate to have an effective team. Further, I will try to avoid stereotyping and prejudice to work effectively with multi-disciplinary and diverse teams. When people are unfairly divided into groups and assigned unfair characteristics, it can affect how they work and interact with others. Therefore, I will accept that diverse people have different and unique working styles and preferences, which does not make them less important or productive. To work effectively, I will improve my conflict management skills. I will consider conflict management training for myself and the rest of the team. With good conflict management, the team will be able to work effectively.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Despite belonging to diverse expertise, disciplines, and backgrounds, teammates need to feel like they are part of the group or community. To achieve effective communication in a diverse group, I should be able to share and exchange ideas respectfully so that everyone can understand each other. I will be open and inclusive to other cultures to ensure effective communication. Every team member's language and communication culture must be respected. Communication needs to accommodate everyone's needs and not just the needs of those in the majority language. Openness and inclusivity in communication will help create trustworthy relationships where people feel comfortable enough to share their ideas with the rest of the team. To appreciate diversity, especially in communication, I will learn about the unique communication styles of diverse groups to promote effective communication. I will use clear and concise language to communicate effectively with people from diverse backgrounds. Keeping my language clear and straightforward ensures that no meaning is lost in interpretation and that my audience can receive the message exactly how I intended it to be received. Paraphrasing my words and asking the team if they understand my message will ensure the communication is clear and effective. Repeating the message help improve communication as I can clarify what I am saying and therefore eliminate misunderstandings. Body language is also very important in oral communication; therefore, I will make an effort to understand the differences in body language for each diverse group. Feedback is critical in ensuring effective communication. Providing and receiving constructive and honest feedback will be critical in my communication. Feedback will make people be sure that their voice is heard and respected and will therefore encourage people to communicate more openly. Most importantly, it can be challenging to know exactly how to communicate with people who are different from you in one way or the other. I will therefore take diversity training which will ensure that a diverse team can communicate effectively with each other

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

The importance of understanding individual differences within any environment, yet alone a high consequence one, is paramount when seeking to further know how a team functions as a whole. In looking at how to address the individuality of each member involved, I believe the most effective strategy in helping coordinate such forces would be communication. In many environments, co-workers will often work alongside each other, not only on their own projects but on one major task as a goal. For example, myself and my fellow interns at Garmin (a pretty small gap diversely) all have our separate functions whilst focusing on the same geographic area and working on the same geographic file. While we each have our own separate responsibilities regarding such, we all have to remain in clear communication with each other and other folks in the department to make sure that we are effectively doing our assigned work without overlapping or stepping onto anyone else's toes. In doing so, we help to promote a work environment that enables us each to assist each other when we have any issues or questions that may arise. This includes a larger portion of people, not only within our own offices, but that of Garmin's Corporate offices, as well as any remote employees as well. Our work environment is filled with hundreds of thousands of very diverse groups and skill sets that come together to help develop products in the name of a greater goal. It helps in managing any Human Resource issues(should they arise) and establishes a better understanding of who we are within a larger workforce. Communication is also paramount in highly-diverse things when everything is going right. Teams that communicate well with each other will not only improve productivity in the office, but it also stands to make a work environment more pleasant for everyone involved. In having a well-functioning team communicate, a door opens to a safer, friendlier, and more productive work environment.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

Effective communication is paramount to a high-functioning team. Ensuring the development and implementation of this process is something that numerous companies have used worldwide in order to help the cohesive teamwork abound in their fields of work. Effective communication must first begin with respect, from co-worker to co-worker, and even from CEO to the lowest new-hires of an establishment. In garnering and fostering respect for one's peers (especially within a work environment) a person gains better understanding in how their co-workers might function differently from them. For example, in my previous field of work (largely customer service), my ability to understand how each of my managers (I was under four managers, two of which owned and operated the waterpark/campground) approached a situation in which a customer was being difficult. For some of my team-members, they largely avoided conflict in the way that they would place blame on another department, another worker, etc. (IE "BLANK didn't properly charge the golf-cart," etc. etc.) whilst others would directly place the blame on themselves (even if it was not directly related to them) so they could resolve an issue with a customer without interference. After having to work with a difficult employee, then, each of these individuals would gather to speak on the issue they were presented with, and (depending upon what type of mishap took place that day) would gather multiple departments as a whole to discuss new ways to prevent similar situations from happening again. In doing so, they fostered a relationship with their employees that would not only call out issues in the system, but also attempt to resolve them. How does this, then, relate to the individuality of each person involved? It gives everyone across departments, each with our own experience and backgrounds in numerous fields (technology, lifeguarding, customer service, food service, etc) an equal voice when speaking to our bosses. The respect established in each member of a team leads to a team that is highly communicative, and thus, a much more high-functioning one.

Question 1. In the context of Individual Differences, what strategies will you employ to work effectively on multi-disciplinary and diverse teams? (300 word minimum)

There are a lot of strategies that I think I can employ to work effectively on a multi-disciplinary and diverse team. A couple of the strategies that I can implement is know your role in the company, be open minded, and be able to work as a team.

Starting with the first strategy of knowing your role in the company. This is important for one main reason the first being, so you don't fail in a project and not to waste any precious resources. This is most prominent in the aviation industry when things are being done by the proper people in the flight deck or on the ground. A perfect example would be in the Tenerife accident when the KLM pilot was doing the pre-checks and because the captain being that he was a higher up in the company he didn't know the proper flows and glanced and forgot crucial steps in the checklist that should have been done by the First Officer.

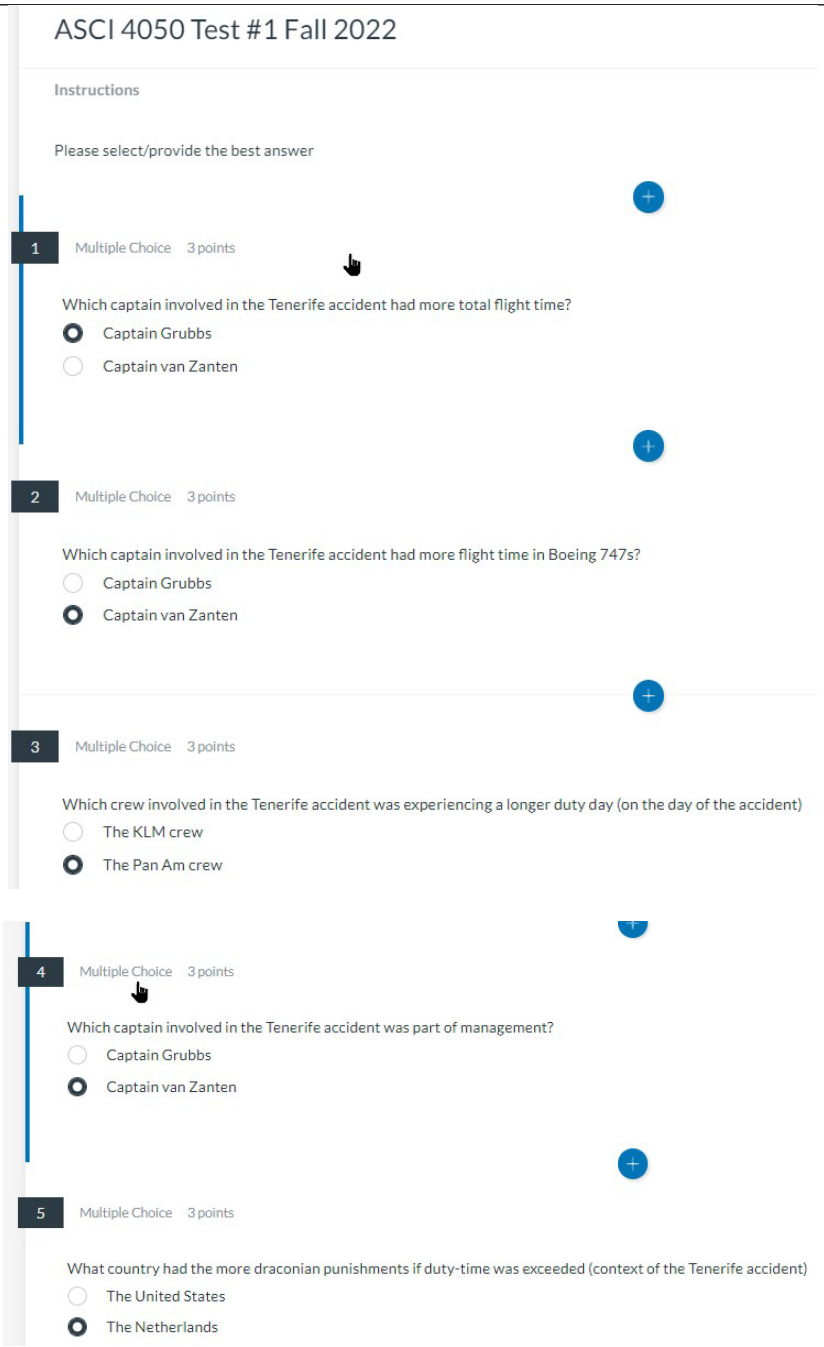
The second strategy that I can employ to work is to be open minded. This is self-explanatory but listen and be respectful of other people ideas. Being able to have meetings, discussions and brainstorming are key aspects to success. This can be found in aviation a lot of the time in flight training, but really any point in your pilot career. Humans aren't perfect so we are going to make mistakes and there is going to be someone there to critique your work so being able to be open to what they are teaching you is crucial so you can become a successful aviator.

The third strategy relates back to the first two strategies that I have briefed on and that is being able to work on a team. Working on a team is so crucial in aviation, no matter what side of aviation you are working on. In the airplane you need to be able to rely on your first officer or captain or flight instructor to help you fly the plane. In commercial aviation you can't do it all yourself you need someone flying the plane and then another person helping monitor and work the radios to allow your flights to be successful and more importantly safe for the passengers.

Question 2. In the context of Individual Differences, how will you ensure effective communication (both written and oral communication) with teammates from diverse expertise/disciplines and backgrounds? (300 word minimum)

In diverse teams, with members who have different levels of capabilities, knowledge, expertise, and backgrounds, I will keep in mind of these differences in my peers to ensure effective communication. I will express my ideas clearly and consciously so all members of the team are on the same page as me, and can understand the task at hand, and how I feel. I will advocate for myself and my ideas in team meetings through verbal communication, additionally, other modes of communication can be used like emails and professional messaging sites. I will consistently send out emails of important tasks or goals that I would like the team to meet as a whole. By using these written communication methods, I will enhance my verbal communication by having my ideas and goals known and able to look back on, them so I can keep myself accountable for them. I will ensure that the members of my team understand what I am trying to say by asking to follow-up questions and interacting with my peers. Since I might be discussing information that requires background knowledge, this is crucial to ensure that all members, no matter their skill set, understand what I am trying to communicate. Another part of communication is listening. Effective listening is very important in any team, and with diverse members, listening can help share ideas and enhance the team dynamic. Body language is another important factor for effective communication, and I will make sure my body language aligns with what I am trying to communicate. I want to be sure that I make proper eye contact and other appropriate body language so I convey the right message to the team member, in whom I am talking with. In conclusion, I will utilize effective communication techniques so that the diverse members of my team can understand me and feel heard.

SLO 4 Test #1 Questions



ASCI 4050 Test #1 Fall 2022

Instructions

Please select/provide the best answer

1 Multiple Choice 3 points

Which captain involved in the Tenerife accident had more total flight time?

- (●) Captain Grubbs
- ( ) Captain van Zanten

2 Multiple Choice 3 points

Which captain involved in the Tenerife accident had more flight time in Boeing 747s?

- ( ) Captain Grubbs
- (●) Captain van Zanten

3 Multiple Choice 3 points

Which crew involved in the Tenerife accident was experiencing a longer duty day (on the day of the accident)

- ( ) The KLM crew
- (●) The Pan Am crew

4 Multiple Choice 3 points

Which captain involved in the Tenerife accident was part of management?

- ( ) Captain Grubbs
- (●) Captain van Zanten

5 Multiple Choice 3 points

What country had the more draconian punishments if duty-time was exceeded (context of the Tenerife accident)

- ( ) The United States
- (●) The Netherlands

Performance Indicator Rubric

Course: ASCI 4250 Professional Ethics and Standards Course Instructor:____Jan McCall_____

Semester Taught:_____Fall 2020_____ Number of Students in Course:___47____

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	98%	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

**Attach description of assignment used for assessment and samples of student work.*

DISCUSSION BOARD ASSIGNMENT

Learning Module 2: Ethical issues in AVN Maintenance, Outsourcing, and Whistleblowers

LM2 Q2: Outsourcing (20 points)

Due 18 SEP

All students should **choose two of the three questions** below to answer.

Then, do a little internet searching and see what you can offer the class but be sure to provide a weblink or APA citation and reference. You may use 1-2 paragraphs or bullet points to list your answers (10 pts x 2 questions = 20 points).

1. What are some of the key differences in FAA regulatory oversight of domestic and foreign outsourced airline maintenance?
2. Chapter 6 provides a union perspective on outsourcing maintenance. Claiming the union protection provided to mechanics ensures safety compared to outsourced non-union labor; how would a non-union mechanic, such as Delta, compare to an outsourced mechanic?
3. Other than saving money, are there other benefits to outsourcing maintenance?

Student Response to Discussion Board Question: LM2 Q2

Question 1: No matter the intention of the FAA, they have been falling behind in oversight over both domestic and foreign outsourced maintenance, and the agency is aware of the issues (Federal Aviation Administration, p. iii). According to Jin (2021), the FAA struggles to hire and retain aviation safety inspectors (Jin, p. 49) as a result of the numerous nuances of government work: inflexible bureaucracy, lack of funding, and government shutdowns leaving employees without a paycheck (Jin, p. 38) It is no wonder potential inspectors defect to other forms of employment, likely in the private sector. The lack of inspectors leaves all MROs with a lack of government oversight including domestic repair stations, but especially foreign ones, relying on each air carrier's Continuing Analysis and Surveillance System. Stakeholders can rest assured that certified domestic repair stations (certified under 14 CFR 145) are required to hold an FAA certificate, maintain a drug and alcohol testing system, and must employ certified mechanics (certified under 14 CFR 65 Subpart D). A myriad of inspections and reports are required on an at-least annual basis. Foreign, off-shore repair stations are subject to less scrutiny than their domestic counterparts: the only parallel is they are required to hold an FAA certificate (if they are certified) that can be renewed every 1-2 years. (Jin, p. 42) Due to the lack of FAA funding for travel, inspectors often cannot reach far-flung repair stations, let alone make follow-up visits on discrepancies flagged on previous visits. In one instance, an inspector was expected to cover 165 certified foreign repair stations when his colleague took sick leave (Jin, p. 49) The FAA is not required to visit any non-certified repair stations, no matter where they are

located on our globe.

Question 2: Delta is unique and accompanied by declining competition using a similar business model. Delta TechOps is certified by the FAA plus many foreign aviation regulatory agencies (Delta TechOps) and is subject to the requirements of a domestic repair station (Jin, p. 42) They must employ certified mechanics and supervisory personnel certified under 14 CFR 65. The repair station certification requires the facility to maintain and use a repair station manual which indicates duties of each position employed by the certificate holder (14 CFR 145.209) The mechanics, as a result of their own certifications as maintenance technicians, must abide by the policies and procedures outlined in their employer's manual (14 CFR 65.81, 14 CFR 65.95).

In contrast, a mechanic working for an outsourced repair station may not hold an FAA certification. If they work in a foreign country that requires a mechanic certificate, they may be certified under that country's regulatory agency. It is possible that the country does not have such a requirement for mechanics to hold that certification (Hoppe, p. 67.) There is hardly an official method to tell if that uncertified mechanic has the skills and knowledge necessary to complete a repair properly. The outsourced mechanic is likely working for a contractor who is willing to pay the bottom dollar. This discrepancy in pay between in-house and outsourced mechanics puts the latter at a disadvantage: their employer is more willing to take advantage of them with long hours and irregular shifts, plus coercion to sign off on an improperly completed repair (Hoppe, p. 67, Jin, p. 41.) In all, there is less accountability when looking at outsourced mechanics compared to in-house mechanics.

Performance Indicator Rubric

Course: ASCI 4350 Team Resource Management Course Instructor: Terrence Kelly

Semester Taught: Spring 2023 Number of Students in Course: 42

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	Overall Project Avg – 89.47% Overall Paper Avg – 89.2% Overall Poster Avg - 89.7% Overall Presentation Avg – 89.5%	Benchmark Achieved
SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.	Homework #1 Avg – 88.93%	Benchmark Achieved

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

SLO #3

All students enrolled in Team Resource Management are required to participate in a team-based project. The project includes a paper, poster, and in-class presentation. Additionally, all teams were required to participate in the School of Science and Engineering Senior Showcase. The overall project average was 89.5% with paper averages at 89.2%, poster averages at 89.7%, and in-class presentations at 89.5%. The grading on the project was generous. As a means of continuous improvement, I plan to require more incremental deliverables throughout the semester rather than having everything due at the end of the semester. A growing concern is the use of artificial intelligence (AI) (i.e. Chat GPT) to assist in preparing some of the course materials. Using a web-based tool for determining the use of AI, the results came back as inconclusive. I plan to speak at length about the use of AI in course deliverables and include in the project guidance material a prohibition on its use.

SLO #4

The assessment of SLO #4 was accomplished using a homework assignment that explicitly asked students to reflect on the importance of integrity, lifelong learning, and

building diverse teams. I was pleased with the results of the assignment. The average grade for the assignment was 88.93%.

Performance Indicator Rubric

Course: ASCI 4350 Team Resource Management Course Instructor: Terrence Kelly

Semester Taught: Spring 2023 Number of Students in Course: 42

FLIGHT SCIENCE CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	*Test #1 – Overall Test Avg. 87%* *Historical Trend Questions* Teamwork in history – 79% Military use of teams – 67% UAL Resource Management – 87% Tenerife Accident – 77% Overall Question Avg – 77.5% *Current Issue Questions* Cockpit to Crew Resource Management -92% Line Operations Flight Training (LOFT) – 79% Current Sector Failures – 87% Groupthink – 95% Overall Question Avg – 88.25% *Emerging Opportunity Questions* Importance of Diversity – 95% Crew to Team Resource Management – 95% Leveling Organizational Hierarchies – 85% Overall Question Avg – 91.6%	Benchmark Achieved
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	Overall Project Avg – 89.47% Overall Paper Avg – 89.2% Overall Poster Avg - 89.7% Overall Presentation Avg – 89.5%	Benchmark Achieved
SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.	Homework #1 Avg – 88.93%	Benchmark Achieved

Course Assessment (Intended Use of Results)

The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

SLO #2
SLO #2 was measured using questions from Test #1. Outcome 2 seeks to assess a student's ability to describe historical trends, current issues, and emerging opportunities in aviation. In order to measure SLO #2 I created three categories of test questions including historical trends, current issues and emerging opportunities. The benchmark of 70% was met in all three categories, consequently the overall SLO #2 benchmark was achieved. Next year, I plan to make a change in measuring SLO #2. I do not think multiple choice test question adequately assess the student's ability to "describe" the criteria in the SLO. While the test including some open-ended questions, a majority were multiple choice. Consequently, I plan to create a written assignment (which I do regularly) that is not limited to multiple [le choice responses and will allow students to create a narrative that provides a better mechanism for indicating their grasp on historical trends, current issues and emerging opportunities in aviation.

SLO #3
All students enrolled in Team Resource Management are required to participate in a team-based project. The project includes a paper, poster, and in-class presentation. Additionally, all teams were required to participate in the School of Science and Engineering Senior Showcase. The overall project average was 89.5% with paper averages at 89.2%, poster averages at 89.7%, and in-class presentations at 89.5%. The grading on the project was generous. As a means of continuous improvement, I plan to require more incremental deliverables throughout the semester rather than having everything due at the end of the semester. A growing concern is the use of artificial intelligence (AI) (i.e. Chat GPT) to assist in preparing some of the course materials. Using a web-based tool for determining the use of AI, the results came back as inconclusive. I plan to speak at length about the use of AI in course deliverables and include in the project guidance material a prohibition on its use. As another means of continuous improvement, I plan to do a better/more consistent job in grading the paper. I was inconsistent this semester in my grading of the submitted papers. In some cases I examined papers with an eye toward detail while in some other cases my review was less detailed.

SLO #4

The assessment of SLO #4 was accomplished using a homework assignment that explicitly asked students to reflect on the importance of integrity, lifelong learning, and building diverse teams. I was pleased with the results of the assignment. The average grade for the assignment was 88.93%.

Assignment Guidance
SLO #2 Test Questions from Test #1

The assessment of SLO #2 was accomplished with test questions.

Each student's perceptive on historical trends were assessed using the following questions:
The notion of team is fairly new, with teamwork essentially beginning in the 1600s.
The military began studying how to best use crews/teams in?
What United States airline started the first resource management program for pilots.
Of the following, which accident is not considered an antecedent to the start of resource management in commercial aviation.

Each student's perceptive on current issues in aviation were assessed using the following questions:
Differentiate between Cockpit resource Management and Crew resource Management.
Define the acronym LOFT used in simulator training.
Differentiate between Cockpit resource Management and Crew resource Management.
What sector of aviation has the highest percentage of accidents related to flight crew failures?

Each student's perceptive on emerging opportunities in aviation were assessed using the following questions:
Describe the importance of diversity in the context of high-consequence teams. 95%
Differentiate between Team Resource Management and Crew Resource Management. 95%
Good teamwork generally will level organizational hierarchies. 85%

SLO #3 Initial Project Guidance

ASCI 4350 Team Resource Management Research Project
Capstone Project – Poster, Presentation, and Paper

(Aspects of the presentation are subject to change)

Overview:

Successful completion of ASCI 4350 requires each student to participate in a research project that includes a comprehensive written report, accompanying academic poster and presentation. This assignment provides a significant contribution to the final grade in the course and everyone must participate. In addition to other requirements, each student must achieve a passing grade on the capstone project (including the written research report, the poster, and a presentation) in order to pass the course. Everyone must participate in the SSE Student Showcase scheduled for Wednesday, April 26, 2023, from 4:00 PM-6:00 PM. Please clear your schedules.

Purpose:

The purpose of Capstone project to highlight your undergraduate experience through a comprehensive research project aimed at a topic related to aviation. The project should showcase important findings from the research and/or analysis performed and provide clearly outlined recommendations. The poster and presentation will demonstrate the critical outcomes associated with your work

Process:

Each team will prepare a written report, poster and oral presentation based on an undergraduate research endeavor. Poster will be displayed in a public forum (SSE Student Showcase) and faculty (and others in the community) will be asked to provide feedback on the work.

A presentation session will be scheduled toward the end of the semester and all teams will present. All team members are expected to be present for the poster presentation and stay throughout the scheduled presentation time. The work will be peer-reviewed by our classmates and contribute to Dr. Kelly's final evaluation of your work. Posters will eventually be displayed in the Hallways of McDonnell Douglas Hall.

Teams will be visited by Faculty evaluators and asked to provide feedback on their project. The format of your oral presentation must be delivered by all team members, and Q&A will commence after presentations.

Selecting a Research Topic

Discussion of your groups aviation research topic should start immediately. The topic must fill a gap in the existing literature. Therefore, it should be sufficiently unique to address a topic that is not adequality discussed in the literature. The topic should be something the group can achieve consensus on with respect to being a) interesting; b) timely, and; c) researchable.

Selecting a Topic - Purdue OWL

Selecting a Research Topic (MIT)

The Research Report

The research report will include the following:

Title Page

Abstract
Introduction
Literature
Review
Results
Discussion
Conclusion
References

Title Page (APA)

The title should reflect the phenomena under study. The title page should be consistent with APA formatting and include a) the name of the project; b) team member names; c) department name (Aviation Science); d) college and university name; d) course number and name

Setting up a Title Page

Abstract (from the American Psychological Association (APA))
The abstract addresses the following (usually 1–2 sentences per topic):

- Key aspects of the literature review
- Problem under investigation or research question(s)
- Clearly stated research questions (sub-questions) and any hypothesis or hypotheses
- Methods used (including brief descriptions of the study design, sample, and sample size)
- Study results
- Implications (i.e., why this study is important, applications of the results or findings)

Writing an Abstract

Introduction (University of Southern California)
The introduction leads the reader from a general subject area to a topic of inquiry. It establishes the scope, context, and significance of the research being conducted by summarizing current understanding and background information about the topic, stating the purpose of the work in the form of the research problem supported by a hypothesis or a set of questions, explaining briefly the methodological approach used to examine the research problem, highlighting the potential outcomes your study can reveal, and outlining the remaining structure and organization of the paper.

Writing an Introduction
Literature Review (Adapted from Purdue OWL)
A literature review requires the group perform extensive research on published work in the aviation field in order to explain how one's own work fits into the larger conversation regarding a topic. This task requires the writers to spend time reading, managing, and conveying information; the complexity of literature reviews can make this section one of the most challenging parts of writing about one's research.

Because literature reviews convey so much information in a condensed space, it is crucial to organize the review in a way that helps readers make sense of the studies be reported. Two common approaches to literature reviews are chronological—ordering studies from oldest to most recent—and topical— grouping studies by subject or theme.

Along with deliberately choosing an overarching structure that fits the writer's topic, the writer should assist readers by using headings, incorporating brief summaries throughout the review, and using language that explicitly names the scope of particular studies within the field of inquiry, the studies under review, and the domain of the writer's own research.

Writing a Literature Review

Methodology (USC)

The methods section describes actions to be taken to investigate a research problem and the rationale for the application of specific procedures or techniques used to identify, select, process, and analyze information applied to understanding the problem, thereby, allowing the reader to critically evaluate a study's overall validity and reliability.

The methodology section of a research paper answers two main questions: How was the data collected or generated? And, how was it analyzed? The writing should be direct and precise and always written in the past tense.

Writing a Methodology

Conclusions (UNC)
Just as your introduction acts as a bridge that transports your readers from their own lives into the "place" of your analysis, your conclusion can provide a bridge to help your readers make the transition back to their daily lives. Such a conclusion will help them see why all your analysis and information should matter to them after they put the paper down.

Your conclusion is your chance to have the last word on the subject. The conclusion allows you to have the final say on the issues you have raised in your paper, to synthesize your thoughts, to demonstrate the importance of your ideas, and to propel your reader to a new view of the subject. It is also your opportunity to make a good final impression and to end on a positive note.

Your conclusion can go beyond the confines of the assignment. The conclusion pushes beyond the boundaries of the prompt and allows you to consider broader issues, make new connections, and elaborate on the significance of your findings.

Your conclusion should make your readers glad they read your paper. Your conclusion gives your reader something to take away that will help them see things differently or appreciate your topic in personally relevant ways. It can suggest broader implications that will not only interest your reader, but also enrich your reader's life in some way. It is your gift to the reader.

Writing a Conclusion

Poster Requirements

The poster must include:

1. Project Title
    a. The title should reflect a clear and concise description of the project
2. Introduction Section
    a. Executive summary of the work performed
3. Scope Section
    a. The scope (breadth and depth) of the project should be detailed. Scope must include methodology and theoretical framework used in the research. The scope section should conclude with key deliverables associated with the project.

4. Research Results Section
    a. A description of the outcomes of the research
5. Recommendations Section
    a. A summary of the recommendations emerging from the research including suggestions on further research
6. Reference Section
    a. A reference section will be included detailing the literature contributing to

the work Poster Observations & Suggestions:

- Space is limited in a poster - keep it simple and to the point. Think about conveying a message
- Be concise and factual in your writing, do not use overly complicated or technical terminology, and remember your Poster is used to supplement your oral presentation
- Avoid using italicized or fancy script-font – these are harder to read
- Ensure you bold, underline, or strategically use colors to highlight important information
- Avoid the use of entire paragraphs on the poster – That is what the paper is intended to demonstrate
- Utilize a consistent font throughout the poster (although consider using differing font sizes to highlight information)
- Avoid using all capital letters except for your title
- Pictures and graphs are expected in poster sessions. Think illustrations, flow charts, diagrams, graphs, etc. Make sure the originals are high quality and acceptable for scaling to a poster
- All pictures and graphics should include a label and properly attributed
- Your poster should be readable from up to 10-feet. Ensure your text and images are well- balanced, use your space wisely

Presentation

The presentation should effectively summarize your poster. The presentation will use PowerPoint and cover/discuss each element contained in your poster.

The presentation should last (no more than) 15 minutes in length followed by questions from the class. Each member of the group must participate in the presentation.

The presentation will be peer-reviewed by our classmates.

A copy of the presentation will be emailed to Dr. Kelly in Adobe pdf format

SLO #4 Homework Assignment #1

ASCI 4350 - Homework Assignment 1 - Name _____

This assignment should be uploaded to Canvas no later than Wednesday, February 8th by the end of the day. Please respond to the following four questions. (SLO 4)

1. Describe the importance of a positive attitude toward lifelong learning when working in a high-consequence field. (300 word minimum)

2. Describe the importance of personal integrity when working in a high-consequence field. (300 word minimum)

3. Describe the importance of embracing diversity when serving on a high-consequence team. (300 word minimum)

4. Describe the importance of embracing diversity when leading a high-consequence team. (300 word minimum)

Work Examples
Test question examples from Test #1

Differentiate between Cockpit resource Management and Crew resource Management.

Crew Resource Management is an outgrowth of Cockpit Resource Management. Crew resource management (CRM) can be defined as utilizing effective communication, all resources (both human and automated cockpit) available to an individual, and including other factors (i.e. human factors) for deciding the best strategies to uphold safety within the aviation environment and ensuring that all individuals are on the "same page" as one another. Cockpit resource management can be defined as utiliziing only those resources in the cockpit and considering only a small number of outside impactful factors that may contribute to the overall safety of each flight, but may not include all of the available resources that are available to each crew member.

Cockpit resource management refers to how specifically the flight deck crew (typically captain and first officer) interacts with one another in the cockpit environment, whereas crew resource management zooms out a little bit and can include how everyone on the crew, pilots, flight attendants, etc. interacts and behaves with one another.

Crew Resource Management is an outgrowth of Cockpit Resource Management. Crew resource management (CRM) can be defined as utilizing effective communication, all resources (both human and automated cockpit) available to an individual, and including other factors (i.e. human factors) for deciding the best strategies to uphold safety within the aviation environment and ensuring that all individuals are on the "same page" as one another. Cockpit resource management can be defined as utilizing only those resources in the cockpit and considering only a small number of outside impactful factors that may contribute to the overall safety of each flight, but may not include all of the available resources that are available to each crew member.

Describe the importance of diversity in the context of high-consequence teams.

By emphasizing and maintaining diversity within the context of a high-consequence team, all team members - regardless of their race, sex, religious background, ideas, etc. - will continually feel welcomed by others and empowered to contribute their unique thoughts and opinions towards solving a particular problem. No one should feel excluded because they do not fit the narrative of a single individual's "preferred teammate." Rather, by dedicating time to get to know each team member and recognizing their strengths, the team can grow in a positive manner and utilize interdependency between all members so complex tasks can be better achieved.

Diversity is critical in a high-consequence team environment because it allows for a wide variety of ideas and opinions to be brought to the table. When you have a diverse group of people who all come from many different backgrounds and who all have many different experiences, one person may be able to contribute something that the person sitting next to them might not, but that person then might be able to contribute something else.

By emphasizing and maintaining diversity within the context of a high-consequence team, all team members - regardless of their race, sex, religious background, ideas, etc. - will continually feel welcomed by others and empowered to contribute their unique thoughts and opinions towards solving a particular problem. No one should feel excluded because they do not fit the narrative of a single individual's "preferred teammate." Rather, by dedicating time to get to know each team member and recognizing their strengths, the team can grow in a positive manner and utilize interdependency between all members so complex tasks can be better achieved.

Differentiate between Team Resource Management and Crew Resource Management.

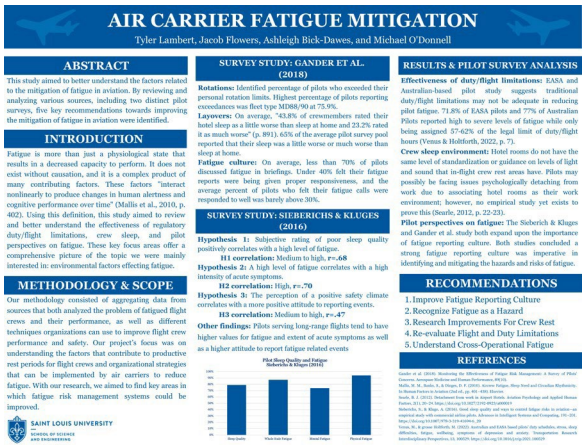
Team Resource Management is an outgrowth of Crew Resource Management, and can be defined as utilizing each team member to hold each other accountable for given tasks, communicating effectively and efficiently with involved parties, and using all resources available to attain success within a high-consequence field like aviation. Crew Resource Management can be defined as incorporating other elements (i.e. human factors, advice and information from other individuals, etc.), besides automated cockpit resources, into the cockpit environment, and then using those elements to create the best possible strategy and outcome to maintain success and prevent catastrophic events from unfolding.

Team resource management is a general term that can be applied to all industries where team members work together, where crew resource management is a subset of team resource management that typically applies to high consequence environments, like aviation.

Team Resource Management is an outgrowth of Crew Resource Management, and can be defined as utilizing each team member to hold each other accountable for given tasks, communicating effectively and efficiently with involved parties, and using all resources available to attain success within a high-consequence field like aviation. Crew Resource Management can be defined as incorporating other elements (i.e. human factors, advice and information from other individuals, etc.), besides automated cockpit resources, into the cockpit environment, and then using those elements to create the best possible strategy and outcome to maintain success and prevent catastrophic events from unfolding.

Work Examples - Project

Poster



AIR CARRIER FATIGUE MITIGATION

Tyler Lambert, Jacob Flowers, Ashleigh Bick-Dawes, and Michael O'Donnell

ABSTRACT

This study aimed to better understand the factors related to the mitigation of fatigue in aviation. By reviewing and analyzing various sources, including two distinct pilot surveys, five key recommendations towards improving the mitigation of fatigue in aviation were identified.

INTRODUCTION

Fatigue is more than just a physiological state that results in a decreased capacity to perform. It does not exist without causation, and it is a complex product of many contributing factors. These factors "interact nonlinearly to produce changes in human alertness and cognitive performance over time" (Mallis et al., 2010, p. 402). Using this definition, this study aimed to review and better understand the effectiveness of regulatory duty/flight limitations, crew sleep, and pilot perspectives on fatigue. These key focus areas offer a comprehensive picture of the topic we were mainly interested in: environmental factors effecting fatigue.

METHODOLOGY & SCOPE

Our methodology consisted of aggregating data from sources that both analyzed the problem of fatigued flight crews and their performance, as well as different techniques organizations can use to improve flight crew performance and safety. Our project's focus was on understanding the factors that contribute to productive rest periods for flight crews and organizational strategies that can be implemented by air carriers to reduce fatigue. With our research, we aimed to find key areas in which fatigue risk management systems could be improved.

SAINT LOUIS UNIVERSITY
SCHOOL OF SCIENCE AND ENGINEERING

SURVEY STUDY: GANDER ET AL. (2018)

Rotations: Identified percentage of pilots who exceeded their personal rotation limits. Highest percentage of pilots reporting exceedances was fleet type MD88/90 at 75.9%.

Layovers: On average, "43.8% of crewmembers rated their hotel sleep as a little worse than sleep at home and 23.2% rated it as much worse" (p. 891). 65% of the average pilot survey pool reported that their sleep was a little worse or much worse than sleep at home.

Fatigue culture: On average, less than 70% of pilots discussed fatigue in briefings. Under 40% felt their fatigue reports were being given proper responsiveness, and the average percent of pilots who felt their fatigue calls were responded to well was barely above 30%.

SURVEY STUDY: SIEBERICHS & KLUGES (2016)

Hypothesis 1: Subjective rating of poor sleep quality positively correlates with a high level of fatigue.

H1 correlation: Medium to high, **r=.68**

Hypothesis 2: A high level of fatigue correlates with a high intensity of acute symptoms.

H2 correlation: High, **r=.70**

Hypothesis 3: The perception of a positive safety climate correlates with a more positive attitude to reporting events.

H3 correlation: Medium to high, **r=.47**

Other findings: Pilots serving long-range flights tend to have higher values for fatigue and extent of acute symptoms as well as a higher attitude to report fatigue related events

Pilot Sleep Quality and Fatigue (Sieberichs & Kluges [2016])

RESULTS & PILOT SURVEY ANALYSIS

Effectiveness of duty/flight limitations: EASA and Australian-based pilot study suggests traditional duty/flight limitations may not be adequate in reducing pilot fatigue. 71.8% of EASA pilots and 77% of Australian Pilots reported high to severe levels of fatigue while only being assigned 57-62% of the legal limit of duty/flight hours (Venus & Holtforth, 2022, p. 7).

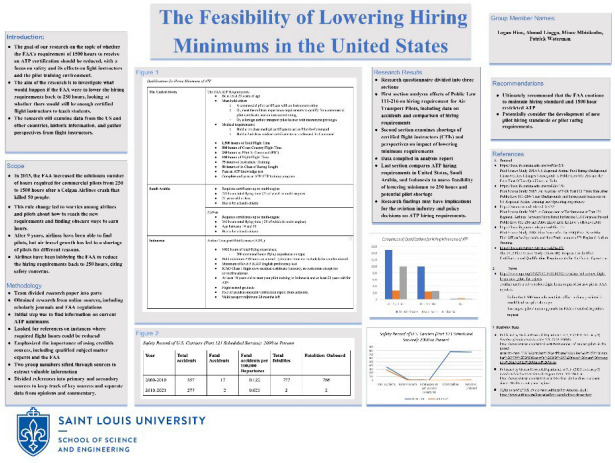
Crew sleep environment: Hotel rooms do not have the same level of standardization or guidance on levels of light and sound that in-flight crew rest areas have. Pilots may possibly be facing issues psychologically detaching from work due to associating hotel rooms as their work environment; however, no empirical study yet exists to prove this (Searle, 2012, p. 22-23).

Pilot perspectives on fatigue: The Sieberich & Kluges and Gander et al. study both expand upon the importance of fatigue reporting culture. Both studies concluded a strong fatigue reporting culture was imperative in identifying and mitigating the hazards and risks of fatigue.

RECOMMENDATIONS

1. Improve Fatigue Reporting Culture
2. Recognize Fatigue as a Hazard
3. Research Improvements For Crew Rest
4. Re-evaluate Flight and Duty Limitations
5. Understand Cross-Operational Fatigue

REFERENCES



The Feasibility of Lowering Hiring Minimums in the United States

Introduction:

- The goal of our research on the topic of whether the FAA's requirement of 1500 hours to receive an ATP certification should be reduced, with a focus on safety, and its effects on flight instructors and the pilot training environment.
- The aim of the research is to investigate what would happen if the FAA were to lower the hiring requirements back to 250 hours, looking at whether there could still be enough certified flight instructors to teach students.
- The research will examine data from the US and other countries, historic information, and gather perspectives from flight instructors.

Scope

- In 2013, the FAA increased the minimum number of hours required for commercial pilots from 250 to 1500 hours after a Colgan Airlines crash that killed 50 people.
- This rule change led to worries among airlines and pilots about how to reach the new requirement and finding educators ways to earn hours.
- After 9 years, airlines have been able to find pilots, but are faced growth has led to a shortage of pilots for different reasons.
- Airlines have been lobbying the FAA to reduce the hiring requirements back to 250 hours, citing safety concerns.

Methodology

- Team divided research paper into parts
- Obtained research from online sources, including scholarly journals and FAA regulations
- Initial step was to find information on current ATP minimums
- Looked for references on instances where required flight hours could be reduced
- Emphasized the importance of using credible sources, including qualified subject matter experts and the FAA
- Two group members sifted through sources to extract valuable information
- Divided references into primary and secondary sources to keep track of key sources and separate data from opinions and commentary.

Figure 1

Figure 2

Safety Record of U.S. Carriers (Part 121 Scheduled Service) 2009 to Present

Year	Total Accidents	Fatal Accidents	Fatal Accidents per 100,000 Departures	Total Fatalities	Fatalities Onboard
2009-2019	107	17	0.121	777	706
2010-2020	277	2	0.021	4	4

Research Results

- Research questionnaire divided into three sections
- First section analyzes effects of Public Law 111-216 on hiring requirement for Air Transport Pilots, including data on accidents and comparison of hiring requirements
- Second section examines shortage of certified flight instructors (CFIs) and perspectives on impact of lowering minimum requirement
- Data compiled in analysis report
- Last section compares ATP hiring requirements in United States, Saudi Arabia, and Indonesia to assess feasibility of lowering minimum to 250 hours and potential pilot shortage
- Research findings may have implications for the aviation industry and policy decisions on ATP hiring requirements.

Group Member Names:

Logan Hess, Ahmad Tagga, Hiroo Mitsikoshi, Patrick Waterman

Recommendations

- I Strongly recommend that the FAA continue to maintain hiring standard and 1500 hour restricted ATP
- Potentially consider the development of new pilot hiring standards or pilot rating requirements.

References

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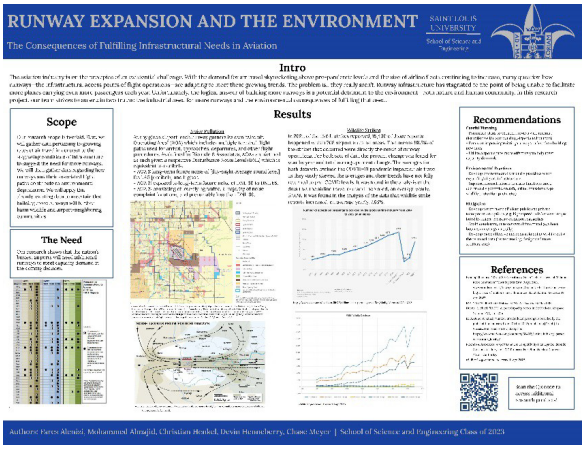
SCHOOL OF SCIENCE AND ENGINEERING



Papers:

The Feasibility of Lowering Hiring Minimums in the United States: A Comparative Analysis

Logan Hine, Ahmad Lingga, Mince Mbisikmbo, Patrick Waterman

Aviation Science

Parks College; Saint Louis University

ASCI-4350 Team Resource Management

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Abstract

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The number of pilots in America is constantly growing, and the need for professional pilots is projected to continue to grow at a steady rate moving forward. We aimed to look at whether or not the FAA's requirement of 1500 hours to receive an ATP certification should be upheld or whether or not it is possible to be reduced. We aimed to

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look at aspects of both safety as well as the effects on pilot training and the number of instructor pilots. With group members from overseas nations we wanted to compare and contrast how those countries fill job openings, and how their pilots are trained.

We hypothesized that an hour reduction could be possible, but were unsure as to whether or not it is likely. We believed that with the sheer number of student pilots and the already existing lack of instructors and other resources, that any drop in hour requirements would lead to flight instructors fleeing to the airlines. When it came to safety, we thought that an hour increase had in fact made commercial airline operations safer, but were unsure at what rate.

When it came to researching this project we decided to locate studies done by other university affiliated flight programs and took a look at their operations. We were also able to look at safety surveys done by and about the FAA as to whether airline safety was increased or decreased post hour increase. , we had opportunities to locate international sources on flight training requirements and safety records which gave us good insight and comparison data.

Following our research, our hypotheses were mostly correct and we found that both safety was increased and that it is very unlikely that flight schools could survive post hour reduction. We had a few other additional unrelated, but applicable discoveries and were surprised by some of the information that we had found.

Ultimately this topic has been somewhat hot lately as there have been efforts by airlines to try and get these numbers reevaluated in order to increase the number of pilots available to work for them. We felt as if the airlines became desperate enough they could make a strong enough case to the FAA, although we would strongly advise against it.

Commented [TK5]: Team not group

Commented [TK6]: research papers are generally written in the third person

Commented [TK7]: studies of what?

Commented [TK8]: they were correct or you believed them to be correct?

Commented [TK9]: too casual for a research paper

Commented [TK10]: what numbers

Commented [TK11]: third person, i won't comment on this any longer

Numbers have shown that this would likely not be a good move and could lead to a decrease in airline safety.

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Introduction

In the year 2013 after a Colgan Airlines crash killed 50 people, the FAA (Federal Aviation Administration) introduced new policies which required commercial pilots to reach 1500 hours in order to be able to fly commercial airliners. Prior to this accident, the FAA only required pilots needed 250 hours which was obviously significantly less. Airlines and pilots alike began to get worried that they would never reach the airlines, and that they would have to spend thousands of dollars to reach their goal. Additionally, this rule change led to pilots finding obscure ways to earn their hours with jobs like banner towing, sky dive pilot, and many other jobs. The CFI (certified flight instructor) market also gained significant traction as this was another way for pilots to gain hours towards the 1500 mark. Airlines became worried because they were unsure how they would find any pilots with the new requirements. Nine years down the road the picture has begun to shift and while airlines have been able to find pilots, air travel has grown significantly which has led to a shortage for different reasons. Airlines have begun to lobby the FAA for reduced hour requirements saying that the one accident was not a good indicator for the rule change, and that lowering the hour requirement would not lead to any less safe of operations.

Commented [TK13]: poor sentence structure

Commented [TK14]: this is not true. The commercial certificate (250 hours) was all the first officer needed for part 121 operations. The captain still needed the ATP and 1500 hours

Commented [TK15]: no citations or references supporting the conjectures made in this section

Ultimately, we aim to look at what would happen if the airlines were to succeed and the FAA were to lower the hiring requirements back to 250We want to see whether or not there would still be enough CFI's left to teach the amount of students who want to flight train; even under today's circumstances there still seems to be a shortage of people who can

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Commented [TK17]: too casual

instruct. We want to know if this would cause a pilot shortage in the opposite direction that it's currently going.

In order to answer these questions, we must look at data not only from the United States, but also from around the world. Many countries do not have the high hour requirements that the United States does, so we must take a look at how students get trained and how many people are flight instructing. We will also take a look at historic information. Obviously this rule change only took place 9 years ago; what is different in today's training landscape? An additional way we would like to produce information is through asking questions. We aim to ask instructors how they feel the market would be impacted. We want to find out what they would do if there were different hour requirements. Ultimately, we aim to look at a large scope of information to give us the best idea of what may change.

Literature review

The 2012 Pilot Source Study (Phase III): Response to the Pilot Certification and Qualification Requirements for Air Carrier Operations.

https://docs.lib.purdue.edu/jate/vol2/iss2/2/

Reading this article talks about the relationship between the requirements of certified flight instructors (CFI), the requirements for Airline Transport pilot (ATP), and enrollment and safety at flight schools. It is clear that the number of students enrolling in flight schools, especially larger flight schools, was significantly affected by the introduction of ATP and CFI Certification requirements. The effect was an increase in both the number of students enrolling in flight training programs and CFI's being trained. The study also shows that the implementation of ATP and CFI requirements impacted flight safety and consistency of

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Commented [TK21]: look at a large scope?

Commented [TK22]: I have no idea with this sentence and hyperlink are meant to convey?

Commented [TK23]: Reading this article talks?

Commented [TK24]: what CFI certification requirement are you talking about

Commented [TK25]: Reference?

Commented [TK26]: What study?

flight training positively, and that led to a decrease in the number of accidents caused by pilot error.

The conclusion of this study is that the implementation of ATP and CFI certification requirements impacted the development of the aviation industry positively with an improvement in safety and an increase in flight school enrollment.

Pilot Source Study 2015: *"A Comparison of Performance at Part 121 Regional Airlines Between Pilots Hired Before the U.S. Congress Passed Public Law 111-216 and Pilots Hired After the Law's Effective Date"* https://commons.und.edu/avi-fac/22/

In this paper, the ATP (Airline Transport Pilot) qualification is not mentioned particularly. However, it does touch on the significance of a pilot's training and expertise in preventing general aviation accidents. The study emphasizes the significance of continuing training and knowledge accumulation over the course of a pilot's career. The paper suggested that in order to maintain knowledge and skills, continuous learning, training, and improvement is required. The document emphasizes the significance of pilot training and experience in preventing accidents in general aviation, even though it does not expressly address ATP certification. The most advanced level of pilot certification in the US is the ATP, which necessitates extensive training and experience. The demanding requirements for ATP certification are intended to ensure that pilots have the abilities and information required to fly complex aircraft.

Pilot Source Study 2015: *"Airline Transport Pilot Certification and Training: A Review of Relevant Research and Recommendations"* https://docs.lib.purdue.edu/jate/vol5/iss2/1/

Commented [TK27]: What study?

Commented [TK28]: Presumably the study you're referring to is what is referenced at the start of the paragraph. Is a 13 year old study still relevant today? When writing a research report, the authors convey information to the reader, you don't just simply link information

Commented [TK29]: Is this information relevant to your study?

Commented [TK30]: The paper your team authored or the paper you are referencing above?

Commented [TK31]: does the paper you reference above explicitly state this or is it your team's conjecture?

Commented [TK32]: I don't really understand how this particular paper applies to your study

This article focuses on the importance and necessity of ATP certification, the article contains research connected to ATP certification and training with some of the most important findings and results being;

1. ATP certification decreased accident rates in commercial aviation
2. ATP certification and training are an important part of commercial aviation safety, and in response to changes in Technology, safety concerns and the aviation industry in general, ATP certification standards changed as well.
3. the latest changes or updates to the ATP certification requirements were introduced due to the need better training and better preparation for airline pilots, changes were in the Transport Pilot Certification Training Program (ATP CTP) and the Multi-crew Pilot License (MPL)
4. These changes have had a big effect on CFIs since they now have to modify their training programs to guarantee that their students are learning the skills and knowledge needed to pass the new ATP certification standards.

The article's overall thesis is that, because CFIs are always required to adjust to changes in the market and regulations, the expansion of ATP certification requirements and standards has had a major effect on aviation and CFIs. Yet, in order to decrease the risk and lower the possibility of accidents in aviation, and to always guarantee that the pilots that obtain an ATP have the required skills and Knowledge to be able to safely operate large, complex, commercial aircrafts, the adjustment and updates to the ATP certification requirements are needed

Commented [TK33]: Frankly this is not a research report, you are simply listing what you are finding and assorted articles

Commented [TK34]: too casual

Commented [TK35]: Why is the word “knowledge” capitalized?

Commented [TK36]: What adjustments and updates are you talking about. You must be explicit

Pilot source study(2022): *"Airline Bid To Reduce Flight Hours For New Pilots Rejected By FAA"* https://www.npr.org/2022/09/21/1124201271/airline-bid-reduce-flight-hours-new-pilots-faa-rejects

Commented [TK37]: Popular media does not make or good reference material in the research papers

According to this article, a group of airlines proposed to lower the number of flight hours necessary for obtaining an Airline Transport Pilot (ATP). Following are some essential points about ATP from the article:

1. The ATP certification is the highest certificate for pilots, and it is required for large, complex, commercial aircraft operation

Commented [TK38]: you established this previously

2. The FAA, or Federal Aviation Administration, establishes requirements for ATP certification, which at the moment call for an absolute minimum of 1,500 hours of flight time in addition to additional training and experience prerequisites.

Commented [TK39]: 1500 hours is not the absolute minimum

3. the airlines' proposal to the FAA was to reduce the required flight time hours for ATP certification down to 1,000 hours, in response to the shortage of qualified pilots to face workforce challenges in the aviation and airline industry, the proposal was faced with rejection due to safety concerns and the need for maintaining high standards for pilots by the FAA.
4. Pilot advocates and experts in the field expressed their concern about reducing or lowering the requirements and standard for obtaining an ATP because it may compromise safety and increase the risk of accidents related to pilot error.

In summary, the article makes the case that ATP certification is still an important part of safe operation in aviation and that the FAA cautiously establishes and upholds the requirements for ATP certification. Even though the aviation industry may face difficulties and labor shortages, keeping high standards for pilot training and certification remains important for preserving the safety of commercial aviation operations.

Commented [TK40]: just repeating what article say it's not research

Methodology

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The research paper portion of our project began with us sitting down as a team and dividing the portions of the research paper into parts. The bulk of our research came from several online sources ranging from scholarly journals written by subject matter experts to products released by the FAA pertaining to regulations involving ATP minimums. Our first step of the research process was to scour articles and regulations looking for information on the current ATP minimums. We found several pieces of writing that laid out the foundation of our research. We then looked for references that pertained to special instances where it would be made possible to obtain an ATP with less than the prescribed amount of flight time. We found that there are a few cases where a pilot could have the number of required flight hours reduced from the initial 1500. We felt that it was extremely important to ensure that all our research came from qualified sources, meaning that any information used in our paper and presentation came from either a qualified subject matter expert or the FAA itself. We felt that this was a to gather information and confirm that the sources we used were credible. Once we compiled several sources two of our group members began sifting through them in order to pull valuable information from them. Not all of the initial sources we found were used in our research but it was still important for us to look over them to ensure they did not contain any information that would be beneficial to our work. After this was completed we were able to divide our references into primary and secondary sources. This allowed us to keep track of the key sources that would be used to describe data and separate them from sources that proved the input of our subject matter experts and the opinions and commentary of other researchers.

Commented [TK42]: What does “scour articles and regulations” mean?

Commented [TK43]: what is a "qualified source"

Commented [TK44]: too casual

Commented [TK45]: too casual

Commented [TK46]: after what was completed?

Results

The findings present data based on three sections of the research questionnaire. The first section of the research questionnaire consisted of collecting data in effect before and after the passage of Pthat can be used in assessing the possibility if the airlines were to succeed and the FAA were to lower the hiring requirements back to 250. In this section, we analyze the number of air carrier accidents that happen pre and post-PL 111-216 and compare the minimum hiring requirement for Air Transport Pilot prior to and post-PL 111-216. The second part of the research questionnaire consisted of whether or not there would still be enough CFIs left to teach the number of students who want to flight train; even under today's circumstances, there still seems to be a shortage of people who can instruct. We examined the data from a couple of journals of pilot sources studies 2010-1018. We collected data regarding the flight programs and the different percentages of CFI and the students. And we also analyzed data on instructors' perspectives on the market that would be impacted and found out what they would do if there were different hour requirements and whether it would cause a pilot shortage in the opposite direction that it's currently going. We compiled the data in an analysis report. The last section of the questionnaire consisted of data analysis on whether the feasibility of lowering the hiring minimum is possible by comparing the hiring minimum of ATP in the U.S., Saudi Arabia, and Indonesia.

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Commented [TK48]: You should remind the reader of what the law states

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Commented [TK52]: what data, the explicit

Commented [TK53]: I don't recall seeing an "analysis report mentioned in the methodology. Where is this analysis report?

Analysis of the number of air carrier accidents that happen pre and post-PL 111-216.

In answering question 1 from the research questionnaire, we analyzed the data from Airlines for America that was depicted by the National Transportation Safety Board (NTSB)'s safety record of the U.S. Air Carriers on the number of air carrier accidents that happened pre and post-PL 111-216. Table 1, the number of accidents that occurred before

Commented [TK54]: Where is the research questionnaire?

and after the implementation of Public Law 111-216, indicates that in the safety record of the year 2000-2021, the total number of accidents prior to 2010 was 357, with 17 fatal accidents that took the total of 777 fatalities. On the other hand, the total number of accidents after 2010 was 277, with two fatal accidents totaling two fatalities. The accident data shows that the number of accidents decreased after the passage of Public Law 11-216, and the safety of air carrier operations increased as it met the purposes of the Airline Safety and Federal Aviation Administration Act of 2010. This result means that raising the minimum hiring requirement, such as having the minimum required number of flight hours to be an air transport pilot, helps to increase the proficiency of pilots, which creates a safe and efficient flight operation that leads to a decrease in the number of accidents.

Commented [TK55]: How did you define the term "accident?"

Commented [TK56]: poor sentence structure

Commented [TK57]: is the decrease statistically significant?

Commented [TK58]: Are you suggesting these results are absolute?

Commented [TK59]: You don't write on how you arrive at this observation.

Table 1

Safety Record of U.S. Carriers (Part 121 Scheduled Service): 2000 to Present

Year	Total accidents	Fatal Accidents	Fatal accidents per 100,000 Departures	Total fatalities	Fatalities: Onboard
2000-2010	357	17	0.122	777	766
2010-2021	277	2	0.021	2	2

Source of data: Data and Statistics of Safety Record of U.S Air Carriers

Commented [TK60]: The number of fatal aircraft accidents is thankfully relatively small (Although even one accident is bad). My point is that how do you know you have enough data to support your conjecture? I'm thinking minimum sample sizes and generalizability of data

According to the air carriers' accident results in Table 1, there were a high number of accidents before the implementation of the minimum requirement for an ATP certificate. The number gradually decreased after the law was passed. Therefore, the passage of PL

111-216 has impacted the U.S. Airline industry to be more effective and aware of the importance of training and improvement of personal skills for flight crews, especially pilots. Even though ATP certification might not be the massive factor discussed in contributing to the airline accident, continuous learning and improvement are essential in maintaining technical and impersonal skills, and knowledge is vital. Similar results were shown in *Pilot Source 2015*, where the authors discussed that the quality of education and flight training has more impact than total flight hours. All three Pilot Source Studies have shown that flight hours are not a reliable predictor of performance by pilots. Thus, instead of focusing on the minimum requirement for an ATP certificate, that will encourage potential pilots to use various ways, including following a malicious path to achieve it. It is crucial to focus on training potential pilots to be more experienced and provide an advanced quality training environment for the pilots to perform well in order to operate complex aircraft safely and minimize the risk of accidents (Smith et al,. 2017).

The comparison of the minimum hiring requirement for Air Transport Pilot prior to and post- PL 111-216.

The second part of the data analysis to answer question 1 was to look at the historical data on the minimum requirement for Air Transport Pilots before and after PL 111-26. And also evaluate the difference in qualifications, benefits, and limitations in assessing the possibility of if the airlines were to succeed and the FAA were to lower the hiring requirements back to 250.

Commented [TK61]: How do you know the law it's what resulted in these changes? Why couldn't it be some other variable that affects aviation safety? Like technology?

Commented [TK62]: Similar to what?

Commented [TK63]: I'm confused. So are you suggesting total time does or does not influence accident rates?

Commented [TK64]: How do you train someone to be more experienced?

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Commented [TK66]: What date are you talking about?

Table 2

Commercial pilots' qualifications prior and post Public Law 111-216 Section 216

Commented [TK67]: Table 2 has a lot going on. Generally, tables are used to provide condensed information. This table is quite broad

Qualifications	Prior to Public Law 111-216 Section 216	Part 121 commercial pilots could possess a commercial pilot license with multi-engine and questionnaire ratings with significantly fewer flight hours and still be qualified as a first officer for Part 121 air carriers.
		Collegiate flight students could earn as few as 500 total flight hours before gaining employment with a Part 121 air carrier.
		Pilots operating as first officers under Part 121 carriers were not required to have earned an ATP certificate.
	After Public Law 111-216 section 216	ATP certification is the highest level of certification for pilots and is required to operate large commercial aircraft in the U.S. All ATP-certificated pilots must also have received flight training, academic training, or operational experience that will prepare a pilot, at a minimum, to: (1) function effectively in a multi-pilot environment, (2) function effectively in adverse weather conditions, including icing conditions, (3) function effectively during high altitude operations, and (4) function effectively in an air carrier operational environment (111th Congress, 2010 pp. 19-21).

		Section 217, of PL 111-216, states that an ATP certificate requires a minimum of 1,500 hours of total flight time. However, an exception to these 1,500 hours now exists for collegiate flight students. Students can now earn a restricted-ATP (R-ATP) certificate with only 1,000 hours of total flight time. - PL 111-216 still requires the collegiate flight student to accumulate several hundred additional flight hours beyond current academic requirements before he/she can sit in the right seat (first officer) of a U.S. air carrier.
		Overall, the impact of these two sections 216 and 217 of PL 111-216 on collegiate flight programs in the U.S. may include: (1) an increase in student flight costs, (2) a decrease in student enrollment and/or student retention issues in collegiate flight programs, (3) a 7 decrease in post-graduate job placements such as first officers, and (4) the increased risk of financial viability of U.S. collegiate flight programs.
Benefits	After the Public Law 111-216	Research has shown that ATP certification is associated with lower accident rates in commercial aviation.
		ATP certification is a critical component of aviation safety, and the standards for ATP certification have evolved over time in response to changes in the aviation industry, technological advances, and safety concerns.

Challenges/ Limitations		The impact of these changes on CFIs has been significant, as they must adapt their training programs to ensure that they are providing their students with the necessary knowledge and skills to meet the new ATP certification requirements.
		Pilots shortage: high number of pilot demands and lower number of qualified pilots supply in the future.
		All first officers are now required to earn considerably more flight hours. An ATP certificate for employment with a U.S. air carrier.
		These additional flight hours represent a significant financial expense not previously experienced by collegiate flight students.

Source of data: Commercial pilots Requirement Prior to Public Law 111-216 section 216 (Casebolt, 2015).

Table 2 indicated some qualifications, benefits, and limitations to being an ATP certificate holder before and after the passage of Public Law 111-216. The data indicated that before PL 111-216, pilots operating as first officers under Part 121 carriers were not required to have earned an ATP certificate and could be employed with fewer flight hours and as few as 250-500 total flight hours. Thus, there were more pilots compared to job availability which allowed people to lie to be pilots in command, which led to more accidents occurring as the pilots had lower qualification requirements. After the Airline Safety and Federal Aviation Administration Extension Act of 2010 implemented PL 111-

Commented [TK68]: Why do you bother with the table if you're going to state it all in the narrative?

Commented [TK69]: Do you have any data supporting conjecture that pilots lied?

216, the qualifications for ATP increased as all flight crewmembers operating in Part 121 air carriers must hold an FAA-issued ATP certificate. They must also have received flight training, academic training, or operational experience that will prepare a pilot, at a minimum, to function effectively under any circumstances. An ATP certificate requires a minimum of 1,500 hours of total flight time; however, students can now earn a restricted ATP (R-ATP) certificate with only 1,000 hours of total flight time. These high flight hours requirements increase student flight costs, decrease student enrollment in flight schools, and create challenges or limitations. For instance, pilot shortage as the pilot demand increases and the supply decreases, and financial issues due to more training after graduating from flight programs and bachelor's degree. Research has shown that ATP certification is associated with lower accident rates in commercial aviation and is a critical component of aviation safety. In addition, there are some benefits after the PL 111-216; however, the current research results indicate that commercial pilots were more successful in completing training than those holding an ATP certificate. This would indicate that quality of experience, not just the quantity of hours and certification criteria, better predicts pilot performance at the regional carriers. According to the results of both the 2010 Pilot Source Study and the 2012 Pilot Source Study, pilots with more than 1,500 hours were less successful in regional airline training than in some pilot groupings with fewer than 1,500 hours. This indicates that using a quantitative measure of Total Flight Hours as the success predictor is unsuitable for the aviation industry that constantly strives to improve safety and training performance. Rather than relying solely on a quantitative measure of total flight hours, the industry should also consider two qualitative measures: (a) the quality of training a pilot receives and (b) the quality of flight hours a pilot obtains after training is complete (Smith et al., pg:22, 2013).

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Commented [TK71]: What do you mean by associated? Are you suggesting there's a correlation?

Commented [TK72]: How do the research results express this?

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The comparison of the number CFIs and flight students in flight programs and the effect of ATP on them.

The second section of the research questionnaire compared the number of CFIs and flight students in in-flight programs and the effect of ATP on CFIs and flight students. Flight instructor jobs demographic statistics data indicated that the average number of years that certified flight instructors enjoy staying in their job for 1-2 years for a percentage of 37%, where 53 % prefer to work at private companies over education companies 34%. These results showed that more flight instructors prefer to work in the private sector than education, creating fewer CFIs in-flight programs and adding to the shorter time they work in the education sector (Zippia, 2022). In contrast, the number of student pilot certificates active in the United States in 2020 was over 222,630 students ((Published by Statista Research Department & 3, 2023). These statistics indicated that there still seems to be a shortage of people who can instruct as there is a higher number of students pursuing flight training. The *2010 Pilot Source Study* produced five significant findings; one was that certified flight instructors (CFI) had fewer extra training events and comparatively fewer non-completions than pilots who were not flight instructors. In addition, the research also indicated that flight instructors are at a disadvantage when it comes to gaining the required aeronautical experience required for the FAA ATP certificate; for instance, a full-time flight instructor obtains an average of 446 total flight hours per year, which take the individual approximately 2.8 years to obtain the needed flight hours to meet the FAA ATP requirement of 1,500 hours of total time. Historically, flight instructing has been the bridge between finishing advanced pilot training and being hired as a pilot for an airline. students pursuing a professional pilot degree attend collegiate flight programs with aspirations of

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Commented [TK75]: Jobs demographic?

Commented [TK76]: Explicitly, what data are you talking about?

Commented [TK77]: How do you know they enjoy?

Commented [TK78]: It's not clear to me why aren't these percentages are included and how they apply to your study

Commented [TK79]: How does this information contrast what was written in the previous paragraph?

Commented [TK80]: What is a non- completion in this context?

job placement in commercial or corporate aviation. They will build flight hours through flight instruction to meet their ATP minimum. As the number of CFIs achieves their ATPs minimum hours, it will affect the flight training CFIs number, which might lead to a shortage of CFIs needed. Some of the reasons for the anticipated pilot shortages are varied and may result from a combination of things including, but not limited to, the mandatory retirement age for U.S. pilots, increased flight hour requirements for ATP and R-ATP certificates, and the increase in transport demand in the U.S. Therefore, to solve this issue, the ATP minimum requirements can be taken into consideration in making changes for the better future of pilot operations.

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Commented [TK82]: Is this a comprehensive list?

Commented [TK83]: What constitutes a "better future?"

The feasibility of lowering the hiring minimum is possible by comparing the hiring minimum of ATP in the U.S., to Saudi Arabia, and Indonesia.

The last section of the research questionnaire explored and analyzed whether the feasibility of lowering the hiring minimum is possible by comparing the hiring minimum of ATP in the U.S., to Saudi Arabia, and Indonesia.

Table 3

Qualifications for Hiring Minimums of ATP

The United States	The FAA ATP Requirements: ● Be at least 23 years of age ● Must hold either: ○ A commercial pilot certificate with an instrument rating ○ Or, meet the military experience requirements to qualify for a commercial pilot certificate, and an instrument rating,

	○ Or, a foreign airline transport pilot license with instrument privileges ● Medical requirements: ○ Hold a 1st class medical certificate to act as Pilot-In-Command ○ Hold a 2nd class medical certificate to act as Second-In-Command ● **1,500 hours** of Total Flight Time ● **500 hours** of Cross-Country Flight Time ● **250 hours** as Pilot-In-Command (PIC) ● **100 hours** of Night Flight Time ● **75 hours** of Instrument Training ● **50 hours** of In Class of Rating Sought ● Pass an ATP knowledge test ● Complete and pass an ATP-CTP training program
Saudi Arabia	● Requires certificates up to multi-engine ● 270 hours total flying time (25 of which in multi-engine) ● 27 years old or less. ● Has to be a saudi citizen
	FlyNas ● Requires certificates up to multi-engine ● 240 hours total flying time (25 of which in multi-engine) ● Age between 19 and 35 ● Has to be a saudi citizen

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Indonesia	Airline Transport Pilot License (ATPL): ● 1000 hours of total flying experience; - 200 command hours flying experience on type; ● Hold minimum 250 hours on aircraft. (simulator time not included) for smaller aircraft. ● Minimum of level 5 ICAO English proficiency test ● ICAO Class 1 flight crew medical certificate (current), no restriction except for corrective glasses. ● At least 18 years old to start your pilot training in Indonesia and at least 23 years old for ATP. ● Flight school graduate ● Free of accident-incident verification report from authority. ● Valid passport minimum 24 months left

Sources of data: FAA ATP Requirements, Saudi Arabia and Indonesia minimum hiring qualifications for airline pilots websites ((Madwire, 2022).

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We researched the data regarding minimum hiring qualifications for ATP certificates in the United States, Saudi Arabia, and Indonesia in order to compare them and see whether there is a possibility of lowering the hiring minimum in the United States. Table 3 shows the minimum flight hours for Saudi Arabia and Indonesia is five times lower than those in the United States; Indonesia is about 250 for smaller aircraft and about 1000 hours for major airlines. Saudi Arabia with 270 hours total flying and certificates up to multi-engine. In the United States, it is required 1,500 hours of Total Flight Time and also to complete and pass an ATP-CTP training program. To determine whether having high total flight hours for ATP impacted high safety in flight operation, we can see from the result of the rank of countries and regions with the highest number of fatal civil airline accidents from 1945 through 2022. The data indicated the United States holds the first place with 864 accidents and Indonesia in seventh place with 106 accidents. At the same time, Saudi Arabia is not included in the lists (Published by Statista Research Department

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& 3, 2023). Given the statistics data, it shows that having high flight time does not have a massive impact on the safe operation of flight because even though the U.S. required higher flight times to get ATP certificate, it has the highest number of accidents which explains the inversely proportional relationship or negative relationship. Despite this result, many different factors contribute to decision-making that requires a minimum of 1.500 flight hours in the U.S. Nevertheless; the U.S might need to see the possibility of lowering the hiring minimum of ATP by analyzing the data on airline safety around the world and some crucial factors that might impact the effectiveness and safety of the aviation industry.

Commented [TK88]: So is the team suggesting that aviation safety in the United states is the worst? Certainly, the wrong number of accidents it's way too high. To better understand the meaning of the data it must be contextualized. In other words, look at 864 accidents and compare that to the number of flight operations. A single data point can be misleading

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Discussion

Based on the research conducted, we have been able to discover a few different things that not only we didn't initially predict, but additionally lead us to some additional discoveries that we did not plan to find. On the topic of safety, we were able to make a couple observations which tie into each other pretty well; the idea that flight hours have made a significant difference in safety, but also that flight hours may not even indicate whether or not someone is a proficient pilot. pilots at all different stages in their training have to take certification tests after they have completed numerous prerequisites such as training objectives, hour requirements, as well as endorsements from their instructors. Ultimately, someone could complete all of these items and they still may not be at a good enough skill level to safely operate a larger aircraft. This is however impossible to measure, and there is not necessarily any sort of test or recruitment moving forward that would prevent these individuals from flying other than seeing how they perform in the workplace. The second part of the observation made was that once the hour requirements were increased, there was a significant reduction of fatal crashes. There were still a good

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amount of crashes, but it could be theorized that with more experience pilots know how to react in different scenarios and can prepare the plane to be in a safer position.

With regards to the research conducted on the actual numbers of flight instructors versus the number of students, we were able to identify information that was more closely related to what we had initially predicted. The number of people who are interested or who are already student pilots is increasing year over year whereas the number of people who are certified to instruct is not rising at the same rate. In addition to the research that was conducted about overseas flight training (and safety) it was a little bit harder to measure the data simply considering the scales of operations. While there are less accidents, there are also significantly less flights that take place on a daily basis. Because of this, the number of student pilots is also scaled down considerably. Due to the lack of flight schools or instructor pilots in these countries, many students choose to relocate to areas where there are dedicated and established flight training programs which will allow them to move through training in a more efficient manner and most likely in better equipment. We were still able to pull some valuable data from overseas sources, and were able to make conclusions similar to what we had theorized.

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Conclusion

In conclusion, we have ultimately come to the decision that it would not be feasible or realistic for the FAA to deregulate the hour requirements as they sit. As mentioned previously, flight time as a lone factor has not done a perfect job of predicting pilot safety, but they have so far done a good enough job. The number of fatal accidents hadrastically decreased since the hour hike, and we believe if it went away, we could see an increase in deaths. With regards to flight training, we still do not believe that it would be realistic to drop the ATP hour requirements. The number of CFI's we currently have are not even

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Commented [TK101]: Deregulate the hour requirement or simply reduce the hour requirement?

Commented [TK102]: Interesting, what criteria do you use to say "good enough job"

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Commented [TK104]: no drop in the hour per requirement whatsoever

enough to support the amount of people who want to become pilots. It is a little difficult to see from our current perspective considering Parks college was always well staffed, however non university affiliated programs often find themselves scrambling to find well qualified instructors. Additionally, we were able to identify what happens in other countries when they have a lack of flight instructors; it leads to outsourcing and a drop in the quality of work. Lastly, the number of pilots who could immediately advance from flight instructor to airline pilot, or even commercially rated pilot to airline pilot would overwhelm the airlines as well as overwhelm the flight schools causing a tremendous logistical issue that would force some unusual situations.

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At the current rate that pilot jobs are needed, it is possible that the FAA reconsiders their decision to uphold the hour requirement. We feel that it is not advisable to do so, and would strongly recommend not changing the requirements.

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What is the Future for Zero-Carbon Aviation Fuels?

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Abstract

This literature review will be a comprehensive dive into the current issues and challenges facing a future with zero aviation emissions. These key aspects are infrastructure, electric technologies, hydrogen technologies, and construction/planning challenges. The aviation industry wants to jump to alternative fuels as fast as it can and the technology is quickly growing, but there is slow progress towards their actual implementation.

In this paper we want to examine; what are the challenges in infrastructure, electric technologies, hydrogen technologies, and construction/planning that are preventing the aviation industry from being zero emission. Current technologies are not yet developed enough for new carbon-free fuel forms to be used functionally on aircraft, ground infrastructure for both electric and hydrogen aircraft has yet to be scaled to an aviation level, and aviation stakeholders are too slow to implement new policies and procedures on new fuels. In this study, all of the data was collected through online research.

There is a plethora of industry stakeholders that are trying to forward zero emissions technologies and have posted their findings, press statements, and opinions. This team gathered those findings to create conclusions about what the future holds for aviation.

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The results of this study found that progress is lagging in each area we explored because of a few reasons. For infrastructure, the technology already exists. Many mature industries already use electric charging and hydrogen fueling. However, none do these things on the scale that a large international airport would need. Scaling all these existing technologies up requires a lot of planning and money. For electric and hydrogen aircraft the technologies simply do not exist right now. There are no batteries dense enough to have a true electric transport category aircraft. The technology for hydrogen fuel cells that are light enough and safe enough to go into an airplane also do not exist yet. Lastly, the Federal Aviation Administration has little to no existing regulations or guidance on implementing electric or hydrogen aircraft. While they will certify these aircraft on a developmental or experimental basis, there is nothing written into the regulations as to the best practices during ground operation. Our most important finding is that with the current and projected technology, we came to conclusions on which segments of aviation could use which technologies best.

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The reason this study is important is there seems to be a lot of excitement surrounding zero emissions but the practicality of them is missed in many publications. Stakeholders in the industry want to build interest in the future so they leave out the negatives or certain challenges that do not have answers. By looking outside the industry and comparing findings to those inside the industry we have been able to paint a complete picture of what we think the future of aviation fuels is going to look like.

Introduction

. This portion will cover the sources used, an interpretation of their content, and how they fit into the greater body of knowledge. Each area where challenges were found will have its literature review. Next, the methodology will be discussed. Here the methods we used to collect the data will be discussed. After the methodology, there will be a review of the results determined in each of the areas. Then a discussion of the findings, where the results will be interpreted and synthesized. Last will be our conclusion where the paper will be wrapped up with the things this group would like the reader to take away.

Literature Review

Infrastructure

In regards to the airport itself in terms of infrastructure, there are a significant number of challenges that must be addressed when considering adding any type of electrical or hydrogen-based systems. A research study was conducted by the National Academies of Sciences, Engineering, and Medicine which was published in 2022 that went into detail on these challenges.

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The first obstacle towards an electric and hydrogen-based system is presented in Chapter 16 of the report on page 137, Aircraft Scenario Planning. It explains that the average airport requires “40 to 50 MW” of power during the day, and “35 to 36 MW” at night. When incorporating an electric aircraft-type system, a careful analysis of the “aircraft-specific power supply requirements” has to be made to ensure that the airport’s current infrastructure can support the increased power requirements that come with its addition (NATIONAL ACADEMY, 137).

These power supply requirements are directly tied to the method of electrical or hydrogen system that an aircraft utilizes. Referenced in Chapter 8 of the report on page 85, Airside Requirements, section 8.1 lists the current three options that are being considered for electric-based systems: “Recharge by fixed ground chargers, also known as charging stations”, “Recharge by the mobile supercharger on batteries (truck or trailer)”, and “Battery swap at the gate (batteries are recharged separately)”.

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With smaller airports, the requirements for these would be far less difficult to consider given the space that general aviation and regional airports have and these airports would be able to utilize their current facilities through the installation of “aircraft battery charging stations” and “low-clearance pop-up chargers” (NATIONAL ACADEMY, 88). This is because aircraft typically sit for decent durations or even fly sporadically or once a day depending on the airport.

Commercial airports, however, would face greater difficulty, particularly larger airports with high departure rates and international flights. The core issue presented is trying to maintain the current pace of ground operations as any significant increase in the turnaround time will reduce the financial advantage of electric aviation for flight operators and negatively affect gate capacity (NATIONAL ACADEMY, 88).

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With fixed or mobile chargers, this issue comes to light with the question typing back to the first obstacle: would the airport’s electrical infrastructure or charging system handle a large number of aircraft at once or even be able to charge larger-sized aircraft? According to the report, current charging technology can only produce an output of 600 kW of power, with regional commercial airliners that are being designed with a hybrid system with the lowest end requiring at least 600 kW and larger aircraft in concept requiring up to 7 MW (NATIONAL ACADEMY, 88). Should the airport want to

eventually handle six or seven large-body hybrid aircraft, that automatically nearly doubles the average power used from 40 to 50 MW during the day to 82 to 99 MW, requiring a substantial upgrade to the overall power capacity that the airport can handle. Depending on the capacity of an aircraft's battery, this could significantly increase ground time and reduce flight time.

Lastly, utilizing a battery system alleviates some of that so long as "ground handlers and FBOs have an adequate inventory of fully charged batteries" (NATIONAL ACADEMY, 88). There are three requirements to maintain a battery changing system: "Equipment and trained personnel to load and unload batteries from the aircraft", "Inventory of batteries that are compatible with the aviation activity and aircraft fleet", and "an infrastructure to store and charge batteries". These would be more useful for commercial airports and larger aircraft as if they are charged ahead of time it is a matter of swapping it out and letting the plane continue. The issue that comes into play however, is not just having the storage space and charging capacity to handle this, but the report also picks on the potential that this might "have to be performed by licensed mechanics instead of trained ground handlers" (NATIONAL ACADEMY, 88). Depending on the airline's operation, this could result in additional operational difficulties for them.

Shifting to hydrogen-based systems, there are also three proposed methods for this type of charging: "Refuel hydrogen from a hydrant system", "Refuel hydrogen from a tanker (truck)", and "Swap H2 containers" (NATIONAL ACADEMY, 85). When looking at hydrogen, one major advantage that has been found is that it has a high energy density which according to the research report: "the energy found in 1 kg of hydrogen equates to that found in 3kg of jet fuel (kerosene)" (NATIONAL ACADEMY, 89). This means that, essentially, for every part of hydrogen powering an airplane, 3 parts of jet fuel would have

been required. So if an aircraft utilizes 30,000 lbs of jet fuel, only 10,000 lbs of hydrogen would have been required instead.

Risks of hydrogen storage, however, can be high, as it is quickly noted that the element itself is not only very flammable but also has a very low viscosity making it susceptible to leaking, is colorless and odorless making detection difficult. These factors combined can easily result in a leak going unnoticed and, along with the pressure requirements that must be maintained due to hydrogen's viscosity level can result in a very risky situation from even a small leak (NATIONAL ACADEMY, 89). According to the report, holding it at high pressure also has its risks, and the gas in the event of impingement can not only damage the aircraft, or cause the fueling pipe to whip around, but the gas pressure can also "cut bare skin" of someone nearby in addition to flying debris should the tank ever rupture (NATIONAL ACADEMY, 89).

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A natural risk that moves towards this fear is that hydrogen can cause both metal and plastic to become brittle and structurally weaken over time, gradually increasing the risk that an impingement could occur and would require more maintenance and observation as the age of the tank(s) becomes more of a factor, so the usage of both a carbon fiber composite casing and a high-density polymer liner for the tank itself address this potential issue and slow the risk, but are much more expensive compared to the regular containers (NATIONAL ACADEMY, 91).

Addressing concerns, it was noted within the report that the Harvard Environment, Health, and Safety Department created a fact sheet regarding safety precautions that should be taken in the event hydrogen containers are used at an airport. These are: "Store the containers with adequate ventilation in the warehouse", "Maintain the temperature of the warehouse that does not exceed 125 degrees Fahrenheit", "Secure hydrogen containers and

tanks to prevent falling or being knocked over", "Use flash arrestor on tanks", "Store full and empty cylinders separately", and "Equip building with an automatic sprinkler or deluge system in case of fire" (NATIONAL ACADEMY, 92).

Electric Aircraft

One of the biggest challenges to electrically-propelled aircraft is having batteries with high enough energy density to accommodate an economically useful range (Pascal 21, Ribeiro, et al).

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While the field of electric propulsion is relatively new, electric aircraft manufacturers are taking cues from the consumer electric vehicle market in that they are adopting standardized charging methods. General aviation scale aircraft manufacturers use the same charging ports as commercial electric vehicles, rather than proprietary chargers or connectors (Pipistrel Manual 8).

In the US and EU, the Combined Charging System (CCS) charger is the most prevalent charger form factor. In Japan, CHAdeMO is the leading connector, and GB/T is the connector of choice in China. All of these comply with the same electrical standards, with the incompatibilities only in a handshake and locking mechanism, meaning that it is feasible to convert a given vehicle to any given charger configuration (MUXSAN). Megawatt chargers are also on the horizon to accommodate charging very large batteries in very short times (NREL.gov).

An aircraft need not be grounded for the entirety of its charging time, either. It is feasible to design aircraft batteries such that they can be swapped with a fully charged one relatively quickly, and the discharged battery be recharged while the aircraft conducts

another mission. Researchers at Delft University have been exploring scheduling solutions for a fleet of electric aircraft. This, of course, would necessitate the inclusion of easily-accessible battery compartments in the aircraft and the installation of safe charging bays for the batteries on the ground.

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The ALICE commuter aircraft being developed by Eviation, is the current frontrunner for commercial electric aircraft. At the time of writing, the platform is still in active development, and information on its charge time and connectors was not publicly available. However, the stated operating range as of Q1 2023 was given as 250 miles (Eviation), with expected advancements in battery technology it could reach the target range of 900 miles by 2024 (Hamilton 40).

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Unfortunately, even ALICE's range is not yet commercially viable today. The specific energy density vs productivity of current electric motors and storage is simply not yet high enough for commercial flight operations and is not expected to be viable before 2035. The specific energy of batteries would need to be more than 2000 Watt-hours/kg for electric aircraft to be competitive in regional jet operations, and the best batteries available today can only deliver about 265 Watt-hours/kg (Hall et al. 28-29).

Hydrogen Aircraft

A hydrogen-powered aircraft is an airplane that uses hydrogen fuel as a power source, hydrogen can either be burned in a jet engine or another kind of internal combustion engine or can be used to power a fuel cell to generate electricity to power an electric propulsor. According to IATA ''hydrogen is the most abundant element in the universe and its liquid form contains about 2.5 times more energy per kilogram than

kerosene. When burning, hydrogen only produces water vapor as a by-product, since the fuel has no carbon content to start with. With regards to local air quality, hydrogen combustion produces up to 90% less nitrogen oxides than kerosene fuel, and it eliminates the formation of particulate matter. From an environmental and energy content perspective, hydrogen has abundant potential. An advantageous criterion for any fuel is high energy density, inexhaustibility, cleanliness, convenience, and independence from foreign control. Liquid hydrogen achieves the criteria, along with the potential to eliminate combustion emissions.

Another useful feature of hydrogen is that it can be used as a replacement for liquid fuel or as a fuel cell for electrical power. Electrical fuel cells could be suitable for short-range aircraft while hydrogen combustion would be suitable for long-range and higher payloads. Hydrogen fuel cells are already common devices found in cars, buses, and aircraft servicing vehicles. Liquid hydrogen fuel has a lower volumetric density than kerosene. It is estimated that to complete a given mission, despite the aircraft requiring a lower mass of fuel, the space that this fuel would occupy would be around 4 times larger than that of kerosene. This presents a challenge for airframe designers and would require a significant redesign of conventional airframes. Water vapor is another greenhouse gas produced by the combustion of fuel, and although the radiative forcing (difference between the energy absorbed through the Earth's atmosphere compared to the energy that is reflected into space) is lower than that of CO2, it still contributes towards global warming. Hydrogen combustion would produce about 2.6 times more water vapor than kerosene fuel. In a study about the climate change effects of hydrogen aircraft, Ponater et al. evaluated the individual and accumulated effects of the emissions of a hydrogen-based flight to a kerosene-based flight. Overall, this literature review provides valuable information about

hydrogen liquid fuel's potential benefits and challenges. It also addresses the challenges for hydrogen to be a viable fuel source. Besides outlining the benefits of hydrogen as a fuel source, like its large energy density, low emissions, and versatility in production methods, it also acknowledges the limitations of hydrogen technology, its high production costs, and the need for significant infrastructure investments. This article lacks further research and development in hydrogen fuel cells to improve their efficiency and safety.

Airbus, ZeroAvia, and Hydrogen Aero are three aircraft manufacturers interested in designing aircraft with hydrogen-electric powertrains. Airbus is aiming towards the world's first zero-emissions commercial aircraft with ZEROe concept aircraft by 2035 to power future aviation. All three ZERO concepts are hybrid-hydrogen aircraft; they are powered by hydrogen combustion modified gas turbine engines. All the technologies are complementary, and the benefits are additive. The methodologies being explored to use hydrogen are as detailed below really interesting content, but it must be supported with citations and references..

Hydrogen can be used directly as fuel for combustion with oxygen that can be used in a turbofan or turbojet engines, or it can be used in Hydrogen Fuel Cells to create electrical power that complements the gas turbine, resulting in a highly efficient hybrid-electric propulsion system. Through future ground and flight testing, Airbus expects to achieve a mature technology readiness level for a hydrogen-combustion propulsion system by 2025. Some example Airbus ZEROe concept aircraft incorporate a Blended-Wing Body, with the exceptionally wide interior opening up multiple options for hydrogen storage and distribution such as underneath the large wings. Two hybrid-hydrogen engines provide thrust on this concept aircraft (Airbus).

Moreover, Airbus is collaborating to utilize a Hydrogen Hib in New Zealand starting with Christchurch International Airport, ‘’Ultimately, the partners will evaluate the means of deploying hydrogen hubs at airports, starting with the case study at Christchurch. If successful, commercial hydrogen-powered aviation could be extended to cover the entirety of New Zealand’s domestic network. The additional participants in the consortium include Christchurch International Airport, Fortescue Future Industries (FFI), Hiringa, and Fabrum. New Zealand, with its large share of renewable energy sources in its energy mix, is a model for a proactive, forward-looking ecosystem with a huge potential for low-carbon hydrogen production’’ (Airbus).

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ZeroAvia is a British/American hydrogen-electric aircraft developer, aiming to satisfy missions from 20-seat regional trips to over 100-seat long-distance flights, ZeroAvia enables scalable, sustainable aviation by replacing conventional engines with hydrogen-electric powertrains. According to ZeroAvia “hydrogen-electric powertrains offer a long-range, lower fuel and maintenance costs, and zero emissions. Non-toxic hydrogen and compressed gas storage are more reliable with less severe consequences in the event of failure. Compressed hydrogen tank integrity is superior to conventional liquid fuel tanks. Also, hydrogen has a lower radiant heat than conventional gasoline.” ZeroAvia had completed a short test flight in the mid of January from Cotswold Airport, “the startup ZeroAvia said it successfully flew its 19-seat prototype plane during a 10-minute flight test… marking an early but important step toward hydrogen-fueled flying. The twin-engine aircraft was retrofitted to include fuel cells — which convert hydrogen into electricity — and batteries on one side, with the other side using an oil-burning jet engine” (Gallucci, 2023). This is a great starting point for hydrogen-fueled aircraft to be more robust in seeking to curb emissions by designing more fuel-efficient engines and combustion jet

engines burning liquid H2. “ZeroAvia said it expects to deliver a 2- to 5-megawatt hydrogen-electric propulsion system that’s certified to fly in 2023, with plans to launch nine- to nineteen-seater commercial aircraft with a 300-mile range by 2025” (Gallucci, 2023).

Universal Hydrogen is a Los Angeles-based company also focused on the decarbonization of aviation by making hydrogen a viable long-term fuel source. Hydrogen Aero is also aiming to create a better and greener environment through hydrogen zero-carbon fuel. A hydrogen regional airliner operated by Universal Hydrogen completed its first flight early in March from Washington state, setting a new record. “Successfully flew a 40-passenger aircraft using primarily hydrogen during part of the 15-minute flight. The Los Angeles–based startup replaced one of the plane’s two turbine engines with a fuel-cell electric powertrain. The flight came just weeks after another hydrogen aviation startup, ZeroAvia, flight-tested its prototype plane over the English countryside. The 19-seater flew for 10 minutes, making it the largest aircraft powered partly by hydrogen to take flight. That mantle now apparently belongs to Universal Hydrogen’’ (Gallucci, 2023).

Hydrogen power has become available to the aviation industry but is difficult to utilize in its natural form as it is extremely buoyant and light in weight, therefore the main challenge in hydrogen-powered aircraft is hydrogen storage. In nature, hydrogen is an extremely light atom that can either be bonded to oxygen (in water) or carbon (in gas), resulting in a low volumetric density. ‘’Powered by hydrogen, the aircraft would require four to five times the volume of conventional fuel to carry the same onboard energy. Providing hydrogen in gas form also requires a lot of storage volume. The compression required by the storage volume can then increase costs and energy needs. As a result, storage can get heavy. At the same time, the mass of liquid hydrogen tanks must decrease

by 50%. Because of this, hydrogen storage appears to be a materials science challenge in trying to identify lightweight materials that will not react with hydrogen. Therefore, a better understanding of its interactions with other elements (such as metals or composites) is crucial'' (SolidSolutions, 2022). Thus, aircraft manufacturers must have a platform or third party to minimize risk and observe and test aircraft designs under different operating conditions.

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Liquid hydrogen tanks can benefit from unique platforms or third-party solutions that enable designers and engineers to evaluate pressure stratification and temperature stratification at the design stage. Therefore, an efficient storage tank system is needed to achieve hydrogen sustainability in aviation with specific specifications such as ''the storage tanks must be manufactured with specialized materials to withstand extreme temperatures. Moreover, the tanks must have thick walls and provide sufficient isolation between stacks to minimize the heat influx through the tank walls. The leaking heat can cause the LH2 to boil and absorb the surrounding heat necessary to keep the LH2 at deep freeze temperatures. Cryogenic tank manufacturers aim to keep the boil-off condition below 1% per day. The shape of the tanks must be as close to a sphere as possible to minimize design losses. A sphere exposes the least surface per held mass of LH2. To maintain the center of gravity, equal-sized LH2 tanks must be placed such that they do not affect the pitching or tipping moment of the aircraft. Stacks of spherical tanks can be placed in the aircraft's front section (just behind the cockpit on the lower deck) and the rear section (just forward of the tailplane). A vacuum flask technique with additional insulation on top will ensure the LH2 boil-off condition is minimized. If the tank loses the vacuum, insulation layers contain the heat influx within the system.'' (Memon, 2023).

Commented [TK121]: What do you mean by third party in this context?

Construction/Planning

When it comes to the legal aspect of planning charging infrastructure there are lots of hoops to get through. For this specific section of our research, we reviewed press releases and articles published by construction and consulting companies. These articles outlined the beginning processes to get airports and the surrounding areas to support new carbon-free energy methods.

To construct a charging site you have to plan the location, size, chargers, and the associated electric support infrastructure. Like any airport, this charging location would have to be large enough to support multiple different-sized aircraft. “Some electric aircraft have wingspans of 50 feet or more. Setbacks and object-free areas will need to be checked, and aircraft will need room to park when they are done charging” (MeadHunt, 2022). Utilities would also have to be analyzed to be sure that the electricity being supplied to the charging location could support the load. “Widespread implementation of electric aircraft in the small and medium-aircraft markets may increase daily airport electricity demand by as much as 30 megawatts (MW), significantly more than what all but the largest airports use” (Weaton and Williams, 2022). To provide enough power, coordination will need to take place with providers to increase the power supply and possibly upgrade the grid or existing infrastructure. Additionally, airport stakeholders such as FBOs may want to install chargers at their ramp to increase revenue and traffic. This would require planning on the operator’s end to ensure they have the necessary facilities to handle the increase in traffic.

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With any airport project, there has to be an environmental review for the impact of the project. “The Federal Aviation Administration (FAA) will determine its level of environmental oversight through the Section 163 process as described in the FAA Reauthorization Act of 2018” (MeadHunt, 2022). The chargers are pretty environmentally friendly and would not have much of an impact on the site’s location. Larger impacts could

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be the running of utilities either underground or above ground. This could result in the clearing of areas that are wooded or possibly wetlands, etc. “Some large hub airports currently contract with local utility providers to host solar arrays onsite” (Weaton and Williams, 2022). If large-scale solar arrays are installed this creates additional clearing, construction, and possibly environmental concerns. Once constructed, though, solar arrays would be environmentally friendly. For a hydrogen tank swap, the challenge is storage facilities that can safely house the hydrogen and be accessible for aircraft. If the ramp for the charging site is near noise-sensitive areas this could also be a consideration. Electric infrastructure can sometimes generate noise besides the obvious noise created by a busy apron of coming and going aircraft.

Every airport maintains an airport master layout plan. This plan contains a full survey of the airport property with future layouts and plans. When there is a project being proposed, this master plan is required to be updated to reflect the project. This is part of the planning process with the environmental impact. These plans are very detailed and would contain utility, elevation, drainage, and other relevant information. For any charging site on a ramp, a new airport master plan would be required to be drafted, reviewed, and approved for the project to go forward. If utilities are to be moved or created for this charging site this could also impact the airport and require more construction. This would also need to be included in the master plan.

The final step for construction would be the FAA Form 7460 which is a notice of construction for the FAA. “FAA Form 7460-1 needs to be submitted for airspace review, a construction safety and phasing plan is needed, and notice should go out to any tenants and users that may be affected by construction activities” (MeadHunt, 2022). The form must be submitted 45 days before the date of proposed construction. Additionally, the airport would

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need to facilitate notices to any other nearby businesses at the airport that would possibly be impacted. This is also true for potential air traffic impacts if the nearby taxiways or runways would need to be closed to ensure safety around the construction site.

Methodology

For this paper, the group decided to gather data through research in the aviation industry and academia. The group members focused mainly on those sources that had either done extensive technical research or were in the process of developing zero-emissions technologies. Opinions or guesstimations were not needed for the study conducted in this paper. Instead, hard evidence on where technologies are in development and when they could be implemented was sought out. Publications from companies such as Airbus, ZeroAvia, and Pipistrel were relied on heavily. This is because these companies either have produced hydrogen or electric aircraft or have a timeline for developing them.

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Commented [TK127]: What is “hard evidence?”

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Results

Through the research stated earlier the group has drawn results for each area. For infrastructure, there is a significant amount of analysis and research that still yet needs to be accomplished by individual airports in determining if and how they can support either electric, hydrogen, or both. Analysis and research around real estate capacity to see if there is sufficient space to adequately provide hydrogen storage, battery storage, or charging system installations. Individual airports would also need to assess what the increases in demand on the power grid would be, and determine if transmission lines to the airport can accommodate the increased loads. Around the costs of purchasing and installing the

equipment, if the appropriate budget is available to do so and allow. As a whole, the framework to accomplish this has been completed and at this point, it is now dependent on the infrastructure and technological capabilities of those that wish to utilize it. Similar results were drawn from the research into electric aircraft. With the existing technologies, charging the aircraft is the biggest challenge.

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Ground charging infrastructure for aircraft is comparable to that of commercial EV chargers. The challenges of installing fast chargers for an electric aircraft are comparable to that of installing an EV charger, primarily access to a high-voltage power supply. As fleet sizes at airports increase, charging in parallel can lead to challenges in having sufficient power available, which can be offset by charging aircraft or swappable aircraft batteries at off-peak times. Unlike electric aircraft, the results from the research into hydrogen aircraft are less focused on the new technologies and more focused on aircraft design. The technology to store and use hydrogen exists but implementing it into an aircraft has been the main challenge.

Hydrogen could provide one solution for fully decarbonizing long-range flights. The hydrogen sector offers both opportunities and limitations. An opportunity would be that burning hydrogen in a jet engine would result in only water vapor emissions. Using this fuel would virtually eliminate carbon-related emissions, such as carbon emissions. However, incorporating a hydrogen fuel tank would require a considerable change to aircraft architecture. Various aircraft designs would be required and some designs utilize blended wing and body aircraft. While this may produce some aerodynamic advantages, a possible downside could be the time involved in the certification of radical modifications to aircraft.

In addition, substantial costs are involved in designing and certifying upgraded aircraft and operational infrastructure. The potential for a new aircraft or engine design is approaching its limit in terms of fuel efficiency, and as other sectors turn to renewable energy, aviation will need to consider all options for reducing its emissions to remain in line with the industry target of halving net CO2 emissions by 2050. To implement all of these new technologies, construction on airports needs to happen soon. The results from this area were few which the group determined was a very important result in itself. The FAA and other organizations have yet to catch up to the advancing technologies so the requirements to plan and build zero-emissions airports still need to be created.

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Due to the large number of processes that take place when constructing new sites at airports, there is a lot of coordination that takes place. Approval from many different agencies is needed and planning must start early. From our research, we've gathered that the process to fully electrify an airport, meaning to support electric aircraft charging and/or hydrogen, would be a multi-year project. This includes updating and managing the living document of airport master plans. This is essential for all major airport projects. Environmental reviews are also required for airports that receive federal funding. Depending on the airport and situation we can conclude that this could have a large-scale impact. Many airports are not already equipped to provide the means necessary to support the new technology. Bringing in the required utilities or in some other cases constructing solar arrays could require additional property and could impact sensitive environmental areas. Airports use lots of energy for powering lighting systems, terminals, hangars, and other businesses nearby. Adding new fuel sources would dramatically increase the energy requirement creating additional problems for the energy industry.

From our review of multiple sources, there has been little legal or regulatory guidance for this new emerging technology. The legal perspective is lagging behind the technology. Other than the general FARs concerning aircraft certification and airport construction processes, there have not been any specific alternative fuel flight rules created. Because alternative fuel aircraft are still a very new and developing technology we expect the research and development to help spark further guidance and regulation.

Discussion of Findings

There are already millions of tonnes of carbon dioxide and gas emissions generated by aviation each year, which has a significant impact on the environment, according to Aviation Benefits Beyond Border "Air transport generated 895 million tonnes of carbon dioxide (CO_2) in 2018" this may sound a lot but aviation only producing 2% of CO_2 generated by all human activities every year; such as electricity, road transport, buildings, heat & electricity, shipping, cement, Iron & steel, and other industrial. "As aviation grows to meet increasing demand - particularly in fast-growing emerging markets - and as other sectors of the economy reduce emissions, aviation's share of overall emissions is likely to increase" (Aviation Benefits Beyond Border).

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As the demand for air traffic will grow in commercial aviation as the demand increases for passengers, "20 years ago, there were 2 billion passengers on planes, today there are 4 billion. If we continue at the same pace, 16 billion people will fly by 2050, according to the forecasts of the International Civil Aviation Organization (ICAO). However, even if the energy performance of engines improves, even if certain engines are electric, and even if the share of biofuels has increased, this will lead in the best case to a

doubling of greenhouse gas production (David, 2022).” Due to the record increase in traffic, and the significant increase in the number of passengers, and trade volume, aviation, and international shipping are the fastest-growing sources of emissions. As for shipping alone, according to Energy Industry Review ‘’emissions from international aviation and shipping have increased by almost 130% and 32% respectively over the past 20 years. This is the fastest growth in the entire transport sector, the only one in which emissions have increased since 1990.’’ By 2050, despite improvement in fuel consumption, it is expected that aircraft emissions will be 7-10 times higher than the 1990 levels.

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Alternative fuels are needed by the aviation industry now. As the industry grows, the carbon footprint of the industry will also continue to grow. The longer it takes to rid aviation of biofuels the more damage is done to the environment. This study is important because aviation stakeholders must first understand the issues it faces before they can tackle them. In this study, those issues were laid out and now a plan of action is needed to go in the right direction.

Through the research done in this study, the group has determined that some challenges faced by a zero emissions future can be helped and some cannot. Right now the aviation industry is limited by the development of more dense and efficient batteries. What the aviation industry can do to move forward with electric and hydrogen technologies is to plan. As discussed these new aircraft are going to have new needs and new requirements. Stakeholders can start planning now how they are going to meet these new needs. Airports can start looking at where they can store hydrogen and how charging stations can be built and set up. Manufacturers can start planning the infrastructure requirements their new-age aircraft are going to need so that the industry can be prepared for them. Lastly, the Federal

Aviation Administration needs to get ahead of the curve and start regulating now, or risk increasing the time before the aviation industry can properly adopt zero-carbon fuels.

Conclusion

Almost everyone in the United States is affected by aviation in some way. Whether that is being a passenger, getting goods shipped, or being in the industry. The world is relying on aviation more and more every year. This means a bigger and bigger carbon footprint. Every person that uses aviation is responsible for this carbon footprint. As humans, we are responsible for being good stewards of this planet. Alternative fuels such as electricity and hydrogen are the answer to this problem of environmental impact. The faster these technologies are in the industry the greater the impact can be reduced. As the group stated, some things cannot be helped, such as battery technology. But nothing is stopping the industry from planning. While the average person may not see their role in this. Anyone can be a part of the solution. Anyone who is an aviation stakeholder has a responsibility to begin planning for this future. Every consumer of aviation is a stakeholder which means that someone who just flies everyone once in a while is still part of the problem and still has a responsibility. Something as little as voting in favor of making changes at your local airport will make a difference. A future without AVGAS and Jet-A is coming and the aviation industry needs to be ready.

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ASCI 4350 - Homework Assignment 1 - Name Redacted
This assignment should be uploaded to Canvas no later than Wednesday, February 8th by the end of the
day. Please respond to the following four questions. (SLO 4)

1. Describe the importance of a positive attitude toward lifelong learning when working in a high-consequence field. (300 word minimum)

A positive attitude towards lifelong learning is critical for those working in high-consequence fields, such as aviation. In this field, it is crucial to stay current with the latest technology, best practices, and regulations, as even small mistakes can have severe consequences. Therefore, continuous education and professional development are essential to ensure that individuals remain at the top of their game and can make informed decisions in high-pressure situations. Learning is a lifelong journey and it's especially important in fields where even small mistakes can have big consequences, like aviation. To be the best in this field, we need to keep up with the latest technology, best practices, and regulations. That's why continuous education and professional development are a must. Having a positive attitude towards learning allows us to take charge of our own growth and seek out new opportunities to improve. This helps us stay ahead of the curve and maintain the highest levels of safety for passengers and crew. It also helps us adapt to new challenges and have a growth mindset, which is key in this fast-paced industry. Not only does a love for learning benefit our work, but it also has a positive impact on our personal and professional growth. It keeps us engaged and motivated and helps us take pride in what we do. In conclusion, a positive attitude towards lifelong learning is crucial for success in high-consequence fields like aviation. By staying current and continuously learning, we can ensure the safety and security of passengers and crew and make informed decisions even under pressure.

2. Describe the importance of personal integrity when working in a high-consequence field. (300 word minimum)

Personal integrity is a cornerstone of success in high-consequence fields like aviation, where the stakes are high and even small mistakes can have severe consequences. Personal integrity refers to a set of moral and ethical principles that guide an individual's behavior, both in their personal and professional lives. In a high-stakes industry like aviation, it's critical to maintain these principles and consistently apply them, in order to make ethical and responsible decisions, even in challenging or stressful situations. Having strong personal integrity means that individuals are more likely to act in the best interests of their team and the organization, and to uphold their commitments and responsibilities. This can build trust and credibility among colleagues and stakeholders, fostering a positive working environment and promoting collaboration and teamwork. When everyone on the team is committed to acting with integrity, it leads to better outcomes for passengers, crew, and all personnel involved. But personal integrity isn't just about the impact it has on others, it also enhances an individual's own personal and professional growth. By consistently upholding their principles, individuals take pride in their work and develop a strong sense of self-esteem and confidence. They know that they are doing the right thing and acting in line with their values, which is incredibly empowering. In conclusion, personal integrity is a critical aspect of success in high-consequence fields like aviation. It promotes ethical and responsible decision-making, builds trust and credibility, and enhances personal and professional growth. By consistently applying our moral and ethical principles, we help ensure the safety and security of all passengers, crew, and equipment, and contribute to the success of our team and the aviation industry. In a field where even small mistakes can have serious consequences, personal integrity is essential for maintaining the highest standards of professionalism and excellence.

3. Describe the importance of embracing diversity when serving on a high-consequence team. (300 word minimum)

Embracing diversity is crucial when serving on a high-consequence team in aviation, as it helps to promote a culture of inclusiveness and respect, while also enhancing the team's overall

performance and effectiveness. In aviation, it is essential that individuals from diverse backgrounds, perspectives, and experiences are able to work together effectively to achieve a common goal. By embracing diversity, individuals are able to leverage the unique strengths, perspectives, and skills that each team member brings to the table, which can help to promote innovation, improve problem-solving, and increase creativity. Furthermore, an inclusive and respectful team environment can also help to foster better communication and collaboration, leading to improved decision-making, and ultimately better outcomes for passengers, crew, and other personnel. Embracing diversity also helps to promote a culture of safety and security in aviation. By fostering an inclusive environment, individuals are more likely to understand, respect, and appreciate differences, which can help to reduce misunderstandings and tensions, and to ensure that all team members feel valued and supported. This, in turn, can help to improve the overall safety culture within the team and to ensure that all individuals are working together effectively to mitigate potential risks and hazards. Moreover, embracing diversity can also help to attract and retain a highly skilled and diverse workforce, which is essential in high-consequence fields like aviation. When individuals feel valued and respected, they are more likely to be engaged and motivated in their work, which can lead to improved job satisfaction and increased retention rates. In conclusion, embracing diversity is critical for ensuring that individuals serving on a high-consequence team in aviation are able to work together effectively and efficiently to achieve their common goals. By promoting inclusiveness and respect, individuals can help to foster a culture of safety, security, and collaboration

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1. Describe the importance of a positive attitude toward lifelong learning when working in a high-consequence field. (300 word minimum)
The phrase that a pilot never stops learning is very true. I feel that in any profession that is in a high consequence field, you always need to be retraining, learning, and better yourself through various qualifications. In the same way why nurses have go through yearly tests to keep their credentials valid, why military members go through requalification training for their specific job, and the same way that police officers have to be physically fit and requalify for firearms training yearly. All these professions including being a pilot are all high consequence fields and a level of proficiency and professionalism is required. You want to come in with the attitude that you do not know everything because we simply cannot know everything about airplanes. There also requires a certain level of humility. In the same attitude that the United Airlines Captain Al Haynes studied asymmetric thrust and how it affects aircraft performance could have been the very reason an un-survivable crash became survivable. Since Al Haynes was a lifelong learner, he read on the affects that asymmetric thrust and losing an engine could affect an aircraft. Had he not been a lifelong learner, I fear the crash outcome would have been much worse. But he survived to tell the story! You should want to become a lifelong learner because when the learning stops you can become complacent and that is not good in a high consequence environment. It is important to come at the attitude with a genuine care for your profession and curiosity to do better. Likewise, I try to come at aviation with the same attitude. The moment you stop learning or wanting to learn is when you can get yourself in trouble. In times distress and emergency situations, your ability to react and make a good decision depends on your training. But also, your curiosity to learn which supports those decisions and actions in stressful situations.

2. Describe the importance of personal integrity when working in a high-consequence field. (300 word minimum)
Personal integrity is very important in a high consequence environment. Integrity is the ability to have amoral compass or code that allows you to make logical decisions. The hope is that when working in a high consequence environment like a cockpit, that both individuals working together

has a high level of integrity. You both want to be able to make sound decisions and follow standard operating procedures to the letter. You both have a high code of principles or standards (integrity) to follow those procedures and make safe sound decisions. You essentially hold up your end of the deal while your partner does as well. You do not want to have someone who does not have a high level of integrity, confidence, or mental sanity. My first thought that comes to mind is the Germanwings crash back in the mid 2000s. That is an example in my mind of a pilot that did not have a high level of integrity, care, or concern for others. He needed mental health treatment for depression and chose to be selfish instead of seeking the proper support and take a break from flying. A person with a high level of integrity would have been reexamined medically and made the safe and sound choice to take time away from flying. I am not being harsh of that first officer; I understand people in those mental situations sometimes cannot help themselves, but I wished someone had recognized it prior to the accident. Procedures and rules are in place for a reason, for the safety and for the care and concern of others. Having a high level of integrity means following them and doing the right thing. During normal and abnormal operations, it is important to work well in the team environment to complete the mission at hand. Completing the mission successfully is having a good level integrity as part of your toolbelt.

3. Describe the importance of embracing diversity when serving on a high-consequence team. (300 word minimum)
I believe that diversity in experience, upbringing, knowledge, and background are all important. I believe embracing diversity of experience and knowledge are paramount in a high consequence environment. Similar to the situation with Captain Al Haynes, he had some knowledge on using differential thrust to fly the aircraft and keep it straight and level from his own knowledge. The check/simulator instructor Captain who was a passenger assisted the crew since he has a more overall picture of how the aircraft operated and its systems. He probably had a more in-depth knowledge on information since he was a simulator instructor. Putting together the experience of the Sim Captain, Captain Al Haynes, and the First Officer, the vast diversity of knowledge is most likely what saved more lives. By cooperating and accepting the diversity, the crew of the United flight was able to operate very well in the high consequence scenario given the odds were stacked against them. While knowledge and experience are important, diversity in how and where you grew up can play a big factor in how you work in a crew environment. Using the example of the flight deck, having a pilot with experience landing in all weather conditions at short runways in Alaska and another pilot who may have had inter-island flying the Caribbean are two vastly different experiences. But it should be seen that the diversity of where they built the majority of their flight experience and how that environment shaped them into the pilot that they are today. Not only does this offer plenty of experience but it can allow for an exchange of diverse ideas that people can learn from. Afterall, life-long learning is key in a high consequence environment, so the diversity aspect only makes the individual stronger but also the crew stronger.

4. Describe the importance of embracing diversity when leading a high-consequence team. (300 word minimum)
When leading a team in a high consequence environment, diversity is key to that team's success. A bad leader is one who believes they are the ultimate authority and cannot be wrong. A good leader is one who can use all the people on their team and diversity to accomplish the mission. Listen to the people below you. My father was an officer in the U.S. Air Force, he was an engineer. He worked in a joint civilian and military unit. When leading his unit, he would accept the diversity of people's experiences. In his mind, as a new officer and college graduate, how could he lead people who may have more experience in the field than him even if they were enlisted. His goal would be to talk to the enlisted, see what they had to offer to the conversation and use their specific jobs and specialties to complete the mission together. He would also ask questions and learn from the people below him. Oftentimes the best leader is

one who can understand all the various roles of the people they are leading. By doing this, he also took the time to get to know his men and understand them on a personal level. This was a way to build comradery while also gaining the respect of his men. He told me that many new officers and college graduates would bark orders and tell the enlisted personnel to do their jobs without getting to know them or their jobs. They figured since they had rank and a college degree that they were “better” than the enlisted. This couldn’t be further from the truth, if anything they lost the chance to gain the diversity in experience and knowledge from their men while also losing the respect of their men. These officers did not last long is what I am told. The military just like the cockpit is a high consequence environment and accepting the diversity, strengths, and weakness of your subordinates and equals is paramount to the success of the organization

Performance Indicator Rubric

Course: ASCI 4450 Aviation Law

Course Instructor: Hoover

Semester Taught: Fall 2022

Number of Students in Course: 46

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner. Submit one assigned administrative law case brief. Quiz 5; Question 4 Quiz 6; Question 11 Quiz 7; Question 7 MidTerm; Question 7	Case Brief: 100%. Student scores on the case briefs ranged from 98% to 100%. Quiz 5 Q 4: 50% Quiz 6 Q 11: 54% Quiz 7 Q 7: 87% Midterm Q 7: 39%	Case Brief: Yes. All students scored well above a minimum of 70%. Quiz 5 Q 4: No Quiz 6 Q 11: No Quiz 7 Q 7: Yes Midterm Q 7: No

ASSESSMENT TECHNIQUES/ACTIVITES USED:

Case Briefs / Administrative Law

This class used real cases to illustrate important concepts needed for understanding law in the field of aviation. These were real life disputes and the students learned about the law by picking up various pieces of it from what the cases told them. Most cases in this course took place in National Transportation Safety Board (NTSB) Administrative Law Judges' (ALJ) hearings, federal and state appeals courts, and the U.S. Supreme Court. There will be an examination of civil and criminal cases. Each of the 46 students was assigned an administrative law case involving the FAA, NTSB or DOT.

Why did the students examine these cases? The U.S. has inherited from England a legal system that is largely judge-focused. The judges have made

the law what it is through their written opinions. To understand that law, the class studied the actual decisions that the judges have written. An objective was to look at the law the way that judges do and study actual cases and controversies, just like the judges. For example, a pilot has a beef

with the Federal Aviation Administration's (FAA) action to suspend her pilot's certificate for several months and wishes to contest this with a lawyer in front of an NTSB administrative law judge in a formal court hearing. In another example, the DOT assesses a civil penalty in the thousands of dollars against a regional air carrier for violating a denied boarding regulation. These real cases and disputes historically have been the primary source of law. Common law generally means law that has developed from adjudicated cases. It is sometimes referred to as case law.

A second reason the class studied these selected cases is that it can be hard for an aviation student to understand a particular Federal Aviation Regulation (FAR) or legal rule, and the merits as a matter of policy, without applying the rule in the real world. Some rules are a bit ambiguous, others are quite specific and easy to understand the spirit and intent behind them. There is the need to understand real-life applications of a rule before a student can understand what the rule really means. These rules have both strengths and weaknesses. By studying cases, a student can learn *to conduct aviation operations in a professional, safe, and efficient manner*. It helps the student to think of specific factual situations that reveal the strengths and weaknesses of a particular aviation-related rule. Hopefully, as future leaders in this industry, they can take that skill to help develop better rules as participants in aviation operations.

At the end of each case brief, the student was required to reflect on the court's opinion and the *application of the case* to the individual student writing the brief and on members of the aviation class which was composed of aviation management majors and professional pilot majors. What are the implications to aviation professionals? How does this case impact activities in aviation? How may we apply this case to our activities in aviation?

Eight quizzes were administered in the course. With 46 students enrolled--and at least 12 of the students being international--a different approach was taken to the assessment process. The quiz questions were issued on paper and each student answered the questions privately and individually. Then all students were permitted to work within groups to negotiate what that group believed to be the correct answer. The group responses were recorded on a separate answer sheet and five points was awarded to the group if they got the correct response on the first try. Any subsequent attempts for the correct response was awarded three points, one point or zero points. This process was to encourage students to collaborate, debate, find evidence, and negotiate for what they believed to be the correct responses. It helped the international students and all students enjoyed the process through reduction of testing stressors. However, the downside results in grade inflation.

EVIDENCE:

Example Quiz Questions Relevant to Learning Outcome (SLO 1)

Conduct aviation operations in a professional, safe, and efficient manner.

Quiz 5; Question 4
Of the following, which ***one*** best represents a potential legal enforcement action that may be taken by the FAA.

a. A flight school is discovered to have a flaw in its operations manual which may lead to unsafe aircraft operations in the training environment.
b. A student pilot made a mistake in the traffic pattern, during touch-and-gos, which was inadvertent on her part.
c. A piloted aircraft was observed by an Illinois State Highway Patrol officer making passes over a rural corn field in a sparsely populated area.
d. Matters involving competence of holders of certificates may require retraining.
e. During a ramp inspection, an FAA Safety Inspector saw a pilot make a mistake during his preflight and did an on-the-spot counseling correction.

Quiz 5; Question 4: With "C" being the correct response, one half of the class responded with "A" or "D"

Quiz 6; Question 11
Some of you in this class will become pilots for a large, major air carrier. Others may work in the customer service unit of the airline. Consider the following statements and identify those that are true and accurate by circling the letter or letters.

a. As the *Al-Watan* case discusses, there are safety-related circumstances in which discrimination is lawful and this not infrequently presents uncomfortable issues of racial, ethnic, and gender-based profiling.
b. The pilot in command of the aircraft is the final authority as to the operation of that aircraft (14 CFR 91.3), including any decision to refuse to transport a passenger provided that pilot follows the airline's required security protocol.
c. COVID-19 is a respiratory illness. Airlines may refuse transportation because of a communicable disease if the passenger's condition poses a direct threat to the health or safety of others. (ACAA in 14 CFR Part 382)
d. The Department of Transportation has set the minimum limit of air carrier liability for provable direct or consequential damages resulting from the disappearance of, damage to, or delay in delivery of a passenger's baggage to an amount less than $2,500 per passenger.
e. Air carriers owe a common law duty of care to their passengers, who, as customers, are business invitees.
f. The Captain holds the ultimate decision-making authority on a passenger's removal from a flight.
g. 49 U.S.C. Section 44902 of the Federal Aviation Act, provides that an air carrier "may refuse to transport a passenger or property the carrier decides is, or might be, inimical to safety."

Quiz 6; Question 11: 23 of 46 students were able to identify the six correct responses (A-B-C-E-F-G) to this question

Quiz 7; Question 7

Scenario. You failed to perform an adequate preflight inspection, attempted to take off on almost empty fuel tanks, and fuel starvation caused the engine to quit on takeoff. But when it did, you were able to abort the takeoff without damaging the aircraft or harming its occupants or anyone else.

a. You could be successfully sued for negligence in that you failed to use care.
b. You could not successfully be sued for negligence. (there was no injury) However, the FAA may suspend or revoke you pilot certificate for careless operation under 14 CFR §91.13, inadequate preflight action under 14 CFR §91.103, or your lack of the care,judgment, and responsibility required of the holder of a pilot certificate.
c. Neither the FAA nor a plaintiff's lawyer will take any civil action against you. You have done no wrong and cannot be held liable for this incident.
d. This is a clear-cut case of intentional tort committed by you, the pilot. You could be successfully sued.

Quiz 7; Question 7: 87 percent of the 46 students responded with the correct letter "B"

Midterm Exam; Question 7

As a result of reviewing several cases in both administrative and criminal law (FAA and DOT/OIG), you have noticed a trend in sanctions and penalties. Which of the choices best reflect this trend?

a. Very few FAA enforcement cases are settled. Most all end up in court; that is, at hearing before the NTSB or on appeal.
b. A study of FAA sanctions would seem to indicate that falsification of documents, records and applications leads to letters of warning to most offenders.
c. There appears to be a great deal of focus on prosecuting those certificated airmen who err in the completion of the application for renewal of the airman medical certificate.

Midterm Exam; Question 7: Only 39 percent of the 46 class members correctly responded with answer "C." The majority of students responded to "B" and a minority of eight students responded to "A."

Case Brief Rubric

The students were assessed using a Case Brief rubric. Students followed the format presented in the rubric. Points earned were up to 84 as a perfect score.

Example Case Briefs from NTSB ALJ and DOT Consent Orders databases

Many administrative law cases assigned to students who are certificate holders involved appeal hearings before the NTSB administrative law judges or full Board. Here is a student example brief that involves a mechanic's falsification of an aircraft record.

Aviation Management majors in the course were assigned Consent Orders issued by the Department of Transportation. Here is a student example of an alleged discrimination case against a Delta pilot in command with a subsequent $50,000 civil penalty against the air carrier.

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

RECOMMENDATIONS (based on the results):

Pending review by the department faculty

**Attach description of assignment used for assessment and samples of student work.*

Performance Indicator Rubric

Course: ASCI 4650 Economics of Air Transportation Course Instructor:_____BRUCE HOOVER_____

Semester Taught:_____SPRING 2023_____ Number of Students in Course:____14____

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 1: Conduct aviation operations in a professional, safe, and efficient manner.	Not applicable to this course	
SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.	**Airline (simulation) Management Audit Report** A management audit report 100% of the class achieved a 70% or higher Reliably Blue Air: Three students **96** Aviation Managers Association: Three students **91** SkyPass Airways: Four students **88** FlexJet: Four students **79**	Airline (simulation) Management Audit Report. Benchmark achieved: Y**es** 100% of the class scored a minimum 70%. The 80% benchmark was met as all 14 enrolled students scored above the 70% minimum.
SLO 5: Apply knowledge of business principles in aviation-related areas.	**Online Airline Simulation decisions** 71% of the total enrolled students achieved a minimum of 70% or higher. Only one airline team of four students was unable to achieve a final score of at least 70%. Reliably Blue Air: 727 points (**73%**) Aviation Managers Association: 918.7 (**92%**) Skypass Airways: 584.5 points (**59%**) FlexJet: 774.5 points (**78%**)	Benchmark achieved: **No** 71% of the enrolled students achieved the benchmark. Four of the 14 enrolled students were unable to meet the benchmark.

EVIDENCE

SLO 3: Apply effective oral and written communication skills to function effectively in the aviation environment.

From the syllabus: “Your airline team will make a brief presentation to the ASCI 4650 class and any guests who may be in attendance. You will conduct the audit from the perspective of an **outside consultant firm** your airline has contracted and you must be objective in your report findings. **Objectivity and honesty**—be brutally frank—are hallmarks of a good external audit. Any attempt to “whitewash” or omit critical points will be dealt with unkindly by the instructor. ***There are several methods of approaching this assignment and your team is encouraged to be creative. Keep in mind you are part of a consulting firm. Your report may follow any creative format appropriate for an outside consulting firm report. Any records, charts, graphs, etc., are welcome if they enhance the presentation.*** Handouts to class members are appropriate if they, too, enhance the presentation.”

The Management Audit Content Guide (below) provided the airline simulation teams with guidance on suggested content reflecting the economic principles and characteristics of the airline industry.

The four airline teams prepared a report of their airline management decisions and the results of those operational, economic, and financial decisions during the semester.

The following are example audit reports submitted by three (of four) teams in the spring of 2023:

SLO 5: Apply knowledge of business principles in aviation-related areas.

Each student participated in an airline simulation where each member was part of an executive team of a small airline firm. Each team met to **formulate their firm level strategy** and submit ongoing (weekly) decisions concerning critical issues facing the firm. Decisions were due online on the Airline Simulation site on a weekly basis by each team leader.

The airline simulation activities were integrated into the classroom learning experience. The group project required collaborative work and everyone was expected to carry an equal share of the work load within each airline team.

Airline Simulation – Learning Objectives

- Experience strategy formulation and implementation in a dynamic (ever-changing and competitive) environment
- Learn about group and organizational processes (team work)
- Understand the financial implications of air carrier operational, marketing and management decisions
- Improve decision-making skills under ambiguous circumstances and time pressure
- Experience the fun and challenges of running a small air carrier business

From the Syllabus: “You will have to make weekly decisions and submit these decisions on the Airline Interpretive Simulations website. Each airline team will be graded on the quarterly (each decision period) performance measures for that period. For example, cumulative net income of the airline may be weighted as 10% of the quarterly score. Depending on how well the airline is managed by the team, these quarterly scores will vary from 60 to 90 points of a possible 100 points on the performance measures (reliability, yield, load factor, social performance, etc.). This is a competitive simulation based on teamwork, analysis of data and good business decisions for the strategies you have decided upon for your particular airline. There will be only one airline (team) winner at the end of the simulation.”

This sheet contains the decision-making schedule.

This sheet is a track of the four airlines progress through the semester.

2023-airline sim quarterly

This sheet provides the final operational, economic, and financial metrics results of the four airline management teams.

Course Assessment (Intended Use of Results)

The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

2022 recommendations by the instructor:

1. Reduce the final grade weight of the management audit oral and written presentation from 30 percent to a lower value. This activity was the most-heavily weighted in the syllabus.
    a. 2023 response: The weighted grade for the management audit report was reduced to 20 percent of the total final course grade. This was a much better balance with other assessments within the course. A peer team member evaluation instrument was added as 10 percent of the final grade.
2. Consider a different textbook. Students expressed some frustration with the textbook's lack of flow, editing errors and some chapters at a graduate level.
    a. 2023 response: The instructor evaluated three possible textbooks and considered each of them to be at the freshman/sophomore level. The textbook choice remained the same.
3. Give consideration as to how the "airline management teams" are to be constructed. This spring 2022 session involved a random drawing of numbers to see what students would be on each (of four) team. Is it better to let the students form their management team? Would this process result in achieving all the assessment values such as the benchmark?
    a. 2023 response: The instructor, again, utilized a random drawing for the determination of team members.

2023 recommendations by the instructor:

There are no recommendations made by the instructor.

Performance Indicator Rubric

Course: ASCI 4900 Senior Seminar
Course Instructor: Nithil Kumar Bollock
Semester Taught: Spring 2023
Number of Students in Course: 17

AVIATION MANAGEMENT CONCENTRATION

Student Learning Outcome Assessed	Assessment Results: (Indicate what % of class achieved a minimum 70%)	Benchmark achieved? (Benchmark: 80% of students will score a minimum of 70% = "C")
SLO 2: Describe historical trends, current issues, and emerging opportunities in aviation.	100%	Yes
SLO 4: Articulate the value of integrity, lifelong learning, and building diverse teams in serving and leading others.	100%	Yes

Course Assessment (Intended Use of Results)
The following will be used for recommendations to improve the quality of course delivery based on assessment results. These recommendations may include prerequisite change; changing course outline and adding more topics; adding a third assessment; changing the course sequence, etc.

**Attach description of assignment used for assessment and samples of student work.*

Assignment 1:

1) Watch the video (Case Study 1: Crossed Wires)

Case Study No.1: 'Crossed Wires' - YouTube

2) Open the links provided below. The links include the personal and organizational professionalism traits that should be practiced and implemented by individuals in aviation industry according to National Business Aviation Association (NBAA).

https://nbaa.org/aircraft-operations/safety/professionalism-in-business-aviation/personal-professionalism/

https://nbaa.org/aircraft-operations/safety/professionalism-in-business-aviation/organizational-professionalism/

Task: From the links provided, identify atleast 10 personal or organizational professional traits not practiced by the characters in the video. Also, explain the situation/scenario to justify the trait.

List of Characters:

Man 1: Roy (Mechanic 1)

Man 2: No Name (Assistant 1)

Man 3: Harry (Manager)

Man 4: Bruce (Customer)

Women 1: Leanne (accountant/auditor)

Man 5: Jonny (Mechanic 2)

Man 6: Jase (Assistant 2)

Example:

1) Maturity: Man 2 (Assistant 1) does not show qualities of responsible adult. He is not paying attention to Roy (Mechanic 1). He is texting on the phone and wearing earphones while at work.

Upload the pdf or word file in the assignment submit

Assignment 2:

Professionalism in Aviation (Week – 2)

Activity – 2

Task 1: Find an article on professionalism in aviation or where professionalism failed in aviation (15 minutes).

Task 2: Explain and debate with your group member about the importance of the article and why you think the article you found should be presented to the class. Decide as a group and confirm the article that your group want to present to the class (15 minutes).

Task 3: Present and explain one article that is critical and important to share with the class. (Each group gets 2 - 3 minutes to present the article).

Task 4: Complete the Peer Review Worksheet

Assignment 3

Name:_____Group No:_____Date:_____

International Aviation (Week – 3)

Activity: Prepare a Power Point Presentation (PPT) based on the criteria below. Use pictures and tables as appropriate.

Assume you are aviation ambassador's representing a country as a group at an international conference. Hence, in the PPT you are required to discuss the pros and cons of aviation aspects of your country.

Task 1: In the first 10 minutes, announce the country you are selecting for the PPT. Look for the conditions below for selecting a country. First come first serve.

Conditions for Country Selection:

- Do not select USA.
- If there is an international student in the group, then do not select the country she/he came from.

Task 2: Prepare a PPT about your country based on the questions below. The questions in red color are required by every group to be answered in their PPT. The remaining are suggestions but not limited ideas for PPT.

- Which organization regulates and controls the aviation aspects in your country.
- How many airports, airlines, aviation organizations, aerospace manufacturing companies etc. are there in your country.
- Do you think the aviation field in your country is very well developed, or do you think there is a need for development? If so, what should be developed and what do you suggest.
- Describe the aviation emphasis in the military of your country.
- Compared to the USA, where does your country stand in aviation aspects overall?
- Is there any critical information or an incident that happened in your country that should be remembered or caused a change to the aviation perspective like 9/11 in the USA?
- How many aircraft accidents happened in your country, and what is the most common cause of those accidents?
- How many flight trainings schools, clubs etc. are there in your country? How much does it cost to become a pilot? How much do pilots earn in your country?
- What is the history of aviation in your country?
- Describe the aviation security and safety aspects of your country. Is there an organization that handles the security in your country? If yes, what are the measures implemented by that organization to attain security? If no, why there is no organization in your country and how security is provided to passengers at airports and in aircrafts?

Assignment 4

Aviation and Airport Security

Suggestions for the Debate

Videos:

https://www.youtube.com/watch?v=qu5FdrsGZoA&ab_channel=CNN
https://www.youtube.com/watch?v=hWDolIZeDyE&ab_channel=CBSN
https://www.youtube.com/watch?v=StXLEsaqx8E&ab_channel=TRUEfoe
https://www.youtube.com/watch?v=cHRdaXfWTc8&ab_channel=Denver7%E2%80%93TheDenverChannel
https://www.youtube.com/watch?v=Iwysq6TrnWQ&ab_channel=HLN
https://www.youtube.com/watch?v=LuPEcLAUOE0&ab_channel=WCVBChannel5Boston
https://www.youtube.com/watch?v=WlFjPRr88G8&ab_channel=ABCActionNews
https://www.youtube.com/watch?v=ziyW73g25kY&ab_channel=Denver7%E2%80%93TheDenverChannel
https://www.youtube.com/watch?v=s8qhLMY88vE&ab_channel=CBSDFW
https://www.youtube.com/watch?v=ddAZA-l64-0&ab_channel=WXYZ-TVDetroit%7CChannel7
https://www.youtube.com/watch?v=i-9R8Zg5nQ0&ab_channel=CNN
https://www.youtube.com/watch?v=5yKeufLazdc&ab_channel=FoxBusiness
https://www.youtube.com/watch?v=SRCj9BiwYwQ&ab_channel=CBSDFW
https://www.youtube.com/watch?v=MpbJ1fhwBdE&ab_channel=FOX9Minneapolis-St.Paul
https://www.youtube.com/watch?v=0AgvjeLD8L4&ab_channel=FoxNews
https://www.youtube.com/watch?v=4e6GW6fRX_E&ab_channel=NBCNews

Questions:

- Did TSA employees cross the line or are they just doing their job? What do you think about the pat-down procedures? Are they important? If yes, why? If no, why? Did pat-down procedures become a cliché (losing the actual meaning)? Do you support the TSA employees or the passengers in the videos? Who should be enlightened: is it the passengers or the TSA employees? How and why? Do you think TSA officers

needs more training or are the passengers that needs more awareness about the importance of security procedures?

- Is TSA following its mission? Are the TSA employees doing their duty effectively? Is TSA failing? Do you think TSA should be replaced? Do you support privatizing airport security? What are the advantages and disadvantages of privatizing airport security in your opinion? Is TSA maintaining or implementing required security measures to attain security? If not, do you have any suggestions for TSA on how to attain more security?
- Why is aviation security an important topic? What are the challenges that aviation security is facing?
- What is the most important security threat in your perspective that aviation or airports are facing today? (Ex: insider threat, terrorism, inflight disruptions, etc)
- Are TSA being more aggressive or are they doing their duty?
- What are the different technologies implemented at airports for security?
- What are the different kinds of crimes that happen at airports?
- How many crimes did TSA stop till now?
- How many crimes took place in all USA airports?
- Do we need to increase security at airports and is it useful?
- What different technologies do you suggest to increase the security at airports?
- What are your comments on passenger's comfortability vs TSA security screening?
- Is there a possibility that a security breach could occur with current security measures implemented at the airports and in-flight?
- What are the security measures implemented in the aircraft flying in the air?
- Some people do not feel comfortable due to pat-down screening. What do you suggest we should do to make those passengers feel comfortable or do you suggest any other method or technology better than pat-down?
- Do you think it is possible to zero down the security breaches in airports and flights?
- Which airports have very fewer security measures?
- Provide statistics on airport crimes like smuggling, trafficking, guns, etc.
- Is it true that TSA will disappear someday and what do you think will happen then or how will the security be attained then?
- What is a 3-1-1 rule and are there any other rules and regulations of TSA like this?

- Explain airport security screening procedures. What are canines? Are canines important? If so why? What do canines do?

Assignment 5

Career Tests:

Task 1: Complete the Princeton Career Quiz. Create an account to see results. https://www.princetonreview.com/quiz/career-quiz

Once you get the quiz results. You will see two aspects: “Your Interest” and “Your Style”. Identify the colors associated with your interests and style. Read the activities and strengths you identified based on color you get. Now select “Print” by pressing right click or select “Ctrl + P”. Save the file as PDF and submit in Canvas.

In the next tab you will see recommended careers. Review the careers.

Task 2: Complete the O*Net Interest Profiler. https://www.mynextmove.org/explore/ip

After getting the results, you will see an option to “Print”. Select the print option and save the report. Read the report and submit in the Canvas. Select “Next” and review the “Job Zones” and “Careers”

Task 3: Go to https://www.careeronestop.org/Toolkit/ACINet.aspx

Under “Training” tab select “Certificate Finder”. Search a profession in the “Search tab”. Example: Aviation Management Professional. You will find certifications associated with the profession. Not all certifications are related. However, you might find something interesting. Task is to review the certifications and learn. There is no submission for this task.

Task 4: Go to https://www.queendom.com/tests/access_page/index.htm?idRegTest=3296

Complete the Ambition Test. At the ends you when you select “Score my test” you will see the results. Select “View Sample Report” in blue color. A new tab will open. Read the report. Select the “Details” option and save the report in pdf.

Task 5: Go to https://www.myskillsmyfuture.org/.

Enter a career that you had pursued and find the career matches. Save the results as pdf by selecting “CTRL+P”. Submit the results as pdf in canvas.

Task 6: Go to https://www.myplan.com/index.php.

Create an account. Go to Assessments tab in the top. You will see “Career Values Assessments” test for free. Remaining will be priced. Do not do them. Just complete the Career Values Assessments. Submit the “Work Value Clusters” you attained as results. Read the result. Save the results as pdf and submit in

Canvas.

Assignment 6

Final Exam Questions

Due: 5/12/2023 (11.59 PM CST)

(Note: References must be included as appropriate)

1) **Sustainability in Aviation (20 Marks)**

   - What are the roles and responsibilities of aviation stakeholders (government institutions, airlines, aircraft manufacturing companies, fuel producers, and aviation fuel distributers) in promoting Sustainable Aviation Fuels? **(150 Words)**

     (Hint: Refer to Sustainable Aviation Fuels Guide of ICAO)

   - Read the article "*Business Aviation and Sustainability: An Industry with a Good Story to Tell"* and provide your summary. **(150 words)**

     Link to Article: https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2019/ENVReport2019_pg177-181.pdf

2) **Aviation Environmental Issues (20 Marks)**

   - Define FAA CLEEN and CLEEN II programs? Explain the developments of different manufacturing companies involved in CLEEN? **(150 words)**

     (Hint: Refer United States Aviation Greenhouse Gas Emissions Reduction Plan)

   - Provide different electric and hybrid-electric large commercial aircraft projects in United States. Describe the details and technical specifications of each project like category, MTOW, range, seat capacity, speed, payload, entry in service, etc.

     (Hint: Refer to Electric and Hybrid Aircraft Platform for Innovation (E-HAPI))

3) **Aircraft Maintenance and Importance (20 Marks)**

   Watch the videos and provide your insights about each video in 50 words.

- https://www.youtube.com/watch?v=abVTKt2Db_0 **(50 Words)**

  (**Title:** Dealing with Challenges in the Aircraft Maintenance Business – AIN)

- https://www.youtube.com/watch?v=0OEt6SkdA4M **(50 words)**

  (**Title:** You Can't Fly Without Us - The World of Aviation Maintenance)

- https://www.youtube.com/watch?v=xmiGL-1qvuE **(50 words)**

  (Title: Federal Aviation Administration on Aviation Maintenance**)**

4) Aircraft Accident Investigation (20 Marks)

*Read the **Case Study -1** document attached in the Canvas and complete the **worksheet** which is at the end of the document and post your answers here.*

CHAIN OF EVENTS

1)

2)

3)

4)

5)

6)

7)

8)

SAFETY NETS

1)

2)

3)

4)

5)

6)

7)

8)

5) **Careers in Aviation and Aviation Management (20 Marks)**

- What is the job or career that you wish to pursue after graduation or in the future? Describe the importance of that job in aviation. **(150 words)**
- What are the roles and responsibilities of the job that you want to pursue?
- Why do you want to pursue that job? Provide any statistics related to the job like salary, number of job available in the USA, racial diversification, etc. (Provide references) **(150 words)**
- Research and provide five best job searching (posting) websites for aviation jobs?

Assessment 1

Name:_____Group No:_____Date:_____

Peer Review Worksheet – 1 (30 Points)
Activity – 1 [Professionalism in Aviation (Week – 2)]

List the traits identified by you and your group members (10 Points)

Your Name:	Name:	Name:

Evaluate the Performance and Contribution of your Group Members (20 Points)

Group Member Name:

- *Give a score to your Group Member*

1	2	3	4	5	6	7	8	9	10

- *Justify the score you gave to your Group Member. Why did you give this score?*

Group Member Name:

- *Give a score to your Group Member*

1	2	3	4	5	6	7	8	9	10

- *Justify the score you gave to your Group Member. Why did you give this score?*

Assessment 2

Name:________________________________Group No:_________Date:_________

Peer Review Worksheet – 2 (30 Points)
Activity – 1 [International Aviation (Week – 3)]

Evaluate the Performance of Other Groups on their Presentations.

Group Number _______________

Give a score to the Group

1	2	3	4	5	6	7	8	9	10

Justify the score you gave to the Group. Why did you give this score?

Group Number _______________

Give a score to the Group

1	2	3	4	5	6	7	8	9	10

Justify the score you gave to the Group. Why did you give this score?

Group Number _______________

Give a score to the Group

1	2	3	4	5	6	7	8	9	10

Justify the score you gave to the Group. Why did you give this score?

Group Number _______________

Give a score to the Group

1	2	3	4	5	6	7	8	9	10

Justify the score you gave to the Group. Why did you give this score?

Final Exam Questions

Due: 5/12/2023 (11.59 PM CST)

(Note: References must be included as appropriate)

1) **Sustainability in Aviation (20 Marks)**

- What are the roles and responsibilities of aviation stakeholders (government institutions, airlines, aircraft manufacturing companies, fuel producers, and aviation fuel distributers) in promoting Sustainable Aviation Fuels? **(150 Words)**

  (**Hint:** Refer to Sustainable Aviation Fuels Guide of ICAO)

  Answer:

  In promoting innovation in the biofuels industry through research and development, there are diverse stakeholders that directly involved to achieve the development and deploying SAF such as government institutions (ie. civil aviation authorities, environmental , regulatory and financial agencies and research and development institutions), airports, airlines, aircraft and associated equipment manufacturers, fuel producers and aviation fuel distributors. These are the roles and responsibilities of aviation stakeholders:

  - **Government Institutions**
    - Governments define and create public policy with the goals and targets needed to develop a SAF market, to evaluate the impacts, benefits and implications, and coordinate the different public agencies and institutions needed to achieve them. They cooperate with the private sector to achieve this goal.
    - The national government is also to develop and implement measures to improve the economic feasibility of SAF projects to mitigate risks generally associated with innovation.
    - The other actions to reduce risk perception are information and demonstration programs, such as developed in Mexico by ASA, a federal agency in charge of management and operation of Mexican airports, including aviation fuel supply.

- The other role of the government is to control or fund support research and development institutions and encourage them to participate in SAF initiatives.
- Government also controls some practical and operational aspects of promoting the use of SAF, focusing on economic competitiveness and logistical issues
- They also initiative to foster the development of a SAF market.

- **Airlines**

  - Many airlines participated in the development of SAF.
  - Support the use of SAF in reducing the fuel emission even though the cost might be higher. Many airlines have used alternative fuels during their flights in order to support environmental sustainability.
  - Join other airlines organizations in the aviation industry to promote the technology and also develop and deploy SAF.

- **Aviation Equipment Manufacturers**
  - Participate in the development of SAF
  - Aircraft manufacturers have sponsored national studies on perspectives for the production and use of SAF, assessing feedstock production, processes, logistics and legislation for introducing drop-in SAF.
  - Aircraft manufacturers have also supported and followed several experimental flights using alternative fuels on their aircraft.

- **Fuel Producers**
  - Produce a sustainable fuel such SAF
  - Fuel producers should make sure that SAF meets the same high quality standards as CAF.

- **Aviation Fuel Distributors**
  - The distributor also participate in the development of SAF
  - As suppliers and handlers of SAF, they must have the knowledge to comply with the regulations and procedures required by the aviation fuel market.

- Read the article "*Business Aviation and Sustainability: An Industry with a Good Story to Tell"* and provide your summary. **(150 words)**

  Link to Article: https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2019/ENVReport2019_pg177-181.pdf

  In this modern world with all the environmental issues, the aviation business industry has been investing their effort in making the environment more sustainable. As global business aviation operations have an impact in creating CO2 emissions, they have been committed to ongoing exploration of new methods and technologies to significantly reduce the greenhouse gas emissions from aircraft. For instance, business aircraft that used winglets, advanced aerodynamics, state of the art avionics, and to demonstrate improved fuel burn from engines. One of the most promising ways for reducing CO2 emissions with today's business aircraft is through the use of sustainable aviation fuels (SAF). By using SAF, the benefit effect is a cleaner burn and commensurate reduction of overall CO2 emissions over the life-cycle of the fuels' manufacturing process, and using the renewable resources creates more environmentally friendly. There are three important aspects of SAF use: that such fuels for business aviation are safe, approved and available for use. Therefore, it is crucial in spreading the awareness in the aviation industry of using SAF for a more sustainable aviation environment for the future and to mitigate and reduce carbon emissions.

2) Aviation Environmental Issues (20 Marks)

- Define FAA CLEEN and CLEEN II programs? Explain the developments of different manufacturing companies involved in CLEEN? **(150 words)**

  (**Hint:** Refer United States Aviation Greenhouse Gas Emissions Reduction Plan)

  Answer:

  Continuous Lower Energy, Emissions, and Noise (CLEEN) program is the FAA's principal environmental effort to accelerate the development of new aircraft and engine technologies that will reduce noise, emissions, and fuel burn. The FAA

partners with the aviation industry via a cost-sharing approach to enable the industry to expedite integration of these environmentally beneficial technologies into current and future aircraft with less noise, fewer emissions, and use less fuel. Different manufacturing companies involved in CLEEN are:

- Boeing

  The CMC nozzle has the potential for 1 percent fuel burn savings-enabling hotter, more efficient engines-while allowing for noise reduction treatment and reducing nozzle weight.
- General Electric (GE)

  Trajectory synchronization will provide pilots and controllers better predictability of an aircraft's location, enabling fuel savings through more efficient aircraft routing.
- Honeywell

  Honeywell completed engine tests of a number of its CLEEN technologies validating their capability of increased engine temperature and efficiency. The Honeywell CLEEN technologies will contribute 5 percent toward an overall 15.7 percent reduction in fuel burn resulting from an engine upgrade relative to baseline engine technology.
- Pratt & Whitney (P&W)

  The P&W built wind tunnel for a ultra-high bypass ratio geared turbofan engine which is projected to reduce single aisle aircraft fuel consumption by 20 percent relative to a CFM International, CFM56-7 engine and reduce noise by 25 dB relative to the Stage 4 noise standards.
- Rolls-Royce

  Rolls-Royce completed CMC turbine blade tracks (shrouds) component tests. This technology, along with RollsRoyce's dual wall turbine vane, is aimed at increasing thermal efficiency in the turbine section of the engine. Technology benefits from Rolls-Royce's work will realize up to a 1 percent reduction in fuel consumption.

- Provide different electric and hybrid-electric large commercial aircraft projects in United States. Describe the details and technical specifications of each project like category, MTOW, range, seat capacity, speed, payload, entry in service, etc.

  (**Hint:** Refer to Electric and Hybrid Aircraft Platform for Innovation (E-HAPI))

  - **The general aviation/recreational aircraft group** consists of aircraft with MTOW from 300 to 1000 kg. These are mostly electric powered aircraft with a seat capacity of two. This category includes aircraft which are already produced and certified.
  - The aircraft under **the business and regional aircraft category** claims a longer flight range close to 1000 km with increased seat capacity (around ten).
  - **The large commercial aircraft category** includes initiatives focused on hybrid-electric, single-aisle aircraft with seat capacities of 100-135 and targeted entry into service after 2030.
  - **The VTOL (Vertical Take off and Landing) category** made significant progress over recent years, with seat capacities from one to five, MTOWs between 450 and 2200 kg and projected flight ranges from 16 to 300 km. These aircraft projects are only electric powered and aim to entry into service in the period of 2020-2025.

3) Aircraft Maintenance and Importance (20 Marks)

Watch the videos and provide your insights about each video in 50 words.

- https://www.youtube.com/watch?v=abVTKt2Db_0 **(50 Words)**

  (**Title:** Dealing with Challenges in the Aircraft Maintenance Business – AIN)

  There are issues of shortage in aircraft maintenance/technicians in the aviation industry due to the lack of skilled technicians, the past experience of them didn't get treated well from the industry as well as the low interest of young

people in pursuing a career in this area of aviation. Even though aircraft maintenance workers are a crucial part of the aviation industry as they build fixed aircrafts to be used in the business and for transportation within the nation, this issue created concern for everyone such as maintenance companies, airlines, customers and the industry as a whole. Maintenance is one of the biggest cost items associated with operating business aircraft to ensure safety as the labor rates are climbing to $200-$300/hr due to the needs of skilled and certified technicians/maintenance personnel. Other than cost, two other factors of choosing the provider: the convenience of location of the maintenance provider, the ability to get aircraft into service on time. As for service providers that want qualified technicians, required maintenance personnels understand the aircraft model, which will create better quality and decrease the costs and make sure to have the right training.This made the technicians want to pursue technician career in other industries.

- https://www.youtube.com/watch?v=0OEt6SkdA4M **(50 words)**
  (**Title:** You Can't Fly Without Us - The World of Aviation Maintenance)

Aircraft maintenance is as important as air travel even though they are the least known and understood part of aviation. Planes can't fly without maintenance because they maintain, build, repair, overhaul the aircraft, aircraft parts and components to make it safe and ready to be used. Maintenance and aircraft technicians/specialists work on complicated technologies that are deployed in the airplane which will bring safety, reliability, comfort and operational performance. The industry needs different specialists in different areas to work on aircraft as there are different parts of equipment in a plane. Aviation maintenance industry is crucial to both safety and economy. Global maintenance market is expected to grow which means opportunities for people looking for existing careers and jobs.Therefore, aircraft maintenance, technicians, specialists in aircraft parts are crucial individuals in maintaining safe, and effective aircraft that affect the industry success as a whole.

- https://www.youtube.com/watch?v=xmiGL-1qvuE **(50 words)**
  (Title: Federal Aviation Administration on Aviation Maintenance**)**

There are endless opportunities in the aviation industry that we can pursue whether right after graduating high school or bachelor and making a good salary by working for companies. There are many different aviation programs opportunities launched by the FAA, airlines and other aviation organizations that we can join and connect in pursuing our career in aviation including maintenance.

4) <u>Aircraft Accident Investigation (20 Marks)</u>

*Read the **Case Study -1** document attached in the Canvas and complete the **worksheet** which is at the end of the document and post your answers here.*

<u>CHAIN OF EVENTS</u>

1) A few days prior to the day of the accident, the aircraft was grounded for 36 hours for a repair to the radar system. During this down time, while waiting for parts, the 125 hour "A" check was begun (32.5 hours before it was due) and the recorded tire pressures indicated two(#1 & #4) were low. A planned four hour maintenance stop was commenced which called for changing 5 tires, however it didn't happen and the tires were loaded into the aircraft instead after a call from the project manager. Routine post-flight maintenance was carried out on the same day.

2) On the day of the accident, the lead mechanic carried out a pre-flight check, and requested nitrogen for a low tire. The request was made to a support facility who informed them that the nitrogen bottles were empty. The project manager then told them to ignore it and the flight engineer signed the pre-flight check as having been completed on the maintenance release while the lead mechanic and project manager boarded the aircraft.

3) The airline was lined up for take-off from Runway 34L at Jeddah, Saudi Arabia with 247 passengers and 14 crew members on board. As the airline began their take-off run, an oscillating sound was heard. The conversation between the first officer and captain demonstrated there might be an issue with the tire, however it was ignored.

4) During the take-off roll, the front tires, then the front wheels failed on the main undercarriage and remnants of the failed tires were burning when the landing gear was retracted after take-off.

5) After the brake release, the flight engineer reported the four low pressure lights warning which resulted in losing pressurization, but the captain ignored it. The first officer requested flaps ten and the captain contact tower to inform them about the slight pressurization problem. However, the tower mistook them with another airplane and didn't give clear instructions about the emergency situation.

6) The spoiler lights, gear unsafe light were on, and losing hydraulics which the first officer tried to solve the problem by putting up the flaps and the airbrake broke. While, the captain was doing all the radio transmissions and was not using the aircraft callsign.

7) A fire developed within the main gear wheel wells causing loss of pressurization, loss of hydraulics, structural damage and finally loss of control of the airplane. As the captain had a contact tower regarding the emergency situation, the controller just realized that the DC8 and not the B737 was in an emergency situation after all the confusion and gave a heading to intercept the final approach.

8) During the final stages of the approach to runway 34C, witnesses reported a significant increase of fire and smoke and the aircraft dived at high speed and angle and rolled to crash 2,875 meters short of the runway threshold. There were no survivors.

SAFETY NETS

1) The maintenance should be done according to procedure, for instance they should be aware that the recorded tire pressures indicated two(#1 & #4) were low and tried to repair it. Other than that, they should have changed the 5 tires instead of delaying it even though the project manager told them to go back because by the time they do the post-flight maintenance, they would be tired and not work effectively. There is power distance that should be addressed between the project managers and mechanics as well.

2) The nitrogen bottles shouldn't be empty in the first place and the support facility should have kept track of this and filled the nitrogen bottle. In addition, the flight engineer should not have signed the pre-flight check as having been completed on the maintenance release when in fact, there is need for nitrogen for the low tire. It was not following the procedures of pre-flight correctly. And the most important is, they should have not ignored the fact that the tire was flat and needed nitrogen just because they were running on time.
3) When they hear the oscillating sound and have the suspension that there might be an issue with the tire, they should not have ignored the sign and instead communicate the issue themselves and with the engineers in identifying the issue.
4) The flight crews should have situational awareness and pay close attention to flight instruments. Even though they can't see clearly the physical situation outside of the aircraft, the indication of flight instruments would tell them what was going on with the aircraft.
5) When the flight engineer saw the low pressure lights warning, they should have realized that there are huge issues they are facing and immediately should have requested an emergency landing instead of ignoring and telling the tower they had a slight issue. They didn't think ahead in solving the problem, therefore they have team resource management training and how they should think ahead about what is the right move when facing an issue. The communication between the captain and the tower also should be more clear, so there is no misunderstanding between them.
6) When facing the pressure situation, the flight crews should calm first, so they can think clearly before making a decision. The captain didn't identify his call sign which confused the tower which made the emergency procedure solution longer to be implemented. Clarifying our call sign is crucial especially in an emergency situation. After realizing they are losing most of the flight control, they should make a quick decision in landing the airplane instead of waiting for instructions from the control tower who was confused about their airplane. They should not stay longer on the air and follow emergency procedures right away.

7) In this situation, the best decision is to land right away and look for the best first and best field to land as they already lost all the flight control and not trying to go back to the airport which is quite a distance in return.
8) It is crucial to be aware of the situation around us whether it is in the cockpit, cabin when flying and ground. Follow the right procedure without skipping, or ignore them because it exists to provide the safety operation. The communication between flight crews, towers and people on the ground should also be effective. Lastly, the power distance between each role creates lack of communication, therefore it is crucial to speak up about the situation if we think it wasn't right.

5) Careers in Aviation and Aviation Management (20 Marks)

- What is the job or career that you wish to pursue after graduation or in the future? Describe the importance of that job in aviation. **(150 words)**

  After graduation, I would like to pursue a career in aviation specifically as a flight attendant or customer service representative either in the airport or airline companies. I have passion for aviation as well as helping others, thus I choose to pursue my dream in a job where I can combine both areas of my passion to work in the aviation industry where I can engage and communicate with others. I believe flight attendants and customer service representatives are crucial in aviation because as flight attendants, they keep passengers safe, ensuring that everyone follows security regulations and that the flight deck is secure. Flight attendants also try to make flights comfortable for passengers. Similarly, airline customer representatives are also important because they provide information and assistance to the flying public and also provide assistance to passengers in emergency situations such as weather events, security breaches, train failures, and security level changes. In addition, they also help customers with flight reservations, itinerary changes, baggage concerns and questions about customer loyalty programs. Therefore, I would love to pursue my career in these areas in aviation, then I will shift my areas of interest to the aviation management field when I have more experiences.

- What are the roles and responsibilities of the job that you want to pursue?

  The roles and responsibilities of Flight attendant and customer services representatives are:

  - **Flight Attendant**
    - Responsible for ensuring the safety, security, and comfort of airline passengers. The Flight Attendant provides customer service while creating a welcoming environment for passengers before, during, and at the conclusion of each flight.
    - Participates in pre-flight briefings to discuss flight details, weather, and service plans.
    - Performs pre-flight safety checks.
    - Prepares aircraft between flights, ensuring cabin areas meet cleanliness standards.
    - Ensures food, beverages, and other supplies are on board and sufficiently stocked.
    - Greets passengers, assists with prompt location of seat assignments, and ensures all carry-on luggage and personal items are properly stowed in overhead or under-seat storage.
    - Provides instruction on safety/emergency procedures; demonstrates the proper use of seat belts, oxygen masks, and flotation devices.
    - Delivers in-flight food and beverage services, collecting payment as required.
    - Answers passenger questions about flight information (time, service, aircraft details, weather, delays, etc.)
    - Responds to any in-flight emergencies by providing necessary assistance to passengers including administering emergency first aid and completing reports on any injuries or incidents.
    - Assists passengers with safe and efficient exit of the aircraft.
    - Prepares flight reports.

    - Maintains current awareness and knowledge of established airline safety and security guidelines.
    - Performs other related duties as assigned.
- **Airline Customer Service Representatives**
    - Demonstrate a refined level of Customer Service
    - Check-in passengers for flights at the ticket counter, assign seats, issue boarding passes and verify passenger identification and travel documents
    - Tag passenger bags to correct destinations
    - Board passengers onto flights, tag gate checked bags and verify travel documents
    - Make pre-boarding and general boarding announcements
    - Monitor carry-on luggage and operate jetways, canopies and aircraft doors
    - Assist all passengers with special needs including passengers in wheelchairs, unaccompanied minors, visual and hearing impaired passengers
    - Assist arriving passengers and oversee the Domestic and International Arrivals baggage area
    - Verify identification and direct connection passengers through the airport
    - Provide assistance to passengers whose baggage is mishandled or damaged
    - Maintain accurate records and update passenger files
    - Complete detailed and Accurate pre departure paperwork, including Weight and Balance.
    - Assist other CSR's where required in performing other functions
    - Actively participate in Porter's Safety Management System (SMS) including, reporting hazards and incidents encountered in daily operations; understand, comply and promote the Company Safety Policy

- Other Duties as assigned

□ Why do you want to pursue that job? Provide any statistics related to the job like salary, number of job available in the USA, racial diversification, etc. (Provide references) **(150 words)**

I want to pursue jobs as a flight attendant and airline customer service representative because I want to meet many different people from all over the world, improve my communication skills and self-confidence as well as other professional skills that I can use to provide the best and safe environment for people who travel. Some of the statistics related to these two jobs are:

- Flight Attendant
  - Salary: Average: $50,198/yr
    Average Male: $57,928/yr
    Average Female: $47,774/yr
  - Number of Job available in the USA: 46,135 jobs
  - Estimated Job Growth: 17.3%
  - Racial diversification: White (non-hispanic): 62.5%
    Black (non-hispanic): 13.4%
    Asian: 6.71%
    Others: 2.42%
  - Composition by sex: Male: 26.3k
    Female: 84k
  - Age by sex: Average Male: 44.8
    Average Female: 46.1
  - Education Major: Business: 24%
    Communications: 11.3%
    Education: 10.2%
    Transportation: 1.75%
- **Airline Customer Service Representatives**
  - Salary: Average : $26,000-$34,000/yr

Average Male: $30,978/yr

Average Female: $30,142/yr

- Number of Jobs available: 27,306 jobs

  Transportation: 45%

  Technology: 11%

- Racial Diversification: White: 47.7%

  Hispanic or Latino: 24.6%

  Asian: 11.1%

  Black or African American: 9.2%

- Gender: Female: 59.1%

  Male: 40.9%

- Age: 40+ years: 62%

  30-40 years: 23%

  20-30 year: 14%

- Education: Bachelor: 36%

  High school diploma: 26%

  Diploma: 7%

  Other Degrees: 6%

□ Research and provide five best job searching (posting) websites for aviation jobs?

- NBAA jobs

  Website: https://jobs.nbaa.org/

- JS Firm: Aviation Job Search

  Website:https://www.jsfirm.com/searchjobs?gclid=Cj0KCQjwpPKiBhDvARIsACn-gzBYD7zLgS2xriuyh383VddvhCihxrhbR3DAb4p-JnDmWAhvb8AP-DEaAtkDEALw_wcB

- Aviation Job Search

  Website: https://www.aviationjobsearch.com/

- Aviation Jobs Me

  Website: https://www.aviationjobs.me/

- Business Services Jobs/Flight jobs

Website: https://jobs.flightglobal.com/jobs/business-services-1/

- Indeed
  Website:https://www.indeed.com/q-Aviation-l-St.-Louis,-MO-jobs.html?vjk=6bc65cf403984a52

References:

- https://www.icao.int/environmental-protection/knowledge-sharing/Docs/Sustainable%20Aviation%20Fuels%20Guide_vf.pdf
- https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2019/ENVReport2019_pg177-181.pdf
- https://www.faa.gov/about/office_org/headquarters_offices/apl/eee/technology_saf_operations/cleen
- https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/media/2015_us_action_plan_final.pdf
- https://www.icao.int/environmental-protection/Pages/electric-aircraft.aspx
- https://www.shrm.org/ResourcesAndTools/tools-and-samples/job-descriptions/Pages/Flight-Attendant.aspx#:~:text=The%20 Flight%20 Attendant%20is%20 responsible,the%20conclusion%20of%20each%20flight.
- https://porter.rivs.com/careers/portercareers/40-40-52/
- https://datausa.io/profile/soc/flight-attendants https://www.zippia.com/airline-station-agent-jobs/demographics/

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Reflection on Guest Speakers - Tyler Lambert

I've known Nick and Abbi for a couple of years now, both being previous safety committee members. I keep in contact with them, speaking with Nick at least once a week. Consequently, it's interesting seeing a formalized presentation of what they've both told me about casually. Both professions they went into have their own quirks, and they did a great job showcasing just how diverse career paths can be when it comes to aviation management.

Nick's job is in a niche I considered. It may be a little cliche to say, but anything in sales is in my blood. My dad is a real estate agent, and I've grown up around that sort of dynamic, so it's familiar to me. However, after hearing Nick's description of just how hard of a job it is, I can safely say I won't be considering Nick's job as a potential career path. I appreciate how honest he was with us in the challenges associated with cargo charter sales, from the infinite problems that can occur during shipping, to the grind associated with building business relationships. I think the thing I'd find most frustrating working Nick's job is having to constantly sell a service to individuals who may not know the true value of what you're trying to sell them. However, I really do think the job has a lot of great benefits and can be a great opportunity to the right person, and being able to fly on so many amazing cargo jets all around the world must be extremely exciting!

Abbi's job sounds interesting, especially if you have family or a background in the military. Her presentation lined up very well with Nick's if you think about it. She's involved in sales just like he is, just in a different facet of the industry. She builds relationships with other companies on behalf of Collins to help acquire orders for the parts and tech manufactured by the company. On the other hand, Nick works with a sales broker company who may be indirectly involved in the transport of some of those parts or the machines that build those parts! It's fun to think about how everything is connected.

Thinking about it from the perspective of my job working at a Part 121 carrier, I also play a part in the greater aviation industry. For instance, Abbi may need to take a trip to a different city to build working relationships with potential customers, and she may end up flying on a GoJet aircraft in the process! After Collins makes a sale, there very well may be an oddly shaped machine or part that needs to get somewhere quickly for the manufacturing process, and, somewhere far upstream in the manufacturing process, the company Nick works for may be indirectly involved in that process.

Name: Jacob Flowers

HR Manager Task Activity

Task: *Complete Section-1 (20 Marks) & Section 2 (20 Marks)*

Section 1: Review your friend's resumes and grade them (***Do not grade your own resume***). Write down any comments on the resumes in the comment's column.

- Grade A - Excellent
- Grade B - Good
- Grade C - Average
- Grade D - Bad

Resumes	Grade (A, B, C, D)	Comments
Resume - 1	**C**	- This has all the right information; it just seems as if it needs better organization and cutting down details of jobs worked - I would find a way to bring this down to a page by combining some of the extracurriculars and creating borders between sections
Resume - 2	**B**	- Better separation of sections needed - Overall, really good that it is down to a page and the way everything is organized is good
Resume - 3	**C**	- I think the fonts needs to be changed, and information needs to be more centered, a bad print job would cut off the top information - Lots of good experience, just need to make sure the top

		has the most important information to grab the employer
Resume - 4	**B**	- I like the color and fonts, it's a unique choice and stands out among others. - I don't think the soccer experience is necessary here, and removing/condensing it would bring it down to a page
Resume - 5	**B**	- This a good looking, unique resume, I would remove some of the dead space at the top - I would play around with the fonts to see if minor adjustments make it look better
Resume - 6	**C**	- I think this resume would benefit from borders. - I'd recommend cutting down and condensing your experience, so the most relevant information sticks out
Resume - 7	**C**	- There is a bit of dead space and it ends up hurting the spacing of the resume - I like the template, it just needs to be more unique to you
Resume - 8	**B**	- A really unique resume, it does pop, the font and background compliment the just right amount of color and gradient.

		- Be mindful of how close of the paper is to the cutoff line if this were to be printed out
Resume - 9	**C**	- The concise nature of the resume is awesome, it just needs to be made unique - Find a way to cut the dead space and it will tighten the resume up even better
Resume - 10	**C**	- Find a way to highlight the military experience more, a lot of employers are looking for that in aviation and it makes it more unique - The length is really good, just need to find a way to make the resume more unique
Resume - 11	**B**	- A lot of really good organizing going on, but creating some space and downsizing a couple of sections would make it even better - Having your name at the top of the resume would help you stand out, I imagine it was removed for the sake of this project
Resume - 12	**N/A – My own Resume**	- I have been making continuous adjustments to the specifics of my resume, particularly on applications for jobs, this resume was specifically crafted

		for Procurement and Quality Specialist positions at aircraft manufacturers and FBOs. - I need to specialize my resume more and add in Some Graphic designs to make my Resume stand out more
Resume - 13	**B**	- From a graphic design perspective this is a really awesome resume, it grabs you, and has just the right amounts of differing graphics - Some things run off or cut off, I'd just take a closer look at the formatting
Resume - 14	**C**	- Cutting things down to just a page would be helpful and removing dead space. - I like the timeline idea, but I think it takes away from some of the other relevant experience
Resume - 15	**C**	- Reworking some of your experience would be good, including employer information and a timeline of your work experience - The key skills area could be expanded on, tie it into courses and projected completed at SLU
Resume 16	**C**	- I would try to condense this resume and cut down on

		some of the skills/combine them for work experience. - Bring your education section to the top of the paper, and maybe incorporate some of your skills into the descriptions

Section 2: Now, after grading your friend's resumes. Proofread your own resume and write down any changes you think should be made to your resume based on your experience from reviewing your friend's resumes. (***Do not grade your resume***)

Example:

- I believe I should change the font size in my resume.

Diversity in Aviation Article Summary

The article begins by discussing different percentages of underrepresented groups within the aviation industry (Johnston, 2022). All of these percentages for women, Black, African American, Asian, Hispanic, and Latino all fall between 1.5% on the low end and 6.1% on the high end. Aviation would like to take more conscious steps to make this disparity not as prevalent within the industry. This article discusses how the industry can approach including more diversity, equity, and inclusion with their respective spaces.

Women's groups are at the forefront of the fight to have more diversity within the aviation industry (Johnston, 2022). Organizations are now starting to provide content to help students from low-income backgrounds have access to STEM textbooks.

As time has progressed, there is a bigger emphasis being placed on equity versus equality (Johnston, 2022). Society is starting to notice that even if the same resources are available to everyone, they are still not being put to the best use. Equity takes into account everyone's different backgrounds and as this applies to aviation, we are able to give extra resources to the backgrounds mentioned above and help them make a way into the aviation industry. If we were to provide these resources for everyone, I think that the disparity in certain backgrounds being represented would persist.

Another aspect to this idea is inclusion, as the article mentions inclusion isn't just about letting other people into space but having them feel welcomed (Johnston, 2022). I mentioned this as one of my diversity ideas to have a mentoring program so that underrepresented individuals feel welcomed when they enter an organization. Inclusion is the final step, in my opinion, to opening up a space to people who originally did not dominate it. It's the step that shows that diversity is persisting. For example, if we were to count the amount of underrepresented people who were being hired, that would not account for turnover of those individuals. Instead, inclusion is the active thought of not just hiring these underrepresented

groups but making sure they stay around and are actually able to change the culture of the company they joined.

To conclude the article, the author gives suggestions as to how we can create a more diverse aviation industry (Johnston, 2022). These suggestions include things such as open communication, have information about the current climate of the organization, and always be willing to reevaluate your program to make it more diverse, equitable, and inclusive. These are intangible topics that may not change the aviation industry overnight but hopefully wakes up some people to the idea that things should be looked at through a DEI lens.

Reference

Johnston, M. (2022, September 29). Diversity, equity, and inclusion in aviation. California Aeronautical University. https://calaero.edu/diversity-equity-inclusion-dei-aviation/.

1. Research, identify, brainstorm, or develop FIVE ideas to increase the diversity in the aviation industry
    a United's Aviate Academy
        i. The first effort that has the intent of increasing diversity is United's Aviate Academy. They intend to train 5,000 pilots and have over half of them be women or people of color. This program will allow for various kinds of people to be able to develop their abilities as a pilot by not focusing on simply who can pay for pilot training but for everyone who has what it takes to become a pilot. Pilot training is offered at a reduced rate as well as offering people to get their PPL for free with the intent of completing the program.
    b Pilot Shortage Long Term Fixes
        i. Thinking about the current pilot shortage, we are going to need more people to become pilots in the future. One of the biggest barriers is that this space is reserved almost exclusively for white males. While this group makes up one of the majorities of the population, we could leverage much more by targeting groups such as women and people of color. This idea stems from the fact that if we want more diversity in aviation we should start by opening up the space to create a welcoming environment.
    c Value of Creating a Diverse Cockpit
        i. Everyone brings different ideas to the table and having a diverse cockpit allows for multiple perspectives to be heard in collaboration. Various perspectives also help when dealing with unforeseen scenarios as hopefully both crew members have different ideas about how to handle the situation and can come to the best answer together. With diversity, it allows for more creativity to be produced with people from different backgrounds.
    d Have a Mentoring Program
        i. For companies trying to improve diversity, they may think that just hiring people of different backgrounds will increase it. However, the aviation industry is an exclusive club and various people may not feel welcome. These organizations should create mentoring programs for underrepresented groups in aviation with other individuals already a part of the organization. This will allow for them to already know a welcoming

face and be able to share their experiences with. They will also be able to receive advice and encouragement from their mentor as they continue with their new hire journey.

e Targeting Younger Individuals

i. The only reason I even know about aviation is because of the role my family played in the industry. For people who may not have the same opportunities, they see the airport as something mystical and unreachable. Reaching out to kids in grade school to show them they can be pilots too is an important outreach that should be used by schools and even airlines. For example, SLU will bring a simulator to grade schools and have current flight science students guide kids as they fly the simulation. It's a unique experience to offer them and could be the start of their very own aviation journey.

Midterm Questions (100 Marks)

Due: 3/10/2023 (11.59 PM CST)

(Note: References must be included for each question. Use APA format for extra credit)

1) **Aviation Professional (20 Marks) (Min 300-500 words)**

I think that being a professional is important because these are the items that drive us to be good people throughout our careers. As discussed in class, there are so many facets that go along with being a professional. All of these traits go along with being a good and competent individual. Acting professionals go hand in hand with how people act in their personal lives whether they like it or not. If one wants to say that "a job is just a job", they do not realize that the actions they display during work hours are going to seep into their everyday lives. Professionalism is required and important in aviation because the aviation industry is one that is lined with integrity and good natured people. There are many different dimensions of the aviation industry where people simply have to trust that their coworkers have the competence and skill to be able to complete a task. For example, pilots have to have inherent trust in their maintenance department. Pilots do not have the knowledge to be able to know if the mechanics did not do their job properly until it is too late. There are a wide variety of traits that professionals must possess. Many of these are outlined in the NBAA's article on personal and organizational professionalism. To highlight a few from the article, I would say the most critical ones are as follows: integrity, expertise, initiative, and team player (National Business Aviation Association, n.d.). I think these traits exemplify the heart of what it means to be a professional. A professional must be honest and forthcoming. A professional should know what they are talking about as well as be able to fill in gaps in other people's knowledge. A professional gets the ball rolling with new ideas and problem solves when need be. Lastly, a professional works in unity with other people on their team and wants everyone to be the best they can be. Overall, I would say that being a professional in aviation is of the utmost importance especially in an high-consequence industry that requires a lot of trust.

2) **International Aviation (20 Marks) (Min 300-500 words)**

ICAO was created on the 7th of December in 1977 (International Civil Aviation Authority, n.d.a). ICAO was first created to benefit civil aviation by developing the industry in a safe and well organized fashion. ICAO is an organization that works with each individual country so they can better develop their individual and personal practices within their civil aviation authority. There are five strategic objectives to ICAO. The first is safety (International Civil Aviation Authority, n.d.b). This objective wants to guarantee the safety of aviation on a global scale. The second is air navigation capacity and efficiency. This objective wants to maximize the potential of the world's airspace. This would be done through technology upgrades and as well as updating procedures. The third is security and facilitation. This objective tells the importance of ICAO as a leader in aviation security. Their role in this extends to security incidents at the country's borders. The fourth is the economic development of air transport. This objective would like to keep the industry as economically viable for years to come. They also do this by providing financial support to some areas of the industry. Lastly is environmental policies. Aviation is seen as a major environmental concern, and ICAO is at the forefront of this to combat the environmental impact of aviation globally. The FAA is seen as a global leader throughout the aviation industry (Federal Aviation Administration, n.d.a). The FAA, personally, engages themselves internationally by associating with international organizations. They work closely with these other organizations to establish world wide policies and procedures that are going to advance safety to the highest standard. The FAA also works with other organizations to solve global problems. All of this is done with the intention of furthering the aviation industry. Overall, ICAO is an important organization that is working to better the aviation industry on a global level. Through their strategic objectives, they show to care and root for the future of the aviation industry.

3) **Aviation & Airport Security (20 Marks) (Min 300-500 words)**

This paper outlined six threats to the aviation industry, and they are as follows: terrorists, criminals, hostile nation-states, insiders, foreign intelligence activities, and infectious disease ("National Strategy for Aviation Security", 2018). The three categories of emerging disruptive technologies or risks are cyber connectivity, increased dependence on radio frequencies, and a significant increase in unmanned aircraft systems. The four strategic objectives outlined in the document. The first is being able to protect the United States and its global companions throughout the aviation environment. The second is maximizing security while keeping a high level of safety along with balancing this with the United States' economic influence. The third is promoting flexibility, minimizing harm, and quickening recovery. Lastly, the fourth successfully captured attention at the international, domestic, and private sector level. Next the five specific strategic actions that will be used to achieve each of the strategic goals mentioned above include the following. The first is to widen awareness of the domestic level. The second is to proactively see threats and determine weak points that are threatening the aviation industry and are a result of the aviation industry. The third is to bolster the already multilayered security within aviation. The fourth is to guarantee the continuation and advance bounce back within the aviation environment. The last one is to intensify collaboration on an international scale. All of these strategies from the NSAS are used to further the development and safety of aviation within the United States but also look out for the interest of our global partnerships. The aviation ecosystem does not rely and develop solely from the United States' failures and success but by everyone around the world working together to make the aviation industry a reliable, safe, and efficient network to allow people to travel all over the globe. Because of this international scale that aviation has, it is important to have such strategies in place to counteract possible threats from others who want to take advantage of the global reach of aviation.

4) **Diversity in Aviation (20 Marks) (Min 300-500 words)**

I think that the most important reason to increase diversity is to get different perspectives. It's great when people are alike and can easily agree on things, but that does not always allow for the best decision to be made. Different experiences and values can put a lot of perspective on certain scenarios and being able to get all this information can make the difference between making a great decision and one that could have been better. While the aviation industry is working hard to be able to allow for diversity into the industry, there are still lots of barriers for certain individuals. Luckily, some airlines have taken the initiative to start their own programs. For example, United's Aviate Academy has been at the forefront of wanting more diversity in aviation. The academy aims to add to diversity and even show that with the demographics of their first four classes. This includes having around 50% be women and between 70%-80% people of color (Vogel, 2022). After doing some research, I found another program called "Fly for the Culture". This program allows for young individuals to be mentored by a career pilot in their same culture. Not many people of color get to experience having someone in their same demographic be their mentors, and this program seems like an amazing opportunity to increase that (Fly for the Culture, n.d.). One of the main suggestions I have to increase diversity is having a good mentor. When a minority enters the industry, it can be hard to stay since there is such a set culture. If minorities are given mentors who are similar to them, that might promote a sense of belonging, and this is the same idea that is being promoted by "Fly for the Culture". I think this also extends to being able to target younger audiences and promote being a pilot at a young age. I think many people simply don't know a lot about aviation or even how to become a pilot. If we were to educate people more on this, I think there would be more varieties of people entering the industry instead of relying on individuals whose parents/grandparents, etc. were pilots during their careers. Overall, the issue of diversity is an important one for the aviation industry, but I am glad to see programs and initiatives that are looking to narrow that gap.

5) **Aviation Safety and Human Factors (20 Marks) (Min 300-500 words)**

The first FAA program I would like to discuss is the "Compliance Program" (Federal Aviation Administration, n.d.b). The main goal of this program is to correct issues and safety programs that stem from a lack of compliance with posted regulations and standards. The FAA wants to solve these issues as quickly as possible to get everyone back on the right track. The program aims to allow for an open stream of communication between the FAA and individuals and organizations. This program wants to focus on establishing a just safety culture that promotes the acceptance and disclosure of personal and organizational errors. The second program I would like to explain is the National Simulator Program (Federal Aviation Administration, n.d.c). The main goal of this program is to produce standards that will be used by every entity to determine the qualification of any certain simulator to actually be used for pilot certification. The standards for these simulators are posted in CFR 14 Part 60, and this program is involved with those regulations. This program is widespread to be able to make sure that high quality simulators are being used to train pilots. The program that will most relate to my future career is the simulator program. While the compliance program almost applies to every hands-on job in the industry, the simulator program will relate to me as I work with pilots to complete their recurrent training. My desire is not to be involved with the simulator training, but it will relate to how I chose to complete my job by getting an entire picture of pilot training. Understanding the simulator program will allow me to better prepare how I plan to lay out pilot training as people come into the organization. Overall, I think both of these programs, and other FAA programs and initiatives, are important to understand when entering a career in a highly regulated industry.

References

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Vogel, A. (2022, March 23). *United aviate academy sets standard for facilitating growth, diversity in the airline industry*. SKIES. https://skiesmag.com/news/united-aviate-academy-sets-standard-facilitating-growth-diversity-airline-industry/

Aviation Management – Data Collected in Support of Faculty and Staff Goals and SLO 2

PARKS COLLEGE FACULTY T/TT ANNUAL EVALUATION SUMMARY 2023 (for calendar year 2022)				
[redacted]		Annual Evalulation Score		[redacted]
	Total Workload Assignment for 2021	24	Proportion	Area Score (1-4)
	Research & Grants and Contracts Assignment	9	0.375	[redacted]
	Teaching Assignment	12	0.500	[redacted]
	Service and Professional Development Assignment	3	0.125	[redacted]
	Administrative Assignment		0.000	

All input data expressed in workload units

Enter data into light gray squares.

Department Chair's Assessment: Evaluate the faculty member's performance in accordance with the mission of the department, college, and university. Consider performance norms for the rank and seniority of this faculty member, overall workload, and the faculty member's overall engagement in the college. List key strengths and weaknesses and suggest strategies for improvement. Comment on any weaknesses or concerns noted in previous evaluations.

[redacted] role in the department is that of a tenured, associate professor. As such, he has successfully fulfilled the duties of his appointment. His performance in teaching was outstanding. He successfully taught the courses assigned to him and he continued to work to imrove his teaching methods. Students recognized hs teaching efforts. He mentored both undergradute and graduate students and served on the graduate committees of our graduate students. [redacted] exceeded expectations in conducting research, collaborating within the department as well as inter-departmentally within the college. He made presentations as PI and with student collaborators, submitted a paper for publication and actively submitted grant proposals, some of which if awarded, would bode well for the department and its research goals. [redacted] performance in the area of service was outstanding, both internally at SLU and within the community. He served on committees at various levels at SLU and served the college as its Chief Diversity Officer. [redacted] is active in service to the Ville area of the St. Louis community. I highly commend his service to the Revitalization 2000 initiative, including his work at the Claver House and the Hickey Elemenltary School. His use of his students in a service learning opportunity was well received by his students and those in the Ville. I recommend that in his role as Chief Diversity Officer, [redacted] has exceeded the expectations of the position, as he worked to establish the position and diverity within the college. There are no weaknesses or concerns that carry over from previous evaluations. I ask that Stephen continue the efforts given to date and I thank him for those efforts.

Faculty Member's Response: Please provide your response to the overall assessment. At the minimum, you are expected to sign the document to acknowledge the receipt of this review.

I acknowledge receipt of the annual evaluation as presented in this document.

Signed:

Faculty Member	Date
Department Chair	Date

PARKS COLLEGE FACULTY T/TT ANNUAL EVALUATION TEMPLATE 2023 (for calendar year 2022)		
[redacted]		2022
Number of Items	*This is imported from Table 3 of "Parks-001 Faculty Workload and Annual Evaluation Policy"*	[redacted]
	Research Activities	**4.5**
	Presentations	
2	Contributed by student in group	0.5
2	Contributed by PI	1
	Invited	0
	Publications and Patents	
1	Papers or patents submitted (provide details for each in FAR)	1
	Papers or patents published (provide year of submission in FAR)	0
	Books	
	When contract obtained	0
	While book is in process	0
	When book is completed	0
	Grants and Contracts	
	Internal proposal funded	0
	External proprosal funded (<$50K)--PI	0
	External proprosal funded (<$50K)--co-PI/co-I	0
	External proposal funded (>$50K)--PI	0
	External proposal funded (>$50K)--co-PI/co-I	0
	External proposal not funded--PI	0
2	External proposal not funded--co-PI/co-I	2
	PI on current externally-supported grant	0
	co-PI or co-I on current externally supported grant	0

PARKS COLLEGE FACULTY T/TT ANNUAL EVALUATION TEMPLATE 2023 (for calendar year 2022)			
[redacted]			2022
Number of Items	*This is imported from Table 4 of "Parks-001 Faculty Workload and Annual Evaluation Policy"*		[redacted]
	Service Activities	**Total pts**	58.25
	Internal Service		
2	Smaller activity (meeting with prospective students, etc.)	0.1-0.25	0.25
15	Committee member (department, college, or university)	2	30
1	Committee chair (department, college, or university)	5	3
1	Professional development activity (workshop, conference, course)	1-3	3
2	Major activity (significant adminstrative responsibility, major initiative)	6-10	10
	External Service		
	Reviewer for papers, grant proposals	0.5-1	
	Chairing or organizing symposia, sessions at conferences	3	0
1	Leadership role in external/professional service	3	3
	Undergraduate Mentoring		
	0-10 students	3	0
	11-20 students	6	0
1	21+ students	9	9

PARKS COLLEGE FACULTY T/TT ANNUAL EVALUATION TEMPLATE 2023 (for calendar year 2022)			
[redacted]		2022	
Number of Items	*This is imported from Table 5 of "Parks-001 Faculty Workload and Annual Evaluation Policy"*	[redacted]	Enter Area Score (1-4)
	Teaching Activities	**Total pts**	**53.5**
	Teaching Productivity & Quality		
	Base teaching productivity	5-7	7
	Student satisfaction/Teaching quality	5-7	6
	New course development	6	0
2	Major course redesign	2-4	4
1	Teaching a large section	3	3
1	Teaching an extra course	4	4
	Pedagogical Activities		
	Attend a teaching-related conference	1-5	
1	Teaching seminar or other teaching professional development	1-5	
	Mentoring and Student Research		
11	Graduate student committee member	0.5	5.5
	Directing undergraduate in research	1	0
12	Directing graduate or postdoctoral student in reasearch	2	24
	Visiting researcher in laboratory	1	0

[redacted]

[redacted]
Coordinator

Manager: Stephen Magoc
Evaluated By: Stephen Magoc

2022 Year End Review

Organization: Aviation Science-General (Stephen Magoc)
Location: Center for Aviation Science
01/01/2022 - 12/31/2022

Overall

Manager Overall Evaluation

Rating: Exceeds Expectations

Acknowledgement

Employee

Entered by: [redacted] Date: 03/14/2023

Status: Acknowledge

Comment: I appreciate the opportunity to be of service at the CAS. Working with students in the best department at the University is a plus!

Goals

Goal_1

Participate in and support the CAS efforts in community and industry outreach.

Due Date: 12/31/2021 Status: Successfully Completed Completion Date: 12/31/2021

Supports:

Manager Evaluation

Rating: Exceeds Expectations

Comment: [redacted] has shown time and again the willingness and ability to be supportive of CAS endeavors to reach out and promote our flight program to the community and industry.

Employee Evaluation

Rating: Exceeds Expectations

Comment: Participates in outreach including Women in Aviation, Girls in Aviation Day, high school outreach camps, and organizes Christmas holiday donations for community families.

Goal_2

Continue to improve your own personal education and skills as an example to the CAS staff. Continue to encourage and enable CAS staff to develop professionally.

Due Date: 12/31/2021 Status: Successfully Completed Completion Date: 12/31/2021

Supports:

Manager Evaluation

Rating: Exceeds Expectations

Comment: [redacted] attends the necessary SLU and CAS required training and certification as the

Employee Evaluation

Rating: Exceeds Expectations

Comment: Worked with DPS and SLU to complete required certifications for dispatcher position.

Dispatch Coordinator.

Also completed Certified Peer Support Counseling seminar through the State of Missouri.

Goal_3

Continue to explore and implement efficient operation of the dispatch department. Work with other CAS, AVSC, Parks College and SLU administrators to improve efficiency in operations at the CAS as the department moves towards an "aviation business" model.

Due Date: 12/31/2021 Status: Successfully Completed Completion Date: 12/31/2021

Supports:

Manager Evaluation		Employee Evaluation	
Rating:	Exceeds Expectations	Rating:	Exceeds Expectations
Comment:	[redacted] is often the go-to person at the CAS, working to ensure that the department chair and SLU administration are kept up-to-date on the inner workings of the CAS.	Comment:	Continues to work with both faculty and staff to insure the department is efficient and operational at the airport. Works as a contact between main campus and the airport to insure communications are effectively distributed.

Work with the Department of Aviation Science and dispatch personnel at the CAS to ensure that AABI-required safety management goals are met.

Take an active role in the development and management of the safety goals set out by the department faculty and CAS administrators.

Due Date: 12/31/2022 Status: Partially Completed Completion Date:

Supports:

Manager Evaluation		Employee Evaluation	
Rating:	Meets Expectations	Rating:	Exceeds Expectations
Comment:	[redacted] actively works towards maintaining a safe and orderly dispatch department at the CAS, which is critical to the operating efficiency of the CAS.	Comment:	This is an ongoing process and is crucial to the safety of the department.

Values

Acting With Character

Approaches work with a sense of integrity and duty to produce high quality results in the Jesuit tradition, even when it's the harder thing to do.

Examples

- Uses good listening skills, gets to know others' needs and takes timely action to respond to those needs.
- Shows up to work regularly, on time and stays on task during the workday.
- Applies knowledge, skills, and mastery of job tasks to achieve results.
- Demonstrates strong work ethic and sense of urgency to meet commitments.

Manager Evaluation		Employee Evaluation	
Rating:	Exceeds Expectations	Rating:	Exceeds Expectations
Comment:	[redacted] often exceeds the work requirements of her dispatch coordinator appointments. She is typically the first person to show up early and/or stay after her normal work hours to accommodate the students, staff, and faculty utilizing the CAS for flight education and training.	Comment:	I strive to work over and above the necessary requirements, working early or late to accommodate students, flight team, etc. I am efficient with my time, and and respond quickly to any questions or requests.

Strengthening Our Community

Forms inclusive and equitable relationships with others in the workplace.

Examples

- Treats others with respect, courtesy, honesty, and compassion.
- Uses appropriate self-control of emotions and behaviors, even in difficult situations.
- Respects, embraces, and celebrates all expressions of identity.

Manager Evaluation		Employee Evaluation	
Rating:	Exceeds Expectations	Rating:	Exceeds Expectations
Comment:	[redacted] works in a sometimes frenetic environment. In spite of this, she is always extremely courteous to coworkers, students, and prospective students and their families.	Comment:	Treats others with respect and courtesy, both internally and with students/parents. This is especially true in answering student/parent billing questi

Driving Change & Innovation

Improves work processes with the goal of adding value, increasing quality and efficiency, or stopping unnecessary tasks.

Examples

- Puts team goals first. Stops tasks that don't help the team achieve its goals.
- Looks for ways to improve quality every day.
- Finds creative ways to solve problems.
- Recommends ways to improve work.

Manager Evaluation		Employee Evaluation	
Rating:	Exceeds Expectations	Rating:	Exceeds Expectations
Comment:	[redacted] always puts the goals and needs of the CAS first and is more than capable of prioritizing her tasks when found necessary. She is a very capable problem-solver in an environment which can be quite tense when something out of the ordinary occurs.	Comment:	Continually looks to improve quality and solve problems at the hangar. I am willing and open to work on problem solving or changes to better the activity at CAS

Individual Development Plan

Professional develolpment

Additional Information: [redacted] should take advantage of any SLU-sponsored (or outside sponsorship) that involve developent to assist with her daily duties and/or personal life.

Status: Successfully Completed

Start Date: Jan 1, 2022 Completion Date: Dec 31, 2022

Aviation Management – Data Collected in Support of Facilities, Equipment, and Service Goals and SLO 2

SAINT LOUIS UNIVERSITY
OLIVER L. PARKS DEPARTMENT OF AVIATION SCIENCE

School of Science and Engineering
3450 Lindell Blvd.
McDonnell Douglas Hall Room 1017B
St. Louis, MO 63103

P: 314-977-8251

May 31, 2023

Dean Duellman,

Following is a report on the condition of the facilities, equipment, and services utilized by the Department of Aviation Science. This report is required to be sent to you as part of the assessment process used by the department.

The department has the following goals for facilities, equipment, and services.

- The facilities remain adequate for the aviation department's academic and flight training activities.
- Saint Louis University will continue to support the services required by the aviation department.
- Saint Louis University will support the aviation department in its need for aircraft and advanced aircraft training devices (AATDs – flight simulators) to operate the aviation academic and flight training activities.

The following describes the condition of the Facilities, Equipment and Services utilized by the department.

Facilities

- The McDonnell Douglas Hall facility remains adequate for the current level of staff and faculty.
- The Center for Aviation Science facility continues to leak in different areas when it rains and needs continual roof repairs. Please note that the facility phased renovations did not restart in July 2022 as planned. Phase 2 renovations are currently being rebid and scheduled to be started as soon as possible.

Equipment

- Equipment used in McDonnell Douglas Hall is generally in adequate condition except for the CRJ 700 flight simulator used by the department. The CRJ 700 flight simulator is due for replacement during the summer 2023. The replacement unit will be a Boeing 737 MAX AATD manufactured by Flightdeck Solutions (FDS).
- Equipment at the Center for Aviation Science is becoming aged. The aircraft continue to be maintained in an airworthy condition, but it is becoming increasingly expensive to maintain them in such a condition. The Diamond DA20 aircraft were manufactured in 2008 and the Piper Seminole aircraft were manufactured in 2001 and overdue for replacement, based on

the department's seven-year replacement cycle.

- The 2018 aircraft simulators are operating adequately and are within the seven-year replacement cycle.
- The 1996 ground support truck used by the department needs replacement and is becoming increasingly difficult to use in support of snow removal from the hangar ramp areas.
- The forklift vehicle used by the department needs replacement or overhaul.
- The aircraft oil storage shed is in an unusable, unsafe condition and requires replacement.

Services

- The services at McDonnell Douglas Hall are adequate.
- The services at the Center for Aviation Science are barely adequate as the facility continues to deteriorate, the roof leaks, several doors require replacement, the HVAC in the simulator room requires adjusting, there is a lack of SLU branding on the exterior and in the interior of the facility, Site 41 aircraft ramp drainage pipe is clogged and does not sufficiently drain, causing a large, long-standing pool of water on the ramp (large area of ice in the winter), etc.

Changes recommended at the last assessment of the Facilities, Equipment and Services criteria included the replacement of the Diamond DA20 and Piper Seminoles. The Provost declined to consider the recommendations of the department.

At this time, the department recommends replacement/repair of the following items of equipment:

- The nine Diamond DA20 aircraft with 10-12 Piper Pilot 100i aircraft.
- The two Piper Seminoles with two or three new Piper Seminoles.
- The ground support vehicle which is being used by the Center for Aviation Science.
- Replacement/overhaul of the forklift which is being used by the Center for Aviation Science.
- Replacement of the oil storage shed which is being used by the Center for Aviation Science.
- Repairs of the hangar facility.
- Repair the site 41 drainage issue.

Further, the department recommends the hiring of a custodian who can be dedicated to a schedule which allows for daily cleaning/servicing at the Center for Aviation Science.

Further, the department recommends the hiring of a custodian who can be dedicated to a schedule which allows for daily cleaning/servicing at the Center for Aviation Science.

Respectfully,

Stephen G. Magoc

Stephen G. Magoc
Chairperson

Aviation Management – Data Collected in Support of Aviation Safety Culture Goals and SLO 2

Safety Survey AY 2022 -2023

One articulated goal surrounding safety in the Department of Aviation Science is to conduct a survey surrounding safety and safety culture at the Center for Aviation Science (CAS). The current iteration of the survey measures participants attitudes and opinions on topics related to safety using a 5-point Likert scale with the opportunity to provide summary narrative feedback. The safety survey was conducted toward the end of the Spring 2023 semester.

The Safety Survey was modified for the 2022 -2023 academic year in order to collect more actionable information. Four overarching themes are measured in the survey including:

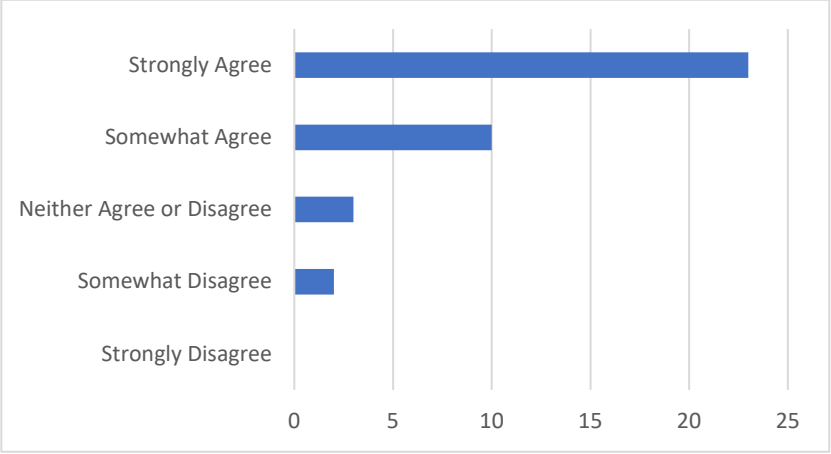
1. Parks Event Debrief and Learning System (PEDALS) Hazard Reporting System
2. Safety Communication (Safety Advisories)
3. Safety Training
4. Safety Culture

The survey was developed by the Assistant Chief Flight Instructor, the Safety Advisor and the Chair of the Safety Committee. The Spring 2023 survey was distributed using Qualtrics, a web-based survey tool. The survey was marketed by in-class announcements and a direct email request from the Department Chair. The survey was administered once at the end of the academic year following recommendations from the Safety Committee to discontinue both a fall and a spring survey. 38 individuals responded to the survey.

PEDALS Survey Questions

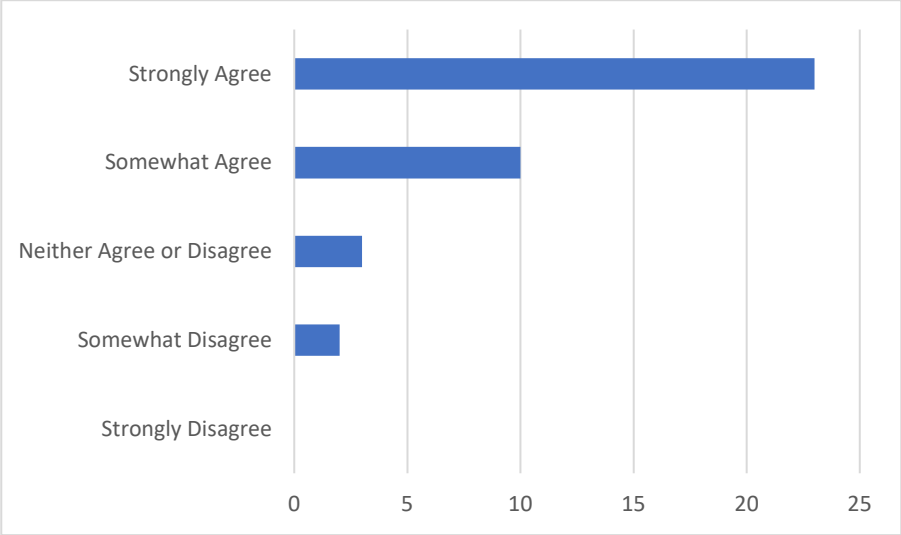
The following questions focused on the Parks Event Debrief and Learning System (PEDALS) Hazard Reporting System. Three questions were asked surrounding PEDALS:

1. I know where and how to file a PEDALS report



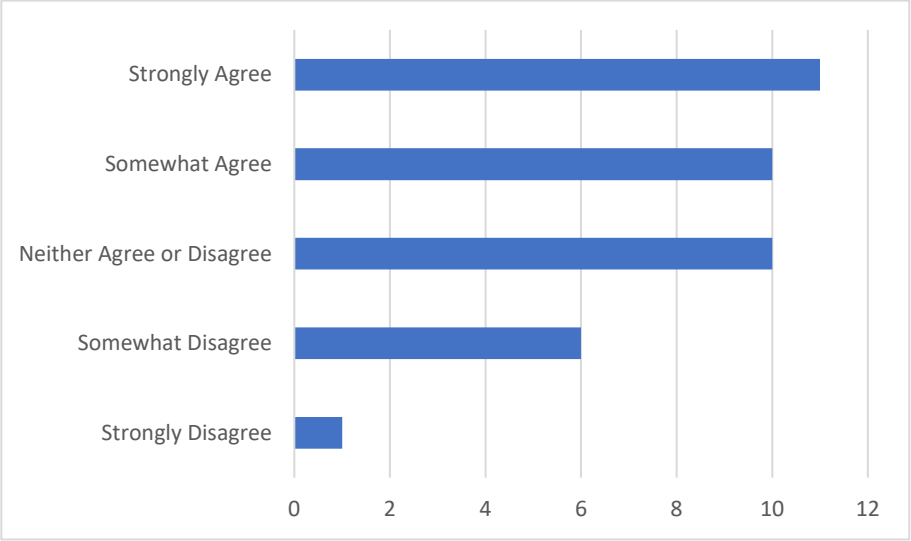
33 of 38 respondents indicated they know how to file a PEDALS report.

2. I feel comfortable reporting hazards within the PEDALS system.



33 of 38 respondents indicate they are comfortable filling PEDALS's reports.

3. I consult a peer, flight instructor, or management before filing a report.

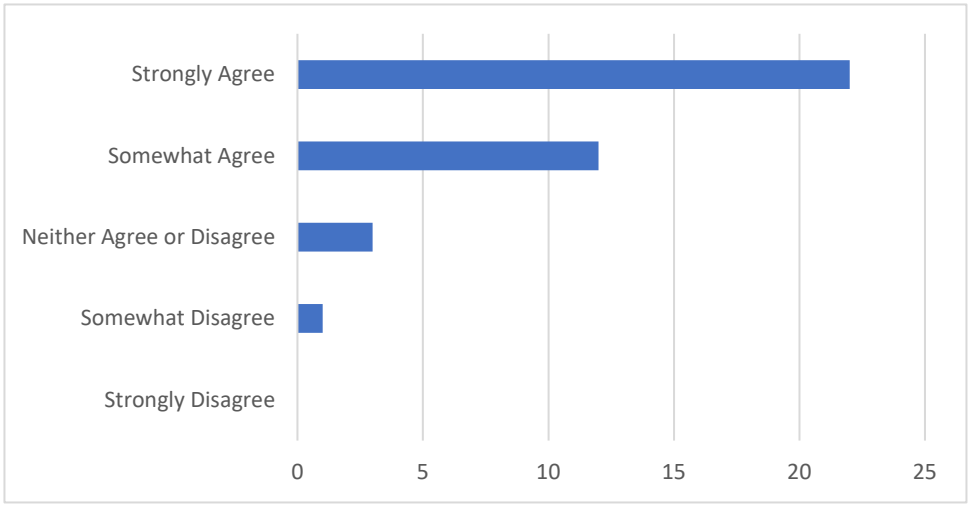


21 of 38 respondents indicate they consult with a peer prior to filing a PEDALS report.

Safety Advisories

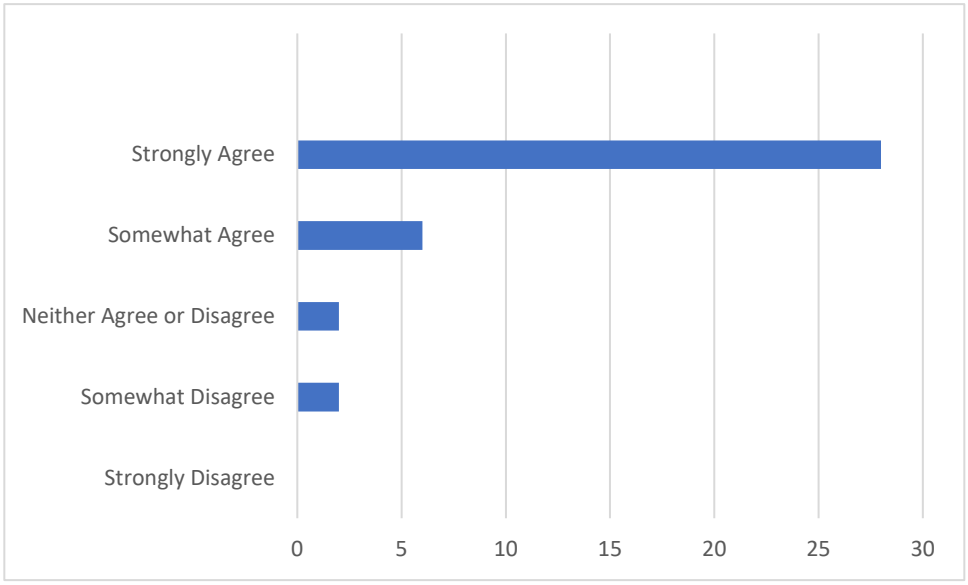
The following questions focused on weekly Safety Advisories.

1. I think that the safety advisory format is easy to read.



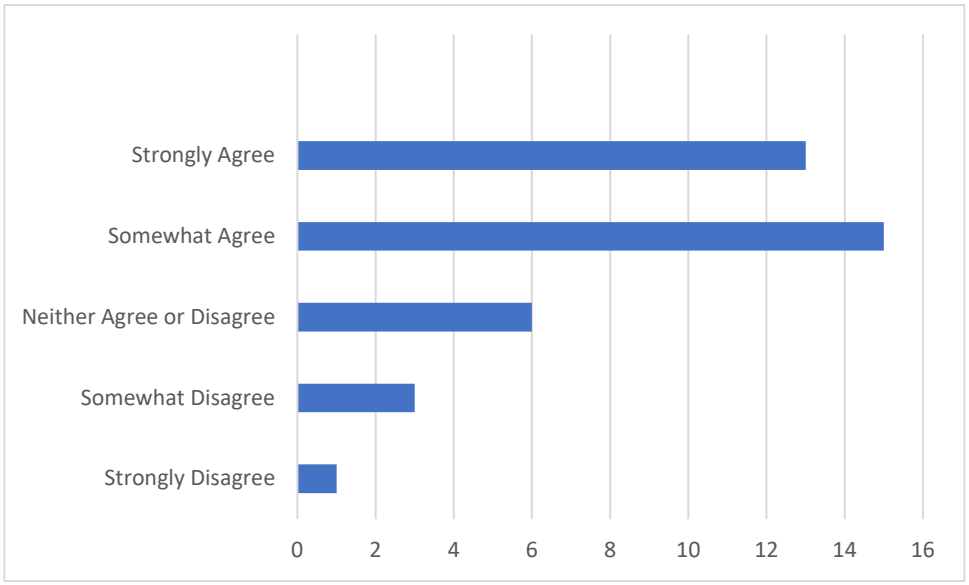
34 of 38 respondents found Safety Advisories easy to read.

2. I read the Safety Advisories.



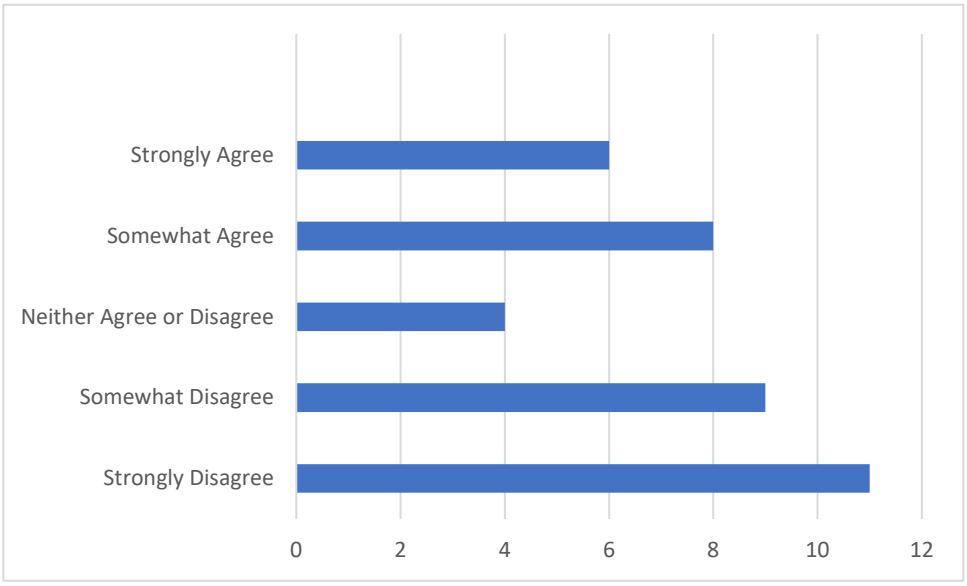
33 of 38 respondents read Safety Advisories

3. I have altered my choices and/or behaviors as a result of a Safety Advisory.



27 of 38 respondents indicate that safety advisories have altered their choices and/or behaviors.

4. I receive too many Safety Advisories.

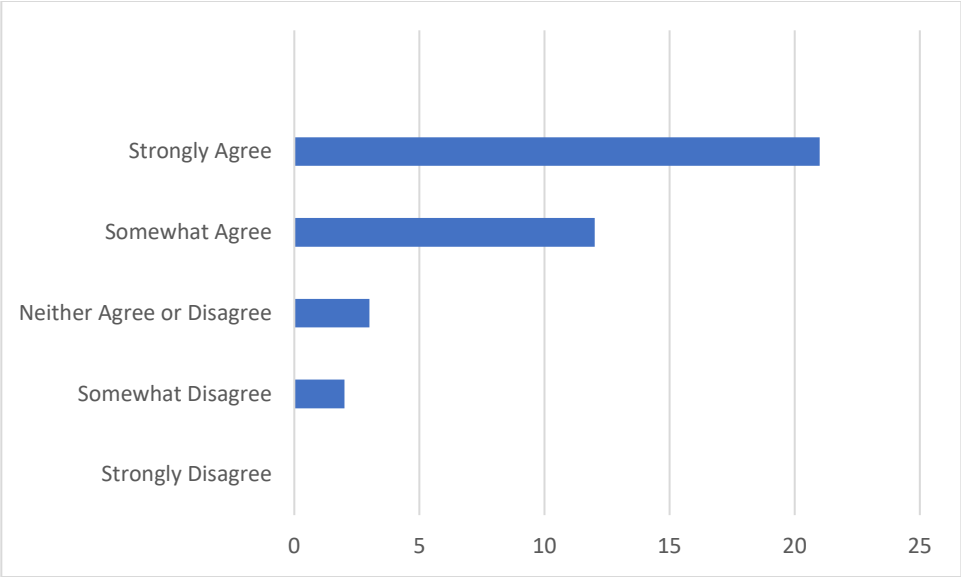


14 of 38 respondents indicate they receive too many Safety Advisories.

Safety Training

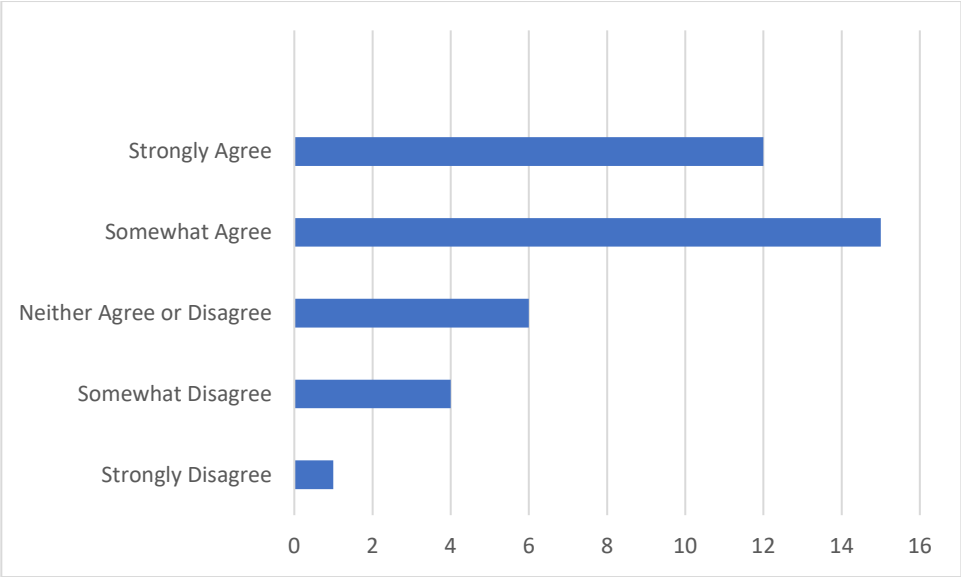
The following questions focused on safety training.

1. I am familiar with the most current version of the Flight Operations Manual



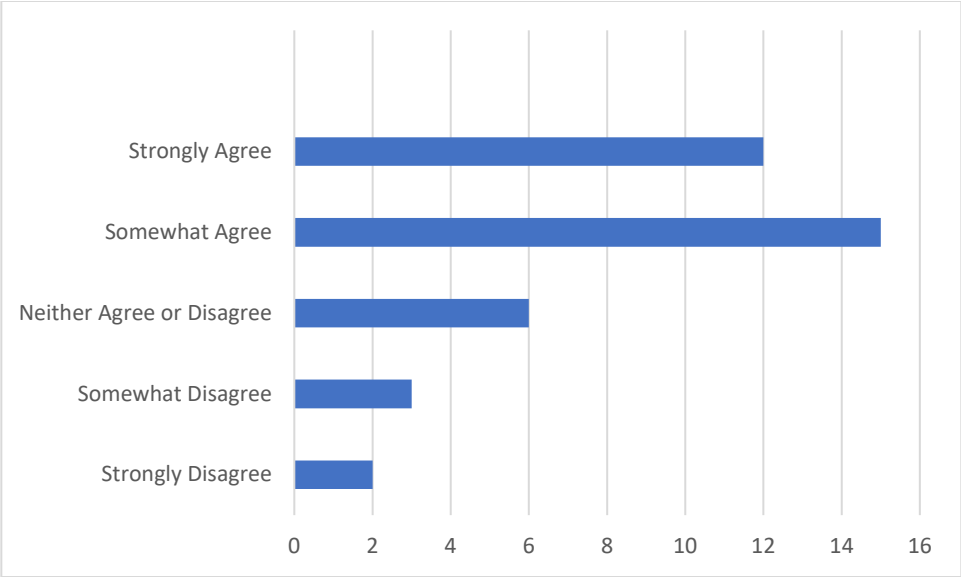
33 of 38 respondents indicated they are familiar with the most current version of the Flight Operations Manual.

2. Changes that might affect safety in our flight operations are adequately communicated to CAS stakeholders (students, instructors, maintenance, management)



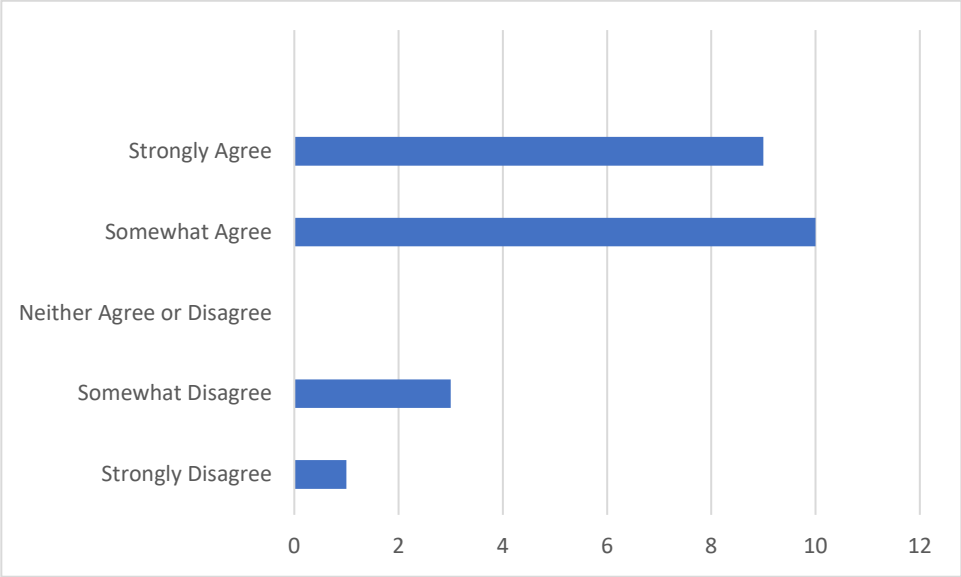
27 of 38 respondents changes that affect safety are adequately communicated to CAS stakeholders.

3. Safety Standdowns are effective in communicating safety information to our community.



27 of 38 respondents indicated Safety Standdowns are effective in communicating safety information to the community.

4. I have read a safety committee newsletter.

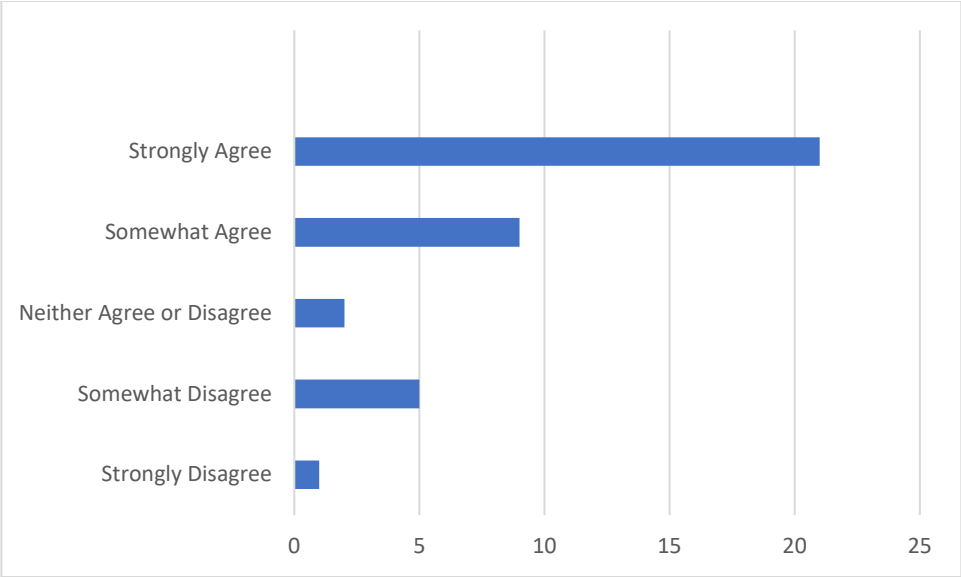


19 of 23 respondents indicated they have read a Safety Committee newsletter.

Safety Culture

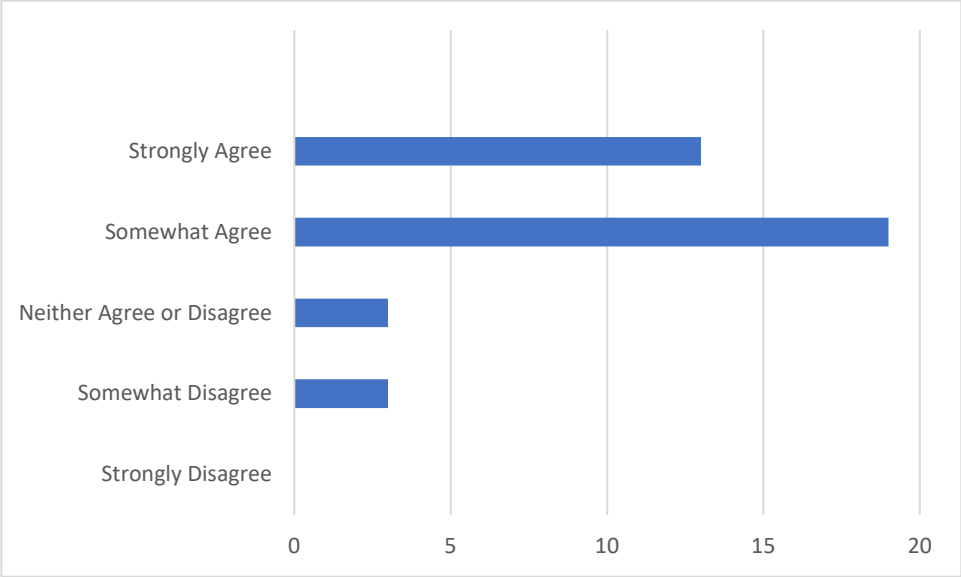
The following questions focused on Safety Culture.

1. I believe the Department of Aviation Science has a non-punitive safety culture.



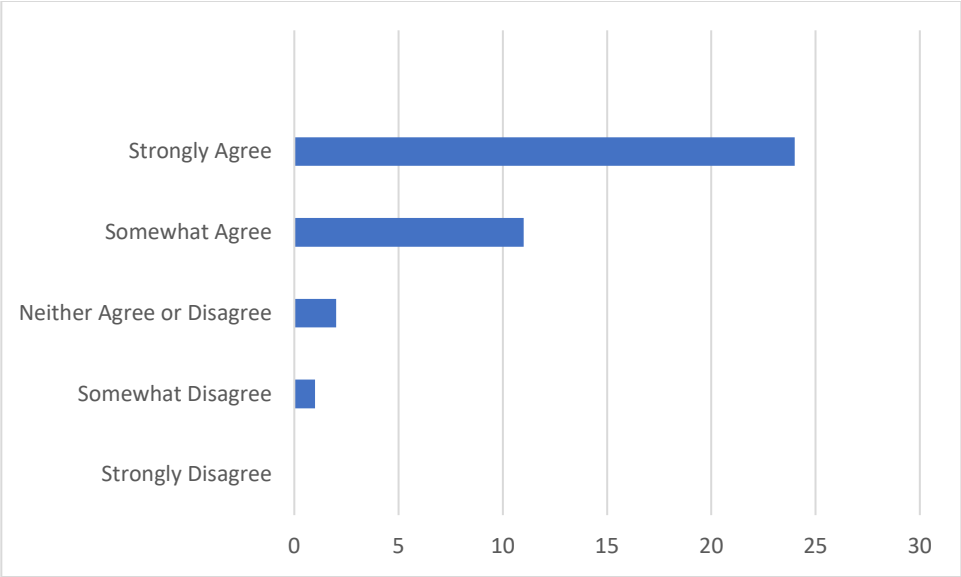
30 of 38 respondents indicate the Department Of Aviation Science has a non- punitive safety culture.

2. Generally, I think students and employees follow polices/procedures/rules.



32 of 38 respondents indicate they believe members of the AVSCI community follow policies, procedures, and rules

3. I believe we have access to the proper resources to be safe in our flight operations.



35 of 38 respondents indicate they have access to the necessary resources to be safe.

Survey Comments

This may sound contradictory to the mission of the Safety Committee, but I would argue that Parks has become "too safe." For example, students have no real experience with soft-field operations due to the ban on these operations. The same could be said with short-fields due to the specific runway requirements listed in the FOM. Similarly, I've noticed that some of my peers are unsure what to do or "afraid" of uncontrolled airports due to lack of ADS-B Out requirements, ATC coverage, and other traffic avoidance measures (besides "see-and-avoid"). As a result, I think it is imperative that Parks not only allows these operations, but encourages them. Safety is always the number one priority, I completely agree. But it is impossible to prepare pilots for real operations when they are constantly being in a safe "bubble" (such as CPS, the south practice area, etc.). Avoiding these situations during training does not create better pilots. Consider videos or a different design layout to readers of the safety newsletter so that it is more visually appealing to your audience. Otherwise, the PEDALS program is very successful in my opinion.

Safety Standdowns are not as effective as they could be because of the lack of a *requirement* to attend them. If we wished to make safety our number one priority, I believe we should make a safety standdown a higher priority than it currently is. Instructors are unfamiliar with several of our FOM policies. Safety (PEDALS) reports are sometimes handled inappropriately. Assumptions are made, rumors spread, and misinformation exists. Members of our community end up being reprimanded (rarely, but not never). It is not perceived to be an *entirely* non-punitive system.

Consider videos or a different design layout to readers of the safety newsletter so that it is more visually appealing to your audience. Otherwise, the PEDALS program is very successful in my opinion.

I feel when a major problem happens like engine problem or something major it feels like we don't hear about to almost a month later, and if you hear something happen like that and try to ask a a (sic) safety committee member they can't talk about it for some reason. When something major happens I feel like we should be know almost right away.

Over my time at SLU I've seen an increase in certain student members of the AvSci community posting photos and videos to their social media accounts while it appears they are operating the aircraft or acting as a crew member. Posting so frequently that I don't say anything to them anymore because I don't believe it will do any good to people in our age group since we are often entranced with our phones. To play devil's advocate, I believe it's okay for us to capture moments in our flight training that we will look back on fondly. The question is whether those photos and videos are being captured during a non-critical phase of flight while the aircraft is under positive control from another crew member (i.e. a Flight Instructor) if they are present. I believe capturing photos and videos while solo in the aircraft distracts us from safety of the flight, to a degree removing us from situational awareness, and preventing the pilot from acting on see and avoid techniques to steer clear of traffic. At United Airlines, the expectation is that once the flight deck door is closed, personal electronic devices are not to be used. If they are used, it is only for business-specific reasons, and the aircraft must remain stationary with the parking brake set to address those reasons. We ought to adhere to the same standards for the sake of our SLU flying community and those sharing the skies and aviation infrastructure surrounding us. Luckily, we already have this outlined in the FOM! If we all acted within the bounds of section 4.3 and specifically 4.3.4, I would have zero feedback for you all this semester. This is not a call to remove iPads/EFBs from our flight decks. I believe ForeFlight and similar flight-specific apps are helpful. My grievance concerns the personal use of electronic devices.

Safety Standdown Report

The Department of Aviation Science created a safety goal of hosting a Safety Standdown each semester; to include at least one external safety expert.

Fall 2022 Safety Standdown

The Fall 2022 Safety Standdown took place on Thursday, September 15th at 5:00 PM in the Carlo Auditorium of Tegeler Hall. Attendance for the event was excellent (140+ attendees) owing to the support of faculty and staff who awarded extra credit (and encouraged attendance). Once again, the Department of Aviation Science and the Safety Committee sponsored the event. Food and drinks were generously provided by GoJet Airlines.

Speakers for the Fall 2022 Safety Standdown included:

Greg Pochapsky (GoJet's Chief Accident Investigator) who discussed how the investigation of aviation accidents has yielded improvements and safety. (External Speaker)

Chris Fuller (CAS Flight Instructor) who discussed how to develop and maintain a safety culture mindset.

The last event for the fall 2022 Safety Standdown was a question-and-answer panel with the CAS management team including:

- Chief Flight Instructor: Bill Baumheuter
- Assist. Chief Flight Instructor: Ryan Boyer
- Director of Maintenance: Eric Heightman
- Dispatch Coordinator: Michelle Scheipeter.

Spring 2023 Safety Standdown

The spring 2023 Safety Standdown took place on Thursday, March 30th at 6:00 PM in the Carlo Auditorium of Tegeler Hall. Like the fall Safety Standdown, attendance was excellent (130+ attendees). The Safety Standdown was sponsored by the Department of Aviation Science and the Safety Committee. Food and drinks were again generously provided by GoJet Airlines.

Speakers for the spring 2023 Safety Standdown included:

Captain James Bono, United Airlines Chief Pilot (Chicago and Cleveland) and Captain Joseph Scaminaci Assistant Chief Pilot (Chicago and Cleveland) discussed the importance of safety culture in commercial aviation operations. (external speakers)

John Teipen (Aviation Professional) who spoke on the E-Z Wings program. (external speaker)

CAS Management Panel who spoke on safety at the Center for Aviation Science - Assistant Chief Flight Instructor Ryan Boyer and Dispatch Coordinator Michelle Scheipeter

SAINT LOUIS UNIVERSITY
EST. 1818

SCHOOL OF SCIENCE AND ENGINEERING

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William Baumheuter
Chief Instructor

Stephen G. Magoc
Saint Louis University
Department Chair of Aviation Science
McDonnell Douglas Hall
3450 Lindell Blvd.
St. Louis, MO 63103

May 26, 2023

For the period of June 2022 until today, there were no accidents or violations of any Federal Aviation Regulations.
We did experience a few significant operational incidents.

DA20 Stuck Throttle - 2 incidents

Narrative from the first incident

"Our investigation revealed the throttle control arm was slipping on the shaft that opens and closes the butterfly valve. The arm was installed backwards, and this prevented the serrations on the throttle shaft from engaging the serrations on the throttle arm. Thankfully, the throttle butterfly valve remained wide open.

The corrective action was to remove and re-install the same throttle arm, this time in the correct orientation. After reassembly, the throttle function was normal. Immediately, the remaining 8 DA-20 aircraft were inspected to see if the same issue existed. All 8 throttle arms were found to be correctly installed. The maintenance personnel are now fully aware of the correct orientation, and it is unlikely this will happen again."

Second throttle incident

An instructor and student experienced a non-responsive throttle. The aircraft was at a flight power setting. Thankfully the crew was able to return to CPS and land safely. The investigation revealed the throttle arm serrations were stripped. We determined this to be due to excessive cushion at the wide-open end of the throttle arm travel. The cushion is set during installation of the engine or replacement of the throttle control cable. Although the service manual doesn't specify a maximum limit to the cushion, Maintenance personnel determined this

amount of cushion allows for an undue amount of stress to be placed on the serrated interface with the throttle shaft. After numerous movements to the

wide-open position during takeoffs and in-flight maneuvers that require wide open throttle, the repeated stresses made the interface fail.

The corrective action was to immediately inspect the remainder of the DA20 aircraft to ensure the amount of cushion at full throttle was equal to the amount of cushion at idle, this effectively reduced the ability of a pilot to stress the interface at either end of throttle travel.
It is clear this throttle shaft interface design is weak compared to other models of engines. Our maintenance personnel are now fully aware of the weaknesses of the design and will take extra care during installation or maintenance of the throttle control.

September Bird Strike
From the Safety Report: "A DA-20 experienced a bird strike at 5,500 ft MSL while returning to CPS. The strike blew the side window into the baggage compartment. The crew maintained control of the aircraft and returned to CPS without incident and determined that the situation did not warrant an emergency declaration. A bird strike report was filed with the FAA."

Seminole oil cooler incident
The left oil cooler on a Piper PA44-180 Seminole cracked during a dual training flight on February 24, 2023. This crack allowed a significant quantity of oil to leak overboard. The crew was able to perform a safe landing after an inflight shutdown of the engine and feathering of the propeller.
An investigation revealed the cooler was relatively new and had developed a crack due to poor manufacture. It was replaced with another new cooler and a report was made to the FAA.

Completion of SLU fleet ADSB-IN upgrades
During the Christmas 2022 break, we were able to complete the installation of new transponders in the DA20 aircraft. This upgrade allows for display of traffic and weather data on the IFD440 electronic moving map in these aircraft, along with reliable wireless connectivity to Electronic Flight Bag (EFB) devices used by students and instructors. All SLU training aircraft now have these capabilities. Situational awareness for personnel operating our aircraft, especially in the busy south practice area airspace, has increased. During the transponder upgrade we were also able to make optional upgrades to the audio systems in the DA20's that allow for aural terrain warnings and various altitude callouts from the IFD440's to be heard by the pilots. Safety at SLU has taken a big step forward.

Replacement of iPads (EFB's) issued to staff instructors
The iPad Mini's we issue to our staff instructors are primarily used as EFB's for use with our ADSB-IN equipped fleet. The older units are slower than these newer models and as the manufacturer issues operating system upgrades and the EFB application keeps getting enhanced, the result is a device that runs slowly. Additionally, the battery life degrades with use. The cost for replacement of the older model iPad Mini's has been determined to be ~$18,045 and we are waiting on funding to complete the purchase of these 22 new units.

Digitally signed by William Baumheuter Date: 2023.05.30 15:43:53 -05'00'

during the routine FAA Surveillance of the Certified repair Station during this time frame.

FAA surveillance dates.

09/14/22

The following are the incidents that have occurred that required FAA investigation.

N325PC Throttle unresponsive. 09/12/22 Throttle arm backwards

N621PC bird strike 09/21/22

N621PC Throttle unresponsive. 01/25/23 throttle arm lousy design.

N552PC Cracked oil cooler. 03/22/23 Oil Cooler with less than 100hr time in service cracked.

Items of concern

1/3 of our fleet has or had a cracked canopy causing extended downtime.

Other FAA related activities.

8/22 we were able to get Field Approval from the FAA to install challenger oil filters if needed due to supply chain issues.

Flight line Maintenance Safety Seminars

As much as we would like to have after-hours hands-on Safety Seminars at the airport for students, the logistics of getting students to the airport have been problematic.

We will continue to pursue this in hopes a solution can be found.

Eric Heightman

Maintenance Manager

CRS NI1R349K

Report date 05/30/23 Report time frame 05/31/22-05/30/23

Avionics servicing, repairs, inspections and upgrades performed at the CRS.

All the DA20-CI Garmin GTX 330ES transponders were replaced with the Garmin GTX345, upgrade was completed in Dec 22.

	91.411, 91413 Due	ELT Batt due
N324PC	12/24	7/25

N325PC 12/24 N327PC 12/24 N329PC 12/24 N423PC 12/24 N426PC 12/24 N620PC 12/24 N621PC 11/24 N628PC 11/24 N475PC 4/25

N476PC 4/25

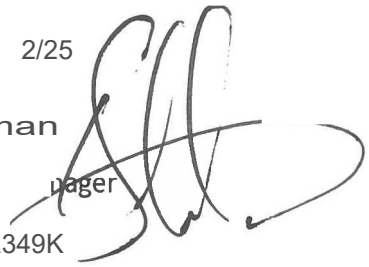
N477PC 4/25

N478PC 4/25

N552PC 2/25

N553PC 2/25

Heightman



CRS NI1R349K

Dispatch Orientation Sessions

In-service meetings for Back to School were conducted on August 22nd and 23rd at the Center for Aviation Science. During this meeting, dispatch discussed with the instructors the orientation items to review with students during on-boarding for the new semester. At that time, the following items were reviewed:

- Arrival check-in procedures
- Proper completion of dispatch tickets, especially during cross-country maneuvers
- Delayed return procedures
- Ramp safety (including no phones)
- Maintenance issue reporting
- Safety issue reporting
- FIF (Flight Information File) – dissemination of non-critical information thru the Talon system

Safety Stand-Down

Dispatch personnel participated in two (2) safety stand-down meetings with students, held on September 15, 2022, and March 30, 2023. During both meetings, open panel discussions were held regarding the dispatch role as it pertains to safety. An open forum discussion allowed students to ask questions and delve into the behind-the-scenes activities within the dispatch department.

Certifications

Campus Security Authority – course completed January 2023
Ask. Listen. Refer – suicide prevention training program completed November 9, 2022
Mental Health First Aid USA – certification completed November 1, 2021 (3-year certification)
TSA Recurrent Security Awareness Training – completed annually per FAA requirements

Completed by:
Michelle Scheipeter – Dispatch Coordinator
May 30, 2023

Safety Inspection of Center for Aviation Science

Emergency Response Manual

Building Emergency Action Plan (BEAP)

Safety Inspection

A safety inspection of the Center for Aviation Science was conducted by the Saint Louis University Department of Public Safety on July 22, 2022. This included a surprise fire drill to ensure all procedures were followed correctly as outlined in the Emergency Response Manual. No deficiencies were found.

Emergency Response Manual

The Emergency Response Manual was updated and distributed. An updated copy, including the Public Safety Dispatch Reference Guide was forwarded to Michael Parkinson in the Department of Public Safety (DPS) on 9/7/22. This copy remains in the DPS office for reference in case of an incident or accident at the airport or with an off-site aircraft.

Building Emergency Action Plan (BEAP)

The Building Emergency Action Plan is updated annually in cooperation with DPS. Current revisions are in process, and due to Anna Rice, Emergency Preparedness Coordinator, by August 1, 2023.

Completed by:

Michelle Scheipeter – Dispatch Coordinator

May 30, 2023

Aviation Management – Data collected in support of Relations with Industry and SLO 2

The following internships were conducted by Aviation Management students during the assessment period.

Name of Company	Academic Term	# of Students
Patriot Group International, Inc.	Summer 2022	1
GoJet Airlines	Summer 2022	1
St. Louis Lambert International Airport	Summer 2022	2
Monterey Fuel Company	Summer 2022	1
Nippon Cargo Airlines	Summer 2022	1
Delta Air Lines	Summer 2022	1
Textron Aviation	Summer 2022	1
St. Louis Lambert International Airport	Summer 2022	2
GoJet Airlines	Spring 2023	1
Jack Henry & Associates	Spring 2023	1