EMBRY-RIDDLE
Aeronautical University
PRESCOTT, ARIZONA

April 8, 2020

From: Dr. Tim Holt, FRAeS, C.M., Dean
Mr. David Small, IAB Chair
To: College of Aviation/IAB Board Members
Subj: 2020 Industry Advisory Board (IAB) Narrative
Encl: (1) Board Agenda, (2) Session Questions & Notes

ATTENDEES:

Fixed Wing
David Alpert – JetBlue
Ryan Crowl – Loyd's Aviation
Roy Evans – Delta Propel College Liaison
Scott Glaser – Flight Research
Kyle Heffelfinger – FedEx Express
Curt Heidemann – SkyWest Airlines
Stephen Rocha – Air Line Pilots Assn Intl
Yllithia Weaver – Delta Propel College Liaison
Darren Young – Warbelow's

Helicopter
John Buchanan – MD Dept of Natl Res
Terry Miyauchi – Bell
David Small – Air Methods Corp
Rob Willis – Integration Innovation

Meteorology
Dan-Michael Coyne – 25th Opertl Wx Sq
Paul Iniguez – NOAA/NWS Phx
Tegan Rieser – Natl Geospatial Agency
Andrew Taylor – NWS Flagstaff

Safety
Dan Grace – Textron Aviation Defense
Tarek Loutfy – GE Aviation
David Robertson – Robertson Safety Inst
Steven Schmidt – NASA (Ret)
Ryan Thowson – Bechtel Corp
Troy Williams – STA Jets

UAS
Travis Cieloha – Insitu
Liam Ehlermann – San Diego G&E
Monica England – Business Development

Work Force Development
Jim Blakey – Business Jet Group
John Frasca – Frasca Intl Inc
Arlando Teller – Navajo Div of Transportation
Joe Wolfsonn – Entrepreneur

Members At Large
Charles T. Crinnian MD – Frontier Aerospace Medicine

ERAU Representatives
Dr. Anette Karlsson – Chancellor
Dr. Kathy Lustyk – Int Vice Chancellor
Mr. Steve Bobinsky – ERAU Philanthropy
Dr. Jon Haass – Int Dean College of Security & Intel
Dr. Ron Madler – Dean, College of Engineering
Mr. Bill Paulin – Adj Prof, School of Business
Mr. AJ Reynolds – ERAU Development

College of Aviation Representatives
Dr. Timothy Holt – Dean
Prof. Ed Coleman – Dept Chair, Safety Sciences
Prof. Dawn Groh – Assoc Dept Chair, AS
Ms. Merrie Heath – Academic Advisor
Mr. Don Heon – UAS Tech
Mr. Dylan Horan – SGA Rep
Mr. Darren Hudak – Career Services Advisor
Dr. Curtis James – Dept Chair, AAS
Ms. Dawn Marcuse – Admin Asst, IAB Coord
Ms. Stacey McIntire – Academic Advisor
Dr. Juan Merkt – Dept Chair, AS
Prof. Parker Northrup – Dept Chair, Flight
Mr. Clarke Pleasants – Professor, AS
Mr. Greg Reverdiau – Professor, AS
Mr. Scott Ritchie – Instructor, AS
Mr. Brian Roggow – Prog Mgr Av'n Safety
Dr. Ronny Schroeder – Professor GIS
Dr. Mark Sinclair – Prog Chair MET
Mr. Kyle Wilkerson – ATM Tech
Prof. Johnny Young – Prog Chair UAS

On February 21, 2020, the College of Aviation held its annual Industry Advisory Board on the Prescott campus of Embry-Riddle Aeronautical University. The following narrative is provided based on the Board agenda (Encl. (1), and preplanned session questions (Encl. (2).

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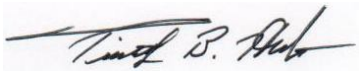

T.B. HOLT

EMBRY-RIDDLE
Aeronautical University
PRESCOTT, ARIZONA

College of Aviation, Industry Advisory Board
February 20th and 21st, 2020

Day 1 - Thursday, February 20

Time	Location	Topic	Facilitated By
10:00-3:00	Activity Center	Spring Career Expo (Optional)	yalel@erau.edu or hudakd@erau.edu
4:30-7:00	Spruance House	Welcome Reception – Open House Beverages and Appetizers – Please use "COA" Shuttle Van from Activity Center or Parking Lot D/E by Student Union	Chairman David Small & Dr. Tim Holt

Day 2 – Friday, February 21

Sec.	Time	Location	Topic	Facilitated By
1.	7:30am	The Hangar (Student Union)	Light Breakfast Items	Chairman David Small & Dr. Tim Holt
2.	8:00-8:30	The Hangar	Program Updates	Program Chairs
3.	8:30-11:00	The Hangar	Student/IAB Engagement	Ms. Merrie Heath, Ms. Stacey McIntire, Mr. Dylan Horan (CoA SGA Rep)
4.	11:00-12:00	The Hangar	Lunch	All Attendees
5.	12:00-1:00	Program Breakouts	Dept. Chairs, Program Chairs & Members	
		• AS – Fixed Wing	Dr. Juan Merkt, AS Chair	
		• AS – Fixed Wing	Prof. Parker Northrup, Flight Chair	
		• AS – Helicopter	Prof. Dawn Groh, AS Assoc Chair	
		• AS – Aeronautics	Prof. Scott Ritchie	
		• AAS – Meteorology	Dr. Curtis James, AAS Chair Dr. Mark Sinclair, MET Program Chair	
		• AAS – Unmanned	Prof. Johnny Young, UAS Program Chair	
		• Safety Sciences	Prof. Ed Coleman, SS Program Chair	
6.	1:00-3:00	The Hangar	Cross-Discipline Forum & Dessert	
7.	3:00-3:30	The Hangar	Visioning Session	Chairman David Small, Dr. Tim Holt, College of Engineering, College of Security & Intelligence, and School of Business Deans
8.	3:30-4:00	GSIS B17-106	IAB Caucus w/Chairman	Chairman David Small
9.	4:00-5:00	The Hangar	Closing and Refreshments	IAB, CoA, Student poster presenters

Aeronautical Science - Fixed Wing (table led by Juan Merkt)
IAB Breakout Session, February 21, 2020:

Representatives in Attendance: David Alpert (JetBlue), Ryan Crowl (Loyd's Aviation), Roy Evans (Delta Propel College Liaison), Hovik Grozian (United Airlines), Kevin Wilson (Mesa Airlines), Michelle Hight (ERAU Prescott).

1. **Are there any technological changes and advances in your sector of the industry that should be emphasized in our courses?**
    - CPDLC (Controller Pilot Data Link Communications)
        - Used in the industry for frequency changes, FIRs, attitude/heading changes
        - Pilots experience relatively low lag times during interactions
        - Provides some standardization across the industry. Growing increasingly popular.
        - Less common in the corporate/business jet sphere
    - Integration of technology is becoming more and more prevalent as technology advances are made.
    - Students should become familiar with Required Navigational Performance (RNP), an important aspect of technology.
    - Use of Flight Director, Autopilot and FMS is widespread.
2. **What do you consider to be the top 5 issues of today in your sector of the industry?**
    - Exposing students to non-commercial (corporate) aviation opportunities.
    - Pilot shortage is leading to low PIC experience translating to weak decision making skills upon entering the industry.
    - Lack of professional leadership development due reduced flight experience among new hires. Scenario-based training could be used to bridge the gap.
    - Interpersonal and intergenerational communication skills. Ability to communicate with older/younger, customer/supervisor etc.
    - Bridging gap between graduation and new hire. Salary, pilot hours, schedule and current/past pathway programs were mentioned as important factors driving decision making.
3. **Is adapting to stronger "Man-Machine Interactive Decision Making" worthy of flight syllabus or academic classroom instruction/development?**
    - Becoming comfortable with automation in the cockpit is critical so that when input is made, output is not a surprise or a mystery.
    - Integrating Procedural and systems knowledge into training (either classroom or flight line).
    - Train decision making skills in the classroom. Use technology and automation in the classroom to cultivate familiarity.
    - Scenario based training using VR and SIMs.
    - Cultivate confidence to vocalize in the cockpit as Co-Pilot. New hires aren't assertive enough in the decision making process.
    - Train for the worst case scenario. Use "case study" type analysis (i.e. Harvard Business Review) to explore emergency/extreme scenarios so new hires are more familiar with stressful weather, drunk passengers, and medical emergencies, etc., occurring in the real world.
    - Incorporate personality analysis in CRM classroom training to explore its influence on work performance and team dynamics.
    - Focus on International Communication barriers to familiarize students with the challenges presented by accents, cultural faux pas, etc.
4. **What are the top 3 meteorological skillsets or knowledge areas that every pilot should have?**
    - There seemed to be a consensus that severe weather, radar/chart interpretation and the GFA tool on AWC.com were areas that industry members deemed important.
    - There was a brief chat regarding a general lack of weather product knowledge and applications.
    - Industry wants to see new hires who are comfortable using a variety of products to create a full picture of future weather events.

Aeronautical Science - Fixed Wing (table led by Parker Northrup)
IAB Breakout Session, February 21, 2020:

Representatives in Attendance: Scott Glaser (Flight Research), Kyle Heffelfinger (FedEx Express), Curt Heidemann (SkyWest Airlines), Stephen Rocha (Air Line Pilot's Assn), Yllithia Weaver (Delta Propel College Liaison), Darren Young (Warbelow's Air Ventures)

Our breakout group consisted of good representation from across the industry (airlines—large and small carriers; mix of experience levels). The conversation focused on what core or base skills feed the ability to handle increasingly complex technological adaptations in the commercial sector.

From this three core observations were reached:

1. Pilots are increasingly required to understand how systems are designed in order to succeed at the training associated with operating them. (For example, logic trees, cascading failure modes, and AI logical progression).
2. There remains a focus on basic human skills to operating airplanes (For example stick and rudder (even if assisted by machine), rules of thumb for validating machine provided results (especially raw or analyzed weather data), and knowing how machine limits works (traditional airspeed/g limits, but also nontraditional associated with operating modes and interfaces).
3. The industry highly values the "soft" professional skill development and notice immediately when it is absent. (Cell phone usage, proper professional focus and appearances, and record keeping (especially for job interview required data)).

Aeronautical Science – Helicopter Program (table led by Dawn Groh)
IAB Breakout Session, February 21, 2020:

Representatives in Attendance: John Buchanan (Maryland Dept. of Natl. Resources), Paul Iniguez (NOAA/NWS Phx), Terry Miyauchi (Bell), Clarke Pleasants (ERAU Prescott), David Small (Air Methods Corp), Rob Willis (Integration Innov.)

Suggestions for emphasis in degree programs:

1. **Soft skills and professionalism:**
   - Pilots need to have excellent interpersonal skills. This is important not only later on in their career but early on as well. Many of the initial jobs in the industry are in customer service oriented fields such as tourism.
   - Emphasis on teamwork and problem solving. Many jobs require problem solving skills in and out of the cockpit. Adjusting to short notice missions and/or mission changes is problem solving with a crew. Company directed projects or ideas for improvement from the pilot him/herself require group work. Organizations rarely view their pilots as individuals but as a part of the company team both in small and large operations.
   - Companies want good employees.
2. **Suggested ERAU Actions:**
   - Continued emphasis on low altitude operations.
   - Have students engage with low altitude weather tools and understanding complexities of local weather, mountain weather and UAS integration
   - Explore the 2-year degree option
   - Must have programmed flow to Worldwide
   - Must include certificates through CFI/I
   - Continue to emphasize the value of the B.S. for long term career planning
   - Explore virtual training options for reduced costs

Applied Aviation Sciences – Meteorology Program (table led by Curtis James & Mark Sinclair) IAB Breakout Session, February 21, 2020:

Representatives in Attendance: Dan-Michael Coyne (25th Operations Wx Squadron), Tegan Rieser (Natl Geospatial Agency), Ronny Schroeder (ERAU Prescott), Andrew Taylor (NWS Flagstaff AZ)

The Advisory Board made the following recommendations and observations:

1. Recommend use of the National Blend of Models ensemble forecasting in WX 427.
2. Remove MA 441 from the curriculum (thus giving students more flexibility in their pursuits of a minor or certificate).
3. Major Coyne recommended continuing visits from Air Force Weather personnel, to discuss career planning with our students. AFROTC students need to know that they will have opportunities to attend grad school (either AFIT or NPS) while in the USAF.
4. The core courses in our program are similar to those at other schools, so grads need to add resume-building electives, certificates, minors, internships (including REU) in order to stand out. We should be encouraging our students to think about career options earlier in their curriculum, in order to tailor these elective experiences to their career ambitions. Having GIS on transcripts helps grads. There were suggestions by the Board members to expand GIS offerings, integrate more with Python programming and introduce machine learning, but no formal recommendations were made.
5. For USAF and NWS, our grads stand out because we combine theory with practice. Our students gain experience decoding METARs, writing TAFS and interpreting satellite and radar products.
6. Examine the WX201/WX301 course sequence for possible improvements to progression and depth of the topics presented.
7. The USAF hires civilian meteorologists (GS-1341/1340 position; advertised through https://www.usajobs.gov/).
8. Bolster efforts to gain increased student crossflow into meteorology. Explore the possibility of including a 1-credit hour ‘current weather discussion’ (or related course). The additional offering may increase visibility amongst students that had not previously considered meteorology.
9. Hydrology is a growing area of interest for the USAF. What potential is there for the addition of more cross disciplinary (Hydro-Met) curriculum?
10. For many students, the career outlook for a meteorologist is constrained to government work either under the DoC, the DoD or NASA. When engaging potential students highlight the additional private sector opportunities for meteorologists (Airlines, cruise lines, shipping, utilities, consulting, engineering, insurance, finance, etc.).

Cross-Disciplinary Breakout Notes:

Weather courses should teach aviation students how to identify threats. Aviation professors may complement this by training students to mitigate these threats and foster situational training. Perhaps we could have a weather course that is co-taught by an aviation and a meteorology professor? Also it was suggested that the flight bag used by Delta Airlines could somehow be utilized by meteorology or aviation faculty to introduce students to weather interpretation? Students should also be trained on international weather.

Applied Aviation Sciences – Aeronautics/BSA Program (table led by Scott Ritchie)
IAB Breakout Session, February 21, 2020:

Representatives in Attendance: Charles Crinnian (Frontier Aerospace Medicine), John Frasca (Frasca, Intl), Arlando Teller (Navajo Division of Transportation), Kyle Wilkerson (ERAU Prescott), Joe Wolfson (Entrepreneur)

Curriculum Improvement Recommendations:

1. Teach job interviewing techniques and skills to non-pilot students (similar to AS 380)
    a. Develop stronger writing skills, particularly in professional communication; Applicant writing skills in e-mails, cover letters, and personal correspondence are very weak.
2. Encourage or require students to complete internships

Student Professional Development Recommendations:

1. Encourage students to network through…
    a. Professional memberships
    b. Professional conferences
2. Develop professional mentors
3. Encourage students to identify…
    a. Personal/academic/professional strengths
    b. Personal/academic/professional goals
    c. Career goals based on findings
4. Encourage students to act as media consultants for aviation-related media stories. Media often publishes inaccurate information and students could provide feedback while developing experience and professional connections.
5. Develop a "How to Build a Strong Internship" seminar at ERAU
    a. Invite businesses to attend the event to learn how to build robust internship programs.
    b. Invite students, staff, and faculty to facilitate the meeting.

Recommended Program Adjustments:

1. Members thought that both "Aeronautical Science" and "Aeronautics" were ambiguous and do not promote strong brand recognition.
    a. A high school student will not search for "Aeronautical science" on the internet if they want to become a professional pilot.
    b. They approved "Applied Aviation Studies" as a new name for Aeronautics and did not offer any new recommendations.

Future Changes:

Based on the input from the members at the table, it would be valuable to have Human Resources representatives from companies that have aviation divisions and civilian employees to provide the most specific guidance about how to help students get hired. Some ideas of companies to include are as follows:

- Law enforcement
- City/county/state/tribal governments
- Airports
- Government agencies (Game and Fish, Department of Transportation, Customs and Border Protection, etc.)
- Oil and gas industry
- Aviation insurance
- Professional pilot organizations with business offices

Applied Aviation Sciences – Unmanned Program (table led by Johnny Young)
IAB Breakout Session, February 21, 2020:

Representatives in Attendance: Travis Cieloha (Insitu), Liam Ehlermann (San Diego Gas & Electric), Monica England (Unmanned Worldwide), Don Heon (ERAU Prescott), Greg Reverdiau (ERAU Prescott)

The Advisory Board made the following recommendations and observations:

1. More space for students in the UAS lab.
2. More funding for the UAS department.
3. At least 1 more full-time professor and 2 more staff to support the growth and prepare for future growth of the program.
4. Integrate more Artificial Intelligence.
5. Multiple board members thought that there should be an Unmanned Department/School.
6. ERAU needs to better prepare UAS students for career field, with an emphasis on public speaking and business communication.
7. ERAU needs larger UAS platforms w/ LIDAR.
8. Tegan Rieser expressed concerns about UAS graduates knowledge about NAS, airport operations.
9. Continue industry partnerships.

Overall, the general feeling from the industry was focusing on infrastructure to prepare for the growth of the program. It was said various times that if ERAU Prescott does not put forth the resources (professors , space, staff) to grow and sustain the program, it will be hard to catch up to other Universities that have recognized the potential.

Safety Sciences Program (table led by Ed Coleman
IAB Breakout Session, February 21, 2020:

Representatives in Attendance: Jim Blakey (Business Jet Group), Dan Grace (Textron Aviation Defense), Tarek Loutfy (GE), David Robertson (Robertson Safety Institute), Brian Roggow (ERAU Prescott), Steven Schmidt (NASA, Ret.), Ryan Thowson (Bechtel Corp.)

1. **What would be beneficial to add to the program?**
    a. ICS courses
    b. Have instructors come to teach basics
    c. SMS certifications for students
    d. Teach root cause analysis
2. **SMS Certification**
    a. Add an SMS course for the safety minor
    b. Certificate for SMS course to certify students
    c. Needs to be valid and legitimate
    d. Could ISABO monitor course?
    e. Would this be good for undergrads?
        i. Yes, you can never have too much SMS training
    f. Should focus more on 135 operations
        i. Nobody graduates and goes to a 121 to create an SMS
3. **SMS Certificate Accreditation**
    a. Can we create an accrediting agency for SMS?
    b. Smaller operations need more help developing an SMS
    c. How do we scale down an accrediting agency for SMS for smaller operations?
    d. RSI to develop the certifying entity - separate from Riddle
    e. AOPA could help with development and funding?
4. **4+1 Degree Idea**
    a. Grad students finding their degree a waste
    b. Separation between aviation safety and EHS
5. **Aviation Safety Position vs. EHS/OSHA Position**
    a. Separate fields
    b. Medium sized operators don't want to spend on separate aviation safety and EHS director
    c. Need more focus on aviation safety
    d. Aviation safety and EHS is usually separated in large operations, but combined in small operations
6. **Book vs. Practical Knowledge**
    a. Practical adds value to the program
    b. Need to survey companies and former students on what was good in the program
7. **Labs**
    a. Teach students how to download and analyze flight recorder data
    b. This is too specific, but a good example
    c. Try to use labs more
    d. Teach modes of failure to students
    e. Get more aircraft for labs?
8. **Writing Skills**
    a. Students need report writing skills
    b. What format does the FAA use?
    c. Very beneficial for career readiness
    d. Hazard reports - needs good narratives, employees unable to do this
    e. Riddle teaches both APA and MLA, and every professor has different standards
    f. Students need to learn analyzation skills
    g. Students need to be able to analyze, collect, and make recommendations
    h. Students need better communication skills
    i. Technical report writing class is an option currently, not required
    j. Maybe change SF 210/201 to a technical report writing class

Continued…

9. Other Ideas

a. Start safety culture awareness from the start
b. Train students to be OSHA 30 instructors?
c. Students need to be taught how to fight for a safety program
d. Teach risk assessment
e. Learn to mitigate risk
f. Needs to be customizable for different operations
g. 3 bladed prop analogy
h. Human Factors degree
i. Add engineering?