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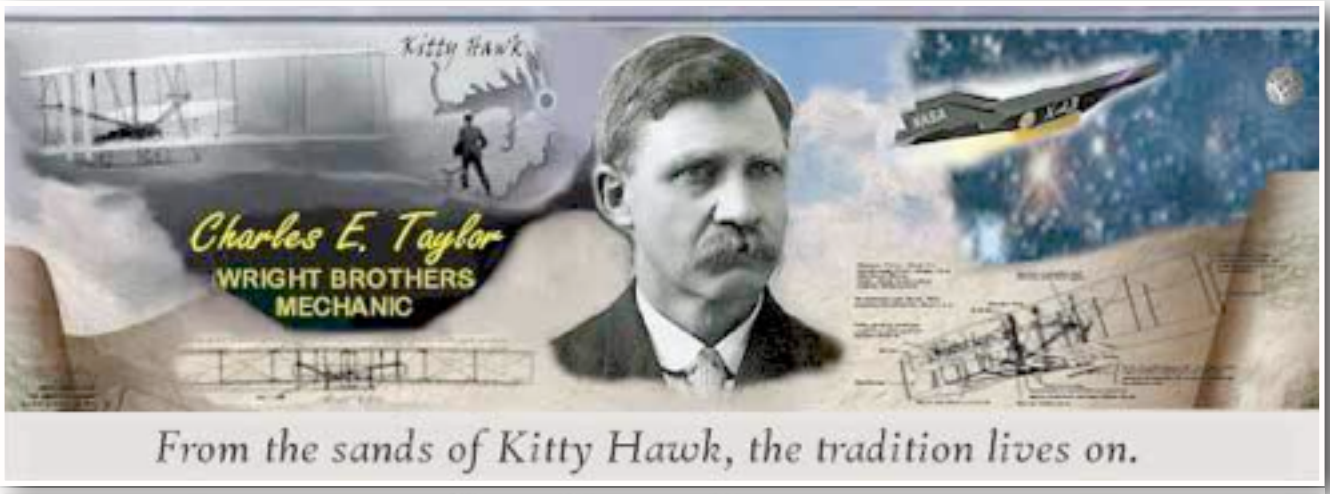

Hello all,

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In this weeks edition of *Aviation Human Factors Industry News* you will read the following stories:

★Accident: Emirates B773 at Islamabad on Feb 27th 2018, ambulift topples over

★AIN's The Human Factor, Episode 11: Takeoff and Landing Assessments

★Aviation industry mechanics retiring faster than they are being replaced, report says

★NTSB: Maintenance issues led to Pearl Harbor helicopter crash

★Revisiting the Failure to Follow Procedures Challenge

★Fokker 100's APU exploded after de-icing fluid ingestion

★Canadian pilots alarmed at spike in accidents, warn incidents mirror cuts to safety oversight

Accident: Emirates B773 at Islamabad on Feb 27th 2018, ambulift topples over

An Emirates Boeing 777-300, registration A6-END performing flight EK-615 from Islamabad (Pakistan) to Dubai (United Arab Emirates), was boarding passengers. An ambulift was lifting passengers with reduced mobility onto the aircraft, when the ambulift toppled over impacting the right hand engine's (GE90) inlet. A ground handler and 5 passengers received injuries as result of the accident and were taken to hospitals.
The airline reported the aircraft was involved in an incident on the ground during boarding causing injuries to five passengers and a ground handling staff. The injured were taken to a hospital.

Emergency services reported one of the injured (59) suffered head injuries.

The aircraft was unable to depart due to the dents in the engine inlet.

A replacement Boeing 777-300 registration A6-EMT positioned from Dubai to Islamabad and performed the return flight EK-615 with a delay of 11:20 hours.

The occurrence aircraft is still on the ground in Islamabad about 20 hours later.

AIN's The Human Factor, Episode 11: Takeoff and Landing Assessments

On Dec. 8, 2005, Southwest Airlines 1248 was completing its trip from Baltimore when it plowed through a runway barrier and skidded onto the streets of Chicago. The Boeing 737 collided with two cars, killing 6-year-old Joshua Woods. The aircraft had been operating in near blizzard conditions and dealt with a stiff tailwind, a short runway, and some technical issues. Ultimately, the pilot did not have the appropriate landing data for Midway International Airport.

In the summer of 2006, the FAA convened a two-day meeting with industry safety experts to attempt to implement more safety measures for pilots. How did aviation organizations and individuals in the industry work together to improve takeoff and landing assessments for pilots?

Listen to the podcast

Aviation industry mechanics retiring faster than they are being replaced, report says

A new report finds that while 30 percent of the aviation mechanics workforce is at or near retirement age, new entrants into the field only make up 2 percent of the workforce population each year.

The report from the Aviation Technician Education Council (ATEC) found that while there are more than 286,000 Federal Aviation Administration (FAA) certified Airframe and Powerplant (A&P) mechanics, 27 percent of the workforce is aged 64 and above.

The large gap between the demand for trained workers and the number of new employees entering the aviation mechanics industry is problematic.

Boeing projects in its 2016 Pilot and Technician Outlook that 679,000 new maintenance technicians will be needed to maintain the world's airlines over the next 20 years. Airlines in North America specifically will require 127,000 maintenance personnel, the report said.

According to the ATEC report, enrollment in all Aviation Maintenance Technician (AMT) schools totals nearly 17,800, but the program's capacity is more than 34,000. And while A&P program capacity has increased by 2 percent in the last 18 months, enrollment has decreased by 2 percent.

Steve Sabold, director of admissions at the Pittsburgh Institute of Aeronautics (PIA), said certified mechanics are an industry necessity.

"Every aircraft that goes up in the air needs to be signed off on by an A&P certified mechanic," Sabold said in an interview with Transportation Today. "That alone makes them, once they get their certification, a very hot commodity."

But getting young people into the program may be difficult because of a larger issue that affects all skilled trade positions.

"There's not a lot of people going into skilled trades period," Sabold said. "When you have less people going into skilled trades across the board, it certainly doesn't help us fill up our pipeline any quicker."

Meeting that demand, Boeing said, will require educational outreach, career pipeline programs, and other innovative solutions.

ATEC suggests a focus on strategies to increase the number of female candidates, where currently they make up just 2.3 percent of the certified mechanic workforce.

Improving the retention of graduates of AMT schools is another critical factor. AMT school respondents who were surveyed by ATEC estimate that 20 percent of graduates pursue careers outside of aviation, and just 60 percent take the FAA test for mechanic certification.

Dan Cooper, vice president of economic development and governmental affairs with Tri County Technical College in South Carolina, said the attitudes of parents can also add to the problem of engaging students in the skilled trades.

“A lot of the parents want their kids to be more successful than they were,” Cooper said. “They have no idea that these jobs have the potential to make six-figure salaries. People consider skilled trades jobs to be dirty or only for those who aren’t as smart. But that’s just not the case.”

The decreased enrollment in aviation mechanics may also be due to the experience of the students themselves.

“I think there is less exposure for young adults in utilizing skilled trades today,” Sabold said. “As technology has advanced, I don’t think young adults see the people doing the hands-on work that is necessary, and because of that may not think of aviation mechanics as a career option.”

According to the U.S. Bureau of Labor Statistics, aviation mechanics make a median salary of $60,270 per year, as of 2016.

Aviation companies, Sabold said, are working to get more young adults into AMT programs.

“Aviation companies are being proactive about getting into the schools, even as early as middle school and changing the mentality of students,” he said. “They are starting to step up and help others see the benefit of a certified aviation mechanic career.”

For example, this month both Piedmont Airlines and Constant Aviation will participate in open house events at PIA to reach out to potential students about careers in aviation mechanics. Piedmont Airlines is owned by American Airlines and operates hubs in Philadelphia and Charlotte Douglas International Airports.

Constant Aviation, with locations at airports in Cleveland, Orlando, Phoenix and Las Vegas, specializes in airframe and engine maintenance, major repairs and avionics.

“Open Houses give PIA the opportunity to deliver critical information about career demand,” said Suzanne Markle, president and CEO of the Pittsburgh Institute of Aeronautics, in a written statement. “That we are hosting events with such a large number of companies in comparison to the number of upcoming graduates attending is a strong indicator of career demand.”

PIA offers programs in aviation maintenance and aviation electronics. PIA’s campuses in Pittsburgh, Youngstown, Hagerstown and Myrtle Beach have been selected as four of approximately 40 aircraft maintenance schools to partner with Delta Air Lines.

“We look forward to the opportunity to serve new students and prepare them with the entry-level mechanic skills we know our employers are looking for,” Markle added.

NTSB: Maintenance issues led to Pearl Harbor helicopter crash

A Hawaii tour helicopter was not properly maintained when it crashed into waters near Pearl Harbor two years ago, according to a federal report.

The final report from the National Transportation Safety Board indicated that increased inspections by the Federal Aviation Administration may have uncovered the aircraft’s inadequate maintenance and prevented the February 2016 crash, KHON-TV reported Friday.The pilot and a family of four from Ontario, Canada, were on the helicopter when it went down and sank.

Riley Dobson, 16, died at a hospital four days later from injuries associated with the crash. Two other passengers and the pilot were seriously injured. Another passenger had minor injuries.

A component inside the helicopter's engine-to-transmission drive shaft did not appear to be properly lubricated, likely causing the assembly to fail from overheating, according to the NTSB report.

NTSB investigators were told that the helicopter underwent maintenance before the crash, but that maintenance was not logged. During that maintenance, grease was not applied as specified in the maintenance manual, according to the report.

Other required maintenance inspections were overdue and were not completed prior to the crash, according to the report.

Revisiting the Failure to Follow Procedures Challenge

BY DR. BILL JOHNSON, Ph.D.
Chief Scientific and Technical Advisor Human Factors in Aircraft Maintenance Systems.

Dr. Bill Johnson revisits the issues associated with failure to follow procedures (FFP). What's new? Not a lot! It's the same people doing the same maintenance tasks, on the same familiar aircraft, with the same OEM procedures or company job cards, committing the familiar FFP sins. Here's an update.

Key Players

OEMs strive to develop useable and understandable instructions for those who maintain their products. It is in their best commercial and safety interest to get the technical instructions right.

They have systems in place for users to make suggestions on document improvement, as necessary. The same is true for operators, who convert OEM instructions into company-specific job cards. There is no reason that they would purposely make the instructions difficult to use. This author does not believe that the complexity or inaccuracy of technical instructions is the primary cause of FFP. Of course, it is a very good and often used excuse from users.

Mechanics and those that maintain aircraft continuously strive for quality and safety. The same is true for those who manage maintenance activity. All parties benefit from doing every task properly with no requirement for rework; no compromise in operational safety; or for any regulatory noncompliance. While intentions are honorable, too often the “Heat of Battle” to meet time and production pressures overrides ideal application of written procedures.

Regulators and corporate lawyers are often blamed for the complexity and redundancy in written procedures. There is no reason that regulators or lawyers would purposely make instructions difficult to use. Perhaps there is a well-intentioned culture to be thorough and safe vs. being simple and maybe risky. In any case there are certainly many examples of the complexity of potentially simple instructions because of cautions from overzealous regulators and lawyers.

Whether it’s the OEM, the document users, the regulators, or the lawyers there are many opportunities for improvement. FFP is among the largest safety issues in aviation maintenance, actually in every aspect of aviation. It leads to errors from the landing checklist of Piper Cub to the diagnostic procedures of a B 787.

Asking Questions

When trying to address the FFP challenge some say the solution is based on “who you ask.” So FAA researchers asked various industry segments about following procedures. Applied Ergonomics Group (AEG), led by Dr. Colin Drury, conducted the work under an FAA contract. Drury has been working on the human factors of technical instructions since the format went from hieroglyphics on stone to parchment paper to I-pads (actually for only about 50 years).

Using hundreds of event reports from the National Transportation Safety Board, the FAA-NASA Aviation Safety Reporting System, FAA technical reports, and the extensive AEG experience, they created a classification scheme, a listing of best practices, and a structured interview form for maintenance personnel and management. They went to eight diverse organizations that write and use written technical instructions. At each location AEG conducted extended private one-on-one interviews, totaling over 150 personnel (all extensively documented in the FAA report to be published in 2018). These interviews focused on FFP incidents and on best practices to ensure that procedures are followed. They helped ensure that our team fully understood the challenges to generate excellent samples of best practices.

Categorizing Areas of Opportunity for Action

In order to address FFP the broad term must be broken into categories. There have been many classification breakdowns to categorize challenges and solutions. Readers are likely familiar with PEAR that addresses People, Environment (Physical and Social-Cultural Environment), Actions performed, and Resources necessary to complete the job. For this project AEG created the term TAPES.

TAPES stands for five critical areas that affect the FFP challenge. T represents the kind of FFP errors that are made during a given maintenance task. A stands for actor, everything about the person who is using the procedure. P stands for the procedure itself. E refers to the physical environment in which the procedures are used. Finally, S refers to social meaning all of the operational and cultural characteristics of the work location and/or the total organization. AEG focused TAPES not only on the maintenance personnel using the procedure but also procedure developers.

Best Practices

Here are example best practices categorized using TAPES

T – Task

- Perform all tasks in the specified order
- When a procedure is problematic correct it at the working level
- Formally recover from any distractions or interruptions in the task

• Be sure to sign off each subtask

A – Actor

• Ensure training and qualification for the task

• Be committed to following the procedures

P – Procedure

• Have a clear procedure that identifies task completion

• Immediately communicate irregularities in the procedure

• Know that “tribal knowledge” is not necessary in a procedure

E – Environment

• Recognize present risk from issues like lighting, temperature extremes

• Address adverse environmental conditions as possible

S – Social

• Everyone must address time pressure, always

• Stop and ask if unclear on task or procedure

• Rely on and apply positive safety culture among peer group

Next FAA Actions on FFP

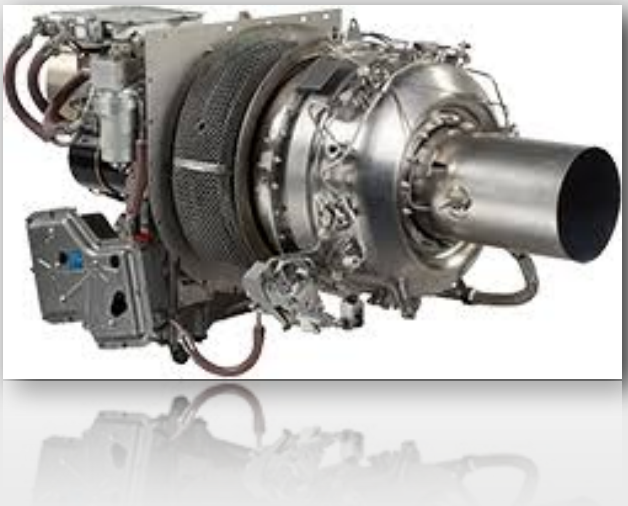
The work related to FFP is endless. That is due to the nature of the aviation maintenance environment and culture. First, FAA will get all the reports published. The writers and editors are keenly aware of at least two separate and different audiences for this FFP research. One audience is the research community, who wants to see the data collection, how it was analyzed, and how it can be transferred to other R&D and to applied solutions. The FAA technical reports will satisfy that audience.

The most important audience is the users/writers of technical procedures. FAA is aware that mechanics know the regulations and the importance of using the written technical procedures. However, knowledge is not enough! The practical products from the research project must alter daily attitude and behavior about explicit use of the procedures. That change must permeate the culture of maintenance from the top executive to the new hire. FFP is not a technical issue. It is a culture issue about attitude and commitment. Our next deliverable will be part two. At press time of this article we are building a training system that focuses on the culture of procedure following. We will supplement the web-based training system with job cards and workplace signage that will serve as a constant reminder to all. We proceed to this next step with full knowledge that changing the culture of FPP will not be easy. However, we are certain that the next important step in our continuing safety efforts centers on following the procedures. Stay tuned in 2018!

The author acknowledges all who contributed to this large project including but not limited to the FAA Civil Aeromedical Institute Human Factors Division, the Cherokee CRC, the Applied Ergonomics Group, the 160 mechanics and supervisors, and their eight companies

Fokker 100's APU exploded after de-icing fluid ingestion

German investigators have concluded that the un-contained failure of a parked Fokker 100's auxiliary power unit was triggered by ignition of de-icing fluid.



The Helvetic Airways aircraft had been preparing for departure from Nuremberg after passengers and crew had boarded.

It was undergoing de-icing treatment on its vertical fin when the APU speed started to increase sharply, before two separate loud explosions were heard and the APU shut down.

German investigation authority BFU says that APU fragments were subsequently found beneath the empennage. A maintenance access door was ruptured, the APU housing was torn open, and the turbine and compressor were badly damaged.

The BFU adds that, inside the aircraft, a fractured section of the compressor wheel had punctured the area below an aft flight attendant's seat and left a 10cm hole in the pressure bulkhead.

None of the aircraft's occupants was injured.

Investigators state that de-icing fluid had been ingested through the APU air intake, ignited, and caused an increase in rotation speed.

Although the APU automatically shut down, and the fuel supply cut off, the ignition of the de-icing fluid meant that the fuel shut-off "had no effect", says the BFU. The rotation speed continued to increase until the APU disintegrated.

The BFU says that, although the de-icing worker had been trained as a pilot, and was aware that fluid should not enter the APU intake, the absence of markings made identification of this area "difficult".

"It would improve safety if such areas were clearly marked and it would also make the work of the de-icing personnel easier," the authority adds in its inquiry into the 20 January 2015 event.

Investigators point out that the de-icing fluid is warm when sprayed, and this creates a misting effect in the cold air temperatures characteristic of de-icing scenarios. The mist can limit the vision of de-icing workers, and this contributed to the APU fluid ingestion.

In its recommendations the BFU is advising that the European Aviation Safety Agency should consider placing de-icing operations under a regulatory authority, like aircraft maintenance, and that the European Commission should establish a legal framework to put de-icing and ground services under EASA supervision.

Canadian pilots alarmed at spike in accidents, warn incidents mirror cuts to safety oversight

Reduced aviation safety oversight by the Canadian government last year led to a significant spike in accidents and incidents involving commercial airlines, commuter aircraft and air taxi services, warns Canada's professional pilot community. "Transport Canada's cuts to aviation safety oversight may be largely invisible to most Canadians but they are having an impact that is increasingly apparent and worrying," said Greg McConnell, national chair of the Canadian Federal Pilots Association.

He said Transport Canada's systematic dismantling of aviation safety oversight has accelerated in recent years due to budget shortfalls and pointed to figures released by the country's Transportation Safety Board (TSB) that show that Canadian aviation last year was marred by a sharp increase in accidents and incidents involving those airlines that carry the most passengers.

McConnell added that the TSB also reported a 'sobering' rise in the number of incidents involving Canadian aircraft which jumped almost 10 per cent to 921 from 833 in 2016 which is 25 per cent higher than the five-year average.

Among several other serious aviation accidents and incidents that have taken place recently are two that stand out, both involving Air Canada jets.

On July 7, Air Canada 759 came within a few dozen feet of crashing into four jets on the ground full of people and fuel after the pilot mistakenly lined up to land on a taxiway.

"The worst aviation accident ever was averted by seconds. And just a few weeks ago, only a terrain avoidance warning system (TAWS) prevented an Air Canada Rouge jetliner from slamming into a mountainside on approach to Huatulco (Mexico)."

"These data, especially the sharp increase in incidents, tell me a major accident is coming," McConnell said.

He said licensed pilots who work for Transport Canada as aviation inspectors have added their support to his assessment. "An Abacus Data survey of these inspectors in April 2017 revealed eight-in-ten (81 per cent) inspectors surveyed predicted a major aviation accident in the near future, according to the survey."

McConnell traced the deterioration in aviation safety back to 2016 when Transport Canada cut back its oversight program 'whole sectors at a time'. "For example, urban heliports such as those atop of many big city hospitals will no longer be subject to scheduled inspections. And, all airports will no longer be subject to full safety assessments."

He said that instead, a Transport Canada inspection will now cover only one small part of an airport's safety plan. "By comparison, the US Federal Aviation Administration requires full inspections of airports annually. Business aircraft, like the aircraft former Alberta Premier Jim Prentice died in, have not been subject to Transport Canada safety oversight for several years." He added that most recently, the safety regulator handed off checking the skills and competencies of commercial pilots to the airlines.

* Meanwhile EASA's 2018-2022 European Plan for Aviation Safety (EPAS) now includes what the agency calls a "rulemaking cool-down." which will reduce the number of regulations issued over the next five years.

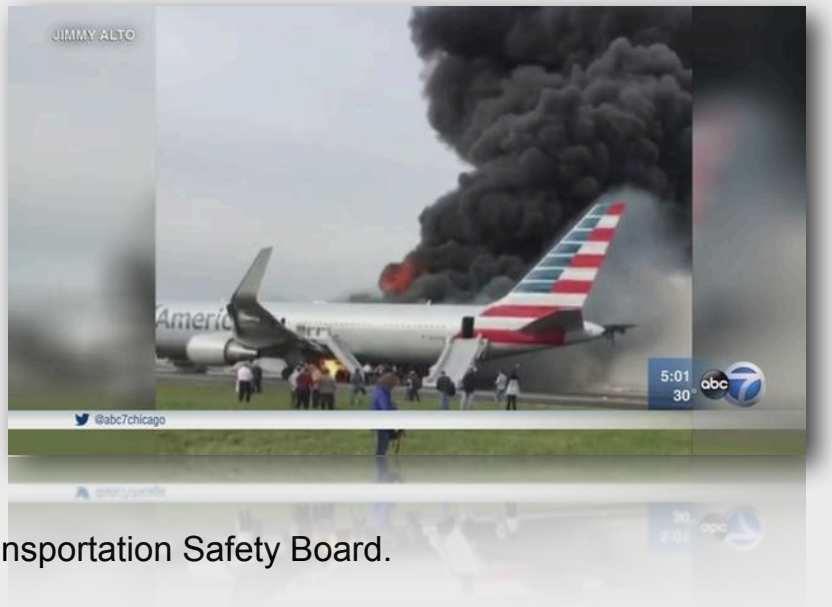
The agency said this reflects the need to put more focus on supporting the implementation of recently adopted regulations and give priority to other means of improving safety, notably focused oversight and safety promotion.

EASA executive director Patrick Ky said: “Safety actions need to be co-ordinated more than ever at regional and international levels, which explains the growing role played by regional safety oversight organizations in the field of aviation and the pivotal activity of EASA in this domain.”

http://avherald.com/h?article=4b4a3896

https://www.easa.europa.eu/sites/default/files/dfu/EPAS_2018-2022%20v2.2.8%20for%20MB.pdf

NTSB asks FAA to look at carry-on bags during emergencies after report on 2016 O'Hare fire



A number of passengers aboard an American Airlines flight that caught fire at Chicago's O'Hare International Airport in 2016 refused to leave behind their carry-on bags in one of four incidents in the past several years in which an evacuation was hampered by travelers grabbing carry-on luggage, according to the National Transportation Safety Board.

The NTSB recently completed its investigation into the October 2016 fire aboard the jetliner, blaming it on an engine problem - microscopic "fatigue" cracks >

in a turbine disk caused it to break apart at incredible velocity, piercing a fuel line and tank and igniting one side of the aircraft, the Chicago Sun-Times reported . The NTSB is asking the Federal Aviation Administration to look into the luggage issue and whether anything can be done to discourage passengers from trying to grab carry-on bags during emergencies.

The fire began before the Miami-bound plane had taken off from O'Hare. Although flames were visible to many passengers and smoke was pouring in, > some people insisted on retrieving their carry-on bags from overhead compartments, according to federal records showing post-incident interviews with flight attendants. One person was seriously hurt and 20 others suffered minor injuries.

Robert Sumwalt, chairman of the NTSB, told the Sun-Times that it's worth exploring whether passengers who refuse to leave behind their bags should be fined. He said that's up to the FAA to decide.

"I have thought about that," Sumwalt said. "People might be less inclined to worry about all their Gucci luggage."

The NTSB is asking the FAA to conduct research to "measure and evaluate the effects of carry-on baggage on passenger deplaning times and safety during an emergency evacuation." It's also recommending that the FAA "identify effective countermeasures to reduce any determined risks, and implement the countermeasures."

The issue also came up after during the evacuation of a United Airlines flight that had slid from an O'Hare runway in January 2016, records show. The captain and flight attendants told passengers to leave luggage, but several people argued, and didn't listen, according to records.

A spokesman for the FAA declined to comment on the luggage issue, saying the NTSB's recommendations and findings will be reviewed.

Sara Nelson, president of the Association of Flight Attendants, said the FAA "should use existing laws to crack down on passengers endangering themselves and countless others as they put computers, cosmetics and clothing ahead of human life."

The FAA has sought civil penalties against more than 150 passengers in the past five years for interfering with a flight crew, an agency official said. However, it's unclear whether any of those incidents involved baggage.

Probable Cause report with recommendations

EASA Releases Aviation Safety Plan for Next Four Years

The European Aviation Safety Agency published its plan for aviation safety for the next four years. The 2018-2022 plan and rulemaking program, which are both included in one document, includes the following highlights:

EASA suggests what it calls a rulemaking "cool-down" over the next half-decade relative to recent years. It says it wants to emphasize the support of recently adopted regulations and focus on oversight and safety promotion campaigns rather than continuing to make rules at the same pace for the time being.

- There has been a full review of research actions resulting in new research projects.
- EASA wants to prioritize the coordination and facilitation of cooperation and technical training strategies at the regional level in support of the "No Country Left Behind" resolution.

As part of the global aviation safety plan, a project team is being established to further develop the plan and present an evolved version at the next regional aviation safety group-Europe meeting. They are focusing on oversight, global tactics for dealing with identified "high-risk categories" and strategies for supporting state safety programs.

https://www.easa.europa.eu/sites/default/files/dfu/EPAS_2018-2022%20v2.2.8%20for%20MB.pdf

NBAA Releases Latest Annual Bizav Safety Focus List

Loss of control in flight (LOC-I), runway excursions, and single-pilot operations once again made the annual list of top safety focus areas identified by the NBAA Safety Committee as primary risk-mitigation targets for business aircraft operators.

Other identified safety focus areas on the list that was released today include procedural compliance; ground handling and taxi incidents; distraction management; scenario- and risk-based training and checking; positive safety culture promotion; in-flight aircraft collision risk; workforce competency and staffing; and safety data sharing and utilization.

“The identified focus areas represent the most critical safety-related risks currently facing business aircraft operators,” said NBAA Safety Committee chairman David Ryan. "This list is the result of spirited collaboration between [those] on the Safety Committee, who are committed to not only identifying potential hazards but also through working with regulators, member companies, and other industry stakeholders to provide the business aviation community with the most effective mitigation tools and strategies.”

The committee’s goal is to promote safety-focused discussion and advocacy throughout business aviation, as well as to help NBAA prioritize its focus on safety-enhancement efforts. In addition to the annual list, the committee continues to promote and focus on its five foundations of safety: professionalism, safety leadership, technical excellence, risk management, and fitness for duty.

UNITED AIRLINES EMPLOYEE INJURED BY TARMAC EQUIPMENT IN LATEST MISHAP

In the latest mishap to befall a major air carrier, an United Airlines employee suffered an injury after being rolled over by a jet bridge at Newark Liberty International Airport in New Jersey.

As the employee guided the wheeled jet bridge to a plane from Aruba, a wheel rolled over his leg, authorities said. The 34-year-old injured employee was part of the team helping passengers disembark.

"On Tuesday evening, an employee was injured by a jet-bridge while working on the ramp at Newark Liberty International Airport," United Airlines spokesman Robert Einhorn said in a statement to *Newsweek. "*Our thoughts are with our employee."

Police arrived on scene at 7:16 p.m., Port Authority Police spokesman Joseph Pentangelo told NorthJersey.com. The employee was taken to University Hospital in Newark, where his injuries were deemed non–life threatening.

TED: Ideas Worth Spreading

How do we find fulfillment in a world that's constantly changing? Raymond Tang struggled with this question until he came across the ancient Chinese philosophy of the Tao Te Ching. In it, he found a passage comparing goodness to water, an idea he's now applying to his everyday life.

In this charming talk, he shares three lessons he's learned so far from the "philosophy of water." "What would water do?" Tang asks. "This simple and powerful question ... has changed my life for the better."

https://www.ted.com/talks/raymond_tang_be_humble_and_other_lessons_from_the_philosophy_of_water