

Aviation Human Factors Industry News

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From the sands of Kitty Hawk, the tradition lives on.

Hello all,

To subscribe send an email to: rhughes@humanfactorsedu.com

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

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FAA recommends specific training to prevent cowl loss

The US FAA wants operators of Airbus A319 and Bombardier CRJ100/200 aircraft to **develop type-specific training** programs to help mechanics and pilots **verify** that engine-fan cowls are properly latched before flight. The Information for Operators note, published earlier this week, follows numerous incidents where unlatched covers have separated from the aircraft in flight or on the ground.



According to the FAA, there have been **15 such events** involving Airbus single-aisle aircraft since 1992 and **33 incidents** involving the CRJ models since 2001, including six cases in 2007.

"Despite the release of an FAA airworthiness directive (AD) for Airbus single-aisle airplanes and numerous bulletins for Airbus single-aisle and Bombardier CL-600-2B19 (CRJ 100/200) model airplanes, engine-fan cowl separations have continued to occur," the agency writes. The FAA is recommending that carriers operating the aircraft "develop a training program for **maintenance personnel and flight crews** on inspection procedures to verify that the engine-fan's cowl is latched".

The agency is also asking that the carriers revise procedures to require maintenance crews **to inform flight crews** when engine-fan cowls have been opened before flight.

Busted! American Airlines Workers Caught In Drug Sting

Eight AA Workers Arrested In Puerto Rico And Miami. An investigation into a drug smuggling operation running from the Caribbean to Florida resulted in 20 arrests last Monday, including eight employees of American Airlines.

The Dallas television station KXAS reports that the employees worked in both Puerto Rico and Miami. They are **accused** of smuggling 9,000 pounds of cocaine. Airline spokesman Tim Wagner told the station the company fully cooperated with the authorities in the investigation.



"As a company, we hope the actions of a few employees don't reflect negatively on the tens of thousands of ethical American Airlines employees who work hard to serve the public daily," Wagner said.

A DEA spokesman said there are 23 warrants connected to the case.

This is the third time American employees have been caught in a drug bust. Similar stings in 1999 netted 55 American employees, according to CNN. And USA Today reports that in 2004, 11 American Airlines cargo workers were indicted on charges of smuggling and distributing cocaine and heroin at Miami International Airport.

Murphy's Law Pays a Visit

On 13 March 2009, an R-8C JSTARS, tail number 93-0597, assigned to 379th Air Expeditionary Wing, experienced a **near catastrophic fuel tank over-pressurization** during aerial refueling. The Mishap Aircraft (MA) terminated its mission and returned to Al Udeid Air Base, Qatar. The crew and mission personnel evacuated the aircraft safely with no injuries. The **mishap** resulted in damage to the MA in the amount of

\$25 million dollars. There was no damage to private property.

The mishap occurred during operations in the Area of Responsibility (AOR). The Mishap Crew (MC) had begun aerial refueling (AR) with a KC-135, when the mishap core and personnel aboard heard and felt a loud bang throughout the midsection of the aircraft.



The MC suspended AR to evaluate the MA to checkout their systems and evaluate the MA for any damage. Finding nothing apparently wrong, the MC re-latched to the tanker and attempted to continue the AR when another series of loud noises and vibrations were heard and felt throughout the aircraft. Personnel aboard the KC-135 observed a **stream of vapor and fuel streaming** from the MA and alerted the MC.

The MC checked for damage through a rear window and observed fuel streaming from at least two holes in the left wing, just inboard of the number two engine. The MC opted to terminate the mission and return to Al Udeid. Maintenance personnel then examined the MA and found that the number **two main fuel tank had ruptured**, causing extensive damage to the wing of the MA.

The Accident Investigation Board (AIB) President found, by clear and convincing evidence, that the mishap was caused when a civilian subcontractor employee **inadvertently left a test plug in the fuel vent system** of the MA during recently completed Programmed Depot Maintenance (PDM) performed on the MA.

Additionally, the AIB President found by substantial evidence **three factors which contributed** to the mishap. First, the PDM subcontractor **employed ineffective tool control measures**. Second, the PDM subcontractor **failed to follow Technical Order (TO) mandated procedures** when employing the fuel vent test plug during PDM. Third, due to the relatively short period of time between takeoff and AR, the MC did not have the opportunity to burn a substantial amount of fuel from the number two fuel tank which could have allowed the

dive “flapper” valve to open. This explains why this mishap did not occur during AR’s conducted between the time the MA left the PDM facility and the time of the mishap.

See attachment on email distribution page for PPT.

A Near-Miss - “Red Flags” Not Heeded. (U.S. Navy)

Hearing a piece of metal hit the floor, I looked down to see wisps of smoke rising from the rigid gas line of the **ejection-seat-harness** retract unit. I immediately stopped work and removed my team from the Prowler. I secured the aircraft and hurried into Maintenance Control.

The investigation began. While disarming the ECMO-1 GRUEA-7 ejection seat in Ironclaw 501, I **accidentally** had discharged a cartridge-actuated device (CAD), nearly injuring myself and my ordnance team.

I thought I had been following the checklist step by step. I didn’t know what could have gone wrong. My assistant had **felt that something was wrong** as we were going through the checklist—like we perhaps had missed some steps. We reviewed the checklist and repeated the current step, but the mechanism still felt jammed. Later, we would learn the step we were trying was the **wrong one**.



HOW DID THIS HAPPEN?

One of my co-workers had asked me if I possibly could have **missed a page**. He mentioned he’d done the same thing a few days ago but had caught the mistake early. I went back into the publication and confirmed that we, indeed, **had missed an entire page in the checklist**, telling how to safe the CAD. I should have recognized some **red flags** leading up to this error. Because we were doing all of our 364-day inspections in the months following deployment, we were **getting comfortable** working on ejection seats. We had removed and replaced 12 seats in the previous two months,

so we were perhaps getting a little **overconfident**.

Workload was another red flag. Coupled with the demands of multiple inspections, the community also was in the midst of an Airframe Bulletin (AFB), requiring a one-time check of the aircraft's bleed-air system during these inspections. Our work center was responsible for the inspection, as well as replacing any faulty valves. We didn't use ORM to recognize and mitigate this workload factor. We **should have taken our time and paid meticulous attention to detail**.

Deviating from established procedure was the last red flag. With an overcommitted work center and numerous tasks at hand, I chose to **stray** from the standard procedure by doing the work with fewer than the required number of personnel. With a dedicated safety observer, perhaps the missed page would have been caught before the CAD had discharged. No inspection is so urgent that it requires **skipping on safety**. You have to focus, from start to finish. If any thing feels wrong, stop, secure the area, and ask for **fresh eyes** to review the process.

Controlling Consequences of Errors Through Assertiveness



AT ABOUT XA00, ADVISED BY CREW OF ACFT X FOKKER F100 AT ZZZ CUR/FDR TEST SWITCH INOP. AFTER CALLING MAINT CTL FOREMAN, **I WAS TOLD** I WOULD HAVE TO REPLACE SWITCH PANEL BEFORE DISPATCH. NONE WAS AVAILABLE AT ZZZ. I CONTACTED DUTY MGR FOR ROB PANEL AUTH. DUTY MGR REQUESTED A ROB FROM ACFT Y AT HANGAR AND RECEIVED AUTH NUMBER FROM MAINT OPS CTL. I REMOVED PANEL FROM ACFT Y AND INSTALLED IT ON ACFT Z.

A TEST OF SWITCHES ON PANEL WAS NORMAL AND LOGBOOK SIGNED AND ACFT DISPATCHED. AFTER RECEIVING REPLACEMENT PANEL AND

ATTEMPTING TO DO DATA ENTRY IN MAINT COMPUTER, I DISCOVERED THAT THE **WRONG PANEL** HAD BEEN ROBBED AND INSTALLED INSTEAD. ALSO ON LOOKING AT MAINT TEST PROCS IN MAINT MANUAL CHAPTER 34, I DISCOVERED **I HAD NOT DONE** A FULL TEST OF AVIONICS SWITCH PANEL. I IMMEDIATELY ADVISED MAINT OPS CTL FOREMAN OF MY **ERRORS** AND ASKED HIM TO LOCATE ACFT AND CORRECT MY ERRORS. I THEN ORDERED PANEL FOR ACFT Y AND SENT SVCABLE PART TO ZZZ FOR INSTALLATION ON ACFT Z.

Synopsis

A FOKKER 100 WAS DISPATCHED **IN NON COMPLIANCE** WITH THE INCORRECT VOICE RECORDER AND FLT DATA RECORDER CTL PANEL INSTALLED.

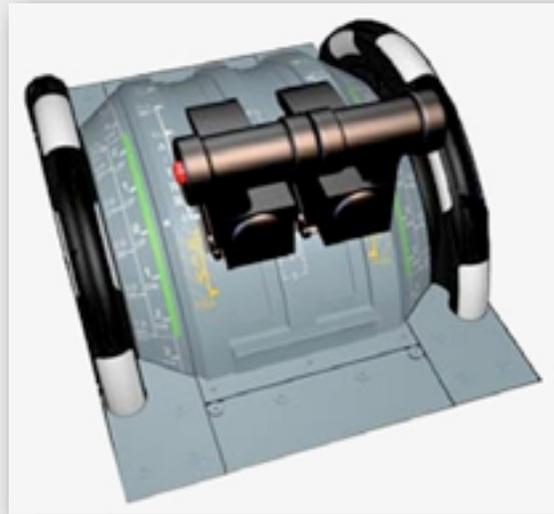
Overlooked trim led to 737's post-V1 abort

Investigators have traced the post-V1 abort of a BMI baby Boeing 737-300's take-off roll **to an oversight** which left the stabilizer trim set in the **wrong**.

The aircraft, departing Birmingham for Edinburgh in snowy weather on 13 February, failed to rotate at 135 kt when the first officer pulled on the control column.

As the aircraft continued to accelerate to 155 kt the captain opted to reject the take-off, says the UK's Air Accidents Investigation Branch. Although the 737 was traveling "well above" the V1 speed of 126 kt, the captain correctly judged that the aircraft would be able to stop within the remaining length of Birmingham's 2,600m (8,530 ft) runway.

The AAIB found that the crew **had omitted to set the stabilizer trim at the usual point because of de-icing procedures under way at the time**. De-icing procedures **"disrupted"** the crew's routine, it says, leaving the stabilizer trim incorrectly set, and the crew was "distracted" by the unusual requirement to leave the flaps up while taxiing in slush.



The crew also **felt pressured by de-icing holdover time constraints**, and the rotation failure "reinforced" the captain's concerns that ice accretion may have affected the aircraft's control surfaces.

"When the first officer said he could not rotate the aircraft, the captain quickly made the decision to reject the take-off, having judged there was sufficient runway remaining to do so and believing the aircraft was not capable of flying," says the AAIB.

While the stabilizer setting was incorrect, it was still within permissible range, **so there was no warning horn** to alert the crew. Simulator trials subsequently indicated that the aircraft could have rotated successfully, and climbed away safely, if the crew had applied a "more forceful" pull on the control column.

FAA forum promotes safety through sharing information, best practices

A wealth of information is available on aviation safety, but improvement is needed in **coordinating and sharing** the best safety practices that could benefit the entire industry, ICAO Secretary General Raymond Benjamin said at the annual FAA International Aviation Safety Forum in Washington. "There's no need for anyone not to have access to safety-critical information," Benjamin said. "We need a **global safety information exchange**." Such an exchange would lead to more "targeted regulations" and provide data and information on best practices, he argued. "It's truly an idea whose time has come."



Benjamin anticipates that the "principle" of the exchange will be agreed upon at a March ICAO meeting in Montreal. The information network would be Web-based and supported by both FAA and EASA, he indicated.

Benjamin also noted that international cooperative efforts are underway to examine issues related to pilot fatigue, which received considerable attention following the February crash of a Colgan Air Q400 outside Buffalo. "We will look at all aspects of **fatigue management**," he said.

JetBlue Airways COO Rob Maruster also spoke out in support of improved information sharing and leadership by example in developing a strong safety culture. "As an industry we need to do a better job just speaking to the results, and the results speak for themselves," he said.

Rather than individual airlines, he argued that FAA, the US Dept. of Transportation and trade groups like the Air Transport Assn. and the Regional Airline Assn. should promote both the industry's safety record and the changes being made to improve it. He acknowledged that some of those changes occur after fatal accidents. "I don't think we do a very good job talking about the changes we have made," he said. "As an industry, we **need to do a much better** job of speaking to those changes when they are made. In essence we are becoming safer in many respects."

Human Factors: Beyond the "Dirty Dozen" - Part II

MRO Programs

In their initial HF training, all three maintenance, repair and overhaul (MRO) organizations emphasize the

"Dirty Dozen"

common sources of errors — as well as what's sometimes called the **"dirty dozen"** — **"just culture"** — a work environment that emphasizes objectivity, analysis and a balanced response to maintenance problems. All three offer initial and recurrent HF training, but both Delta and LHT add an **upper management focus** as well. "You have the confluence of all of these different things that can create the reason why somebody said, 'I'm going to deviate from procedure,'" says Bob Baron, president of The Aviation Consulting Group, which specializes in human factors training, consulting and research. "In many cases it can be because of **time stress or pressure** that's propagated at some of the highest levels of the organization." LHT has also crafted an economic metric that includes human factors.

Initial HF training is typically an intense, two-day course that encourages participation. Aveos, which started its HF program in 1996, seems to have been doing it the longest of the three. The challenge is to **"make a connection at the personal level,"** so that the students are likely to apply the concepts in their lives, said Jim Cairns, the Canadian MRO's general manager of technical training.

Line and base mechanics at Aveos, as well as executives with technical responsibilities, take the course, although employees working in sales and

finance generally do not. Recurrent training occurs on a 36-month cycle. The Canadian MRO recently revised its program from a rehash of the initial course to **focus on case studies and root cause analysis** in the context of four homogeneous modules: 1) complacency, fatigue and lack of awareness; 2) communications, assertiveness and teamwork; 3) lack of resources, knowledge and norms; and 4) stress, pressure and distraction.

Another interesting aspect of HF training in Canadian maintenance facilities is that many of the mechanics coming through Aveos' initial course already have been exposed to the concepts. Aircraft maintenance engineers receive their academic training at community colleges in Canada, and programs that are approved by Transport Canada **include a human factors element**.

Besides their initial and recurrent training, Delta and LHT also have developed various specialized modules. Delta is adding **lessons learned from its initial HF course to its Technical Operations Policies and Procedures manual**. The manual also includes the methodology used in Delta's new "administrative action decision tool class" aimed at managers, general managers and directors.

The new class sets forth guidelines about **how to handle errors, incidents and accidents**, explained Christian Vehrs, an instructor and developer in Delta's human factors program. It uses a methodology derived from FAA's Enforcement Decision Tool (see **FAA Order 2150.3**), a document that provides a way to categorize behavior by intention. Participants learn to look at the mesh of human factors involved in a case, such as the availability of proper documentation, fatigue, pressures and work place norms. The **aim is to guide management** into making more consistent decisions.

Whereas in the past, there had been a **"wide range of outcomes" in management decisions**, the new training has helped to instill more consistency. The first, one-hour segment of the class emphasizes the need for more consistent outcomes for similar incidents and how variables affect administrative actions. The second reviews the new policy. Then an instructor shows how to apply the tool via a Delta Air Lines case study.

In the remaining two hours the students break into small groups and learn to apply the tool for themselves. So far, 261 managers, general managers and directors have taken the course, and the consistency of the outcomes for these incidents has been remarkable, the MRO said. The primary incident used during the instructor-led module has generated the recommended outcome 100 percent of the time.

LHT also provides specialized training. Senior managers, for example, receive a one-day initial HF training course that focuses on problem-solving, **communications** and their responsibilities within the organization. Supporting and certifying staff members who sign off on overhauls also receive an additional two days of recurrent training related to their technical responsibilities, including one day of HF training, said Stephan Liebenow, team leader for qualification and training, with LHT's commercial overhaul and VIP completions organizations.

In addition, the German MRO is also developing HF training for incident investigators to show them how to conduct interviews in a **non-punitive atmosphere**, Liebenow said. Developed initially for line maintenance investigators, the techniques are being adapted to base maintenance.

LHT also stresses its **positive work culture**. "I'm interested in the facts — what happened, why and how to improve things," Liebenow said. "It's a different approach, and people realize that and come to us."

Bill O'Brien AMT Awards Program Now Online

Effective with the release of Advisory Circular (AC) 65-25E on June 3, 2009, the William (Bill) O'Brien **AMT (Aviation Maintenance Technician) Awards** is now online at www.FAASafety.gov. This provides AMTs an **easier and more effective** way to participate and receive credit for initial and recurrent maintenance training courses. The new program is named after the late Bill O'Brien, a former FAA National Resource Specialist, co-founder of the original AMT Awards Program, and a well-known and respected advocate for AMTs nationwide.



The new online program has several levels, or phases, of recognition for both technicians and employers. Technicians who successfully meet the program requirements within a given calendar year will obtain a certificate of training, along with a Bronze, Silver, or Gold AMT Awards Program decal. Employers can obtain a Gold or Diamond Award of Excellence depending on the percentage of their employees receiving awards each year.

Part of the requirement for any award level is the **completion of specific "core" course(s) available online**. The courses focus on accident/incident

causal factors, special emphasis items, and regulatory issues. The remaining program-eligible courses for an award may be provided by manufacturers, repair stations, FAA Safety Team- [\(FAASafetyTeam\) sponsored safety seminars or symposiums](#), or FAA Web-based training.

“We’re thrilled about offering this new learning opportunity for AMTs and AMT employers,” says FAASafetyTeam Outreach Program Manager Bryan Neville. “Participation in the AMT Awards Program will help reinforce and promote a high level of [professionalism](#) and safety within the aviation maintenance industry.”

For more specifics on eligibility and requirements for the award program, go to the “Maintenance Hangar” section of [FAASafety.gov](#) and reference AC 65-25E, or click the help tab to access a detailed tutorial. Also, here’s an e-mail address for any additional questions: AMT@FAASafety.gov. Please note that you must register on www.FAASafety.gov before you can enroll in the awards program.

<http://www.faasafety.gov/>