Aviation Human Factors Industry News

Volume VII. Issue 11, March 25, 2011

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:

A "Pirep" from the Maintenance Side

Maintenance Technicians sometimes use the term “pirep” too, but in a different way than pilots as short-hand for a pilot write-up of an equipment problem in the aircraft logbook.

Two Maintenance Technicians reported to ASRS the problems they had resolving a “pirep” for an MD-80 stabilizer trim that operated in only one direction.

After seven hours of troubleshooting this aircraft in miserable weather, my co-worker and I consulted with our Manager and his Manager. It was then decided that we replace the stabilizer trim primary drive motor. We were informed at that time that, conveniently enough, it’s in stock here. Anxious to fix the aircraft, we hastily installed the replacement drive motor. The cold weather coupled with a stiff wind of 25-30 MPH, and throw in some snow -- made the conditions almost unbearable. We wanted to get done. The “pirep” indicated the stabilizer trim would only operate in one direction. We checked operation of the stabilizer trim in both directions OK.

It was near the end of our shift, and we wanted to complete the job. In our haste, we failed to notice the part number difference for the stabilizer trim drive motor between the newer MD-80 and the legacy part number.

Reasons to Maintain Situational Awareness

We were doing a precipitation-static (p-static) test on aircraft 782, an E-6B Mercury. This test checks electromagnetic interference (EMI), ensuring that all aircraft panels are properly bonded (un-bonded equipment can affect the aircraft’s radios and communications gear).

The test involves inducing high voltages (up to 50,000 volts) near the skin of the aircraft, using an aircraft sprayer wand. The radios are then monitored for any excess static, popping, or unwanted noise. We began our work on 782 by running through our set-up and pre-op checks on the p-static test set. We then positioned the man-lift under the starboard horizontal stabilizer with two onboard: an AT3 holding the p-static sprayer wand and an ATAN driving the man-lift. When the AT3 gave the “good for power” command, power was initiated by the two additional ATs manning the power supply on the deck. While checking a panel, the ATAN who was driving the manlift reminded the AT3 to watch the gauge on the end of the sprayer wand as the meter needle began to rise past its nominal readings. When the ATAN raised his hand to point to the rising gauge, an arc of 40,000 volts jumped from the wand’s head and struck his hand. He collapsed in the man-lift basket. The other ATs secured power immediately, and I ran to Maintenance Control. We got the ATAN out of the basket, and to our surprise, he didn’t appear to have any visible injuries.

We took him to medical for a complete check up to make sure he didn’t have any electrically-induced internal injuries. With a clean bill of health, he was cleared back to work the next day.

As the night-shift supervisor/CDI, I should have better prepared for the risks and hazards of running this kind of test. Situational awareness was not what it should have been. Had the ATAN maintained the mandatory one-meter standoff distance from the “hot” section of the wand, this whole incident could have been avoided. You can never be too careful when working around high voltage equipment.

Return to service

Maintenance is an area that's totally foreign to most pilots, even those who own aircraft. Technicians have to deal with the same types of responsibility and regulations pilots do, however, so it's good to know exactly what it is they do. Among those responsibilities is the authority to return an aircraft back to condition. It's important to learn now what that means and what it doesn't.

Part 43 of the federal aviation regulations specifies issues surrounding aircraft maintenance. Section 43.5 details returning an aircraft to service, and the first thing you'll notice when you read it is that it says nothing about a qualified airframe and powerplant technician having to approve an aircraft for return to service. The reason is because aircraft owners and operators can do certain maintenance tasks on their own aircraft and make the necessary endorsements.

Those tasks can be found in FAR 43.17. Section 43.5 is very basic. It boils down to three points–that the person returning to service must make a logbook entry, that the repair be made in accordance with a manner prescribed by the FAA, and that any change resulting in a performance or limitation change be noted appropriately in the flight manual.

Although simple in nature, the implications of the regulation are huge. Endorsements are the FAA's equivalent of signing your name in blood. Flight instructors know this well. To put an endorsement in a logbook is to put your certificate on the line. It's the same for flight instructors and mechanics. What that means for pilots is that in most cases, properly qualified maintenance technicians can be trusted to do their best to make the airplane safe and not return it to service before it's ready. That's evident in accident statistics where fewer than 20 percent of which are maintenance-related (that includes airborne failures of components that haven't been previously worked on).

With that being said, mistakes do happen. There have been documented cases of accidents that occurred as a result of a maintenance flub. As a pilot, you can do some simple things to avoid such a situation.

1. Get to know your maintenance personnel

If your school doesn't have a shop and you don't already know these professionals, make the effort to go to the shop where work on your school aircraft is done. The benefits to having a personal connection with a maintenance tech are many. Most will let you look over their shoulder while they work, which means you'll get some intimate knowledge not only of the type of work these folks do, but also the systems on your airplane. They can be a go-to source for systems questions, and you'll less intimated in the future to casually ask them about an issue with your training airplane. Plus, maybe you'll find your mechanic for your own future airplane in the process.

2. Read maintenance logbooks

Knowing who did what to the airplane is imperative. Many schools make this quite difficult because the maintenance logs are understandably locked away for safe keeping. But if an airplane's been down–or even if it hasn't–take the time to study the logs and ensure you know what has been done to it in the recent past.

3. Do thorough preflight checks

This point can't be overstated. If you've ever wondered why we do a control check before takeoff, maintenance is one of the reasons. Many accidents have been caused by aircraft controls being hooked up backward after maintenance. This is especially true of the annual or 100-hour inspections, where these components are inspected. A control check is cheap and quick insurance against a senseless accident. There are many such examples of this. Carefully checking things such as oil, inspection plates, tires, and cockpit instruments could save you a heap of trouble.

Although some owners can fall into these traps, it's much easier for them to keep track of maintenance records because they retain possession of the important documents. But students are no less immune to the issue. They just have to try harder to keep up with it.

Analysis: NASA underestimated shuttle dangers

NASA seriously underestimated the dangers astronauts faced when the shuttle fleet began flying in the early 1980s, a new internal safety study shows.

At the time, managers thought there was only a 1-in-100,000 chance of losing a shuttle and its crew. Engineers thought the probability was closer to 1 in 100. But in reality, the odds of a disaster were much higher.

On each of the shuttle's first nine missions, there was a 1 in 9 chance of a catastrophic accident, according to the new risk analysis. On the next 16 flights that led up to and included the January 1986 Challenger disaster, the odds were 1 in 10.

NASA lost 14 astronauts in two shuttle tragedies, and saw near misses on a dozen other flights. "We were lucky. There were a number of close calls," NASA summarized in the new risk assessment.

NASA's Shuttle Program Safety and Mission Assurance Office at Johnson Space Center in Houston performed the assessment to gauge the progression of risk - increases and decreases - over three decades of fleet operations.
Doing so could help next-generation rocket and spaceship operators better understand the real level of risk involved in flying astronauts on inherently dangerous missions.

"The instructive piece of this is that over 30 years of operations, two accidents, countless engineering tests and all those things - looking back at it, (now) we understand what the real risk was. But there was no way to know at the time," NASA shuttle program manager John Shannon said.

It's important "to be humble when you're starting a new program, and make sure you have a very robust test program to ferret out these potential issues that could be safety risks," he said.

"Collect as much data (as possible) and stay hungry, and distill that data down and learn, and then make good decisions to lower your risk based on real data."
NASA, which now plans just three more shuttle flights, will rely on Russia to fly American astronauts to and from the International Space Station for the next several years after that. The U.S. is counting on commercial companies to start flying astronauts on private-sector space taxis by mid-decade, and the new NASA study suggests initial risks will be high.

Consider this: There was only a 6% chance that NASA would fly its first 25 shuttle missions without losing an astronaut crew, the assessment shows.

Moreover, on the 88 shuttle missions flown between the Challenger and Columbia accidents, there was only a 7% chance disaster would be averted. "It's useful for upcoming programs to understand that maybe their risk is higher than what they think it is," said Teri Hamlin, the NASA safety expert who led the study.

"With the shuttle, we have 132 flights of history, of understanding and flying this vehicle, and gaining insight on the drivers of risk. And obviously, we weren't aware of certain ones early in the program."

Among the study's key conclusions:

- The shuttle now is 10 times safer than it was during the first flight in April 1981. The odds of a catastrophic failure now are 1 in 90.
- The increase in flight safety was the result of safety improvements, the most significant of which were made after major events such as the Challenger disaster and the 2003 Columbia accident.
- Not all safety modifications reduce total risk.
- Risk can increase if managers trade safety margin for increased vehicle performance, or as a result of external events.

The results of NASA's shuttle risk progression study will be presented at an American Institute of Aeronautics and Astronautics conference in late September.

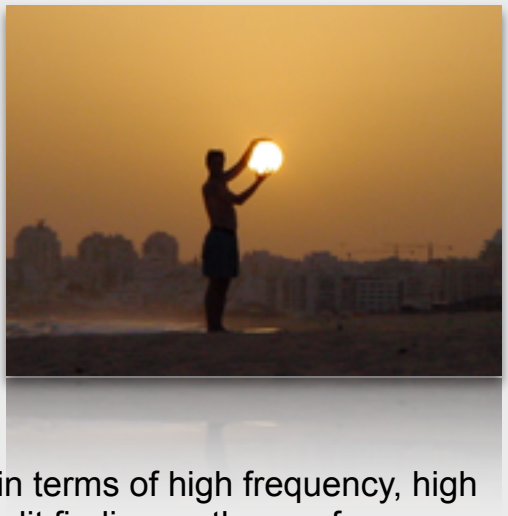
Shuttle managers were briefed on the outcome late last month. "This is a great piece of work," Shannon said. "It's an honest assessment, and that's going to be a good legacy from the shuttle program that will be very instructive to future programs."

A Safety Management Perspective

Big changes are taking place in workplaces across this continent. These are not safety changes, per se. They're changes in economic, social and political structures. But they're having an impact on health, safety and environmental issues. If you choose to sit back and wait for change to happen, you may not like what you get when changes filter down to you. A better approach is to be active. That doesn't mean resisting change.

It means managing it. From a safety management perspective, those who do the best job in strategic planning with the known will be the best prepared for the

unknown. Risk Management Approach Strategic planning efforts for safety should not be turned into a bureaucratic "committee" process. There is a time and place for committees. But no responsible organization can afford to allow itself to be managed by committee. (Who is it that said that a camel is a horse designed by a committee?) Here are some of the things to consider to focus your strategic safety planning:



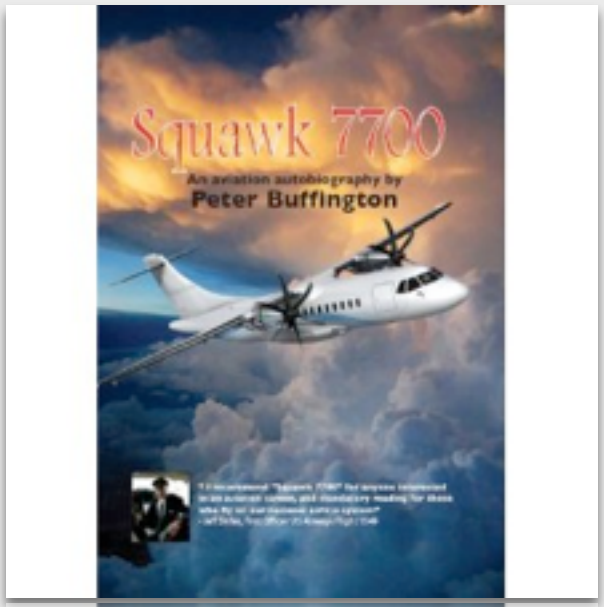
- What are the risks associated with your business/industry?
- What has past performance indicated, e.g., in terms of high frequency, high severity, total accident costs, WCC costs, audit findings, other performance measures or indicators?
- How would you rate your "safety maturity level"? Are you simply doing the bare minimum, or have you identified safety as a strategic, core business value, and integrated safety performance into business improvement efforts?
- How knowledgeable is your executive group about current safety issues, practices and trends? Are they familiar with due diligence concepts? Do they plan an active role in safety initiatives, or are they simply relegated to the sidelines as cheerleaders?
- What do you want to achieve over the short and long term? Where do you want to be this time next year? How about in the next 1 to 3 years? Where do you see your organization in the next 5 years?

While some of these targets may seem far off, it's important to remember that the process of planning where you want to be and how you intend to get there is just as important as setting the actual target. It's simply a matter of asking, "Is safety important in this company?" If the answer is yes, the next simple questions should be, "What exactly is it about safety that's important? What do we have to do to achieve our objectives? And who is going to do it?"

If you can answer these questions honestly and openly, and can bring key players into the strategic planning process, your short and long-term safety improvement plans stand a better chance of success.

Autobiography Offers Behind-The-Scenes Look At Regional Airline Ops

Former Regional Airline Pilot Provides "Eye-Opening Details" In New Book



Squawk 7700, an aviation autobiography by Peter M. Buffington, tells of a into the world of aviation to achieve a professional airline pilot career. He offers details of his experience with daily operations within the aviation industry, and the struggles flight crew members face to maintain their lifestyles.

From student pilot at age 15, to flight instructor, to nighttime cargo pilot, and finally to first officer aboard the ATR 42 and ATR 72 turboprop airliners, Buffington details his personal experiences of becoming an airline pilot.

Squawk 7700 also provides insight as to why recent accidents, like Colgan Air Flight 3407, in Buffalo, NY, and Comair Flight 5191, in Lexington, KY, can occur.

Jeff Skiles, the first officer with Captain C.B. "Sully" Sullenberger on US Airways Flight 1549 that ditched into the Hudson River, endorses "Squawk 7700" as "mandatory reading,"

"Based upon my personal experiences as an airline pilot and as acting first officer aboard US Airways Flight 1549 that ditched into the Hudson River," Skiles says, "I recommend 'Squawk 7700' for anyone interested in an aviation career, and mandatory reading for those who fly on our national airline system."

Shortly after the US Airways Flight 1549 incident in New York, Buffington and Skiles began working together to see that changes were implemented in the way regional airlines hired pilots, and to expose the daily lifestyle challenges of regional airline pilots. Skiles was called to testify before Congress on numerous occasions in 2009. On July 30th, 2010, the U.S. House and Senate passed the FAA Safety Bill, setting forth new pilot hiring minimums, increasing pilot flight hours from 200 to 1,500 total flight hours. On August 1st, 2010, the President of the United States signed the FAA Safety Bill, HR 5900.

FMI: www.squawk7700.com

Swapped lines disable fire extinguisher

Swapped engine feed lines detected in Dassault Mystere Falcon 50 and 50EX aircraft have led the European Aviation Safety Agency to issue an emergency directive ordering immediate inspection of the installation. The lines found swapped on two in-service aircraft were the No 2 engine fire extinguishing system line and the No 2 engine low-pressure bleed air line. This swap would render the No 2 engine fire extinguishing system ineffective. EASA has ordered operators to inspect the connections of these lines at frame 42 in the rear compartment, according to Dassault service bulletin F50-519.

Inspection was to take place within eight days, and operators are asked to report the findings to Dassault even if they are negative.

Drowsy Surgeons Should Inform Patients

Would a airline flight crew or aircraft maintenance technician think of doing this with their customers?

While regulations have been put in place to restrict the work hours of doctors in, no such regulations exist for fully trained physicians. A recent editorial in the New England Journal of Medicine argues that sleep-deprived physicians should not be permitted to proceed with an elective surgery without a patient's informed, written consent.

According to the authors, "This approach would represent a fundamental shift in the responsibility patients are asked to assume in making decisions about their own care and might prove burdensome to patients and physicians and damaging to the patient-physician relationship." They further write that "this shift may be necessary until institutions take the responsibility for ensuring that patients rarely face such dilemmas."

The editorial authors identify a number of barriers that may make this informed consent and surgery rescheduling unpopular with patients and physicians. Patients may have made logistical provisions for their surgery and may be unhappy if they have to reorganize their schedule again. Clinicians may lose cases to colleagues and thus income. Departments and institutions may lose income if patients reschedule and seek treatment elsewhere.

And while the study authors acknowledge that there may be financial and administrative costs associated with any informed consent plan, they argue that the costs may be offset by improved surgical outcomes and reduced complications.

Where's That Darn Box of Emergency Keys?

This set-up is what you call a visual oxymoron. On the one hand, you prominently announce an important precaution. And then, since you assume that some idiot is going to mess around with the shut-off switch, you negate the original precaution.