



Aviation Human Factors Industry News

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Naval Safety Center

The “Can Do” Mechanic

By AME2 Aaron Hall

All good squadrons take pride in knowing they expeditiously can and will complete a job correctly each and every time. This feeling has those of us in the **aviation-maintenance profession** looking forward to the next challenge. This knowledge also keeps our organizations moving at an efficient and productive pace. Many people refer to this sentiment as the “can-do” spirit, **but it can spell trouble and can lead to tragic results.**



It was early afternoon, and my supervisor had told me to safety wire a pressure switch for the equipment-cooling system, which is located in the aft equipment bay (birdcage) of one of our EA-6B aircraft. Knowing I had limited time to complete the task before I was needed on the flight line for the next aircraft recovery, I quickly cut a piece of safety wire and grabbed a flashlight out of a tool pouch. I then double-timed to the aircraft. In my haste, I neglected to sign the tool log, and I failed to have my supervisor inspect the tools before I left the shop. I finished the job, ran back to the shop, and told my supervisor the job was complete. Before getting a response from him, I left the shop and headed to the flight line to recover incoming aircraft.



Soon after the recoveries were complete, I left for the barracks to assume my watch. During the tool inventory at the end of the day, the shift supervisor discovered a flashlight missing from my tool pouch. He called me about the missing tool. I immediately remembered the flashlight I had used earlier in the day and knew I had been working in the birdcage area. My blood ran cold as I retraced my steps in my mind and realized that I couldn't remember returning the flashlight to the shop.

The supervisor told me that the folks in maintenance control and quality assurance already had been notified. He also mentioned that the suspect aircraft was out flying, but it had been recalled to home base. A relief was sent over to take my watch, and I made my way back to the shop. Thinking about the incident made it a long trip.

By the time I arrived at the squadron spaces, a missing-tool report already had been started, and the aircraft was about to land. Once the aircraft was parked, I ran out to the flight line with the recovery crew and anxiously lowered the aft extensible platform (birdcage). To both my dread and relief, the flashlight was in the birdcage and was recovered. Fortunately, no damage to the aircraft had occurred.

Our tool-control program had failed. We had not followed the established procedures listed in ComNavAirForInst 4790.2, Chapter 13. In addition to checking tools at the beginning and end of each shift, my supervisor or collateral-duty inspector should have inspected my tools before letting me leave the shop. I, too, was at fault because I should have inventoried my tools on arrival at the job site and then again when I was done with the job. I also should have made sure the supervisor or CDI had checked the job and my tools.

I also made other mistakes. Instead of taking out only the tools I needed, I should have taken out the whole tool pouch. It didn't take long for me to realize that the whole situation easily could have been avoided with a few basic and simple administrative steps. I should have initiated a maintenance-action form (MAF) to safety wire the pressure switch. This would have alerted maintenance control of the gripe and my desire to work on it. I had assumed one had been written and that my supervisor had put my tools and me "in work."

I learned that the importance of MAFs cannot be overstated. They not only keep track of the maintenance being done on each aircraft; they also give a history of the job itself. For example, they tell us who initiated the gripe, who corrected and inspected the job, and what tools were used on the job.

I could have avoided all the pain and embarrassment I endured that day with a few seconds of thought. My reputation took a beating, but I'm glad no one was hurt, and the aircraft wasn't damaged. The Navy has lost aircraft and people because of poor tool control. We must learn from incidents like mine and keep from making the mistakes that take lives. It takes only a moment for a well-meaning, "can do" mechanic to make a mistake.

New Evidence on Recent Crash of Garuda Crash.

Indonesia National Transportation Safety Bureau investigator Marjono Siswo Suwarno, who is leading the inquiry into last week's Garuda Indonesia 737-400 crash in Yogyakarta, said Friday that **the initial evidence does not support** the flight captain's contention that a sudden "downdraft" as the aircraft was attempting to land caused the accident on March 9.

"**There was no downdraft at the point of landing,**" Marjono told reporters.

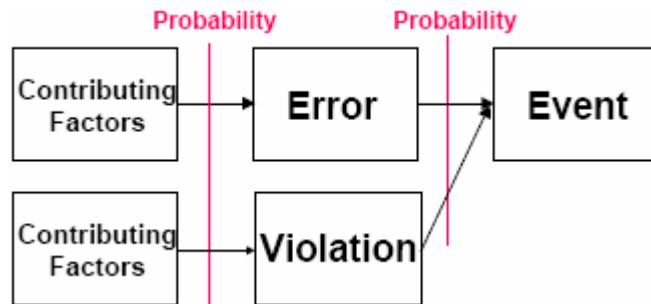
"Data from the meteorological board shows that wind speed was less than five knots, so conditions were good. . .the final words from the control tower were 'clear to land.'"



Meanwhile, **political fallout** continued in Indonesia, which has seen its **air safety record heavily scrutinized** in the wake of the second fatal 737-400 crash in three months. Vice President Jusuf Kalla told reporters Friday that the government is "embarrassed Indonesia has had so many accidents. We will issue stronger regulations and older aircraft will be banned, **and all high-ranked transport officials must be replaced.** That's the strongest option of actions."

FAA Fines North Dakota Over Maintenance

The FAA is proposing \$75,000 in fines for **alleged maintenance violations** on the state of North Dakota's three aircraft, including its King Air B200 that's regularly used to fly the governor and other dignitaries. The Bismarck Tribune says **North Dakota is fighting the assessment and contends that the aircraft are properly maintained although it did "voluntarily" ground its Piper Cheyenne for more than two weeks last year when it was shown that unspecified engine tests hadn't been carried out.** On the King Air, **inspectors allegedly discovered that an air data computer had been replaced without the required calibration and testing.** A damaged prop and oil leak were found in the rear engine of the state's Cessna 337. "**We see all these events as serious events,**" FAA spokeswoman Elizabeth Isham Cory told the Tribune. However, the state, so far, sees them as "**allegations**" and has hired a lawyer to fight them.



Fuel Spill Soaks JetBlue Bags

An accidental jet fuel spill at Kennedy Airport last week left some Bermuda-bound JetBlue customers fuming after their luggage became soaked, officials said.

A spokesman said JetBlue flight 1731 was being fueled at the gate before a 10:15 a.m. departure when flammable jet fuel spilled out under the wings. It was not immediately clear how much fuel was spilled.



Officials attributed the incident to **human error**. "It was a fuel overflow during the fueling process" said Todd Burke. There were no reports of injuries to any of the 46 passengers on board, Burke said.

Pilots Support Bill to Enhance Safety Culture at Canadian Airlines

Non-Punitive, Confidential Safety Reporting Programs Essential to Success

Capt. Dan Adamus, president of the Canada Board of the Air Line Pilots Association, Int'l (ALPA), issued the following statement supporting Bill C-6, currently under consideration by the House of Commons Standing Committee on Transport, Infrastructure and Communities. If passed, the bill would put "**Safety Management Systems**" in place throughout the Canadian aviation industry.



"Putting '**Safety Management Systems**' in place at aviation companies regulated and certified by Transport Canada would be an extremely promising step forward in safeguarding Canada's passengers, crew, and cargo. If it is passed, Bill C-6 would set the stage for a **quantum leap in safety** that will help detect safety threats long before accidents occur. ALPA strongly urges the Parliament to pass this important legislation.

"The proposal before the House of Commons Committee contains each of the building blocks for success in **creating a more robust safety culture** at Canadian airlines. The proposal clearly establishes accountability for safety at the highest levels within a company; provides for the reporting of safety occurrences and information **without fear of retribution**; and also requires employee involvement



and a formal risk assessment and decision-making process when hazards are identified.

"Equally important, the bill includes **non-punitive and confidential safety programs** as a foundation for heading off safety risks before incidents or accidents occur. In the past, the aviation industry has had to wait for an accident or incident to improve safety. **Canada and the U.S.** have approached aviation safety in this way for more than 70 years and it has helped to create an **air transportation safety record that is unsurpassed in the world.**

"Now, rather than depending on increasingly rare airline accidents to identify safety risks, our industry needs a **proactive approach** to identifying hazards before accidents occur. Safety data must be collected within a safety-centered and **non-punitive culture** where pilots and **other aviation employees** feel comfortable reporting emerging risks.

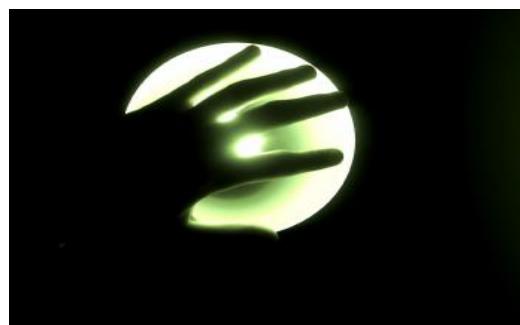
"Additionally, **as the science of 'human factors' becomes more robust**, it is essential to go beyond simply citing '**human error**' as the cause of missteps, we must look at the '**why**' behind it, whether it is training, experience, knowledge, or inadequacy of procedures. ALPA maintains unequivocally that a non-punitive, confidential safety reporting program is essential, especially when it comes to identifying and responding to **human factors** issues.

"However, regardless of whether this bill passes, ALPA maintains that the minister remains responsible, through inspectors, for providing comprehensive safety oversight of the Canadian aviation industry."

JAL Pilot Reprimanded for Photographing Cabin Attendant in Captain's Seat During Flight

Japan Airlines Corp. said Monday it has reprimanded a pilot for allowing a cabin attendant to sit in the captain's seat and pose for photographs during a flight.

The cockpit photo session did not affect the safety of JAL Flight 422, which was on autopilot at cruise altitude, carrying 176 passengers and 14 crew members from London to Osaka on Dec. 3, airline spokeswoman Yuko Takahashi said.



The female flight attendant, 28, briefly sat in the captain's seat and placed her hands on the controls. The pilot, 45, encouraged her to do so after she entered the cockpit to serve him and the co-pilot soft drinks while they were flying above Siberia, about six hours after takeoff, Takahashi said.



The incident surfaced late last year after the company was tipped off by an employee who heard of it, she said.

After more than two months of investigation, the airline verbally reprimanded the captain and the cabin attendant and reported the incident to the Transport Ministry in late February, Takahashi said.

The co-pilot, 34, was also reprimanded verbally for failing to intervene.

JAL called their acts "imprudent behavior" and apologized in a statement. "We deeply regret what has happened," JAL said, promising to take steps to prevent a recurrence.

Fatigue Costing U.S. Employers Billions

Fatigued workers cost U.S. employers more than \$136 billion per year in health-related lost productivity, according to a study in the January issue Journal of Occupational and Environmental Medicine. And while fatigued workers are significantly more likely to miss work than employees that aren't fatigued, the majority of lost productivity is attributable to reduced work performance, such as difficulty concentrating or working more slowly, rather than absences. (Kathy Gurchiek, "Study finds eye-opening cost associated with fatigued Workers" Society for Human Resources Management, January 30, 2007)



Fatigued employees are less productive and cost your company more. However, the question remains what are you going to do about it? Too many companies that are willing to spend millions of dollars in legal fees after an accident, but won't spend a fraction of that on preventing the problem in the first place. The challenge is not sit back and accept fatigue as a cost of doing business. Imagine the money that can be made, and how much employee health can be improved, by investing in a fatigue management plan.

Napping Helps the Heart

In a study of more than 23,000 Greek men and women ages 20 to 86, researchers found that napping at least three times a week for half-hour was associated with a significantly decreased risk of death from heart disease. After controlling for factors like smoking, body mass index, physical activity and diet, the researchers found that



people who regularly took a siesta had a 37 percent lower coronary death rate than those who never napped. (Nicholas Bakalar, "Regular Midday Snoozes Tied to a Healthier Heart" The New York Times, February 13, 2007)

While more research is needed to confirm the link between **napping** and heart disease, experts do agree that one of the best ways to boost production and alertness is to take a **nap**. Furthermore, studies conducted in recent years show **there are extensive benefits for employers who permit controlled, on-the-job napping**. Yet despite the research, many companies are still reluctant to install **napping policies** (in fact many treat napping as a major disciplinary issue). However, there are some industry segments that are more likely than others to permit **napping at work**. For example, a 2002 survey of industry managers suggested that up to 50% of the health care industry and 42% of the manufacturing industry permit controlled napping.

FAA Tweaks New ETOPS Ruling

Allows "Dual Maintenance" In Limited Circumstances

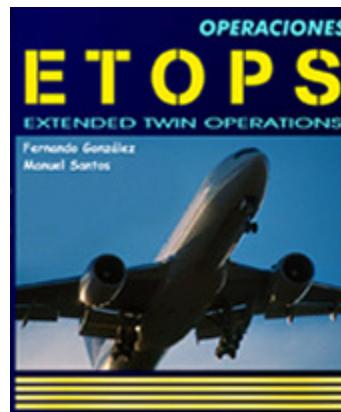
They aren't big changes... but the FAA has already tweaked its ruling on Extended Operations (ETOPS) regulations for Part 121 and Part 135 turbine transport aircraft, one month after the original rule was published.

The changes -- none of which are substantive, in the FAA's words -- correct the rule language applicable to dual maintenance and formatting of a Part 1 definition and section of Appendix G. Following publication of the final rule, it was brought to the attention of the FAA the original intent of the concept of "**dual maintenance**" in the final rule did not codify existing FAA ETOPS guidance, as published in the notice of proposed rulemaking.

The amendment clarifies that language.

"**Dual maintenance**" is a concept relating to **repetition of maintenance errors** on redundant systems -- i.e., when **one mechanic performs the same error while repairing two or more systems on the same aircraft**. An example of dual maintenance **error** is failing to install o-rings on engine oil or fuel components on multiple engines.

Establishing procedures to avoid dual maintenance can minimize the probability of such errors. The use of two or more mechanics reduces the risk of this type of error. Routine tasks on multiple similar elements, such as oil and fuel filter changes, should never be scheduled and assigned on the same maintenance visit.





However, the FAA states, in **some cases such procedures may be unavoidable**. For instance, a pilot's report of a discrepancy on an ETOPS significant system may require maintenance on one engine, while a scheduled maintenance event is performed on the other engine.

In such cases, the certificate holder must establish and follow procedures to mitigate the risk of human error, according to the FAA's new language.

ETOPS regulations allow aircraft, other than an all-cargo operation in an airplane with more than two engines, to operate on one engine in the event of emergency within a time threshold identified in part 121 or part 135. That time threshold is determined using an approved one-engine-inoperative cruise speed under standard atmospheric conditions in still air.

ASAP Air Safety Program Rewards Those Who Admit Mistakes

Four Alaska-based carriers participate in program that allows them to report incidents without fear of retribution



A safety program created by the Federal Aviation Administration and embraced by the Medallion Foundation and four Alaskan carriers is setting the path for safer flights in Alaska.

The Aviation Safety Action Program, or ASAP, is proving to be a success with both the aviation carriers involved and the FAA, according to Kent Adams with the Medallion Foundation.

The **ASAP program takes the place of a disciplinary action** by the FAA, and allows carriers a corrective action for volunteering information.

“For example, a pilot deviated from an air traffic control specified altitude; in the past they could receive a reprimand from the FAA,” Adams said. “Now if this happens — and the pilot self-reports it — with some explanation, the information is reviewed by the carrier and the FAA to see that it doesn't happen again.”

The premise of the program is to get the carriers involved to report incidents that could violate regulations and could create an accident or injury before, during or after a flight.

“**This is an amnesty type program,**” Adams said. “The impetus is to get carrier employees to report the information with no retribution by the FAA to the individual or the carrier.”



Adams said the carriers' pilots, crew, mechanics, dispatchers and flight attendants may all report infractions.

According to Adams, the Medallion Foundation made a request to the FAA to start the test program.

The foundation, a nonprofit created to improve commercial and general aviation safety in Alaska, began working with the FAA after the two agreed on a memorandum of understanding.

The ASAP program started between the two entities in March 2005 for an 18-month demonstration phase with the Medallion Foundation acting as the facilitator for the program in Alaska.

According to Adams, there are four Alaska carriers participating in the program: Peninsula Airways, Frontier Flying Service, Era Aviation and Warbelow's Air Service. **Nationally there are 48 carriers participating.**

"We found that self-reporting worked in ways that the carriers had never imagined," Adams said. "**Ninety-five percent of the events were not known by the carriers, and the FAA had about 5 percent of the what was really happening.**"

Dick Harding, vice president of operations for Pen Air, concurred. "We found out things about our operation that we would have never heard about until the FAA came knocking," he said. "This allows an employee to make a report about **insidious little things** that can lead to problems or even accidents."

Harding believes creating an atmosphere of immunity encourages people to submit information.

The information is entered into a database and can be reviewed by management and the FAA. Currently in Alaska, each carrier may review its company's reports by employees, but not other carriers.

"Until we have five carriers in the system, the information can't be shared," Adams said.

As more carriers enter the program the information will be sterilized so it won't reflect any one carrier," according to Harding.

The Medallion Foundation, the Capstone Program and other FAA safety programs are credited not only with saving lives by avoiding crashes, but have served to reduce insurance costs to Alaska-based carriers, according to the Alaska Air Carriers Association.



Wanted: Women With An Interest in Aviation Careers

The Aviation Industry Wants YOU

Admittedly, there is a wide gender gap in aviation... particularly among pilots and mechanics. But the word is getting out, with the help of events like Saturday's Aerospace Career Day, organized by the Girl Scouts and the Alaskan Chapter of the 99s.



With the mission of raising awareness for women considering a future in aviation, the event featured speakers from a wide range of careers, including air traffic control, **aircraft mechanics**, airport management, and pilots, in a KTUU television report.

For organizers, the long-term goal is to spark an interest in math, science and technology in young women - and show them some of the opportunities available.

"Introduce girls to different careers, in this case, the aerospace industry that are interesting and challenging and keep them interested in math and science," said Roberta Degenhardt of the Alaska Chapter of the 99's, "in an effort to give them more opportunities for careers as they reach high school."

FAA statistics demonstrate the size of **aviation's gender gap**. Of the more than 600,000 licensed pilots in the US, only 6 percent are women. **That gap widens with other careers, such as in mechanics, where fewer than 2 percent are women.**

According to the FAA's 2005 General Aviation Statistical Databook, there were 37,243 female pilots in 2004, including student; recreational; private, commercial and airline transport pilots; and flight instructors. Non-pilot women accounted for 18,666, **including mechanics**, repairmen, parachute riggers, ground instructors, dispatchers, flight navigators, and flight engineers. Those numbers aren't much larger than the 1997, when women accounted for 34,460 pilots and 14,562 in non-pilot positions.

The gender gap among military pilots is even wider than in the civilian population, with just 2.5 percent women.

For today's young women, however, the skies the limit.



"Almost anything you could think of there is an opportunity, especially now with the space program, that you might be a microbiologist or a horticulturalist or a doctor or a pilot and be able to go into space," Degenhardt said. "We said just about the only thing they don't have yet are real estate agents, but that'll probably be coming soon."

Rossia Airlines Denies Blame For Plane Crash in Ukraine

Rossia airlines issued a statement on Tuesday expressing its disagreement with the verdict of Russia's Aviation Committee that said human error caused one its planes to crash in eastern Ukraine on Aug. 22, killing all 170 people on board.

"The committee's decision implies that the crew were responsible for the disaster, and we cannot agree with this conclusion," reads the statement. "The pilots actions fully corresponded to instructions. The height and speed requirements were also carefully adhered to."

The airplane, operated by St. Petersburg-based Pulkovo Aviation Enterprised which has since been renamed Rossia after a merger, was traveling from Russia's Black Sea coast to St. Petersburg.

The Aviation Committee said it was a mistake to place an inexperienced trainee in the co-pilot's seat. Leonid Kashirsky, head of the technical commission of the Russian Aviation Committee, said the crew failed to come up with an adequate solution when the flight began to go wrong and develop a consistent response to the crisis. But Rossia insisted that bad weather was responsible for the crash.

"A severe storm had formed spontaneously near Donetsk, and the crew was not informed about it in advance and in sufficient detail," the company statement said. "Upon reaching a zone of turbulence, the crew acted according to instructions."

When the plane reached an altitude of 11,600 meters it entered turbulence. The crew then asked for permission to climb to 11,850 meters, but the pilots lost control of the plane. At the critical altitude, the TU-154 stalled and went into a flat tailspin.

Rossia claims the technical specifications of TU-154M were a negative contributing factor as they limit possibilities for the pilots to lead the plane out of a flat tailspin.





"The crew did everything possible to save the passengers but in the circumstances it was impossible," reads the Rossia statement. **"A string of objective factors did not allow the pilots to prevent the disaster."**

The prosecutor general's office is still investigating the incident.

WHO SAID IT?

Quotes Quiz

Here are five quotes about human character. See if you can match the quote with its author.

1. "Real integrity is doing the right thing, knowing that nobody is going to know whether you did or not."
2. "Men's natures are all alike; it is their habits that set them apart."
3. "Always acknowledge a fault. This will throw those in authority off their guard and give you an opportunity to commit more."
4. "Self pity is our worst enemy and if we yield to it, we can never do anything good in the world."
5. "More than any other time in history, mankind faces a crossroads. One path leads to despair and utter hopelessness. The other, to total extinction. Let us pray we have the wisdom to choose correctly."



*Helen
Keller: The
mortal
enemy of
self-pity*

Choices

- A) Mark Twain
- B) Helen Keller
- C) Woody Allen
- D) Confucius
- E) Oprah Winfrey

Answers

1. E; 2. D; 3. A; 4. B; 5. C.

LONGER BREAKS NEEDED

To Avoid Back Injuries on the Job

A recent study funded by the National Institute for Occupational Safety and Health (NIOSH) and conducted by Dr. William Marras and researchers from Biodynamics Laboratory at Ohio State University **studied the effects on workers of lifting boxes onto conveyor belts**. The study included:

- 4 new workers
- 6 experienced workers
- Boxes weighing 2, 11 and 26 pounds
- 8-hour workdays
- 30-minute lunch break
- 2 15-minute rest breaks
- **Oximeters** on the participants' lower backs, measuring the amount of oxygen reaching the muscles (indicating how hard the muscles worked and assessing fatigue).



The study found that while the two 15-minute breaks did help the participants' back muscles recover somewhat from the strain of lifting, **the 30-minute lunch break was the most helpful, allowing oxygen levels to return to the resting level**.

However, as the day progressed, the workers' oxygen levels rose considerably, leading researchers to conclude that **the risk of back injury is greatest towards the end of a work shift**. Researchers also found that **the new workers tended to tense up their muscles, preventing proper blood flow and oxygenation, more so than experienced workers**.

The study suggests that workers require longer and more frequent breaks to avoid work-related back injuries, particularly later in the day. And, according to Dr. Marras, “**The bottom line is that it's much more costly from a physiological standpoint for novices to do the same work as experienced people.**”



Picture This!



END