

Aviation Human Factors Industry News

Volume V. Issue 08, April 17, 2009



Hello all,

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

★Cockpit Fire Damage ASA
Bombardier CRJ-200

★American Airlines made mistakes
before, after fire, safety board says

★Loose Fastener Causes Control
Disconnect

★General aviation still deadliest in
U.S

★Procedural Error and Non-
compliance in Maintenance

★Wrong Fuel Causes Forced Landing
- But Why ?

★Garuda Pilot Jailed In 2007 Accident

★Just Culture: Balancing Safety and
Accountability

★FAA LAYS GROUNDWORK FOR
SMS RULES

★Professional Pursuit A&P's Flash
Cards

★The Key to Waking Up Refreshed

Cockpit Fire Damage ASA Bombardier CRJ-200

Currently these pictures of a damaged CRJ-200 are making the rounds on the Internet. Unlike said in many forums and blogs, this damage was NOT caused by a lightning strike! Instead it was simply caused by a **cockpit fire**, probably due to an overheated electrical power relay. Preliminary NTSB report:

ASA Airlines flight 5533, a Bombardier CRJ-200 - registration: N830AS, experienced a cockpit fire on the ground shortly after external power was applied to the airplane in preparation for flight. The captain and one flight attendant evacuated the airplane via an airstair without injuries. **They were the only individuals on the airplane at the time.** The fire department extinguished the fire after it had burned an approximate 18 inch hole through the left upper cockpit crown skin. The flight was to be flown from Tallahassee Regional Airport (TLH), Tallahassee, Florida, to Hartsfield Jackson Atlanta International Airport (ATL), Atlanta, Georgia.



American Airlines made mistakes before, after fire, safety board says

Safety investigators traced a 2007 American Airlines engine fire to **unapproved maintenance practices** that eluded the carrier's quality-assurance auditors, the National Transportation Safety Board disclosed Tuesday. The September fire happened shortly after American Airlines Flight 1400 departed



Lambert-St. Louis International Airport. The pilots returned to the airport without injuries or fatalities to any of the plane's crew or 138 passengers.

Yet the pilots also prolonged the fire by **failing to follow a checklist** that leads them through steps during such an emergency, the safety board said. Accident investigators said the **crew became distracted** and failed to quickly shut off fuel to the damaged engine, causing a loss of hydraulic pressure. That led to problems deploying the front landing gear.

"It was a series of **people taking shortcuts** that accumulated on this particular day into what could have been a much more catastrophic incident," said board member Kitty Higgins.

American has been under closer regulatory scrutiny since last year, when it grounded hundreds of McDonnell Douglas MD-80 jets following federal safety audits. The Federal Aviation Administration last month started a three-month audit of American's safety procedures.

Safety board members said their review was limited to the engine fire, which occurred on an MD-82.

"There was a host of **serious problems** that ... **when you added them** all together could have been extremely catastrophic to the point where life could have been lost," acting board Chairman Mark V. Rosenker said.

During the week before the accident, the jet's left engine failed to start on multiple occasions, the board said.

Mechanics **repeatedly used an unapproved tool**, such as a screwdriver, to open a valve that manually starts the engine, the board found. Boeing **warned carriers** in 1997 that using the wrong tool could deform a pin on the start valve.

The damaged pin triggered a malfunction that sent sparks into the metal cover that contains the engine, where there was probably some kind of fuel leak, the board said.

The safety board determined that American mechanics replaced the start valve **six times** but missed the cause of the failed engine starts: **a worn-out, stainless steel air filter**. American's audit team also failed to identify the cause of the problem, the NTSB said.

"Where they have found deficiencies in how our personnel performed, we are going to strengthen our training," said Tim Wagner, an American spokesman.

American has started to replace components of the start valve on all MD-80s and plans to complete the work in 2010, Wagner said. The carrier has also increased staffing on its **audit team to monitor** more mechanical work, he said.

Loose Fastener Causes Control Disconnect

Aerospatiale AS 350B. Substantial damage. Four fatalities, three serious injuries.

The helicopter was returning from a sightseeing flight on March 8, 2007, the pilot reported **hydraulic system problems** and that he would perform a run on landing at the Princeville (Hawaii, U.S.) Airport. As the helicopter neared the runway, the pilot radioed, “Okay, we’re done.” The sound of the rotors changed, and the helicopter descended into a grassy area next to the runway. The pilot and three passengers were killed, the three other passengers sustained serious injuries.



“Post accident examination of the helicopter revealed that the left lateral flight control servo **became disconnected** in flight at the transmission,” the report said. The disconnection was traced to maintenance personnel who, while replacing the servo about a month before the accident, had installed a **“severely worn”** lock washer and had tightened the jam nut on the lower clevis – a U-shaped attachment fitting – to the **lower torque value** specified for the upper clevis.

“ Examination of the company’s maintenance program revealed that **none of the mechanics at the helicopter’s base had received factory training** and the maintenance manuals they used **were three revisions out of date**” the report said.

General aviation still deadliest in U.S

General aviation remains the deadliest form of air travel in the United States, statistics compiled by the federal government indicate. The National Transportation Safety Board's annual review of aviation accidents says general aviation accounted for 495 of the 564 civil aviation fatalities that occurred last year, The Washington Post reported.



Accidents on charter flights killed 66 people, the highest number since 2008. Fifteen of those deaths involved medical helicopters. Besides medical helicopters, the air charter category includes tour flights and air taxis.

Commuter airlines, which often fly smaller aircraft, recorded seven accidents but none resulted in fatalities.

Large commercial carriers had 20 accidents in 2008 but the safety board says there were no fatalities among the **750 million passengers** who traveled commercially.

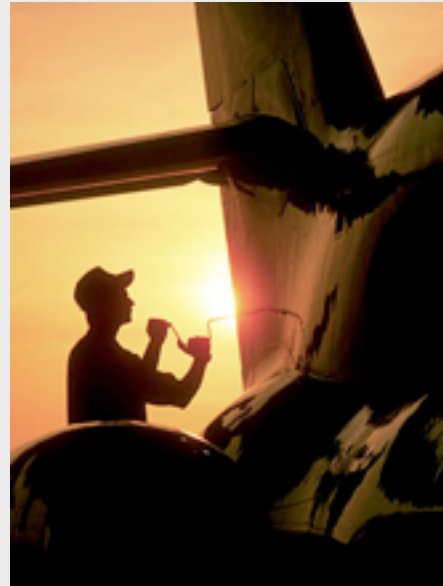
This year 64 people have died in aviation accidents.

A commuter turboprop crashed into a home outside Buffalo, N.Y., killed 50 people and a small plane crashed in Butte, Mont., resulting in 14 deaths.

Procedural Error and Non-compliance in Maintenance

Aircraft maintenance information comes to us in many forms. The most used is probably the aircraft maintenance manual. Other technical documents include service bulletins, airworthiness directives, technical/service letters and many more.

It is most important that maintenance information be **understood** by the target audience. The primary members of this audience are the technicians, inspectors and maintenance managers who perform scheduled aircraft maintenance and troubleshoot and repair aircraft systems. An analysis of NASA Aviation Safety Reporting System (ASRS) incident reports from 1998-2001 indicated a significant proportion (44%) of maintenance reports pertained to **procedural errors** and implicated many types of maintenance documents, such as: Maintenance manuals, task cards and minimum equipment lists. There were various reasons for these errors.



Sometimes the procedure itself was deficient or it was not current. Sometimes the source of the problem was that the user of the procedure misread or misinterpreted the document, or simply did not follow it.

These types of problems can become more prevalent with aircraft that are manufactured in a different country. There are some instances where the technical language of the manufacturer **does not translate easily** into the technical language of the customer. This can degrade the technician's ability to understand the procedure and lead to errors.

Procedural errors and procedural non-compliance are a common occurrence in maintenance operations. Hobbs & Williamson (2000) reported that 80% of the maintainers surveyed said that they have deviated from procedures at least once in the past year; nearly 10% reported doing so often or very often. McDonald (2000) reported that 34% of routine maintenance tasks were performed contrary to procedures. A large and varied list of reasons why people don't follow procedures comes from a study by Human Reliability Associates,

Ltd. Reasons include document deficiencies (inaccurate, impractical, inaccessible) as well as user practices (they find "better" ways to work, or are unsure of policies, and don't feel they need them).

User errors may be simple slips due to local factors or they may be intentional deviations for complex reasons. While simple errors may be resolved by paying attention to local work environment or individual

factors, procedural non-compliance requires investigation of organizational level factors from high-level company policies to workforce practices on the floor.

We all realize we cannot eliminate errors; however, **better communication** between maintenance managers, manufacturers, technicians and others can go a long way in understanding technical information and promoting proper procedures – all in an attempt to **eliminate links in the event chain** and maintaining safety standards. _

Submitted by: Michael O'Callaghan – Chief Quality Assurance Inspector/Maintenance Technician - Johnson Controls Aviation Department.

Wrong Fuel Causes Forced Landing - But Why ?

The National Transportation Safety Board releases a preliminary cause on what forced a small plane to make an emergency landing earlier this year.

On January 30, 2009, the pilot of a CESSNA 421C landed the aircraft in a field in the 13000 Blk. 69th St. N. in Sedgwick County. After an examination of the airplane, the NTSB found that the fuel tanks contained a mixture of **100 low-lead and Jet-A fuel**.

After questioning, an employee of Jabara Airport admitted to fueling the plane with **80 gallons of jet fuel**.

Midwest Corporate Aviation tells Eyewitness News that employee **has been terminated**, and that remaining employees are going through training again.



Garuda Pilot Jailed In 2007 Accident

Komar Says He Will Appeal Verdict

Former Garuda Indonesia pilot Marwoto Komar says he will appeal a guilty verdict handed down by an Indonesian court Monday, on charges of **criminal negligence** in the case of a notorious crash landing at Yogyakarta in March 2007. Agence-France Presse reports Komar received a **two-year sentence**, far more lenient than the life sentence prosecutors had wanted



Komar was the captain of a Boeing 737-400 that overshot the runway on landing at Yogyakarta airport in central Java, and slid into a rice field. The aircraft burst into flames, **killing 21 people**, while 119 others were able to escape through the exits of the burning jet in the March 7, 2007 accident.

Investigators later disclosed Komar **ignored repeated warnings** -- both from cockpit alarms, and the flight's co-pilot -- that the jet was coming in for landing **much too fast**. Cockpit recordings indicated the co-pilot had repeatedly called for the captain to abort the landing, and go-around. Police arrested Komar in February 2008... but he was later released, pending formal charges.

In its final report on the crash, released in October 2007, Indonesia's National Transportation Safety Committee (NTSC) found the pilot was **"singing" during the approach**, below 10,000 feet and prior to reaching 4,000 feet, which was "not in accordance with the Garuda Basic Operations Manual policy for a sterile cockpit below 10,000 feet

While it's easy to scapegoat Komar in this matter, there appear to be lots of potential targets for outrage. It came to light during the investigation that Garuda pilots **were paid bonuses** for saving fuel, a possible factor in the decision by Komar not to go around. The airport also came under heavy criticism for **taking an hour** to reach the burning plane with firefighting equipment.

AFP reports Komar wore his uniform to court to hear his two-year prison sentence announced Monday, despite being forced from his job about a year ago. He still blames defective flaps for the crash. Investigators say

they were working fine.

The ugly safety record of Indonesian carriers prompted the US Embassy in Jakarta to warn **US citizens to avoid flying the nations airlines** during stays in the country. In June 2007, flights by Indonesian carriers were banned from airspace controlled by the European Union.

Just Culture: Balancing Safety and Accountability

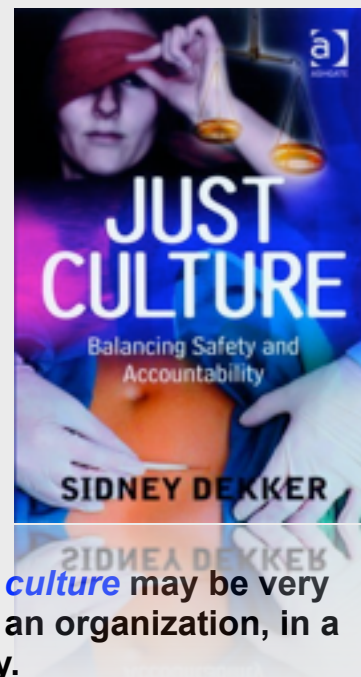
A *just culture* **protects people's honest mistakes** from being seen as culpable. But what is an honest mistake, or rather, when is a mistake no longer honest? It is too simple to assert that there should be for those who "cross the line." Lines don't just exist out there, ready to be crossed or obeyed. People construct those lines – and we draw them differently all the time, depending on the language we use to describe the mistake, on hindsight, history, tradition, and a host of other factors.

What matters is not where the line goes, but who gets to draw it. If we leave that to chance, or to prosecutors, or fail to tell operators honestly about who may end up drawing the line, then a *just culture* may be very difficult to achieve. The absence of a *just culture* in an organization, in a country, in an industry, hurts both justice and safety.

Responses to incidents and accidents that are seen as unjust can impede safety investigations, promote fear rather than mindfulness in people who do safety-critical work, make organizations more bureaucratic rather than more careful, and cultivate professional secrecy, evasion, and self-protection.

A just culture is critical for the creation of a safety culture.

Without reporting of failures and problems, without openness and information sharing, a safety culture cannot flourish. We should never end the efforts to create an environment where learning and accountability are fairly and constructively balanced. We must continue to report hazards and



occurrences, and share information. This is critical to our responsibility not only to ourselves as individuals, but to the organization we are part of and to our company.

*From “Just Culture – Balancing Safety and Accountability,”
by Sidney Dekker*

FAA LAYS GROUNDWORK FOR SMS RULES

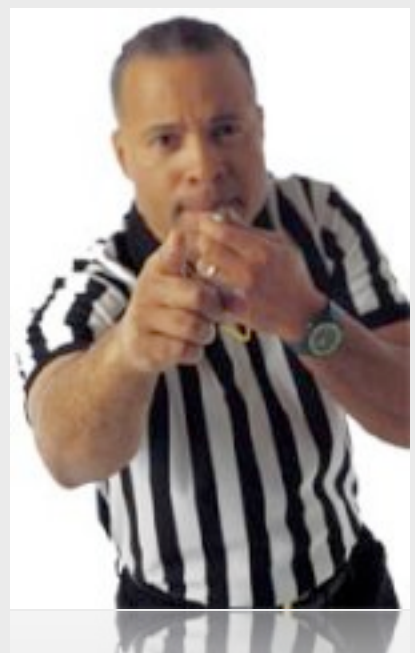
FAA is targeting a June 30 release of an advanced notice of proposed (ANPRM) laying the groundwork for requiring aviation operators and businesses to implement a **Safety Management System (SMS)**. FAA last month completed the initial ANPRM and sent it for Department of Transportation review. The ANPRM also must undergo Office of Management and Budget review.

Don Arendt, manager of FAA’s Flight Standards SMS Program Office, called the ANPRM “basically a fishing expedition,” a survey that seeks industry input on requiring SMS. The ANPRM is the first step toward a more forward rulemaking that would **mandate SMS**.

FAA defines SMS as **“a management system for integrating safety activities into normal day-to-day business practices.”** SMS is designed to help organizations integrate a systematic risk-based and process-oriented approach to managing safety. “The FAA is considering SMS rulemaking to further enhance the practice of managing safety and oversight of that management,” the agency said. “Such an approach stresses not only compliance with technical standards, but increases emphasis on those management systems.”

Current regulations impose technical standards for industry products and services, the agency said. “However, they do not address the framework within which the safety of those products and services are to be managed.”

Arendt stressed **SMS is not a substitute** for compliance nor oversight. SMS is not indicative of a “cozy relationship,” he added, but it is designed to establish a more cooperative, collaborative environment. “It’s about how to make safety decisions,” he said.



The ANPRM is expected to cover all aspects of aviation – from operators to manufacturers, [maintenance organizations](#) and other service providers. The rulemaking would create a new “Part” within the Federal Aviation Regulations to accommodate SMS, but also would include elements that would fold in with the existing FARs that apply to the different aspects of aviation, Arendt said.

The agency late last month convened a new Aviation Rulemaking Committee to develop recommendations for the comprehensive SMS rule (BA, March 9/105). The ARC initially is made up of 12 people from across the industry, but Russell Lawton, the director of safety management for the Air Charter Safety Foundation who was appointed to the ARC, said that the membership will grow as working groups form to consider the application of SMS to various aspects of industry. Chartered through February 2012, the ARC will review comments and develop recommendations for the rulemaking.

FAA is under [international directive](#) to establish an SMS rule. The International Civil Aviation Organization established a January 2009 deadline for nations to adopt an SMS mandate. Most member nations – including the U.S. – have not yet met the requirement. [Canada is one of the few nations to have an SMS rule in place.](#)

FAA filed a “difference” ICAO over the mandate. Arendt defined the difference as “merely a statement of noncompliance,” while the agency works toward full compliance.

FAA, meanwhile, has established a pilot project to help organizations voluntarily implement SMS. The project, ongoing since 2007, currently has about 50 participants, and Arendt indicated that his office would be willing to work with other volunteers.

But the agency currently has no guidance or procedures in place to formally approve SMS programs. The lack of ability to have a formally-approved SMS in place is worrying some international operators. Flight Safety Foundation President Bill Voss acknowledged those concerns at the 2009 Air Charter Safety Symposium held earlier this month. The concern isn’t so much that U.S. operators would not be in compliance with international law, Voss said, but one of liability protection, particularly with the [growing trend of criminalizing accidents](#).

“There’s some really big reasons [the SMS rule] has got to get done,” he said.

Professional Pursuit A&P's Flash Cards

Set of 400 Cards / 1,600 Questions Professional Pursuit, A&P Flashcards is a deck of 400 popular style flash cards containing questions and answers from the FAA general, airframe, and powerplant test banks plus the FCC avionics technician's elements 1, 3, and 8 exams. Each question is converted from the standard multiple choice to a direct question and answer style format. Questions and answers are color coded with questions on one front side of each card, and answers on the back. **They make a great portable study tool.** Carry a stack with you and have a partner ask you questions during your idle time. Go over them as self study, or put them together with a Trivial Pursuit playing board and have fun while mastering the material for your A&P exams.



<http://www.avwebbooks.com/products/av530/>

The Key to Waking Up Refreshed

Why is it so hard to wake up to a normal alarm clock? Because a normal alarm clock can't detect where you are in your sleep cycle - a continuous from deep sleep, to brief almost-awake moments, and back to deep again. Occasionally, your alarm may catch you at an optimal, **almost-awake moment** and you wake up feeling refreshed, but usually you grope for the snooze button waking up tired and groggy.

Wake at Your Perfect Time

SLEEPTRACKER® puts an end to that tired



Gift Wrap!
Sleeper Tracker

feeling. Once you set its alarm window, it monitors your body and continuously looks for your optimal waking times so it can wake you at **just the right moment**. Imagine not feeling tired in the morning and getting a few extra minutes out of your day.

How does SLEEPTRACKER® work?

SLEEPTRACKER® continuously monitors signals from your body that indicate whether you are asleep or awake. Because you wear SLEEPTRACKER® on your wrist like a watch, its internal sensors can detect even the most subtle physical signals from your body. SLEEPTRACKER® finds your best waking moments, so that waking up has never been easier.

When you sleep, your body goes through a series of **sleep cycles**. The average adult experiences 4-5 full sleep cycles over an 8-hour period. Each cycle lasts about 90-110 minutes and comprises five different stages, as illustrated by this chart.

Sleep Cycles

No two people have the same sleep cycles, and nobody has the same cycle twice. Many factors can influence sleep cycles, including diet, exercise, medications, drugs or alcohol, stress, sleep disorders, and sleep deprivation. Age and gender can play a role, too: women tend to sleep more soundly than men, and as we age, we sleep more restlessly.

A typical sleep cycle has five stages and takes 90-110 minutes. During Stage 1 of your sleep cycle, you sleep lightly. At Stage 2, your sleep gets progressively deeper. At Stages 3 and 4, also known as **"Delta Sleep,"** you sleep most heavily; this is when your body rebuilds itself.

Stage 5 of sleep, also known as **REM** (rapid eye movement) sleep, is marked by extensive physiological changes, such as accelerated respiration, increased brain activity, rapid eye movement, and muscle relaxation. People dream during REM sleep.

In the first third of the night, Delta sleep stages last longer than REM stages. As the night progresses, Delta sleep diminishes in length. By the last third of the night, Delta sleep usually ceases, while REM stages lengthen.

SLEEPTRACKER® may find multiple almost-awake moments within the sleep cycle. Almost-awake moments may also vary in frequency throughout the night.

By monitoring your sleep cycles for optimal waking moments during the preset ALARM WINDOW, SLEEPTRACKER® finds those almost awake-moments and gently wakes you when you're most alert. The result? You wake up refreshed instead of groggy. Waking up has never been easier.

<http://www.sleeptracker.com/>

Picture This!

- While the forklift on the left has a maximum lifting capacity that is 5,000 pounds greater than the weight of this armored vehicle, **would you want to be standing under the elevated vehicle** while washing dirt off it? I don't think so!

