

Challenges aplenty to tackle

by Robert P. Mark

An improving aviation safety record in some sectors is an impressive accomplishment. At the close of last year, 2011 became the second year in a row there were no fatal Part 121 airline accidents. Part 135 on-demand operators experienced a safety decline, however, with 50 accidents last year (16 of them fatal) versus 31 accidents (six of them fatal) the year before. Accepting the bad with the good still translates into a relentless need for training and communicating accident details to avoid repeated mishaps. While the NTSB's job is determining a probable cause, educating the industry about the intricacies of lessons learned falls to organizations such as the Flight Safety Foundation (FSF). In San Antonio in April the foundation held its 57th annual Corporate Aviation Safety Seminar (CASS). One of the event's speakers, NTSB Member Robert Sumwalt, said, "I'm not supposed to have favorites, but if I did, I'd have to call this conference [CASS] mine because I started out in corporate aviation."

FSF president and CEO Bill Voss opened the conference with insights into the ying and yang of aviation safety: even as the number of accidents declines, there is still a wealth of safety challenges. Some of the examples presented at this year's CASS in fact emerged from airline operations.

Notable topics included Pete Agur's review of second-generation flight risk assessment tools and a forum on how fatigue affects corporate aviation flight crews presented by Lee White, Doug Carr and Curt Graeber. Attorneys David Adams and

Camille Khodadad explained the constant threat from prosecutors in the aftermath of an accident. Sumwalt spoke to the intricacies of how simply following standard operating procedures can dramatically improve aviation safety. Sprint's chief pilot, Chris Broyhill, explained a correlation between the rollout of CRM a few decades ago and similar obstacles with safety management systems (SMS) today.

Criminal Acts

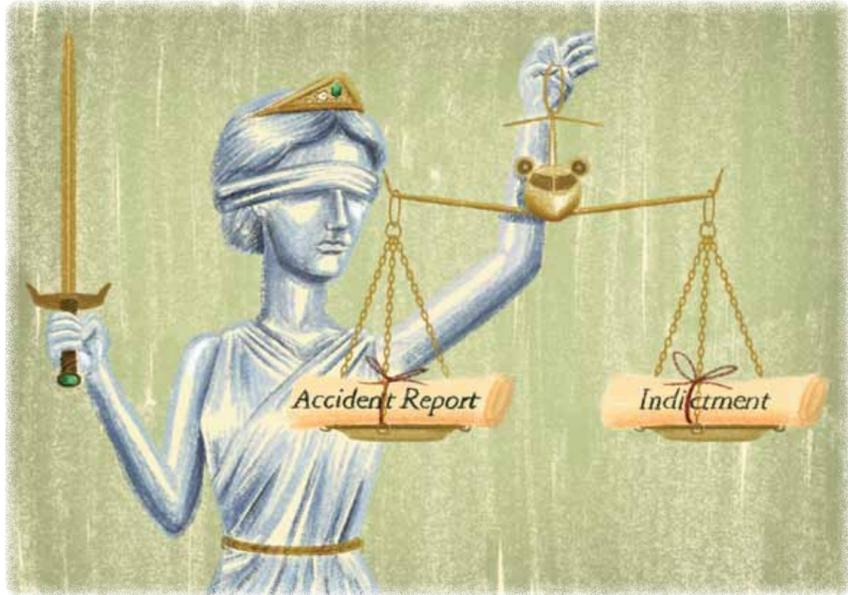
In Europe, a Greek mechanic was recently sentenced to 10 years in prison for maintenance work related to the crash of the Helios Boeing 737 in 2005.

litigation. Adams and his law partner, Camille Khodadad, addressed the CASS audience with a global look at post-accident judicial actions.

According to ICAO Annex 13, "The sole purpose of the investigation of an accident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability." However, said Adams, "Very often there is an automatic response to aviation accidents and a criminal investigation depending upon how a particular judge regards the facts. There is great tension between the initial investigation to determine

in China, Japan and Africa.

In September 1999, on descent into Bucharest the pilots of an Olympic Airways Falcon 900 manually overrode their autopilot and produced violent pitch oscillations, killing seven in the cabin (they were not belted in) and seriously injuring two others. The courts ruled pilot error and brought manslaughter charges against the crew, as well as eight Olympic Airways mechanics for what was later determined to be a malfunctioning pitch system. The pilots received five-year prison sentences for their roles, while criminal charges against the OEM are still pending. More famously, charges and counter charges are still pending in France over the Concorde crash in 2000, as well as in Brazil over the 2006 midair between a Gol Airlines Boeing



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Strategies for International Crews

- Become familiar with the accident investigation process in countries to which you fly. Heading for the embassy is nice, but you might not be able to make your way there due to police restrictions.
- Develop a plan to retain aviation-competent representation in any country.
- After an accident, cooperate as much as possible because it gives you a chance to participate. But have an attorney present—whenever possible—during any interviews.
- Help preserve the evidence. Some countries may allow appeals, but some may not.

SOURCE: PRANGLE & SCHOONVELD

reluctant to prosecute aviation professionals for unintentional errors or omissions," Khodadad said. "Civil Law systems operate somewhat differently and there is much less protection for information. Civil Law follows an inquisitorial format where a judge conducts an inquiry and decides if a crime has been committed. [Such systems] are much more likely to prosecute for an unintentional act or omission. The accused is often charged after the judge's review."

Criminalizing an accident simply diverts attention from determining the cause and preventing another. "Criminalizing is uncomfortable and time consuming for all parties," Adams said. "Legal exposure can certainly extend for ten years post accident. In the ExcelAire accident, the pilots have criminal convictions on their records, which means they must be careful where they travel."

Breaking the Rules

NTSB member Sumwalt discussed the importance of following procedures, using the July 1994 crash of USAir 1016 as an example. In its report on the crash, the NTSB blamed the accident on a failure to follow procedures. Sumwalt said, "We see that so often at the NTSB. Developing good standard operating procedures and a culture of safety doesn't need to cost a lot of money." After a July 2008 Hawker 800 crash in Owatonna, Minn., the Board also said that "well designed cockpit procedures are an effective countermeasure against operational errors, and disciplined compliance with SOPs, including strict cockpit discipline, provides the basis for effective crew coordination and performance."

Reports of potential criminal prosecution proceedings surfaced within just a few days of the April Bhoja Air accident in Pakistan. A Dutch court recently decided against criminal charges for Turkish Airlines in the 2009 crash of its Boeing 737 on approach to Amsterdam Schiphol Airport.

While the history of post-accident legal action against anyone in the U.S. is small when measured against other parts of the world (see adjoining chart), criminal or quasi-criminal investigations and prosecutions have occurred, according to Dave Adams, a partner at Prangle & Schoonveld, a Chicago-based law firm specializing in aviation

the cause, which is an aviation safety role, and the prosecution of alleged criminal activity."

Today, a criminal investigation affects almost everyone involved with aviation—pilots, maintenance personnel, owners, operators, OEMs and air traffic controllers. While accidents happen less frequently these days, the frequency of prosecutions is on the rise. "Of 55 accidents that resulted in prosecutions since 1956, 27 of them occurred in the nearly 45-year span between 1956 and 1999," Adams said. "In the 12 years since 2000, there have been 28 more." A considerable number have occurred in Europe and South America, with some also

737 and an Embraer Legacy over the Amazon rainforest.

Khodadad said, "ICAO supports air safety investigation by restricting the disclosure of information. How individual states operate is somewhat different, however. Some states are torn between providing relevant accident information for safety reasons and knowing that might actually incriminate them." She took a few minutes to explain why, citing the differences between the Common Law system under which the U.S. operates, as do the British and the Australians, versus the Civil Law system of France, Germany and Japan.

"Common Law systems are

Sumwalt said, "The NTSB conducted a safety study several years ago of 37 crew-caused accidents. Procedural errors, not making required callouts or not using the appropriate checklists found in 78 percent of the reviewed accidents." Although the accidents were unfortunate, Sumwalt saw light at the end of the tunnel. "The good news is that if you're looking for the causes of accidents...one bar in that chart is very tall saying 78 percent of the accidents were caused [by crews] not following SOPs. So wouldn't that be a great place to begin looking for ways to reduce accidents?" He also cited "Killers in Aviation," a November 1998 article in *Flight Safety Digest*. "It showed that intentional crew non-compliance was a factor in 40 percent of the worldwide accidents reviewed. It means we should begin focusing on how to get crews to adhere to SOPs more strictly."

The big question of course is why pilots avoid SOPs. Sumwalt said, "An organization might never have developed any SOPs, or for some reason the crews intentionally disregarded those SOPs." In one accident Sumwalt cited, an Astra ran off the runway at DeKalb Peachtree Airport. The investigation showed the company had no SOPs—no guidance on where to make what kind of callouts, how to fly the approach, where to put the gear down and so on—because the company began flying with just a single airplane and one full-time pilot. "Over the years, the fleet grew but the infrastructure didn't," Sumwalt said. A guiding document for developing SOPs, AC 120-71A, said, "SOPs should be clear, comprehensive and readily available in the manuals used by flight-deck crewmembers."

Sumwalt showed an SOP dialogue box that makes teaching and operating much easier. "On the approach, for example, when the pilot flying calls for 'flaps one,' that triggering event clearly outlines what actions and callouts the [pilot not flying] should respond with. In a Shuttle America crash, fatigue was a causal factor for the Embraer

E170 running through a fence at the end of the runway in Cleveland. The captain was told he'd be fired if he called in sick again. The pilot arrived for work tired, but flew anyway. The investigation showed that while the airline had fatigue-avoidance procedures in place, those SOPs were not easy to understand. "Shuttle America's failure to administer its attendance policy as written might have discouraged some of the company's pilots, including the accident captain, from calling in when they were sick or fatigued because of concerns about the possibility of termination." Sumwalt said it's important to remove as many barriers as possible to pilots calling in fatigued.

In another runway overrun accident at Charleston, W.Va, in 2010, a US Airways Express CRJ was stopped just short of a disaster by the EMAS at the departure end of the runway. The pilots completely avoided the airline's sterile-cockpit SOP during taxi and incorrectly set the flaps for departure. During takeoff, the captain noticed the problem and moved the flaps to 20, which caused the configuration horn to sound. He aborted the takeoff and barely avoided the 350-foot drop-off at the runway's end.

"Boeing studied world-class airlines," Sumwalt said. "It found some commonalities, including a commitment to standardization and discipline. Those airlines insisted on cockpit procedural language that is tightly controlled to maintain consistency and to avoid confusion from non-standard callouts that should be handled verbatim. If you want a world-class organization, why not emulate other world-class organizations? Well designed SOPs are essential for safety. But companies need to make a strong commitment to procedural compliance and make it not only a priority but a core value."

Building a Safety Culture

The weather...everyone talks about it, but no one ever does anything about it. Discussions about safety management systems have

begun to sound just as pointless at times. Chris Broyhill, Sprint's chief pilot and a Ph.D. candidate at Embry-Riddle Aeronautical University, spoke to a disconnect between the philosophy of a safety management system and its implementation. "The tough part of an SMS is actually making it work well, especially if a company doesn't spend much time figuring out how the SMS will affect the safety culture of the organization," he said. Without that change being a part of the process, the SMS will simply sit idle in a computer somewhere.

Broyhill and his research partner, David Freiwald, saw a valuable correlation between how cockpit resources management (now called crew resource management) first evolved and was later implemented by airlines and corporate flight departments. "CRM is now considered a standard by most," Broyhill said. SMS isn't quite that far along yet. "Consider the 2010 BP oil spill in the Gulf," he said. "The rig had a living, breathing SMS program in place, but no one really understood how to use it. They worried their own jobs might be at risk if they identified shortcomings on the rig." Eleven people died in the BP explosion.

"There are managers who believe in a safety management system but try to implement it without changing the culture of the organization," Broyhill said. "Try that and the SMS quickly becomes marginalized. How do you deal with the skepticism? If you're in the leadership role, you need to read about organizational culture. Not just about safety culture, but about what makes cultures work. There's a model to help as well...CRM. Crew resource management has become deeply ingrained in our culture today. We just accept it. SMS needs to take that same road if it is going to succeed."

Broyhill explained some of the lessons learned during the initial rollout of CRM. Some of the authoritarian captains the plan was designed to eliminate dismissed CRM: "Yeah, there are problems out there, but I'm not one of them." Others called CRM an erosion of a captain's authority. But CRM thrived, so much, in fact, that it became a victim of its own success as management started wondering why they were spending so much money if things were improving. The real importance of the culture change was when

management began to walk the CRM walk. There is a 24-month training cycle for a good CRM program, which meant it was an ongoing process. It became more than simply checking a box.

"SMS is an evolving cultural tool to combat organizational risk. In the early days of aviation, we dealt with mechanical risks. So we improved manufacturing and reliability. Then came human-factors risks that we countered with CRM. Now we're looking at organizational risk. With an SMS, we're trying to fix things a company might be doing to contribute to safety risks. That takes time," Broyhill noted.

So why the huge focus on SMS these days, besides the obvious regulatory demands? "Before CRM the captain had authoritarian rule," Broyhill said. "After CRM everyone, including the flight attendant, had a vote. CRM leveled the playing field. Before SMS, employees had no say in how an organization

influenced their flying business. Now they do." Perhaps a more significant SMS implementation question is why anyone wouldn't want a voice in the company culture and how it affects the flight department?

"You're hoping to develop willing compliance with SMS," Broyhill said. "But management needs to walk the walk, to change the culture. Eventually employees will buy in when they realize everyone is serious about uncovering the organization's influence on potential safety risks." □

Spotlight on Safety

Safety programs are an important element for insurance coverage as well. At the Aviation Insurance Association annual conference, Eric Barfield, vice chairman of the NBAA Safety Committee, highlighted some of the leading general aviation safety issues. A broker with Hope Aviation Insurance, Columbia, S.C., he advised clients not to keep a good safety training program hidden under a bushel but to pass it on to the underwriter through his broker. "All aviation insurance is negotiated," he stated, noting that if a formal, comprehensive safety management system is in place and active, "it does play a huge role in negotiating coverage and premiums."

A successful safety audit can also exert a downward influence on premiums, he continued. "Safety benefits everyone," Barfield continued. "A decrease in the light business aircraft accident rate will lower insurer payouts and ultimately work to reduce premiums and provide more favorable coverages."

Barfield reported that among the top 10 risk areas are runway excursions (see article on page 40), where an increased number of incidents is directly reflected in premiums. "The FAA has given a lot of attention to runway incursions, but more needs to be done to analyze and prevent runway departures," which he attributed largely to pilots not executing a go-around after an unstabilized approach. He concluded with an observation on professionalism: "Champions are made when nobody's looking." Joe Taccetta of Global Aerospace reviewed post-crash procedures from an insurance perspective. He pointed out that the insurer is the buffer between an airline or operator and the various government entities who become involved after an accident. He called the Environmental Protection Agency (EPA) "one of the more difficult agencies of the government with which you'll deal." He added that insurers must prepare for "...the litigation that is sure to follow."

Taccetta warned, "It may not be long before" those involved in or with an accident become subject to criminal prosecution in the U.S., as in Europe and Latin America today. He advised that at Global Aerospace "Our motto has always been, 'Do the right thing' regardless of expense" in caring for accident survivors and next-of-kin, adding that everything connected with post-crash activities has an effect on premiums.

-H.W.

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Sumwalt Stresses SOPs for Accident Prevention
In the cover story of this issue, NTSB member Robert Sumwalt explains the vital role of SOPs in preventing accidents. He emphasizes that SOPs are not just a set of rules, but a living, breathing part of a company's safety culture. Sumwalt stresses that SOPs should be clear, comprehensive, and readily available to all crew members. He also discusses the importance of training and discipline in ensuring that SOPs are followed correctly.

Safety Spotlight
This issue features a special report on the investigation of a recent accident. The report details the sequence of events leading to the accident, the findings of the investigation, and the actions being taken to prevent a similar incident from occurring. The spotlight also highlights the role of the NTSB in conducting thorough investigations and providing recommendations for improved safety.

Japan Publishes New Visual Departure for PWK
Japan will publish the new visual departure for PWK (Peach) at the end of this month. The new procedure is designed to improve safety and efficiency during departures from the airport. It includes specific instructions for pilots and cabin crew, as well as updated visual aids for passengers.