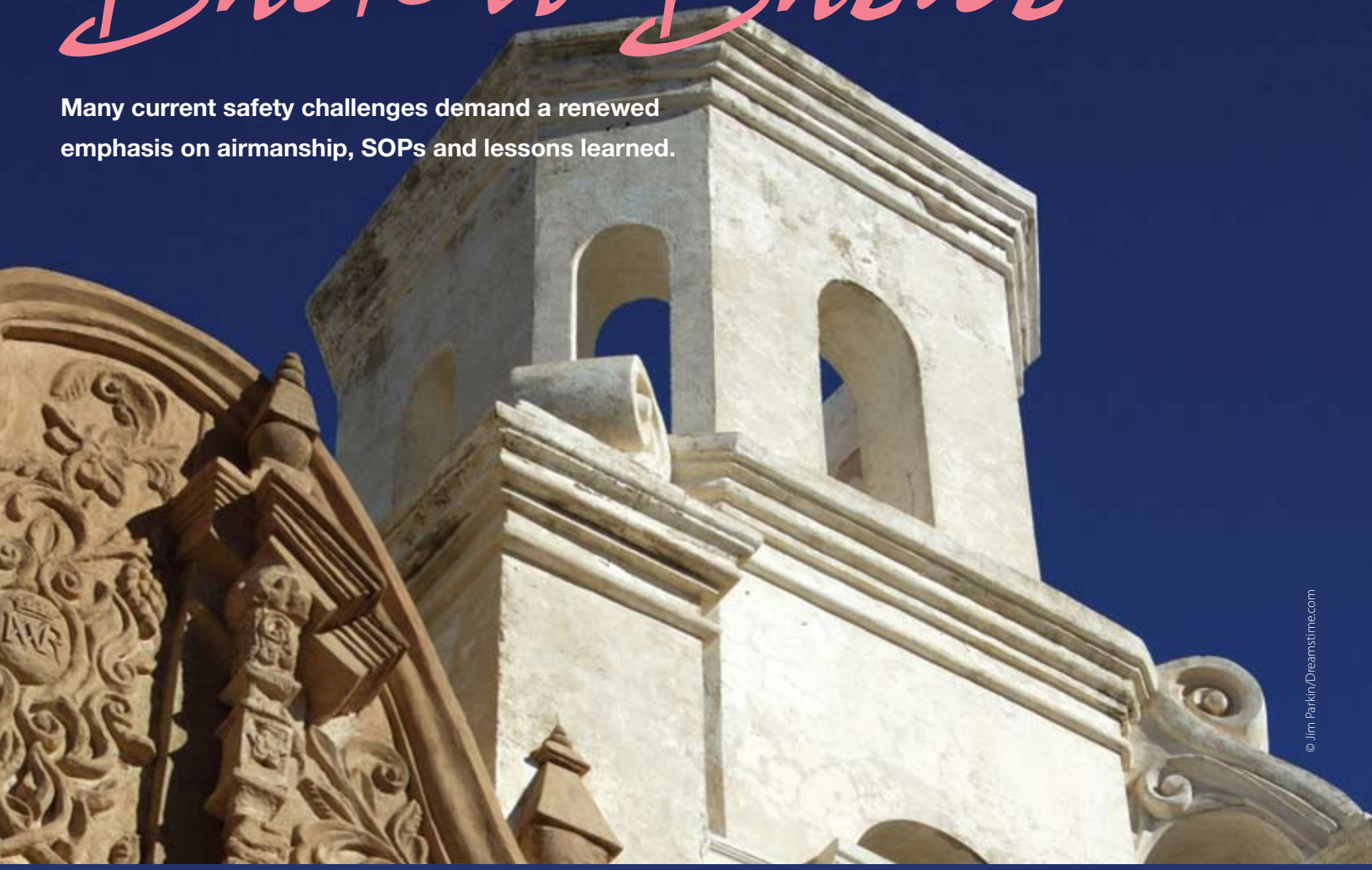
Back to Basics

Many current safety challenges demand a renewed emphasis on airmanship, SOPs and lessons learned.



BY RICK DARBY | FROM TUCSON

Several speakers at the 55th annual Corporate Aviation Safety Seminar suggested — to paraphrase Oscar Wilde — that to lose one airplane may be regarded as a misfortune, but to lose more looks like carelessness. Many recent accidents have been similar to others in the past that have been analyzed and from which lessons have been learned. But those lessons, incorporated into standard operating procedures (SOPs), are not always heeded. Moreover, some accidents continue to involve failures of basic airmanship.

John Cox, CEO, Safety Operating Systems, said that "loss of control in flight continues to be the number one cause of accidents in the commercial fleet. And unfortunately, the trend is not improving. It's static."

He discussed stall prevention on takeoff and during climb as well as loss of control in flight. "This is airmanship," he said. "This is something that people believe that you learn in primary flight school. The data are telling us that the lessons are not being learned. So we face a challenge, not only for the next generation of aviators but the generation of aviators in flight decks today."

Among maneuvering accidents, Cox said, the top category is stalls: "This is simple stuff. Don't get too slow, don't stall the airplane. You learn it in Piloting 101. But we continue to have that accident type. We're not adequately addressing this, and the statistics show it."

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Cox

Sumwalt

Cox cited a study that reviewed reports of accidents involving purpose-built business jets — that is, not airliner derivatives — worldwide from 1991 through 2007.[1] "Of the 389 reports found and analyzed, 59 — that's almost one out of seven — involved loss of control," he said. "Of 35 fatal loss of control accidents, we believe that, in 14, upset recovery training could have had a positive effect."

Cox said that an upcoming rewrite of U.S. Federal Aviation Regulations Part 121, subpart N, *Training Operations*, and subpart O, *Crewmember Qualifications*, has a very high likelihood of including upset recovery training as mandatory for air carrier pilots. "Why should we in corporate aviation be any different?" Cox asked. "And more important, why do we have to wait for a regulation?"

Analyzing some recent corporate aviation accidents, Robert Sumwalt, member, U.S. National Transportation Safety Board (NTSB), discussed causal factors in the fatal runway overrun accident involving a Learjet 60 at Columbia, South Carolina, on Sept. 19, 2008 (*ASW*, 5/10, p. 24).

Following tire failures, the captain hesitated, then rejected the takeoff at a speed greater than V_1. Sumwalt pointed out that U.S. Federal Aviation Administration (FAA) guidance in Advisory Circular AC 120-62, *Takeoff Safety Training Aid*, cautions pilots not to reject takeoffs at high speed because of tire failures.

In its report, the NTSB assigned as probable cause "the operator's inadequate maintenance of the airplane's tires, which resulted in multiple tire failures during takeoff roll due to severe underinflation, and the captain's execution of a rejected takeoff after V_1, which was inconsistent with her training and standard operating procedures."

Sumwalt then turned the audience's attention to Colgan Air Flight 3407, which crashed with a loss of 50 lives on Feb. 12, 2009 (*ASW*, 3/10, p. 20). The investigation found that the pilots violated basic cockpit discipline by engaging in nonpertinent conversation while neglecting important SOPs such as conducting an approach briefing, the descent checklist and the approach checklist.

The NTSB determined that the probable cause was "the captain's inappropriate response to the activation of the stick shaker, which led to an aerodynamic stall from which the airplane did not recover." The "flight crew's failure to monitor airspeed in relation to the rising position of the low-speed cue" was a contributory cause.

In-flight loss of control was not the only type of accident involving "lessons not learned" that attendees heard about during the seminar.

In his presentation titled "Reducing the Risk of Runway Excursions," James M. Burin, FSF director of technical programs, reported on a just-competed update of approach-and-landing accident data. "The top factors such as omission of action, poor professional judgment/airmanship and crew resource management deficiencies are still there. The order has changed slightly, but not much."

An aspect of approach and landing accident reduction that is not improving is runway excursions, Burin said. He said that the data support these conclusions:

- "Unstable approaches increase the risk of an excursion;
- "Crews will get away with not going around when they should 99 percent of the time. But most of the accidents are in that remaining 1 percent;
- "Contaminated runways increase the risk of excursions;
- "Combinations of risk factors increase the risk by more than their sum;
- "The aviation community has been searching for over 20 years for a universal standard of runway condition measurement and reporting. We need to stop searching and come up with something; [and,]
- "Good SOPs — and good adherence to SOPs — will reduce the risk of an excursion."

Burin said, "We found that many basics are forgotten — or maybe never learned. For example,

flying a stabilized approach *to include meeting all stabilized approach criteria* and touching down in the touchdown zone is a large risk reduction factor.

"But there are some basics besides flying a stabilized approach which need to be learned, or re-learned. Reverse thrust is nice on a dry runway, but it is critical on a contaminated runway.

"It was estimated that in 98 percent of landing excursions, the calculated stopping distance was before the end of the runway. Unfortunately, many excursions do not meet all the conditions the calculations are based on. If you calculate that you can land on a 9,000-ft [2,743-m] runway, then land one-third of the way past the touchdown zone — you just landed on a 6,000-ft [1,829-m] runway, and your calculations are no longer valid."

Stephen Charbonneau, senior manager, aviation safety and security, Altria Client Services, asked a relevant question: If stabilized approaches are SOP in every flight department and are the first line of defense against an approach and landing accident or runway excursion, "why do pilots continue to attempt to salvage unstabilized approaches?"

He cited four possible reasons: "Excessive confidence in a quick recovery; excessive confidence because of runway or environmental conditions; inadequate preparation or lack of commitment to conduct a go-around; or absence of decision because of fatigue or workload."

Stabilized landing criteria are derived from guidelines established by the FAA, manufacturer's performance certification data, safety research and empirical data gathered from review of corporate flight operational quality assurance [C-FOQA] reports, Charbonneau said.

"The criteria consider the effects of excessive height, airspeed, groundspeed, landing beyond the touchdown zone, and insufficient or ineffective braking. Each of the criteria will need to be met, within reasonable tolerances, in order for a landing to be considered as stabilized."

Keeping up with best safety practices is not only the responsibility of pilots. Management has its own part to play. W. Todd Chisholm, managing director, V2climb, pointed to the lack of widespread voluntary reporting systems in corporate aviation. The only widely recognized reporting program is the Aviation Safety Reporting System, maintained by the U.S. National Aeronautics and Space Administration, he said. However, "it is a program that typically collects minimalist reports but does not offer much usable output for operators," Chisholm said.

He urged business and corporate aviation to follow the lead of airlines. "Our segment of the industry is an anomaly for its failure to develop a just culture and formal voluntary safety reporting programs," Chisholm said. "In fact, while corporations continue to gain efficiency and improve safety through sharing of best practices, airlines are moving into the second generation of ASAP [aviation safety action program] where they will share information across the industry. Meanwhile, voluntary safety and operational reporting remains a foreign, if not threatening, concept to corporate aviation."

He recommended a process "to collect reports from corporate aviation operators, de-identify them, run root cause taxonomy and produce highly valuable insights. Broadly incorporating that program into corporate aviation safety management systems will allow other operators to identify hazards before experiencing them in a surprising operational situation. It is time for corporate aviation to recognize the safety opportunities offered by ASAP."

Adopting a program that has proven its worth in other industry segments will enable corporate aviation operators to "share experiences and leverage their lessons learned, so that the industry discovers how to mitigate risk before even recognizing the hazards," Chisholm said.

Cox of Safety Operating Systems summed up the overall corporate aviation situation: "We have work to do."

Note

1. Veillette, Patrick R. *Aviation Week & Space Technology*, May 6, 2009.

Charbonneau

Chisholm

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Photos: J.A. Donoghue