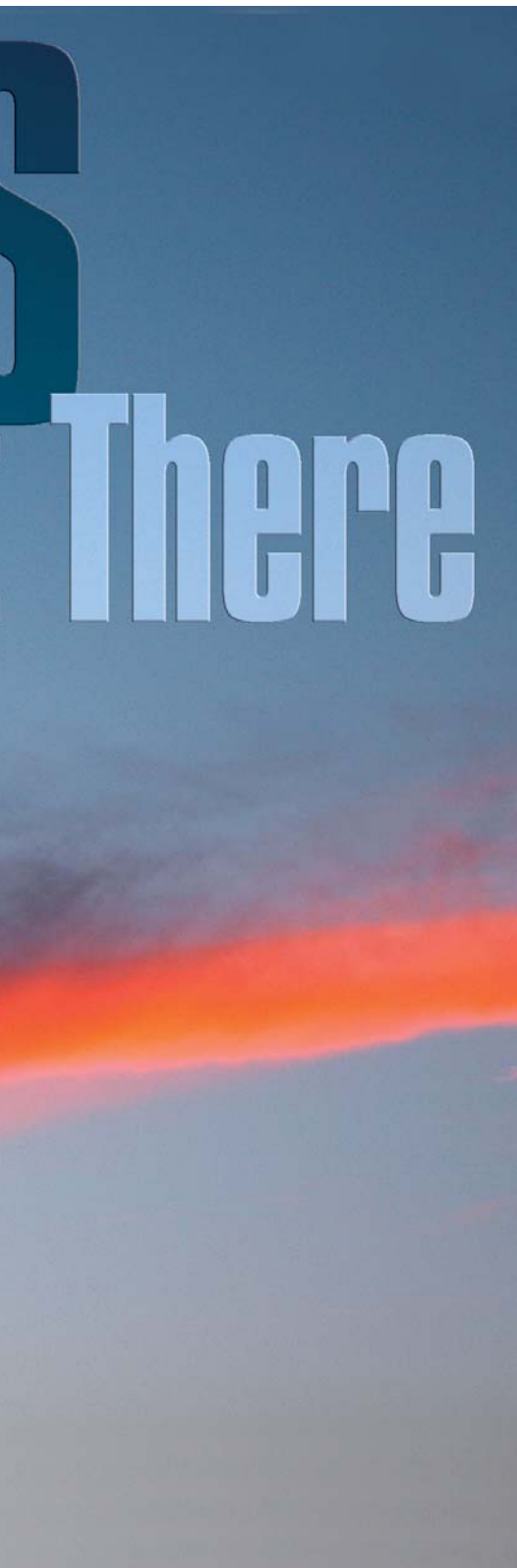# SAFER SKIES
We're Almost

Ten years ago, the U.S. government and the airline industry—including ALPA—set a goal of reducing the U.S. airline fatal accident risk by 80 percent by Sept. 30, 2007. How are we doing so far, and what lessons have we learned?

By Capt. Terry McVenes (US Airways), ALPA Executive Air Safety Chairman

There

W ithout receiving the fanfare it deserves, tremendous progress has taken place: In the last decade, the U.S. airline industry has reduced its rate of fatal accident risk by a staggering *76 percent*. That's a phenomenal achievement, especially considering that the last 6 years were marked by enormous upheaval in the U.S. airline industry, jumpstarted by the terrorist attacks of Sept. 11, 2001.

How did we achieve this dramatic reduction in the accident rate, and what have we learned in the process?

Safer Skies

All too often during the mid-1990s, U.S. airline accidents were headline news.

In April 1998, Vice-President Al Gore, Transportation Secretary Rodney Slater, and FAA Administrator Jane Garvey announced the creation of the Safer Skies Program in response to recommendations that the 1997 White House Commission on Aviation Safety and Security (the "Gore Commission") and

Capt. Terry McVenes represents ALPA members in safety and engineering matters within the airline industry; he oversees more than 600 pilot safety representatives from U.S. and Canadian 41 pilot groups, plus more than 200 ALPA Safety Structure projects.

the National Civil Aviation Review Commission issued in 1997. Safer Skies, they said, would be a major government/ industry effort to significantly reduce U.S. fatal aviation accidents—both

ALPA Members Who Have Been Representatives to CAST

Approach and Landing: Capts. Rick Williams (Delta) and John Long (US Airways)

Controlled Flight into Terrain: Capts. John Long (US Airways), Rob Wayne (Delta), and Rick Williams (Delta)

Loss of Control: Capts. Greg Bland (Comair) and Benny White (Delta), and F/O Steve Erickson (Northwest)

Runway Incursions: Capts. Alan Campbell (Delta), Marty Coddington (Express One, Ret.), and Mack Moore (United)

Turbulence: F/O Bob Massey (Delta) and Capts. Bob France (United) and Dan Stack (Northwest)

Remaining Risk: F/O Steve Erickson (Northwest)

ALPA Engineering and Air Safety Department staff members Chris Baum, Charlie Bergman, Joe Bracken, Kevin Comstock, Steve Corrie, Keith Hagy, John O'Brien, Bill Phaneuf, Corey Stephens, and Jerry Wright also served on a number of CAST JSATs and JSITs. O'Brien, then director of ALPA's Engineering and Air Safety Department, was one of three co-chairmen for the Runway Incursions JSAT and JSIT. And ALPA Communications Department staff participate in the CAST Communications Committee work. ✈

airline and general aviation—by 2007.

The specific goal for the U.S. airline industry was to reduce the fatal accident risk by 80 percent from the 1994–1996 baseline. For FY 2007, the FAA set a goal of a 3-year rolling average rate of 0.010 fatal accidents per 100,000 (1 in 10 million) departures by FY 2007. A second declared goal was to reduce the overall number of accidents per year.

Concentrating resources on the most prevalent causes of aircraft accidents, the Safer Skies initiative has used a disciplined, data-driven approach to find root causes of accidents and determine the

A Roadmap to the Future

ALPA's Air Safety Structure Steering and Oversight Committee (SOC) uses its own deliberate, data-driven process to develop ALPA's aviation safety priorities. The members of the SOC are the chairman of the Operations Committee, which is made up of the MEC central air safety chairmen from all the ALPA pilot groups; the chairmen of the five ALPA-wide technical groups; two MEC chairmen; a national officer; the Executive Air Safety Chairman (EASC); the Executive Air Safety Vice-Chairman; and administrative assistants to the EASC. The SOC establishes and funds project teams to work on these issues as appropriate.

These are current aviation safety project areas in which ALPA has been working and will continue to work:

1. Accident Investigation and Prevention

A. The end of **criminalization of accidents**
B. Industrywide **information sharing**
C. **Human factors** incorporated in **accident and incident investigations**
D. Flight Operations Quality Assurance **(FOQA)** and **ASAP** programs implemented and standardized
E. An Aviation Safety Action Program **(ASAP) for air traffic controllers**
F. "**Probable cause" removed** from NTSB methodology for investigating accidents and incidents

2. Aircraft Design

A. Improved **aircraft performance and operational parameters**
B. **Human factors** incorporated in the **design** process
C. Line pilot input provided to manufacturers during **new aircraft development**
D. Reduced risk of inflight **smoke, fire, and fumes**
E. Optimal design and use of **survival systems**

3. Air Traffic Capacity Initiatives

A. Safe operations on **closely spaced parallel runways**
B. Safe operations on **intersecting runways**
C. Line pilot input provided to development of NextGen, **the future U.S. air transportation system**
D. Reduced risk of encounters **with wake turbulence**

4. Cargo Safety and Dangerous Goods

A. **Accessibility of dangerous goods** improved/ensured on all-cargo airplanes
B. Safe transport of **lithium batteries**
C. A **single level of safety for passenger and all-cargo** airline operations
D. Reduced risk of **undeclared dangerous goods**

5. Appropriate Aviation Environmental Strategies Developed With Line Pilot Input

6. Reduced Pilot Fatigue

7. Pilot Training and Licensing

A. Line pilot input provided on proper use of **distance learning**
B. **Human factors** incorporated in **automation training**
C. Line pilot monitoring of implementation of **multicrew pilot license** (MPL)
D. Training on **threat and error management**

8. Runway Safety

A. Improved safety of operations on **contaminated runways**
B. Reduced rate and risk of **runway incursions**
C. Improved **runway safety margins**
D. Line pilot input provided to **modernizing airport infrastructure**
E. Line pilot monitoring of and input provided to improved **airport operations**

9. Safety Management Systems (SMS)

A. **SMS standards** developed
B. **SMS implemented** industrywide

10. Space-Based Communication, Navigation, and Surveillance

A. Wise development and use of automatic dependent surveillance-broadcast **(ADS-B)**
B. Improved **charting and instrument procedures**
C. Line pilot input provided in developing **RNAV/RNP** procedures and cockpit instrumentation
D. **Unmanned aerial systems** (UAS) not reducing safety in civil airspace ✈

JOCELYN AUGUSTINO

best actions to break the chain of events that lead to incidents and accidents.

Safer Skies consists of three teams with similar goals: (1) the Commercial Aviation Safety Team (CAST) deals with airline accidents; (2) the General Aviation Joint Steering Committee focuses on general aviation accidents; and (3) Partners in Cabin Safety, another joint government/industry group, has worked on child restraints, passenger seat belt use, carry-on baggage issues, and unruly passengers.

Six government agencies, including the FAA and Transport Canada; four employee groups, including ALPA and IFALPA; and eight organizations, including three manufacturers, representing the airline industry, form CAST.

How CAST works

The Safer Skies initiative uses a disciplined, data-driven, focused approach of

- analyzing past accidents and incidents,
- identifying accident precursors,
- developing specific interventions (sometimes called "mitigations") to address precursors,
- implementing the interventions,
- tracking the effectiveness of the interventions, and
- using knowledge gained from this process to improve the overall air transportation system.

CAST charters three types of working groups for in-depth analysis of the top accident categories. The working groups develop the "intervention strategies" and set priorities and coordinate plans for implementing and monitoring the effectiveness of the interventions.

Each of one type of working group, the Joint Safety Analysis Team (JSAT), performs an in-depth analysis of a particular accident category—e.g., runway incursions. Following a prescribed analytical format that has been validated

ALPA FOQA/ASAP Project Team

Capt. Hank Yaap (Alaska), Project Team leader
Capt. John Buchan (Continental)
Capt. John Parsons (Delta)
Capt. Dan Sicchio (US Airways)
Capt. Jim Smith (United)

Checklist for Success: What *You* Can Do

Besides continuing to maintain the highest level of professionalism and living out the ALPA Code of Ethics, what can you do as a line pilot and ALPA member to help reduce the rate and number of airline accidents and incidents? Plenty. Here's your checklist:

✓ Lobby for FOQA, ASAP, and SMS at your airline if you don't already have these important safety programs.

✓ Be involved—squawk the system! File ASAP and ASRS reports as appropriate, and pass your safety concerns and information to your local and central air safety chairmen.

✓ Volunteer to serve in the ALPA Air Safety Structure—maybe on your local council's air safety committee or as an ALPA airport liaison representative (ALR). The Association will train you and put you in touch with experienced ALPA safety reps who've been there and done that.

ALPA holds its 2-day Basic Safety School three times per year at various locations in the United States and Canada (this year, in San Antonio, Tex., Herndon, Va., and coming up in September in Vancouver, B.C.). The only prerequisites are to (1) be motivated to work on your MEC's aviation safety team (local air safety committee or central air safety committee) or the ALPA International aviation safety team and (2) have the approval of your MEC's central air safety chairman.

ALR training takes about 4 hours and is held the day after the Basic Safety School and at the same location. Completing the Basic Safety School is a prerequisite for attending ALR training. Again, your central air safety chairman must approve the training.

As Capt. Scott Schleiffer (Atlas), ALPA's Executive Air Safety Vice-Chairman, said in welcoming ALPA members to a recent session of the Association's Basic Safety School for new ALPA line pilot safety representatives, "Air safety work has purpose, and it is noble. Its promise is a demand for hard work, often on your own time, for which you will receive little credit. But if you want to look back at a phrase you helped change in the regulations, or a piece of technology you helped shape, or a checklist or philosophy of operations that you helped modify, or the myriad other things that ALPA safety reps have done over the past 75 years, then join us. You can always take a small measure of pride in your work."

To volunteer, contact your local air safety chairman or MEC central air safety chairman; call the toll-free ALPA air safety reporting line, 1-800-424-2470; or visit the ALPA members-only website, Crewroom.alpa.org, click on "Committees," then "Air Safety Committee," then "Volunteer," then "Whom to Contact."

JOHN PERKINSON

independently, the JSAT examines the chain of events leading up to each accident studied, then determines ways to intervene to break those accident chains. The JSAT then evaluates the intervention strategies for their effectiveness.

A separate working group, a Joint Safety Implementation Team (JSIT), determines the feasibility of the intervention strategies that a JSAT has recommended. Each JSIT also develops and recommends a plan of action for government and industry to follow to implement the recommended strategies.

Both JSATs and JSITs report back to

the full CAST, which has final review and approval authority over all reports and can ask for an independent validation of the conclusions.

Finally, Joint Implementation Monitoring-Data Analysis Teams (JIMDATs) monitor implementation of the safety interventions and suggest modifications to the safety strategy to CAST. Senior-level safety officials from the organizations that participate in CAST (including ALPA) attend regular meetings that are directed by CAST co-chairs from government and industry. These meetings, typically held in the Washington, D.C.,

There's Gold in Them Thar Reports

Who holds the key to driving down the airline accident rate toward the elusive goal of zero accidents? You!

Not *just* because you're strapped into one of the cockpit seats. Not *just* because you're the last line of defense against whatever accident precursors may be stacked up against you. But also because *you* know what's happening out there in the real world, and why. No one knows the down-and-dirty reality of life on the line like pilots, mechanics, flight attendants, dispatchers, air traffic controllers, and the other employees who keep our air transportation system running.

Okay, that's no surprise to *you*, working in the "trenches." But now we can even back up that ages-old worker gripe with statistics. Here are a couple that prove the point:

Some time ago, an ALPA pilot group of a legacy airline, plus the airline's management and the FAA, established a now mature Aviation Safety Action Program (ASAP) partnership—the nonpunitive safety reporting system for the U.S. airline industry. During a recent 2-month period, the pilot group contributed 106 reports. The airline knew about only nine of the events or issues from other sources; of those nine, the FAA knew about a mere five. So more than 90 percent of those reports were "sole source" —without them, the airline and the FAA never would have known the details or even the sheer number of events that, because of ASAP, triggered flightcrew members to put pen to paper.

By one internal ALPA estimate, with which FAA officials agree, the *average* ratio of sole-source to non-sole-source reports in a mature ASAP program is 16 to 1.

Why is this so important? Because the future of aviation safety is "data mining"—and your reports of real-life experiences are the nuggets that aviation safety professionals in the federal government, airline management, and ALPA are eager to mine.

FOQA and ASAP

Through the CAST process that the Safer Skies initiative engendered, we've learned how to dramatically reduce the rates of fatal airline accidents—e.g., installing enhanced GPWS in airlines practically eliminates controlled flight into terrain. But perhaps just as important, we've learned a *process* for preventing accidents that works.

CAST began its work by primarily looking closely at accidents from a several-year period, then added and looked at other databases, including those that deal with incidents. Now, especially, given that the accident database has been scoured pretty thoroughly, and precisely because accidents are relatively rare, the real gold is to be found in analyzing incident reports and other nonaccident data.

Flight Operations Quality Assurance (FOQA) programs have been tremendously illuminating. FOQA involves collecting objective data from a quick-access digital data recorder of many airplanes during regular line operations, then examining aggregate data on a number of different events to catch trends in operational safety.

With FOQA, you find out *what* happened—e.g., unstabilized approach; with ASAP, you find out *why*. No formal mechanism exists for putting together an ASAP report and the FOQA data for the same event, because of concerns about protecting the confidentiality of the data. However, *aggregate* data from an airline about, say, unstabilized approaches can be combined with *aggregate* data from ASAP reports to reveal what is happening in these un-stabilized approaches, and why. The combined "big picture" can reveal much.

When a pilot group, its airline, and the FAA begin an ASAP program, pilots tend to send in reports primarily because of the reporting incentives—i.e., if the report is accepted into the program, the reporter is assured that no company discipline or FAA enforcement action will result. After the pilot group has seen the program in action, and the airline gives the pilots feedback about reports received and changes that were made to fix problems, pilots begin to submit the sole-source reports that are the real nuggets of an ASAP program.

Here's an example of a sole-source nugget: A flight crew became distracted during preparation for a demanding departure. Multiple distractions, along with compressed taxi time, caused the pilots to fail to set the flaps for takeoff. Although the pilots had responded to the checklist by stating the proper flap setting, they had not, in fact, checked the actual flap position.

On takeoff, at about 100 feet AGL, the stickshaker activated. The first officer immediately recognized that the flaps were up and lowered the flaps to the takeoff setting. The pilots were able to recover the airplane without losing altitude and continued their demanding departure. The aural "configuration warning" alert had not sounded when the flightcrew advanced the thrust levers because a circuit breaker had opened without the pilots' knowledge.

Later, the flight crew submitted a very detailed ASAP report on their no-flap takeoff. The ASAP Event Review Committee explored the human factors issues leading to the event. The ERC also felt that offering the opportunity to the pilots to "get the event off their chests" would help the crew reach closure.

Because of the safety culture at that airline, the event helped to solidify the ASAP's status as a method of reporting a significant safety issue without fear of being identified or punished. And because of the courage of this flight crew in coming forward with their sole-source report, a previously unknown weakness was discovered. The airline added a "takeoff warning" check to verify functionality of the warning system before takeoff; this previously was not part of the SOPs for that fleet.

More data-sharing needed

To bring FOQA and ASAP programs to the next level, we have to share with each other the safety information we

learn at our individual airlines. This will help us further identify issues and help all of us allocate our resources better to reach the ultimate goal of zero accidents.

The majority of that work has been done on two Aviation Rulemaking Committees (ARCs)—one for FOQA and one for ASAP. These two ARCs were first established in 2001 and have worked through numerous issues, such as development of the FOQA and ASAP Advisory Circulars. The ARCs have advised the FAA on FOQA and ASAP policy matters and most recently developed the process for sharing information among airline industry stakeholders. All segments of the airline industry have been very active in these efforts and have maintained key leadership positions on both ARCs.

Can we really develop a system that will get us to our goal of an accident-free air transportation system? Doing so will require creating real change—building the technology and processes from the vision of that final state, and building *trust* by developing ongoing safety data-sharing efforts.

Building/sustaining trust
That's one reason why it was so important that ALPA safety representatives met in May with senior FAA officials and agreed to new language to replace earlier changes that the FAA had made to the agency's generic memorandum of understanding (MOU) that defines how airlines, employee groups, and the FAA set up and run an ASAP. The earlier unilateral changes delayed implementation of new ASAP programs for a number of ALPA-represented pilot groups.

The FAA agreed to remove the confusing language from the generic ASAP MOU. The agency also agreed to brief its inspectors and certificate management offices immediately about these changes.

In recognizing the need to revise these earlier changes, the FAA

ensured the continued viability and effectiveness of these programs to the benefit of the traveling public.

This agreement should pave the way to implementing ASAP programs for ALPA pilot groups at U.S. airlines that currently don't have an ASAP, including FedEx and Delta.

We also reached agreement in principle to establish an industry

The Event Review Committee at United Airlines brings management, ALPA, and the FAA together to discuss ASAP reports.

working group to deal with future ASAP policy matters. This will require some further discussion, but ASAP has the support of others in the airline industry, including the Air Transport Association and the Regional Airline Association.

Our efforts to spread the gospel of FOQA and ASAP—plus the safety management system (SMS) concept, the umbrella that covers these and other risk-management efforts and makes the business case for safety—have not been without potholes on the road to success.

Some airline managements and FAA officials have been very receptive and appropriately flexible in implementing these programs; others, less so. But that's why ALPA continues to promote FOQA and ASAP programs and monitor them closely at each airline whose pilots we represent.

The future of aviation safety is data-mining, and the stakes are huge. That's why ALPA is in this game for keeps. ✈

area, set overall policy and charter and oversee the activities of the JSATs, JSITs, and JIMDATs.

CAST results
So what has come from all those long meetings in windowless rooms (including some ALPA hosted in its Washington, D.C., and Virginia offices)? Plenty!

After agreeing on a short list of the 1990s'"big killers"—controlled flight into terrain (CFIT), approach and landing accidents, loss of control, runway incursions, uncontained engine failures, and turbulence—CAST created JSATs (and later JSITs and JIMDATs) for each. Later, they established a category, "Remaining Risk," which includes cargo loading, ground deicing, maintenance, and midair collisions.

To date, CAST has developed a consensus list of 47 near-term and 18 long-term interventions. Some call for mandating new equipment and technology. Some set new design and certification standards. Some cover procedures and training. Some involve new ways of communicating information.

By now, 10 years after CAST began, 40 of the 65 interventions have been completed. The other 25 are under way. And CAST's work is not done—the government/industry team continues to refine its work on U.S. aviation safety and has begun broadening its outreach to the international aviation community.

So CAST has been an impressive success, and ALPA remains an enthusiastic participant in the process.

Meanwhile, one final group deserves a standing ovation for its contribution to this tremendous achievement—the line pilots who have continued to make the U.S. and Canadian air transportation systems work, day after night after day. Despite all the slings and arrows that fate has flung your way during the last several years, you have helped achieve this superlative improvement in safety.

My hat's off to every one of you.

To learn more about CAST and to examine the complete list of 65 CAST safety interventions, visit www.cast-safety.org. ✈