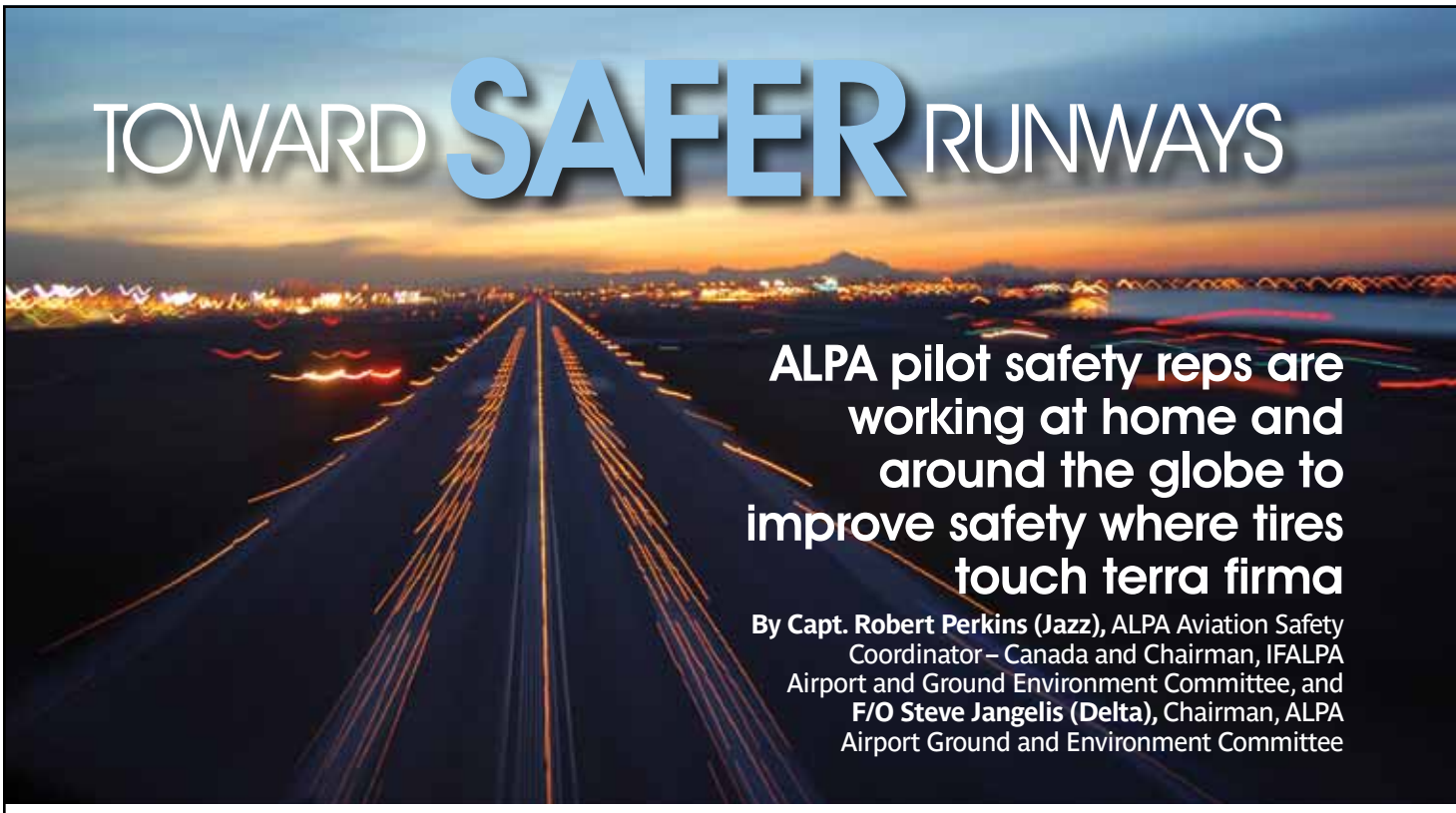

TOWARD SAFER RUNWAYS

ALPA pilot safety reps are working at home and around the globe to improve safety where tires touch terra firma

By Capt. Robert Perkins (Jazz), ALPA Aviation Safety Coordinator – Canada and Chairman, IFALPA Airport and Ground Environment Committee, and **F/O Steve Jangelis (Delta),** Chairman, ALPA Airport Ground and Environment Committee

All airplane flights that don't end in an accident begin and end on a runway of some kind. So do some that *do* end in accidents.

That's why runway safety has been on the U.S. NTSB's "Most Wanted List" of safety improvements for years (for 2013, the board broadened "runway safety" to "airport surface operations"). And it remains one of ALPA's ongoing top safety concerns.

Runway safety touches every ALPA technical group—Accident Analysis and Prevention, Air Traffic Services, Aircraft Design and Operations, Airport and Ground Environment, Human Factors and Training, and Aviation Sustainability and Environment. It involves airport design and maintenance, pilot training, operations, air traffic control, aircraft design, and more.

Runway Safety Council

ALPA continues to be involved on several fronts in efforts to improve runway safety. The FAA's Runway Safety Council (RSC), a government-industry group created in 2008 in which I [Jangelis] am seated as the only representative for transport-category pilots, makes recommendations to all stakeholders regarding best practices and how to prevent future runway incursions. I [Jangelis] am also the industry co-chairman of the Root Cause Analysis Team (RCAT), which forensically breaks down runway incidents and forms recommendations and prevention theories based on root causes. These findings are then forwarded to the RSC, which then decides if the recommendations are worth pursuing and can be implemented. We have been actively pushing to expand the scope of the RSC to include excursions and other airport surface operations safety issues.

Meanwhile, here are a few recent takeaways from the council's work:

- The council fully supports the FAA guidance regarding "line up and wait" instructions: If you've lined up on the runway for takeoff and do not receive a takeoff clearance within 90 seconds, query ATC.
- ASAP and ATSAP (the air traffic controller self-reporting safety program) reports are showing a continuing need for pilots and controllers to use standard phraseology and to read back clearances precisely.

Runway Safety: **ALPA Policy**

ALPA policy regarding runway safety includes Association support for

- grooving runways "to maintain the runway friction coefficient at the highest levels and improve directional control capability on wet and slippery runways."
- installing runway distance-to-go markers at airports served by airlines.
- an approved visual glideslope indicator (VGSI) system with PAPI being the current international VGSI standard.
- lighted wind socks, of standardized size and shape, at the approach end of each runway.
- installation of overrun deceleration systems—not to justify reducing certificated runway length, but as a substitute for a standard runway safety area (RSA) where the standard RSA "is precluded by water, wetlands, or other impediments."

—Capt. Robert Perkins and F/O Steve Jangelis

CANADA REPORT

Work in Canada on runway safety continues on a number of fronts

In 2005, NAV CANADA proposed to other Canadian aviation stakeholders that a national interdisciplinary forum be formed to exchange information on runway safety. As a result, the Runway Safety and Incursion Prevention Panel (RSIPP) was created in 2006. The mandate of the panel is to provide a national forum for exchanging safety-related information with the aim of promoting runway safety and reducing risk. Chaired by NAV CANADA, RSIPP meets at least three times per year.

RSIPP has launched a number of initiatives to prevent runway incursions and excursions. For example,

- ATC phraseology was changed from "taxi to position" and "taxi to position and wait" to International Civil Aviation Organization (ICAO) standard phraseology, "line up" or "line up and wait."
- NAV CANADA asked pilots to provide a complete readback of all taxi clearances that include "hold" or "hold short."
- Controllers now clear pilots to either "cross" or "hold short of" any runway they will cross while taxiing.
- NAV CANADA now depicts "hot spots" (i.e., surface locations that are known to be confusing) on airport charts.
- Airport Surface Detection Equipment (ASDE) has been installed at more Canadian airports.
- Use of stop bars at Toronto's Pearson International Airport has been expanded.
- Local runway safety teams or committees are active across Canada.
- NAV CANADA is exploring new surface detection technologies such as tracked video and implementing enhanced surveillance using multilateration fused with surface movement radar.

I am heavily involved in work through ICAO to include the runway status light (RWSL) system in Annex 14, from which Canada draws its own regulations regarding airport infrastructure.

Unfortunately, Toronto Pearson International Airport (CYYZ) has delayed plans to install four Engineered Materials Arresting System (EMAS) beds—three at the western end of each of the east-west runways and one at the east end of Runway 06L. The airport management shelved the EMAS plan after learning of an alternative product on the market (see "Crushable Concrete—or Recycled Glass?" page 22). In our view, we already have a proven, tested system available in EMAS; improving runway safety shouldn't have to wait for years of testing of a potentially questionable product.

Also, Transport Canada is undertaking a risk assessment of its own regulations on runway end safety areas (RESAs) and is expected to change the current rules to something more restrictive. While CYYZ's decision to delay installing EMAS beds is disappointing, the airport management has assured ALPA that they are currently in compliance with Canadian regulations and that if those change, they will bring CYYZ into compliance with the new rules.

Regarding runway condition reporting, Canada continues to use the Canadian Runway Friction Index (CRFI) system. While it is a good system, it is not "officially" available to non-Canadian flight crews. Instead, work continues on a number of different approaches to provide runway friction measurement information to pilots around the globe. This makes it more difficult for Canadian pilots operating in foreign countries and for foreign pilots (including U.S. pilots) operating in Canada.—*Capt. Robert Perkins*

- During Fiscal Year (FY) 2012, the United States saw a large spike in Category A and B (most serious) runway incursions, but this has been attributed to changing the reporting metrics.
- Flight simulator visual scenes must be updated as runway construction changes the surface of the airport.

A number of runway excursions have involved the lack of timely, accurate information about runway condition being provided to the pilots. So we've reemphasized to our airport management friends the importance of pilots receiving timely, accurate runway condition reports.

Another issue: In FY 2012, 17 airplanes (general aviation and air carrier) took off from or landed on closed runways in the United States. In response, the FAA is developing a closed runway operation prevention device (CROPD) that uses voice recognition technology to listen for takeoff or landing clearances to a closed runway. For example, if Runway 30 was closed and traffic was landing to the north, a pilot or controller transmitting "cleared to land Runway 30" would trigger an automated system to broadcast in the tower cab and the tower controller's headset, "Runway 30 is closed," until reset. The ALPA Airport and Ground Environment (AGE) Group will participate in operational testing of CROPD as it is being developed.

International efforts

While U.S. and Canadian pilots have governments that mandate some of the critical components of runway safety at major airports—good navaids and runway cleaning to remove accumulated contamination (and in the United States runway grooving and runway safety areas)—work remains to be done in both the United States and Canada to improve runway safety. And the need for improvement is even greater overseas, particularly in the area of runway excursions, which have occurred with alarming frequency outside of North America.

A lot of activities are going on around the world, with manufacturers, airport operators, regulators, and other stakeholders all working toward the same goal—improved runway safety. For example, the International Federation of Air Line

IFALPA is trying to get the runway status light (RWSL) system added to the ICAO manual and is succeeding. But RWSL isn't appropriate or necessary for every airport, and it's expensive.

Pilots' Associations (IFALPA) has been working closely with the International Air Transport Association and other stakeholders in presenting the International Civil Aviation Organization (ICAO) regional seminars on runway safety. To date, ICAO and co-hosts have held seven such seminars around the world; four more are scheduled for 2013.

Unfortunately, improving runway safety costs money. And in today's economic environment, it can be difficult to get government expenditures for this purpose.

For example, IFALPA is trying to get the runway status light (RWSL) system added to the ICAO manual and is succeeding. But RWSL isn't appropriate or necessary for every airport, and it's expensive.

Charles de Gaulle International (Paris, France) and Tokyo Narita are installing systems that should be operational by next year. Adding RWSLs to the ICAO manual is needed to ensure that we have a common standard to prevent pilots from needing to understand and use several different systems.

Crushable Concrete—or Recycled Glass?

To help mitigate the potentially severe consequences of a runway overrun, the FAA approves use of an Engineered Materials Arresting System (EMAS) (see FAA Advisory Circular 150/5220-22A), which is composed of frangible, aerated concrete blocks designed for safely stopping transport-category airplanes without significant damage or injuries to occupants in the event of a runway overrun. EMAS beds are installed beyond the end of the runway, typically for runways without adequate runway safety areas (RSAs). The arrestor beds are designed to safely slow and stop an overrunning airplane by exerting uniform deceleration forces on its landing gear, without causing structural failure, as the collapsible EMAS material crushes beneath the airplane's tires. The system operates independently of runway friction conditions and airplane braking action and works well in all weather conditions.

ESCO/EMAS

The EMAS installation at Greenville (South Carolina) Downtown Airport.

EMAS is installed on 55 runway ends worldwide. Of those installations, 51 can be found at 35 airports in the United States, where many more sites are under consideration.

Since 1996, there have been seven uses of EMAS beds worldwide, all of which have been in the United States, undoubtedly saving numerous lives and preventing serious injuries and airplane damage. Successful arrestments have involved a wide variety of airplane types ranging from small jets and turboprops to widebody freighters. One of the proven benefits of the EMAS system is that almost all of the airplanes that have used it have returned to service within 24 hours of the excursion; the crushable concrete material can be easily flushed from engines with water.

However, during an August 2011 meeting of the FAA Research, Engineering, and Design Advisory Council (REDAC), a government-industry group, we were briefed on a new entrant to this market. The FAA announced that it had established a Cooperative Research and Development Agreement with Norsk GlassGjenvinning (NGG) in Norway to test and evaluate an EMAS concept called Glasopor. This system involves a bed of chunks of recycled glass, reconstituted into a material similar to volcanic pumice, which then is covered by a sheet of solid material.

To date, as far as we know, Glasopor has never been installed at any airport in the world, and neither the FAA nor anyone else has subjected Glasopor to rigorous testing. We are concerned that, given the abrasive nature of the bed material, deploying aircraft emergency evacuation slides onto Glasopor, especially in windy conditions, might cause the material to abrade the slides until they deflate. We have communicated clearly to the FAA that, per ALPA policy, any type of arresting bed material must be rigorously tested—especially for abrasiveness, flammability, and FOD risk to engines.—*Capt. Robert Perkins and F/O Steve Jangelis*