

ISASI FORUM

“Air Safety Through Investigation”

OCTOBER–DECEMBER 2008



**This issue is devoted to
ISASI 2008 events**



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A replica of the Silver Dart as it hangs suspended from the customs clearing hall in the Halifax Stanfield International Airport. ISASI 2008 used the aero plane in its seminar logo to commemorate its history and its 100th anniversary construction date. Photo: E. Martinez



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Welcome to Metro Halifax and to ISASI 2008!

By Frank Del Gandio, ISASI President



(President Del Gandio's September 9 opening remarks to the delegates of ISASI 2008 have been abbreviated. His entire presentation is available in ISASI Proceedings 2008, which will soon be placed on the ISASI website at www.isasi.org.—Editor)

Our theme is “Investigation: The Art and Science.” Most people would agree that the science of accident investigation is better than ever.

Today, we routinely apply precise data from digital flight data recorders, quick access recorders, GPS and radar overlays, onboard voice recorders, FADECs, and so on. Even the once-humble general aviation aircraft may offer some onboard data, GPS data, or FADEC and trend monitors.

Given all the science available to us today, does art really continue to play a role? The short answer is, “yes.” Accident investigation continues to be a mix of art and science. Just ask anyone who visually scans an accident site or anyone who converts the digital data to an animated simulation; we know fairly precisely what the various parameters are, but we do not necessarily know what the airplane was really doing, or what was happening during the fractions of seconds between recordings.

At each of our annual seminars, I briefly note the major accidents of the preceding year to remind us that there is still work to do. Though some major accidents occurred in the 12 months since we met in Singapore, the past year has been a good year for aviation safety. By my count, we had 12 fatal accidents, and 8 major fatal passenger accidents. Once again, carriers from Africa and central Asia accounted for a disproportionate share of those accidents, but the good news is that we had just one major accident in air carrier passenger operations in the 30 Organization for Economic Cooperation and Development (OECD) countries, plus China and India. Those 32 countries account for about 90 percent of all air carrier operations in the world.

One of the year's most significant accidents in those 32 countries was the non-fatal B-777 accident at Heathrow. When I first heard that both engines had lost partial power at essentially the same time after a long flight from Beijing to London, I thought to myself, “Let me guess, they were running out of fuel.” Well, it turned out to be much more complex and more instructive. The B-777 investigation is a good example of the marriage between art and science, and of the international character of aviation accident investigation. The aircraft took off from China, flew a third of the way around the world, and crashed in the air carrier's home country in an aircraft that was certified in a third country.

In short, our profession will always remain at the front line of accident prevention, whether we investigate well-understood

accident scenarios or new and complex scenarios.

Before I close, I want to make a few comments about our hosts. Ten years ago last Tuesday, 229 people died in the Swissair Flight 111 accident in ocean waters just a few miles from here, near Peggys Cove. Recalling that crash reminds us about the skill and professionalism shown by the Transportation Safety Board of Canada in a very complex investigation. It also taught us something about the people of Peggys Cove and of Nova Scotia. The accident occurred at 9:30 at night. Yet, in the darkness, scores of local fishermen and other boat owners voluntarily accepted real

Our profession will always remain at the front line of accident prevention, whether we investigate well-understood accident scenarios or new and complex scenarios.

risk to themselves in setting out to rescue any survivors. The accident was non-survivable, but that does not diminish the deep-felt concern displayed by the local would-be rescuers. (See “Remembering Swissair Flight 111,” page 22.)

Also, let's not forget the Sept. 11, 2001, aviation tragedy. In addition to the trauma associated with those events, we Americans were again reminded of the skill and the generosity of the Canadian people, particularly the people of eastern Canada.

When the U.S. closed its airspace that day, 39 aircraft and 6,000 to 7,000 passengers and crew were diverted to Gander in New Foundland. Nearly as many passengers were diverted to Halifax International Airport. In both communities, the local people showed incredible generosity.

The story in Gander was especially impressive. A community with perhaps 2,500 homes had to figure out—and quickly—what to do with 7,000 unexpected guests. Their answer was wonderfully simple: local people opened their homes to give shelter and feed and even entertain all 7,000 people for several days, and at no small expense to residents. The hospitality was impressive in Halifax, as well. But, after what we saw at Peggys Cove several years earlier, we really should not have been surprised. Once again, words like decency and kindness come to mind.

Finally, I will remind everyone that whatever your particular interest may be in aviation safety or accident investigation, one or more people in this room will know all there is to know about the topic. I urge everyone, but especially any students or young aviation professionals who have joined us here today, to take advantage of the wealth of knowledge and experience that is in this room. I also urge everyone to participate actively in the seminar and to share your considerable expertise with anyone who seeks it out. ♦

ISASI 2008 Speakers Meld Investigation Art, Science



In aggregate, the 24 technical papers presented at ISASI 2008 validated selection of the seminar's theme: "Investigation: The Art and the Science."

By Esperison Martinez, Editor

Many of the ISASI 2008 attendees, all aviation devotees, who passed through customs at the Halifax Stanfield International Airport may have felt a twinge of awe or, at the minimum, surprise, when after departing from the aircraft, traversing the muted terminal passageway into the cavernous custom clearing complex, the first thing that struck their sight was a full-sized fabric and wood bi-wing aero plane suspended from the ceiling. Emblazoned under the aircraft was a sign declaring "Welcome to Nova Scotia," almost as if the display was directed to arriving ISASI 2008 delegates. The biplane was a replica of the Silver Dart, which made the first controlled power flight in Canada and the British Empire, and which ISASI 2008 chose to honor in recognition of its 100th anniversary construction date (see "Silver Dart Salute," page 16).

Photos of ISASI 2008 seminar activities are available for viewing online at isasi.org. (Photo link is found in ISASI 2008 promotion box.)

By any measure, ISASI's 39th annual international conference on air accident investigation was a success. With the theme of "Investigation: The Art and the Science," the event drew 284 air safety investigators, instructors, regulators, students, and other aviation safety professionals from 33 countries. Not only were they all treated to an excellent program, but the venue location and conference accommodations also lent an ease to the Monday through Thursday program, which began on September 8 with two 1-day-long tutorials.

Held at the Halifax Marriott Harbourfront Hotel, Halifax, Nova Scotia, the conference was provided ample space to conduct its ranging list of activities that included, in addition to the tutorials, a technical seminar, morning and noon meals, coffee networking times, a welcome reception, ISASI society and chapter meetings, and an awards dinner that seated nearly 300 persons.

And for those precious few evening hours when a delegate could shed the conference seat, the hotel—sited smack on the Halifax Bay waterfront's Harbour Walk—allowed one to stroll a line that flows through the history of its waters: privateers, pre-settlement fishermen, 1749 colonization, immigration administration, Titanic rescue efforts, and a good many more absorbing events.

The air accident investigation conference was organized and presented by the Canadian Society of Air Safety Investigators (CSASI). Barbara Dunn, Society president, served as chairperson of the ISASI 2008 committee. Other members included technical program, Jim Stewart and Nick Stoss; sponsorship, Ron Schleede and Joe Jackson; companion program, Gail Stewart and Paula Demone; and seminar registration, Sharon Morphey and Gary Morphey.

Halifax was selected as the conference location because of its strong civil and military aviation history coupled with its role in the development of transatlantic and international civil aviation. Two significant anniversaries occurred during the conference's duration: the 10th anniversary of the Swissair Flight 111 crash in the waters off Nova Scotia on Sept. 2, 1998, and the terrorist attacks of Sept. 11, 2001, on the twin towers of New York City. In both instances, citizens of those townships just outside Halifax performed extraordinary voluntary rescue and hospitality services to those involved in the aftermath of the events. (See "Remembering Swissair Flight 111," page 22 and "President's View," page 3.)

During the opening ceremonies, President Del Gandio introduced C. Donald (Don) Bateman, the selectee for the 2008 Jerome F. Lederer Award (see "C. Donald Bateman Receives Lederer Award," page 14). Also introduced were the winners of the 2008 ISASI Rudolph Kapustin Scholarship: Catherine Rae T. Ricafort, USC; Micheál Ryan, University of Limerick; and Jennifer Gritton, ERAU (see "Council Names Three 'Kapustin' Scholars," page 18).

His opening remarks welcomed all to metro Halifax and thanked "Our hosts, the Canadian Society of Air Safety Investigators. I



During the 2-day registration period, 339 people registered to participate in some part of the seminar.



ABOVE: Tutorial 1 morning speakers panel, left to right, D. King, panel moderator; H. Mawji; J. Gadzinski; and B. Fisher.
ABOVE RIGHT: Tutorial 2 afternoon speakers panel, left to right, T. Baker, H. Harris, and A. Lemishko.



LEFT: Tuesday morning panel, left to right, A. Bouillard, A. Desjardin, T. Crowch, and M. Walker. **ABOVE:** Thursday afternoon panel, left to right, A. de Kock, R. Wever, and F. Hilldrup.
BELOW: Delegates in assembly at ISASI 2008.

give special thanks to the president of the Canadian Society, Barbara Dunn, who has organized more annual seminars for ISASI than any other member. Special thanks also to Jim Stewart and Nick Stoss for organizing the technical program, to Gail Stewart for organizing the companion program, and to everyone who helped to organize yesterday's tutorials. Lots of other people deserve thanks as well, but I will ask their forgiveness if I simply move onto the seminar." (See "President's View," page 3.)

His talk recapped the great benefit technology and science have brought to the reduction of aircraft accidents and noted how "accident investigation continues to be a mix of art and science." In speaking about the accident rate for the past year and some of the ensuing investigations, he said: "Our profession will always remain at the front line of accident prevention, whether we investigate well-understood accident scenarios or new and complex scenarios."

In concluding his talk, President Del Gandio spoke of the tremendous investigative effort put forth by the Transportation Safety Board of Canada and the humanitarian efforts by citizens of the maritime provinces in the aftermath of the Swissair Flight 111 crash, and of the massive show of hospitality Canadians demonstrated when thousands of passengers descended upon their cities following the grounding of 39 aircraft in the wake of the terrorist



attacks on Sept. 11, 2001.

Wendy Tadros, chair of the TSB of Canada, gave the seminar's opening keynote address. In speaking of advancing aviation safety one investigation

at a time, she said, in part, "I want to talk to you about the science behind some key TSB investigations and the contribution they have made to aviation safety worldwide. In particular, I want to talk to you about our Morningstar and Air Transat investigations, which have resulted in positive change, thanks to solid investigative work and prompt action by regulators and industry in Canada and abroad.

"I also want to practice the gentle art of persuasion and talk in more detail about MK Airlines, Air France, and Swissair. These are three investigations where we would like to see greater uptake of our recommendations. With your support, together we could make air travel even safer." (See "Advancing Aviation Safety One Investigation at a Time," page 10.)

Speakers and Technical Papers Presented at ISASI 2008

SEPTEMBER 9

Welcome Remarks:

Frank Del Gandio, President ISASI

Keynote Address:

Wendy Tadros, Chair, Transportation Safety Board of Canada

DHC-6 Twin Otter Accident off the Coast of Moorea French Polynesia

Alain Bouillard and Arnaud Desjardins, BEA, France

SW111 and the Modi-Plus Modification

Timothy Crowch, Advanced System Safety Management, Switzerland

Causation—What is it? Does it Matter?

Michael Walker, ATSB, Australia

Investigator's Culture Issues

Wen-Chin Li, Asst, Professor, National Defense University, ROC

International Investigative Support

Syed Naseem Ahmed, Technical Investigator, Pakistan CAA

Learning from Others

Graham Braithwaite, Head, Department Air Transport, Cranfield University, UK

Investigation—A Complete Service?

Philip Taylor, Senior Inspector of Air Accidents, AAIB, UK

SEPTEMBER 10

Silver Dart

Capt. Jerry Davis, ALPA Canada

Modelling the Investigative Process

Bruce Coury, Transportation Research Analyst, NTSB, USA

Weather Risk Management

John Dutcher, Aviation Consultant, and Mike Doiron, Aviation Consultant, Canada

Applying HFACS to Major Accident Investigations—A Report

Yukiko Kakimoto, NPO, Aviation & Railway, Japan

Exploring Cockpit Conversations

Noelle Brunelle, Product Safety Team Leader, Sikorsky, USA

Cockpit Information Recorder

Roy Fox, Chief, Flight Safety, Bell Helicopter Textron, USA

Occurrence Site Survey

Michael Guan, Director Investigation Lab, ASC, Taiwan

Gas Turbines & Ice—

The Mysterious Culprit

Al Weaver, Instructor, SCS, USA

Turbine Engine Risk Management

Richard Greenwood, Flight Safety Investigator, Pratt & Whitney, USA

SEPTEMBER 11

What is SMS?

Michael DiLollo, Executive Vice-President, Transat Tours Canada

Analyzing General Aviation Accidents

Bob Matthews, Senior Safety Analyst, FAA, USA

Reducing the Helicopter Accident Rate

Jack Drake, Aviation Safety Consultant, USA

Investigating Organizations with SMS

John Gadzinsky, Safety Chairman, SAPA, USA

Unmanned Aircraft Systems

Tom Farrier, Senior Analyst, ASOAS, USA

Occupant Protection

Nora Marshall, Investigator, NTSB, USA

Presented by Frank Hilldrup

Analysis—Evacuation Slide Problems

Gerard van Es, Senior Consultant, NLR, Netherlands

Presented by Rombout Wever

Accident Prevention &

Investigation ICAO

Andre de Kock, ICAO ♦

Tutorials

Nick Stoss, tutorial coordinator, said that the tutorial sessions also followed the seminar theme and added that 121 persons attended tutorial 1 and 71 tutorial 2. Tutorial 1, in presenting “Conducting Safety Investigation in a Safety and Management Systems (SMSs) Environment,” posed this quandary for discussion: “As the aviation industry, worldwide, starts to embrace the concepts of SMS, many are still wondering whether this new approach (which includes confidential and non-punitive reporting, fewer regulatory audits, and greater reliance on companies auditing themselves) will be beneficial in advancing safety, or will such an approach actually result in greater risks and potentially more accidents?”

The nine speakers who filled the three segments of the day-long session offered answers to these questions: “What will the impact of SMS be on safety investigations?” “How do we investigate under the shadow of SMS?” Speakers included—Session 1: Bryce Fisher, TSB Canada; Hanif Mawji, Transport Canada; John Gadzinski, SWAPA; Dave King, UK AAIB (panel moderator). Session 2: Nick Seemel, ALPA and Air Canada Jazz; Larry Lachance, NAV CANADA; Jacques Mignault, Air Transat; Thomas Dodt,

Boeing (panel moderator). Session 3: Christopher Courtenay, Airbus; Bryon Mask, Air Canada Pilots Association; Mike Doiron, Moncton Flight College; Danny Ho, EVA Air (panel moderator).

Tutorial 2 subject matter, “Investigating General Aviation Accidents” was a meaningful departure from the usual topics of major investigations into accidents involving modern, large transport aircraft. Stoss explained that “ISASI truly believes that there are also very valuable lessons that can be learned from investigating smaller accidents involving general aviation aircraft and helicopters.”

Hence, speakers addressed subjects such as

- manufacturers' safety mandate—how do they achieve it?
 - balancing the safety mandate and product support mandates
 - safety board and regulator challenges in conducting general aviation investigations
 - investigating general aviation accidents in an environment where oversight is difficult
 - what are the challenges facing general aviation investigations?
- How do we meet these challenges?

Speakers included Vikki Anderson, FAA, tutorial coordinator; Bradley T. Miller, Cirrus Design Corporation; Randy Mainquist,



In the conference room are coffee breaks and networking time—essential to help hold seminar attendees' concentration.



In the costal town of Lunenburg, a world heritage site, companions' visits begin with the Lunenburg Academy—considered one of Canada's outstanding examples of a 19th century public school architecture.

Cessna Aircraft Company; Andy McMinn, TSI; Ron Schleede, Session 1 panel moderator; Alex Lemishko, NTSB; Doug Baker, TSB Canada; Hooper Harris, FAA; Barry Holt, TSB Canada, Session 2 panel moderator; Roy Fox, Bell Helicopter Textron; Peter Hildebrand, TSB Canada; Andre de Kock, ICAO; Bob Matthews, FAA, Session 3 panel moderator.

Technical seminar

The old adage "If it ain't broke, don't fix it" was taken to heart by ISASI seminar planners, as the format for the annual event remained fixed: 1 day of tutorials and 3 days of technical paper presentations interspersed with ample coffee breaks and social times to ease professional networking and rekindling of friendships. Attendees, who proved extremely faithful in attending sessions, began their day with a 7 a.m. buffet breakfast, an 8:30-4:30 session broken by coffee time-outs and lunch, and then society or working group meetings after the daily session.

In announcing the seminar's Call for Papers in support of the



North Atlantic lobster is the specialty of the house.

theme "Investigation: The Art and the Science," Jim Stewart said, "We are looking for papers that will deal with the hard and soft aspects of investigation—in particular, new ideas that will lead us to improved investigation, whether it be techniques, management, process, technology, factual analysis, high tech or low tech.... For the art side, we are interested in subjects ranging from dealing with the news media and relatives to interview techniques and the art of communication."

The heart of the international conference on air accident investigation, which saw 33 countries represented, was the 3-day technical paper session of PowerPoint presentations displayed on two large screens on either side of a raised lectern that looked out on the row upon row of delegates. In all, 24 papers were presented, although some 30 persons stood before the microphone to make related remarks. Each speaker was allotted 30 minutes speaking time. Before the start of each session, a briefing of the moderator and speakers was conducted: PowerPoint presentations were loaded onto computers, trials were run, voice levels were attained, and cautions to "stay on time" were given. After each morning and afternoon session, respective speakers assembled in a panel to answer questions from the floor, which in most cases were many and meaningful. (See "Speakers and Technical papers Presented at ISASI 2008," page 6.)

Throughout the 3 days of listening and taking notes, the delegates gained some relief from the need for intense concentration when Barbara Dunn would announce "drawing time" for some of the many door prizes made available by sponsoring organizations (see "ISASI 2008 Sponsors," page 9). Many hats, airplane models, writing tools, etc., were carried away by happy winners.

Other valuable relief came once each morning and afternoon when all spilled out into the hallways to fill coffee and tea cups, sample bakery goods, stroll about the product displays, and engage in some solid exchange of talk, one professional to another.

Camaraderie time

For attendees arriving from all parts of the globe, nothing is more greatly appreciated than a place and time when all can gather and exchange greetings while shaking off the weariness of travel. The president's Welcome Reception, held on the evening before the start of the technical session, amply filled that role. For the available few hours, attendees took advantage of the informal environment, enjoyed refreshments and the tasty delicacies that filled buffet tables, and engaged in greetings, cluster talk, and other networking activity.

Following the first day of attendees' sitting and absorbing the essence of speeches, technical papers, and powerful PowerPoint presentations, the evening's planned event was a welcome relief and an unforgettable experience for those who had never before been asked to partake of a bright red crustacean with beady eyes and long antennae: lobster, boiled, was the order of the evening and was served with the pageantry of a bagpipe player in full kilt regalia leading a parade of waiters hefting lobster-filled platters among the seated guests. Those diners who had no idea how to get at the sweet meat encased in the thick claws received instruction from tablemates.

But it was the companions of the delegates who really got to sample the geography and ocean delicacies of this cold-water land. The 2-day companion program included tours of three coastal villages necessitating travel along the area's winding seacoast that one guide said could best be described by looking at the back of one's hand with fingers outstretched. A city tour of Halifax and the Eastern Passageway included historic locations such as the 19th century fortification now named the Halifax Citadel. It was once the command post and landward bastion of the city's defenses. It sits atop the highest point in the city, behind heavy masonry walls and is surrounded by a ditch up to 29 feet deep.

Peer to peer

With an exhaustive 3 days of investigative arts and science discussion just hours behind them, seminar attendees made a rapid transition to "dinner guests" at the annual Awards Banquet. This is the evening reserved for peer-to-peer recognition, to present the coveted Jerome F. Lederer Award, and to acknowledge other achievements and efforts.

The dinner refreshment hour carried over to dinner table conversations raising the din of talk, banter, and laughter to ceiling height. After dessert, President Del Gandio extended the attendees' thanks to all the planners and the companions' gratitude to Gail



President Del Gandio presents the Award of Excellence to the BEA team for its "best technical paper." Left to right: F. Del Gandio, A. Desjardin, M. Del Bono, and A. Bouillard.

Stewart for the planning and execution of the companion program. He then announced the winners of the ISASI Award of Excellence for development of what is judged to be the best technical seminar paper. The paper "DHC-6 Twin Otter Accident off the Coast of Moorea, French Polynesia," which will be published in January/March issue of *Forum*, was authored by Alain Bouillard, investigator-in-charge, special advisor to the BEA (Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation civile) and Arnaud Desjardin, safety investigator, BEA Engineering Department.

The selection carries a \$500 award from an anonymous member who wishes to acknowledge a paper at the annual seminar that makes an outstanding contribution to the advancement of technical methodologies in aircraft accident investigation. The authors have announced that they are contributing the \$500 to the ISASI Rudolph Kapustin Memorial Scholarship Fund.

Special recognition was bestowed upon Jim Stewart for converting a vision into a highly successful program. President Del Gandio put it like this:

"Reachout was a vision of one-time ISASI President Olof Fritich. In 1999, the International Council adopted the vision and Jim Stewart became chairman and developer of the program. Basically, its intended purpose is to hold workshops in various locations worldwide to benefit areas having high accident rates by leading to improved accident investigations higher quality reporting and analysis of incidents and reducing risk—that is to improve air safety. The Czech Republic, through the efforts of Ladislav Mika, became the host for the first Reachout. It was held in Prague in May 2001. That first seminar had 100 attendees and was a total success. Since then, there have been 31 Reachout workshops attended by more than 1,700 participants who included regulators, airlines, manufacturers, and others.

"Reachout has become a total success for all the right reasons. A cadre of our members has made this happen. However, the motivating and driving force behind Reachout was Jim Stewart. Jim transformed a vision to a reality. His background, training, skill,



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 WestJet
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WRIGHT BROTHERS

U.S. ALPA
 Cranfield University
 NAV CANADA
 Transportation Safety Institute
 RTI Group, LLC

and experience, coupled with his can-do attitude, made it happen... Jim, we are indebted to you; thanks for a job well done."

Stewart hesitatingly stepped to the microphone and said softly, "You don't do this for this type of recognition, but I certainly appreciate it." When the applause quieted, he added, "When we decided it should happen, there is one person I could not have done without—Ladi Mika. Thank you." Before departing the stage, he asked all in the room who may have participated in any of the 31 Reachout programs to stand. It was surprising how many people had volunteered their time and knowledge.

Jim Stewart, along with Gary Morphew and Lindsay Naylor, were recognized with the award of "Fellow" membership pins, following their acceptance into the coveted class of membership that now numbers 24 (see "ISASI 'Fellows' Program Makes Fresh Start," page 24).

Corporate members that joined ISASI over the year were also cited. They included Finnish Military Aviation Authority; Korea Air Force Safety Center; Qatar Airways; Curt Lewis & Associ-

ates, LLC; Cyprus Aircraft Accident and Incident Investigation Board; Northwest Airlines; Dombroff Gilmore Jaques & French PC.; General Aviation Manufacturers Association; Safe Flight Solutions; Baines Simmons Americas; Ethad Airways; and National Aerospace Laboratory, NLR, which was present and accepted its corporate membership plaque.

Student membership and student interest in ISASI appears to be growing, albeit slowly. The Society scholarship program has certainly made an impact. President Del Gandio spoke about the program and its need for continued funding through donations so that it could continue to attract the interest of students such as the three who were selected to receive the 2008 scholarship awards (see page 18). He also introduced Marissa LaCoursiere, who was a 2007 selectee but was unable to attend last year's seminar.

The evening finale of peer recognition was the presentation of the Jerome F. Lederer Award to Don Bateman for fulfilling the requirement of "outstanding lifetime contribution in the field of aircraft accident investigation and prevention." The Award was created by the Society to honor its namesake for his leadership role in the world of aviation safety since its infancy.

President Del Gandio opened his remarks by saying: "I am honored to present the annual Jerome Lederer Award to C. Donald Bateman. He has been a member of ISASI since 1992, and Don can fairly be described as the person who invented the ground proximity warning system (GPWS) and, later, the forward-looking enhanced GPWS (EGPWS). If Don never did anything else in his career, these tools alone might allow him to say that he has saved more lives in aviation than any other single person who has ever worked in the field." Don's accomplishments include being a pioneer in the development of angle-of-attack indicators, autothrottle systems, windshear detection, and altitude awareness systems (see "C. Donald Bateman Receives Lederer Award" page 14).

In closing the evening, President Del Gandio exuberantly thanked the seminar's sponsors. He added that 21 attendees had

joined ISASI and one attending airline became a corporate member. He then called for the traditional transfer of the "cowbell" from Dunn to Jayme Nichols, chair of the ISASI 2009 seminar. ♦



The traditional transfer of the "cowbell" from Dunn to Jayme Nichols, chair of ISASI 2009.

Advancing Aviation Safety One Investigation at a Time



By Wendy Tadros, Chair, Transportation Safety Board of Canada

(Remarks presented by Chair Tadros in her keynote address to the ISASI 2008 air accident investigation seminar delegates on September 9 in Halifax, Nova Scotia, Canada.—Editor)

As chair of the Transportation Safety Board of Canada, it is a pleasure for me to speak to the world's leading safety investigators. In my 12 years at the TSB, I have come to admire the work you do. I am impressed by both your dedication and your attention to detail. Today, we have an opportunity to share our ideas and experiences. It is also a great opportunity to discuss the latest investigative techniques and to foster the strong working relationships that are absolutely essential to advancing transportation safety.

This year's ISASI theme is "Investigation: The Art and the Science." I want to talk to you about the science behind some key TSB investigations and the contribution they have made to aviation safety worldwide. In particular, I want to talk to you about our Morningstar and Air Transat investigations, which have resulted in positive change—thanks to solid investigative work and prompt action by regulators and industry in Canada and abroad.

I also want to practice the gentle art of persuasion and talk in more detail about MK Airlines, Air France, and Swissair. These are three investigations where we would like to see greater uptake of our recommendations. With your support, together we could make air travel even safer.

I want to start by telling you about some very positive international efforts on two fronts: firstly with Cessna 208 aircraft and secondly with inspections for composite materials.

Morningstar—loss of control and collision with terrain

In the early morning hours on Oct. 6, 2005, a Cessna 208 cargo plane took off clean from Winnipeg with one pilot aboard. It climbed normally, but within minutes the performance of the aircraft diminished as ice built up on its critical surfaces. The situation quickly worsened and the aircraft crashed, killing the pilot.

The TSB did not wait until the investigation was complete to communicate with our international partners and to make our safety recommendations. In January 2006, both the TSB and the NTSB made the following recommendations to advance safety for the more than 1,600 Cessna 208s flying worldwide: *Cessna 208 pilots: (1) do not take off into anything more than "light" icing conditions and (2) maintain 120 kts minimum speed in icing conditions. Action taken: the FAA issued airworthiness directives (ADs) stating Cessna 208 pilots must: (1) maintain 120 kts mini-*

mum speed in icing conditions and (2) immediately exit icing conditions exceeding "light." Transport Canada adopted both ADs.

The actions taken by Transport Canada, the FAA, and the manufacturer on design, training, and procedures are positive. I hope they will mean no more inflight icing accidents with Cessna 208s.

Air Transat—Flight 861, loss of rudder

On March 6, 2005, an Airbus A310 took off from Varadero, Cuba. Seventeen minutes later, the crew heard a loud bang, followed by vibrations. Then the aircraft started to Dutch roll. The crew managed to descend, stabilize the aircraft, and return safely to Varadero. Once on the ground, the problem quickly became obvious: The rudder was missing. This occurrence did not garner a lot of attention with the public. After all, the aircraft landed safely and nobody died.

But it certainly intrigued TSB investigators, and they were determined to figure out what caused the rudder to fall off a modern aircraft. The Air Transat investigation is another stellar example



of international cooperation resulting in positive and concrete action to advance aviation safety.

What was learned in the initial days of the investigation into the rudder's composite material regarding disbands, hinge damage, and fluid ingress led to Airbus issuing an all operators telex calling for the inspection of all aircraft equipped with these composite rudders. Four hundred and eight Airbus widebody aircraft were inspected worldwide. These fleet checks suggested inspection programs may not always find defects in composite materials.

When we learned this, the Board urgently recommended that Transport Canada, the European Aviation Safety Agency (EASA), and industry come up with an inspection program to detect damage before it progresses. In the United States, the NTSB took similar action, reflecting the importance of international voices. Transport Canada and EASA heard us. Transport Canada is working with the National Research Council on inspection techniques to detect failures in composite materials, and EASA is working with Airbus.

What followed was the development of early, consistent, and reliable detection programs for composite materials. This absolutely could not have been accomplished without solid investigative work and international cooperation. The implementation of the Morningstar and Air Transat recommendations are two of our successes.

Now, let's start by tackling a number of the hard issues in avia-

tion safety today by talking about some areas that need more improvement. I would like to see greater uptake of the recommendations flowing from the MK Airlines, Air France, and Swissair investigations. These are not easy issues—if they were, they would have been fixed a long time ago. They are the tough issues, and I would like to try to make the case for why I believe these recommendations are so important. Perhaps if I can do that—if I can gain your support—we can get the ball rolling internationally and make aviation even safer.

MK Airlines—reduced power at takeoff and collision with terrain

Let's look at the investigation of the MK Airlines crash on Oct. 14, 2004, at the airport right here in Halifax. A Boeing 747 cargo flight took off using speed and thrust settings that were too low for its weight. It hit a berm at the end of the runway, crashed into the forest, and burned. All seven crewmembers died.

Major air investigations are often global in scope, and this one was no exception. This accident involved an American-built aircraft, registered in Ghana, operated by a Ghanaian-licensed crew working for a U.K.-based airline. Equally international were the investigators. Investigators from the United Kingdom, Ghana, and Iceland participated in this TSB investigation.

What's interesting about this investigation and the reason it's worth talking about is it was not a "one off." Indeed there were 12 similar accidents worldwide in which four aircraft were destroyed and 297 lives lost. When you see one performance accident, the inclination is to say, "Well, the pilot should have followed the SOPs." When you see multiple accidents around the world where actual takeoff performance differed from expected performance, you come to the conclusion that additional defenses are needed in the system.

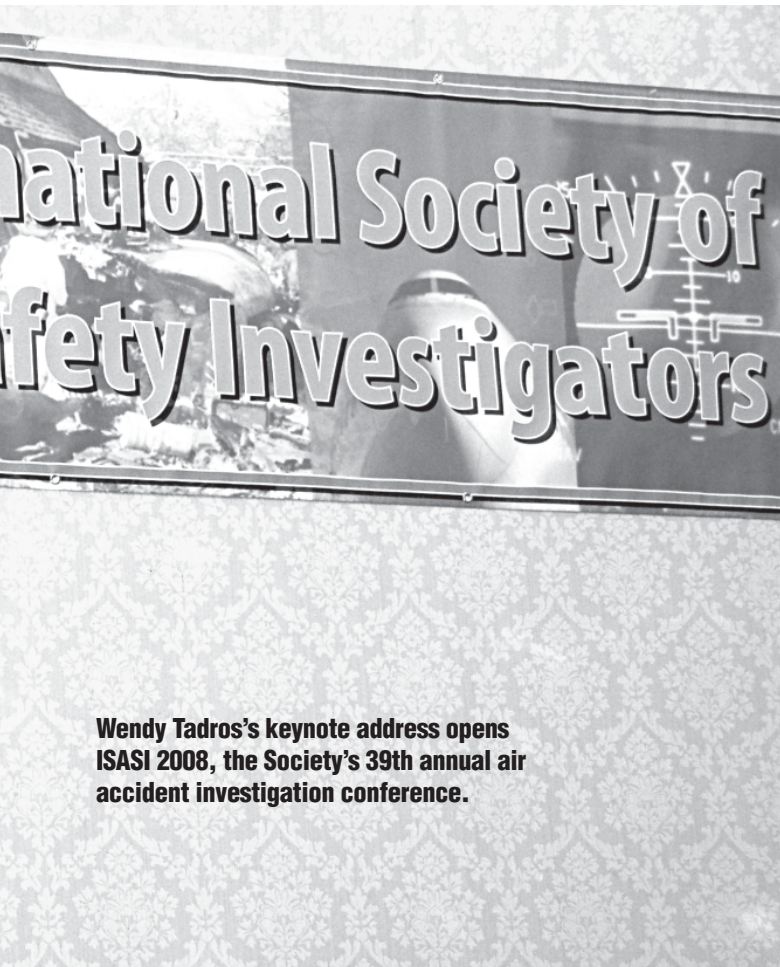
That is why the TSB recommended that Canadian and international regulatory authorities require a takeoff performance monitoring system to ensure that crews of large aircraft will be alerted in time when there is not enough power to take off safely. Transport Canada committed to working with industry on the development of a takeoff performance monitoring system. This is a step in the right direction. The Board is hopeful that a solution can be found to eliminate this safety deficiency.

Air France—runway overrun and fire

This accident took place at Canada's busiest airport, beside Canada's busiest highway at rush hour. It would be an understatement to say the overrun of an Air France A340 at Toronto caught the world's attention.

On Aug. 2, 2005, with 297 passengers and 12 crew on board, Air France Flight 358 approached Toronto in a severe and rapidly changing thunderstorm with shifting winds and limited visibility. It came in too high and too fast. Touching down 3,800 feet along the 9,000-foot wet and slippery runway, it simply ran out of room. The aircraft came to a stop in a ravine; and while the evacuation was not without its difficulties, everyone got out before fire destroyed the aircraft.

The TSB is grateful to the people from the Bureau d'Enquêtes



Wendy Tadros's keynote address opens ISASI 2008, the Society's 39th annual air accident investigation conference.



et d'Analyses (BEA), EASA, Airbus, Air France, Transport Canada, and many other organizations for providing information and invaluable assistance to our investigators.

Thanks to your participation, we developed a comprehensive analysis of the causes and contributing factors that led to seven recommendations to make air travel safer.

So, what did we learn? We learned this crew was not alone. Since the Air France accident in Toronto, at least 10 large aircraft have gone off runways around the world in bad weather. This tells us that the potential for landing accidents in bad weather remains. To make air travel safer, the TSB made seven recommendations. Five of them focus on crews and the need for mandatory standards, training, and procedures, and two are aimed at reducing the risk of injury following an accident.

The Board made recommendations asking that Transport Canada and the world's regulatory bodies limit landings in thunderstorms and require enhanced pilot training. Our investigation revealed that the Air France crew, like many others, did not calculate the landing distance required for the conditions at the destination. That is why we recommended that regulators require these always be calculated, so crews will know their margin of error. The NTSB made a similar recommendation following an accident in which a B-737 left the runway at Chicago's Midway Airport.



We also made two recommendations aimed at reducing the risk of injury following an accident.

We took a good, hard look at the terrain at the end of Canada's runways and found it can increase the risk of injuries to passengers and crews. To address this risk, the TSB recommended that Transport Canada require 300-meter runway-end safety areas or an alternate means of stopping aircraft. This will bring all of Canada's major airports in line with international benchmarks.

Lastly, we examined the evacuation. As you know, successful evacuations are measured in seconds. We found, despite directions to the contrary, many passengers stopped during the emergency to take their carry-on baggage with them. To improve evacuations, the TSB asked Transport Canada to require that passenger safety briefings include clear direction to leave all carry-on baggage behind.

While the response to many of these recommendations has been positive, we are concerned about the response on our recommendation calling for runway end safety areas (RESAs) or EMAS (Engineered Materials Arresting System). Let's not forget that in the past 25 years, at least one aircraft a month overran a runway somewhere in the world. It is my conviction that until this problem is faced *squarely*, the trend is bound to continue. I believe this important issue deserves more attention from the world's regulators, including Transport Canada.

Swissair—inflight fire leading to collision with water

Here in Nova Scotia, September 2 marked the 10th anniversary of the night Swissair Flight 111 crashed off Peggys Cove. It is only fitting that I end with this investigation.

On that evening in 1998, Swissair Flight 111, a McDonnell Douglas MD-11, departed New York City on a scheduled flight to Geneva, Switzerland, with 215 passengers and 14 crew on board.

About 53 minutes later, while cruising at Flight Level 330, the crew smelled an abnormal odor in the cockpit. Their attention was drawn to the area behind and above them, and they began to investigate the source, which they thought was the air conditioning system. After further troubleshooting, they assessed there was definitely smoke and decided to divert to Halifax.

While the flight crew was preparing to land, they were unaware that a fire was spreading above the cockpit ceiling. Soon thereafter, the aircraft's FDR logged a rapid succession of system failures. The crew declared an emergency and an immediate need to land. About one minute later, radio communications and radar contact were lost, and the flight recorders stopped functioning. About five-and-a-half minutes after that, the aircraft crashed into the ocean with the loss of all 229 souls on board.

The crew did what made sense to them at the time. Knowing what they knew, we pieced together the sequence of events. We ran a number of detailed scenarios and concluded that based on the time available before the fire disabled the aircraft, the crew could not have landed the plane safely.

The Swissair investigation took four-and-a-half years. It was the largest and most complex safety investigation ever undertaken by the TSB. I continue to be heartened by the way in which so many people—from so many places—helped provide this investigation with its strength and purpose. Coordinated national and



international efforts and the contributions of many hardworking people like *you* were absolutely invaluable.

This investigation led to a comprehensive report with the potential to change the face of aviation safety. The TSB made 23 recommendations, 14 during the investigation and 9 in our final report.

These recommendations fall into five broad categories: onboard recorders, circuit breaker resetting procedures, supplemental type certification process, material flammability, and inflight firefighting.

We are pleased to see that the Swissair investigation led to improvements that make flying safer. However, there are areas where we think there still needs to be more progress. Let me talk to you about three of those.

The first material to ignite in the Swissair accident was MPET insulation. When we discovered this we advised regulators. Canada, the United States, and France required the removal of MPET insulation from many aircraft. The TSB learned that, at the time, the flammability test to approve insulation materials was not rigorous enough. We were pleased to see this test replaced by the radiant panel test.

We would like it if MPET was removed from *all* aircraft or we would like to know *how* the FAA's alternative means of compliance will ensure insulation materials will not propagate fires. We would also like to see more stringent testing for all existing insulation materials.

Since the Swissair accident, crews routinely divert to land im-

mediately at the first hint of fire or smoke in an aircraft, and the International Air Transport Association and the Flight Safety Foundation have worked together to develop industrywide guidance on more effective checklist procedures for smoke and fire. This in turn resulted in some aircraft manufacturers making improvements to their aircraft flight manuals. These are positive steps.

What we would really like to see is international adoption of the emergency checklist template. We will also continue to focus attention on two areas: the need for designated fire zones and a systematic approach to inflight firefighting.

In the transportation world, aviation has led the way with requirements for FDRs and CVRs. With each investigation, we refine what data we need to figure out what happened. The Swissair recommendations are aimed at ensuring crucial data will be available to investigators. The upshot is the FAA now requires that any single electrical failure not disable both CVR and FDR. By 2012, the FAA will also require 2-hour CVRs and an independent power supply providing 10 more minutes of recording time. There has been progress for sure in this important area, and the FAA is leading the way. We would like to see 2-hour CVRs and an independent power supply as the international standard. We are looking to Transport Canada to harmonize these rules for all Canadian-registered aircraft.

One other outstanding recommendation we feel strongly about is the installation of image recorders. These recorders will help investigators to better understand what went on in the cockpit and with the aircraft. The NTSB also made this recommendation. That being said, the cockpit is a pilot's workplace and I understand why they would oppose greater surveillance. This resistance can be overcome only if the international community protects the confidentiality of all recordings. We must ensure they will not be released and will only be used to advance transportation safety.

Our success depends on supporting each other's work. I invite you to go to our website—www.tsb.gc.ca. There you can learn more about the recommendations we have made during the TSB's 18 years. After taking a closer look at these reports, and where you find similar safety deficiencies, I urge you to carry the flag for aviation safety and adopt the TSB's recommendations as your own.

Earlier, I spoke to you about how the Morningstar and Air Transat investigations changed the face of aviation safety. And we have looked at how, as a result of the MK Airlines, Air France, and Swissair investigations, there has been much progress. This would not have been possible without your cooperation and dedication to aviation safety.

And while many recommendations have been implemented, I would like to see the face of aviation safety changed even more dramatically. I would like to see *all* of the recommendations from the MK Airlines, Air France, and the Swissair investigations effectively implemented.

International cooperation and information sharing are critical to advancing transportation safety. Let's work together to make sure that happens.

Tadros's keynote address opened ISASI 2008, the Society's 39th annual air accident investigation conference. ♦

A giant in his field and a long-time ISASI member.

C. Donald Bateman Receives Lederer Award



By Esperison Martinez, Editor

Quiet, unassuming, soft-spoken, mannerly, in demeanor very much like Jerry Lederer is how this year's selectee for the coveted ISASI Jerome F. Lederer Award is best described. C. Donald Bateman, who prefers "Don," received the coveted award at the ISASI 2008 Awards Banquet held September 11 in Halifax, Nova Scotia, Canada.

All readers know the high esteem in which a person selected for the Award is held, so it might be expected that the person receiving the Award might be a bit piqued by lack of special attention at the place of the presentation. In an incident that perfectly reveals Don's nature, President Frank Del Gandio related to the awards dinner attendees how Don, upon his arrival at the seminar hotel after a tiring flight, was told that his room would not be ready for several hours—so without any complaints or demands, he and his wife settled themselves in comfortable lobby chairs to wait. "Which is where I stumbled onto them," said Frank, "and profusely apologized for any mix-up that may have caused the long delay. Don wouldn't hear of it, and said he 'enjoyed the rest.'" As the reader can imagine, a proper room was quickly made available for the Batemans.

President Del Gandio went on to introduce Don and make the presentation of the Award. The president's remarks very much illustrate the tremendous effort Don Bateman has put forth in fulfilling the requirement to receive the Jerome F. Lederer Award,

which was created by the Society to honor its namesake for his leadership role in the world of aviation safety since its infancy: "outstanding lifetime contribution in the field of aircraft accident investigation and prevention."

President Del Gandio remarked: "I am honored to present the annual Jerome Lederer Award to C. Donald Bateman. He has been a member of ISASI since 1992, and Don can fairly be described as the person who invented the ground proximity warning system (GPWS) and, later, the forward-looking enhanced GPWS (EGPWS). If Don never did anything else in his career, these tools alone might allow him to say that he has saved more lives in aviation than any other single person who has ever worked in the field.

"That is not an overstatement; Don's work has saved lives, and lots of them. To give you a sense of scale, from 1945 through 1974 the United States alone had 80 fatal CFIT accidents, which killed nearly 2,000 people. Since 1974, when GPWS was finally required on air transport aircraft in the U.S., we have had just three such accidents, all of which occurred abroad in developing countries. Since enhanced GPWS was required some 13 years ago, we have had no fatal CFIT accidents involving aircraft with an operating EGPWS unit on board. Don personally deserves much of the credit for virtually eliminating CFIT accidents in much of the world.

"But GPWS is not all that Don has accomplished. He also was a pioneer in the development of angle-of-attack indicators, autothrottle systems, windshear detection, and altitude awareness systems.

"So how did Don accomplish this impressive list? He did it by becoming a real student of certain kinds of accidents. For example, he is well known for having investigated scores of CFIT accidents not by kicking tin on site, but by flying the estimated flight paths of every civilian CFIT accident and many near-CFIT accidents that occurred in the U.S., Canada, and Mexico from the late 1940s through the late 1960s when CFIT accidents were brutally common. He filmed every flight path, collected original data, and noted where and when warnings could have averted each accident.

"Don did this work as an employee of Honeywell's Flight Safety Technologies, where he is the chief engineer. In effect, Don operated a unit at Flight Safety Technologies that can be compared to Lockheed's famous Skunk Works.

"In the 1970s Don began to publish his findings and his data and began developing the downward-looking GPWS. As computer

Past Lederer Award Winners

1977—Samuel M. Phillips	1994—U.K. Aircraft Accidents Investigation Branch
1978—Allen R. McMahan	1995—Dr. John K. Lauber
1979—Gerard M. Bruggink	1996—Burt Chesterfield
1980—John Gilbert Boulding	1997—Gus Economy
1981—Dr. S. Harry Robertson	1998—A. Frank Taylor
1982—C.H. Prater Houge	1999—Capt. James McIntyre
1983—C.O. Miller	2000—Nora Marshal
1984—George B. Parker	2001—John Purvis and The Transportation Safety Board of Canada
1985—Dr. John Kenyon Mason	2002—Ronald L. Schleede
1986—Geoffrey C. Wilkinson	2003—Caj Frostell
1987—Dr. Carol A. Roberts	2004—Ron Chippindale
1988—H. Vincent LaChapelle	2005—John Rawson
1989—Aage A. Roed	2006—Richard H. Wood
1990—Olof Fritsch	2007—Thomas McCarthy
1991—Eddie J. Trimble	2008—C. Donald Bateman ♦
1992—Paul R. Powers	
1993—Capt. Victor Hewes	



President Del Gandio, left, introduces Bateman to the assembly. Inset shows the Lederer Award presented to Bateman.

PHOTOS: E. MARTINEZ

and satellite technology improved, Don later was able to incorporate very accurate topographical maps that became the basis for “forward looking” enhanced GPWS. Don even convinced Honeywell to give customers free access to updates of the terrain database to ensure the continued effectiveness of the equipment.

“By honoring Don here today, ISASI joins a long list of organizations that have recognized his unsurpassed contributions to safety around the world.

“He is a two-time winner of the Flight Safety Foundation’s Admiral Luiz de Florez Award (1975 and 1998). He was recognized as a Laureate by *Aviation Week* in 1994. He received the New Zealand Air Safety Foundation Award in 2002. In 2003, Don was named a “Pathfinder” at the Museum of Flight in Seattle. He was recognized yet again by the Flight Safety Foundation in 2006 when he won the Laura Taber Barbour Air Safety Award.

“Don also has been inducted into the National Inventor’s Hall

of Fame and he is a Fellow at the Royal Aeronautical Society. Don’s current title as Corporate Fellow at Honeywell demonstrates the respect that his peers have for his contributions.

“It is always an honor to introduce a giant in his field. It is especially a pleasure to do so when that giant has been a long-time member of ISASI. Ladies and gentlemen, please welcome Don Bateman.”

Throughout the president’s remarks, the audience could observe Don’s discomfort as his accomplishments, one after the other, were told. As he walked to the microphone, the 250 dinner guests arose in unison and gave a thunderous applause.

In keeping with his character, Don chose not to make a lengthy discourse about his selection, rather he recounted a story from his days as a youth, about 8, that he says was foretelling of his future career and was his introduction to accident investigation. In taking his audience back to the early 1940s, he told how he and a companion were looking out the window and saw a very bright flash of light. Being young and curious, they eventually went to see what it was, skipping school to do so.

The next day when his teacher asked why he hadn’t been in school, he was very forthright and said he spent the time at the plane crash scene, looking at the debris and watching the events. To prove his story, he pulled a piece of fabric from his pocket and handed it to the teacher, saying he had picked it up at the scene. The teacher examined the fabric, then looked sternly at him and scolded: “You did a terrible thing—you moved some evidence from an accident.”

“As punishment,” he said, “she had us write a two-page report on what we did, and what we saw. When she read it, she said to me ‘You know, you are going to be an engineer because you can’t spell.’”

When the laughter subsided, he closed by saying: “Thanks to all of you for the selfless work that you do. You are all true professionals, and it is a great honor to be here.” ♦



Bateman spends time with scholarship winners, Melissa LaCoursiere, center, and Catherine Rickafort.

Silver Dart Salute

By John A.D. McCurdy aka Capt. Gerry Davis

(The ISASI 2008 Seminar Committee honored the 100th anniversary of the construction of the Silver Dart at Baddeck, Nova Scotia, in late 1908, by featuring the biplane in the seminar's logo design. Made of steel tube, bamboo, friction tape, wire, and wood, the Dart was powered by a V-8 engine supplied by Glenn Curtiss, which developed 35 horsepower at 1,000 rpm. John A.D. McCurdy piloted his design on its first Canadian flight from the frozen expanse of the Bras d'Or Lake on Feb. 23, 1909. It logged more than 200 flights. The legacy of the Silver Dart continues to live on, and was certainly enhanced by a special presentation made at ISASI 2008.

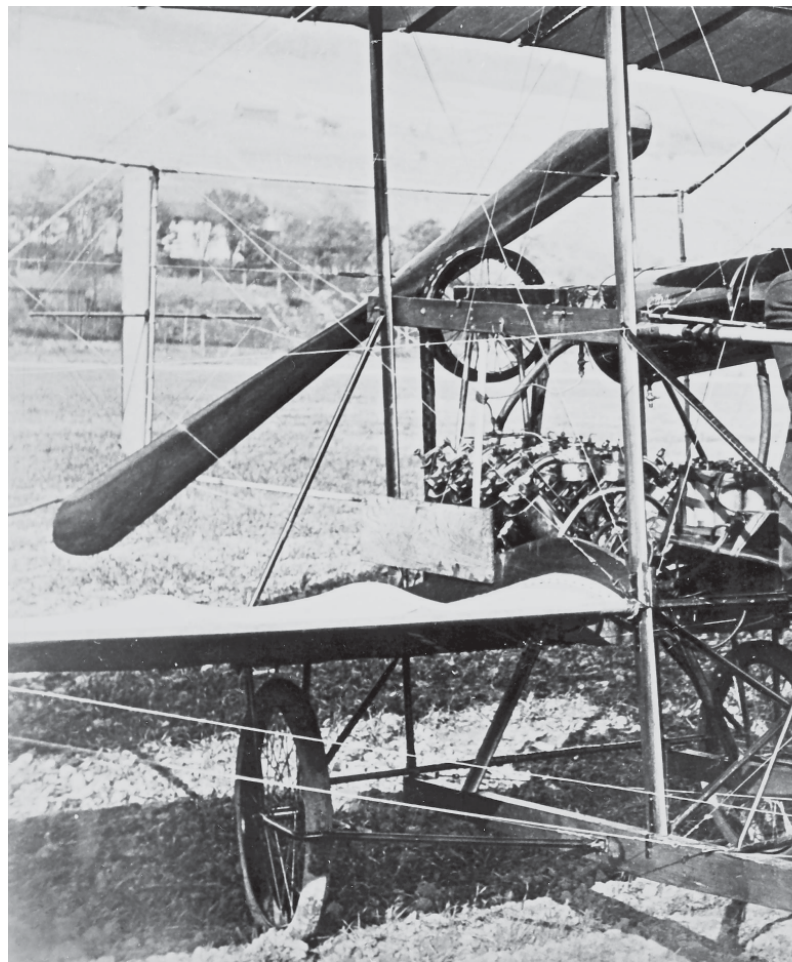
Capt. Gerry Davis, an ISASI and ALPA member, donned the persona of John McCurdy and delighted the audience with a recap of the aviation pioneer's life and a "first person" account of the famous Silver Dart flight described above and its many achievements. He has flown more than 18,000 hours in 28 aircraft types over 31 years and has investigated or participated in three major fatal accidents including Swissair Flight 111 and a number of smaller non-fatal accidents. For 5 years, he served as the vice-chairman of ALPA's Accident Investigation Board.—Editor)

I was born at Baddeck, Nova Scotia, where I spent the early years of my life. In 1906 I graduated from the University of Toronto with the degree of mechanical engineer. Early on I became interested in aviation and in the construction of a machine that would fly. Dr. Alexander Graham Bell also had a home at Baddeck, Nova Scotia, where he carried on experiments with flying machines. I grew up in the company of the Bell family and was a familiar presence at Beinn Bhreagh, the Bells' summer estate. I was later among a group of four young men recruited by Bell and his wife, Mabel Hubbard Bell, to form the Aerial Experiment Association (AEA). As a boy, I had become interested in Bell's work and assisted him in his experiments.

At that time he was assisted by Simon Newcomb, the eminent mathematician, and Samuel P. Langley, secretary of the Smithsonian Institution. During the course of my studies at Toronto University, I used to return to Baddeck during my vacations and continued at these times to work with Mr. Bell and his associates.

The Aerial Experiment Association was formed in the summer of 1907. The members were Dr. Bell, F.W. Baldwin, Lieutenant Thomas Selfridge, U.S.A., Glenn H. Curtiss, and me. The United States Army was interested in the development of flight and therefore had Lt. Selfridge serve as its observer in the Association.

The AEA conducted experiments during the summer and fall of 1907 at Baddeck with tetrahedral kites, with motors, and with serial propellers mounted on boats. The first experimental flight



carried out by the group took place on Dec. 6, 1907. The test aircraft, piloted by Selfridge, was a large, tetrahedral kite placed on pontoons called the Cygnet I. It was pulled by the steamboat Blue Hill on Bras d'Or Lake, Nova Scotia. Cygnet I reached a height of 51 meters and remained in the air for 7 minutes, but when it landed on the lake the towline was not released and the kite with Selfridge was pulled below the water's surface. The kite was destroyed, but Selfridge was rescued.

In December 1907, we decided to move to Hammondsport, New York, where Mr. Curtiss had a factory, to build a glider. This move was made on December 24. We proceeded at Hammondsport to experiment with gliders and then to build machines that would fly; the members of the Association worked together, although each one in turn had general charge of the design of a machine.

The first machine built by the Association was called the Red Wing because of its color. The first engine Curtiss designed specifically for aircraft was used in the Red Wing. Casey Baldwin successfully flew it on March 12, 1908, for 97 meters. His second flight took him 37 meters, but ended with heavy damage to the aircraft. The Red Wing had no controls except an elevator (a control used to adjust the up and down motion, or pitch, of an aircraft's nose or tail), and it was this lack of control that led to its destruction.

Following the construction of the Red Wing, other machines were made. The next aircraft was named the White Wing, and the members of the Association developed controlled flaps on the wings, which improved stability. These control flaps were soon called aile-



E. MARTINEZ

LEFT: John A.D. McCurdy at the wheel of the Silver Dart at Hammondsport, New York. ABOVE: "McCurdy," aka Gerry Davis, relates his story to ISASI delegates.



The younger members of our group did not immediately recognize the historic significance of this flight; however, Dr. Bell, being of mature judgment in these matters, seemed to have grasped its full significance and he therefore preserved a permanent record of the event by sending telegrams to the news centers of the world. These were the first public flights that had ever been made in aero planes. The following day, I flew the Silver Dart in a graceful 7-kilometer circle.

I continued flying the machine through the winter of 1909, making many flights and covering in all more than 1,000 miles. The flights that I made with the Silver Dart in Canada were the first flights that had ever been made in the British Empire.

rons by another well-known aviation pioneer, Hari Farman.

The White Wing was flown four times in

1908: first by Baldwin on May 18, for 82 meters; by Selfridge on May 19, for 73 meters; by Curtiss on May 20, for 310 meters; and finally on May 23 by myself for 183 meters, landing with a destructive crash in which I was slightly injured. The Association's next aircraft was the June Bug. It was flown many times between June 21 and August 31, with the longest flight lasting more than 3 kilometers. When it was flown by Curtiss on July 4, 1908, it set the record for being the first aircraft to fly one kilometer in the western hemisphere and received the Scientific American Trophy.

The one called the Silver Dart was designed by me. In this machine I made a flight on Dec. 12, 1908; however, it was the Dart's first Canadian flight, from the frozen expanse of the Bras d'Or Lake on Feb. 23, 1909, that drew the attention of the world. I remember the circumstances of that flight as if it were yesterday. It was a brilliant winter day and the ice of Baddeck Bay was completely free of snow. We wheeled the aircraft out of its shed on the shore amidst the incredulous stares and remarks of a couple of hundred spectators who had gathered to witness the event. Having taken my seat, the machine was released by men on skates. After a run of about 100 feet, it took to the air. I lifted the biplane about 9 meters off the ice, and I flew the entire length of Baddeck Bay.

I landed on the ice about one-half a mile away and taxied back to the starting point. One thing that impressed me was the look of absolute astonishment on the faces of the spectators, but the thing that stands out most in my mind of that event was the great pleasure and animation in Dr. Bell's face at the completion of the flight.

In 1909 the Curtiss Exhibition Company was formed, and I took part in the work of this Company. For several years, I gave exhibition flights in practically every state of the United States east of the Mississippi River and also in Mexico. The purpose of these exhibitions was to advertise Curtiss machines and to obtain funds with which to carry on the further development of the aero plane. In 1909 I conducted the first wireless experiments at Sheepshead Bay Race Track and for the first time sent from an aero plane a wireless message.

After the first of January 1910, I carried on these experiments in Florida and succeeded in both sending and receiving messages. In 1910, I made the first flight across water out of sight of land flying from Key West, Fla., to Havana, Cuba, a distance of 110 miles. During this time, I frequently carried messages and passengers for the purpose of demonstrating the uses to which the aero plane could be put.

In the fall of 1914, I moved back to Canada and at the request of the government organized a training school for aviators for service in the war. This was the only aviation school in Canada, and we trained more than 600 men. I also organized as a subsidiary of the Curtiss Motor Company, the Curtiss Aeroplanes and Motors, Limited, of which I was president and general manager, and ran the school in conjunction with this Company, the students using the machines that were manufactured by us. This school was carried on for 2 years and during that time not a single man was hurt.

In later years, I worked in the aviation supply business. During World War II, I became assistant director of aircraft production for the Canadian government, and in 1947 I was named lieutenant governor of Nova Scotia.

Depending upon your viewpoint, I surmise that I have, out of pure interest and childhood fascination with all things mechanical, participated in some "watershed" events in the history of aviation in Canada. ♦

Council Names Three 'Kapustin' Scholars



Students from the University of Southern California's Viterbi School of Engineering; the University of Limerick, Ireland; and Embry-Riddle Aeronautical University, Fla., USA, have been named as the 2008 recipients of the ISASI Rudy Kapustin Memorial Scholarship Fund.

By Esperison Martinez, Editor

"It is my pleasure to notify you on behalf of ISASI that you have been selected as one of three winners of the ISASI 2008 Rudy Kapustin Memorial Scholarship..." read the e-mail message transmitted by Richard Stone, ISASI executive advisor and one of the two scholarship fund administrators, to Catherine Rae T. Ricafort, USC; Micheál Ryan, the University of Limerick; and Jennifer Gritton, ERAU. The three selectees attended ISASI 2008 and were introduced by President Frank Del Gandio to the assembly during opening ceremonies as was a 2007 winner, Marissa LaCoursiere.

Ricafort is a senior at the USC Viterbi School of Engineering, majoring in industrial and systems engineering, with a minor in musical theatre. She is a Presidential Scholar and has been working with the USC Merit Research Program for two-and-a-half years, conducting research on human factors and runway incursions. Her work on runway safety has been published in the *Los Angeles Times*. Her proposal to create a "master plan for runway safety at LAX" has led her research to be recognized and supported by the USC Rose Hills Foundation.

Ryan is an ISASI student member in his third year at the University of Limerick seeking a degree in aeronautical engineering. To date he has completed courses in engineering mathematics, mechanics, electronics, air transportation, aircraft vibrations, aircraft design, flight mechanics, industrial organization, finite element analysis, CAD, mechanics of solids, aerodynamics, thermodynamics, engineering materials, fundamentals of aerospace engineering, chemistry, and fluid mechanics. He is on an 8-month cooperative education placement with the Air Accident Investigation Unit of Ireland.

Gritton is in her second year of a masters of aeronautical science program at Embry-Riddle in Daytona Beach, Fla., USA. She expects to achieve her degree in May 2009 with a dual concentration in human factors and safety systems. She lives in St. Louis, Miss., USA.

The Kapustin Fund was established in memory of all ISASI members who have died and was named in honor of the former ISASI Mid-Atlantic Regional Chapter president, Rudy Kapustin. The scholarship is intended to encourage and assist college-level students interested in the field of aviation safety and aircraft oc-



The 2008 scholarship winners and one from 2007 pose with scholarship fund administrators. Shown, left to right, are R. Stone, C. Ricafort, J. Gritton, M. LaCoursiere (2007), M. Ryan, and R. Schleede.

currence investigation, according to Stone. Contributions have and will continue to provide an annual allocation of funds for the scholarship. Contributions are tax-deductible in the U.S., and may be made in the name of a specific deceased member payable to the ISASI Kapustin Fund and sent to the ISASI home office.

ISASI Vice-President Ron Schleede and Stone serve as executors and administrators of the Fund. They review all applications, which include a 1,000 (+/- 10%) word essay in English addressing "the challenges for air safety investigators." The scholarship consists of an annual \$2,000 award, a one-year ISASI membership, fee-free attendance at an accident investigation course at FAA's Transportation Safety Institute, the Southern California Safety Institute, and at Cranfield Safety and Accident Investigation Centre, Cranfield, England.

The scholarship essays of the awardees follow.

The Challenges for Air Safety Investigators: A Human Factors Angle

By Catherine Ricafort



This past year has seen a dramatic increase in air traffic, fuel prices, and delays. Most alarmingly, however, there has been a rise in the number of safety risks due to an increasing number of airlines that fail to follow safety guidelines. These lapses in safety culture are extremely grave, because they have the potential to kill many people. Air safety is no laughing matter;

for example, aviation history's most infamous accident led to the death of 583 people in Tenerife in 1977, when two Boeing 747 airliners collided on the runway.

For passengers, pilots, crews, or passerbys, both our key to understanding and our strongest line of defense against future accidents lies in the people who dedicate themselves to the role of air safety investigator. As defined in the ISASI By-Laws, "An 'air safety investigator' is a person who is or has been actively engaged in the investigation of aircraft accidents or incidents or in accident prevention activities designed to identify, eliminate, or control aviation hazards before they result in accidents or incidents." However, this role is not one that is easy to fulfill—it is fraught with numerous challenges, from difficulty in examining spread-out debris as evidence to obtaining credible accounts from witnesses. The most difficult thing of all is that there is no single cause or answer to be found leading to an accident. The investigator must dive into a complex system of interacting factors that all intertwine together to create an environment of safety risks and hazards. There is one common thread among all of these: human factors.

The web of contributing factors to an accident can be captured by the SHEL Model (Figure 1), which is used in the ICAO's (International Civil Aviation Organization)

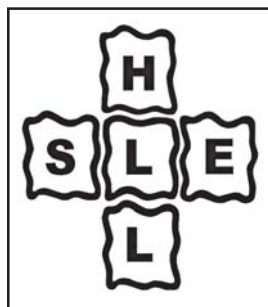


Figure 1: SHEL Model

Manual on the Prevention of Runway Incursions released in 2007. The Model illustrates the interaction of Software, Hardware, Environment, and Liveware (humans) in the aviation environment. As noted, any disjoint between the blocks "can be a source of human error." Thus, human factors issues tie all contributing components together. The challenge to investigators is that they must analyze all of these blocks together:

Software, **H**ardware, **E**nvironment, and **L**iveware in order to recreate a storyline that explains the cause of a safety breach. In taking all of these into account from a human factors perspective, investigators can help prevent future accidents by controlling aviation hazards.

Environment block

When examining the cause of an accident that occurred on or near a runway, investigators must consider the cramped and usually complex configurations of runways and taxi routes at airports. Investigators need to identify every source of confusion in aerodrome layout for pilots, such as runways that were already in use, were under construction, were too short for the plane, or were intersecting other active runways.

Another major part of the environment is the weather. Investigators have to take into account the visibility pilots had due to fog, the slickness of the runways due to rain or snow, and the external forces due to high winds. Another challenge from the environment lies in the location of plane wreckage. Crashes may occur anywhere: over jungle terrain, oceans, or snowy mountains. Pieces of debris or evidence can be spread out over an entire location and can be difficult for investigators to find. Investigators must navigate all types of difficult environments in order to get a full understanding of an accident location.

Software/hardware block

Investigators have the challenge of trying to understand the situation leading to an accident from cockpit voice recorders and flight data recorders. While these may offer important evidence, the recorders are often difficult to understand, damaged from the impact, or are completely lost. In addition, new materials such as composites that are being used in planes are not as functional for accident investigation, as they burn much more easily than traditional materials and are not as easy to read for fatigue cracks. Another challenge to investigators is that the use of digital tools in the cockpit causes data to be lost after the crash. Gauges used in the past, which are now considered less innovative, actually are more helpful to investigators as they can be analyzed for their readings during the time of flight.

The data that investigators collect from all of these accidents are implemented into runway surface accident prevention technologies, such as the Airport Movement Area Safety System (AMASS) and the Airport Surface Detection Equipment-Model X (ASDE-X). However, these technologies often fail to aid investigators with actual prevention, as they have to date proven inconsistent and unreliable, either issuing false alarms, sounding alarms seconds too late, or not at all. Also, investigators are also challenged because while there are upcoming promising technologies that could help in accident prevention such as runway status lights and in-cockpit guidance systems, they are not being implemented full scale due to strapped budgets.

Liveware block

When examining an accident, investigators must take into account all human parties involved in the incident, both before and after the actual crash. The investigator is faced with understanding the cultural and language difference among interacting cockpit crews and air traffic controllers. Investigators also need to examine "air traffic controller fatigue, which may result from regularly working overtime," and which "continues to be a matter of concern for the National Transportation Safety Board" (GAO, Aviation Runway and Ramp Safety). Controller staffing, workload, and stress, which can lead to the "losing the picture" phenomenon, leave room for critical errors. Investigators can also find roots of accidents in controllers' communication practices, such as switching and handling over and call-sign changes.

After the crash, investigators have to work with witnesses, police teams, insurance agents, family members, and airline representatives. This is extremely challenging, as investigators must be prepared to keep an unbiased mind in creating the accident storyline while understanding these different parties' perspectives. While it may be difficult in such a diverse setting with many agendas and influential energies, investigators must stick to the bare facts in order to create credible reasoning for accident occurrence.

Conclusion

As noted in ISASI's document entitled "Positions on Air Safety Investigation Issues," "Human Factors: An investigation of an accident or serious incident should include an examination of all factors influencing human performance. This investigation should include all persons whose decisions and actions could have influenced the occurrence." Investigators are challenged with the need



to understand human performance in relation to all aspects of the SHEL Model: Software, Hardware, Environment, and Liveware. By taking all of these facets into account from a human factors perspective, accident investigators save multiple lives

by effectively collecting incident data to create a repository of invaluable prevention information. ♦

The Challenges for Air Safety Investigators

By Micheál Ryan



It could be argued that Aesop's Daedalus became the first accident investigator when, in Greek mythology, he observed the treacle of molten wax, heated by the sun's rays, which lead to the failure of his son Icarus' makeshift wings. Unfortunately, modern accident investigation rarely leads to such a simple prognosis. Investigators face many challenges as they strive to uncover the cause of an accident. These challenges can be categorized as technical challenges and professional challenges.

Technical challenges arise from the continuous manufacturing advances made in the aviation industry. While the advent and incorporation of new technologies into aircraft design have undoubtedly lead to safer, more efficient aircraft, they have made the job of the accident investigator more complicated when something does go wrong.

Each new generation of aircraft has exponentially more complicated systems than the previous generation. This requires accident investigators to expand their capabilities and skills as new aircraft come into service. This century has already seen some of the most innovative steps in the history of aviation. Light aircraft such as the Cirrus SR-22 and Diamond Twinstar incorporate cockpit displays akin to those of a modern jet. Aircraft such as the Boeing 787 Dreamliner and Airbus A380 incorporate the latest advances in composite materials.

Even the most trivial technological advances can have a serious effect on an investigator's ability to investigate an accident effectively. In many new aircraft, light emitting diodes have replaced conventional bulbs in navigation lights and annunciator panels. Analysis of a light bulb under a microscope can tell the investigator if the bulb was illuminated at the moment of impact, depending on the nature of the filament fracture. Thus, very important data on the condition of the aircraft can be determined. Was the "low fuel" light on? Was the oil pressure low? LEDs do not contain a filament and as such cannot be analyzed in this way, thus any such data on the aircraft condition prior to impact is lost. This makes the investigator's task even more difficult.

The widespread use of modern composites in aircraft structures allows elegant, aerodynamically efficient designs. This comes at a cost to the investigator tasked with investigation of an accident to such an aircraft. Composites will burn or melt in the presence of fire, destroying any evidence of pre-existing structural damage in the process. This can leave an investigator with no leads as to the cause of an accident.

Returning to the story of Icarus and Daedalus, further parallels can be drawn between this myth and the harsh reality of modern accident investigation. Daedalus had the gruesome task of recovering his son's body for burial. This personal involvement may be present in any modern investigation and is a personal challenge that must be overcome by the professional investigator. An occurrence to a large airliner may result in multiple casualties. At the end of the day, all accident investigators are human and as a result may be affected emotionally by such an accident. This makes the task of investigating the accident even more difficult as all emotions must be cast aside in order to conduct the investigation in a professional manner.

During the course of an investigation, evidence may be uncovered that may alter the course of an investigation considerably. This leads to a further challenge—that of flexibility. An investigator must be able to see the big picture and keep it in mind at all times throughout the investigation. He or she must be capable of reassessing the course of the investigation in the light of new evidence and presenting this evidence in accordance with the requirements of ICAO Annex 13.

One further aspect of flexibility that investigators must contend with is the ability to deal with rapidly changing circumstances on initial notification of an accident. On receipt of a call, a normal day's work in the office can become a journey across the country, or across the world if appointed as an accredited representative. The destination may be inhospitable terrain in inclement weather conditions. An investigator must be able to adapt to these circumstances rapidly and be able to begin the field investigation immediately on arrival at the scene. This presents a significant challenge to the investigator; as coordination between various aspects of the investigation must be completed on the move. It is therefore important that an investigator be a good communicator in order to minimize the stress caused in dealing with this challenge.

An investigation requires the involvement of numerous interested parties ranging from the deceased's family, legal teams, the news media, manufacturers, and airlines—each with a reputation and their own agenda. An investigator faces the constant challenge of balancing these agendas against each other. A professional attitude must be maintained toward individuals who may make enquiries about confidential information relating to an accident. In this news-media-hungry society, this may present a greater challenge than one might perceive.

The prevention of reoccurrences of the same accident scenario is the ultimate challenge facing any accident investigator. The issuing of safety recommendations designed to prevent reoccurrences is the investigator's ultimate goal in any investigation. SRs must be logical and originate from the findings of the investigation. Recommending a design amendment to a popular aircraft type may cost millions in installation and recertification costs. Thus a professional attitude must be taken when considering what safety recommendations are to be issued. Uneconomical or illogically issued SRs may be challenged and rejected by their respective recipients. This can negate the overall goal of the investigation and can be frustrating for the investigators concerned.

The ultimate goal, and the greatest challenge, facing the modern accident investigator is to educate the aviation community about the dangers involved in flying and how these dangers can be re-

duced to an acceptable level of risk through proper planning and a professional attitude toward flying at all levels. Unfortunately, these warnings can sometimes fall on deaf ears, as was the case when Icarus was warned of the danger of flying too close to the sun. ♦

The Challenges for Air Safety Investigators: People Want Answers

By Jennifer Gritton



People want answers. And this statement could not be truer concerning air safety and accident investigation. Air safety investigators face pressure to find the contributing and leading causes of aircraft accidents. The determination that an investigator makes often leads to recommendations for increased safety in the aviation community. However, the journey to the answers of how an accident happened is never easy. Many factors contribute to hardships that air safety investigators face on a day-to-day basis, such as the environment, the location of an accident, witness recollection, and preserving evidence. But the most important issues air safety investigators face in today's world are pressures from the news media and the public to provide answers quickly. Air safety investigators are subjected to enough pressure attempting to accurately diagnose the who, what, where, why, and how of an accident. Adding news media speculation and pressure from the public puts additional, unneeded demands on investigators who already have enough to worry about.

In today's technologically savvy world, the public has access to news 24 hours a day, 7 days a week. And the news media outlets pride themselves on being up-to-date on the hour, every hour. However, this almost impatient need for information raises questions as to how far reporters will go for fast, quick, and sometimes inaccurate information. Whether it's a plane that must burn fuel before landing due to a landing gear problem or an aircraft lost in the deep forest of the Rocky Mountains, the news is always "there." The pressure of always having a reporter "looking over your shoulder" is just the beginning for investigators. Almost as quickly as the rescue squads, news media personnel arrive on scene, microphones in hand, searching for information. This creates a hectic environment for everyone. It raises concerns about securing the scene, preventing the tampering of evidence, and most importantly the premature release of information. Because investigators do not necessarily arrive on the scene immediately after an accident or incident, these issues are important to keep in mind and factor into an investigation.

Following the initial scene investigation and "no comment" interviews with the news media, investigators begin the most important part of the investigation process—determining the cause of the accident. When this time arrives, the news reporters have already released stories stating the vague where and when details. However, they are still left lusting for more information to provide to the public. That desire creates even more strain on investigators because the pressure then shifts from the basics of what happened to the more complicated procedure of determining why the accident occurred. At this point, investigators themselves may be evaluating several possible causes to the accident but those

are merely parts to formulate a larger picture. It's difficult to explain to the public that even though days or weeks have passed, an answer is still not available.

The public and news media are not trained as investigators, and it is difficult for them to understand that the most important phase of accident investigation is gathering all of the evidence for evaluation. This creates a sort of "feeding frenzy" environment for the news media. Every tiny piece of information provided by investigators is formulated, twisted, and combined to provide the public with what they want despite the fact that the information may lack authenticity and accuracy. The misconstrued picture the news media can paint can lead parties involved to second-guess what actually happened. For instance, a witness who provides a statement to local authorities at the scene may begin to incorporate the information the news media provide. Further into the investigation, that same witness may change his or her statement because now he or she has included not only what was seen but also what the news media alleged was seen.

The misconception that the news media provide plays a crucial role once the investigation is complete as well. The news media choose to present what supposedly happened instead of what actually happened; and since it was the only story available to the public at the time, it was the opinion that was accepted. What happens now when that original judgment differs from the actual probable cause? Unfortunately, many times the public takes this misconceived cause and seeks to have justice served on whomever they were made to believe is responsible. In addition, the investigators find themselves facing scrutiny because the informed, accurate conclusion that was developed differed from the news-media-speculated opinion provided earlier. This scrutiny can cause the public to question the judgment of investigators and question the timeliness of his or her conclusions. Situations like this may eventually cause a rift between organizations like the FAA and NTSB with the public because people may feel that the news agencies take too much of a "relaxed" approach toward determining the cause of an accident.

Lastly, the news media and the public attempt to play a large role in the safety recommendations suggested after an accident occurs. Because the news media lack the formal training that investigators have, the suggestions news outlets provide to the public are at times uneducated opinions of how the government agencies could completely prevent similar accidents from occurring. The news media forget to incorporate pertinent facts such as pilot toxicology, spatial disorientation issues, or aircraft performance specifications into their initial opinion of what happened. Therefore it is impossible to create a useful and preventative safety recommendation. In addition, once the NTSB or FAA suggests safety recommendations, the news media want to scrutinize and imply that what was suggested was not enough.

All of these complications combined have a negative effect on investigators' ability to thoroughly, accurately, and efficiently conduct an investigation. The pressures experienced by air safety investigators as a result of the news media are excessive and unnecessary, especially when factoring in the other unavoidable stresses. It is important for investigators to keep in mind the issues that news media involvement can create. From this, they can formulate ways to keep the public informed with accurate and useful information without sacrificing the integrity of the investigation. ♦

Remembering Swissair Flight 111



By Esperison Martinez, Editor

During ISASI 2008, President Frank Del Gandio led a contingent of 25 delegates to the Bayswater Swissair Flight 111 memorial to honor the memory of the 229 persons who perished in the crash of the aircraft in the North Atlantic waters off the coast of Peggys Cove, Nova Scotia, on Sept. 2, 1998. Del Gandio also gave thanks to the Canadian citizens for their steadfast support and hospitality extended to the thousands of passengers who were forced to land on Canadian soil following the terrorist attacks of Sept. 11, 2001, on the Twin Towers in New York City.

Joining in the remembrance were Wendy Tadros, chair, TSB Canada; the Honorable Geoff Regan, Parliament member; and Laura McCue, rector of the Parish of Blandford, along with some townsfolk of the area and the ISASI 2008 companions who were at the shrine as part of their historic tour day. Tadros added a wreath of flowers to the 28 that graced the memorial. Both Regan and McCue told about the creation and meaning of the memorial.

The Canadian government erected the memorial in memory of “those who perished off these shores,” and in recognition of “those who worked tirelessly to provide assistance in the recovery operation and comfort to the families and their friends during a time of distress.” Etched into the granite slabs are the names of those who participated in the recovery operation and those who perished. The memorial also serves as the interment grounds for the remains of passengers and crew. While the communities of Peggys Cove and Blandford were central to the recovery operation following the crash, Bayswater Beach was selected as a memorial site because it and a similar memorial in Whaleback have views to the crash site and to each other, forming a triangular shape that is reflected in the design of the memorials.

Speaking to the assembled group, Del Gandio said, in part: “Thank you for the opportunity to make some comments here today on behalf of the International Society of Air Safety Investigators. Ten years ago, 229 people died near by in the Swissair accident. That accident was investigated by our members and their coworkers from three countries, under the leadership of the Transportation Safety Board of Canada.

“We learned a lot from that accident and we were reminded of some hard-taught lessons of the past. We learned once again the importance of getting the aircraft on the ground immediately whenever a flight crew has reason to believe they have a fire on board. We also learned again about the importance of accurate and adequate information in the cockpit. With better information in the cockpit, the Swissair crew almost certainly would have landed much sooner in Boston or Portland.... The important thing is that ... the learning did not fade with time. The aviation com-

munity really has internalized the core lesson of Swissair 111.

“The accident also reminded us of the competence, thoroughness, and professionalism of the Transportation Safety Board of Canada. I say sincerely that all Canadians can be proud of the TSB; it is a world-class organization.

“We also learned something about the good people of Peggys Cove and other communities in Nova Scotia. The accident occurred at 9:30 at night, and it was even later before word began to spread in the local area. Yet, in the darkness, scores of local fishermen and other local boat owners, one by one, voluntarily accepted real risk

“We learned a lot from that accident and we were reminded of some hard-taught lessons of the past.... The important thing is that...the learning did not fade with time. The aviation community really has internalized the core lesson of Swissair 111.”

to themselves and set out to try to rescue any survivors. We soon learned that the accident was non-survivable—no victims were saved, but that does not diminish the heroic efforts of lots of local people that night.

“Air safety investigators also learned that the people of Peggys Cove would remain hospitable throughout the long investigation... ‘Decency’ and ‘kindness’ were among the words that I heard at the time.

“Finally, I want to acknowledge the anniversary this week of another aviation tragedy: Sept. 11, 2001. Among other things, the events of that day caused the United States to close its airspace for several days. As a result, 39 aircraft heading across the Atlantic enroute to the U.S. landed in Gander with nearly 7,000 people on board. Nearly as many people had to land at Halifax International. In both communities, the local people showed incredible generosity.

“But, after what we had seen a few years earlier in Peggys Cove and Blandford during Swissair 111, we really should not have been surprised by the generous response on 9/11.

“I will close by saying that the International Society of Air Safety Investigators and its members continue to have great respect for the people of Peggys Cove and Blandford. I thank you for the opportunity to speak here today. I thank you for what the people of Halifax and Gander did on 9/11, and I thank the people of this region for the dignity they showed to those who died in Swissair 111, and for the decency and kindnesses they showed to the ISASI members who worked long and hard on that investigation.” ♦



PHOTOS: E. MARTINEZ



ABOVE: Townsfolk and others take part in the memorial ceremony. INSET: The memorial is situated atop a knoll overlooking the sea and is flanked by the interment field. LEFT: Reverend L. McCue opens the ceremony with prayer. From left are the Honorable G. Regan, L. McCue, President Del Gandio, and W. Tadros. BELOW: President Del Gandio makes his address.



‘Air Accident Investigation in the European Environment’

The European Society held its inaugural air safety seminar at Cranfield University, Bedfordshire, UK, on April 24-25. More than 100 delegates attended. Seminar planners call it “an overwhelming response to the new event that was aimed primarily at European members.”

Attendees came from all over the world, as far away as the U.S., Africa, and Japan. The emphasis of the technical program was on current European issues in the investigation and prevention of accidents and incidents.

The program began with the changing

legal framework in the European environment and presentations from regulators and government investigators. There was a lively exchange of views. Rolls Royce and Airbus demonstrated European collaboration in accident investigation—a case study on an Airbus A340 accident that occurred at Quito, Ecuador, in 2007.

Presentations covered the varied challenges in accident investigation; the challenges of scale, for example, the A380; the challenges of investigations involving complex systems on board new-genera-

tion aircraft; and the challenges of accident investigation in hostile environments. Presenters came from various European countries, including France, Switzerland, Ireland, and the United Kingdom. The seminar was a very useful forum for members to exchange ideas on current techniques and future developments in accident investigation.

The feedback from attendees was very positive in terms of the length and extent of the technical program, and ESASI hopes to follow this very successful inaugural seminar with an annual event.

The main seminar was followed by a social program that included a visit to the Shuttleworth Collection at Old Warden in Bedfordshire. About 20 delegates made the journey to see the unique flying collection, which showcases the first 100 years of flight and is famous for its regular flying displays. The visit included a tour of the workshops, which gave a fascinating insight into the painstaking restoration techniques necessary to maintain the original Edwardian aircraft.

The seminar also coincided with the opening of the Cranfield Accident Laboratory facility, part of the Cranfield Safety and Accident Investigation Centre. The opening by Dr. Eddie Trimble marked the end of his long involvement with the successful Accident Investigation Course run by Cranfield University. ♦



ABOVE: Bernard Bourdon from EASA speaks to the seminar attendees.

LEFT: Dr. Eddie Trimble and Professor Graham Braithwaite at the opening of the Cranfield Accident Laboratory facility.

ISASI ‘Fellow’ Program Makes Fresh Start

President Frank Del Gandio has appointed “Fellow” Ludwig Benner chairman of the ISASI Fellow Board, which oversees and judges applications for appointment to the coveted membership status. He succeeds Ron Chippindale, who “flew west” in February.

In 1991, ISASI’s Council established a new membership classification of Fellow to provide a vehicle for the Society to give peer recognition to achievements of those



E. MARTINEZ

ABOVE: President Del Gandio (left) announces “Fellow” status for Jim Stewart and Gary R. Morphew. Lindsay Naylor (inset) was unable to attend the seminar.



E. MARTINEZ

Fellow lapel pin

members. The Council also adopted qualifications and an application process for promotion to the new Fellow membership class and established a Board of Fellows made up of five or more current Fellows to administer the program, which became effective in 1993.

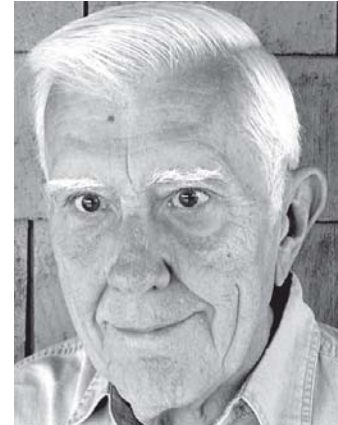
At ISASI 2008 in Halifax in September, three members of ISASI were honored with promotion to Fellow: Lindsay Naylor, James Stewart, and Gary Morphew. Since the program’s inception, 25 members have been recognized by ISASI as meriting this prestigious

membership class and have been promoted to Fellow and inducted at the annual seminar. Members from countries around the world, including Australia, Canada, Ireland, Israel, New Zealand, the United Kingdom, and the United States have been so honored (see “Fellows” listing, left).

Fellow classification is a permanent member status. Whenever you see members wearing

the distinctive Fellow lapel pin, know that their contributions to air safety and ISASI have been judged to merit this special peer recognition.

Chairman Brenner said in speaking of the program, “The membership of ISASI undoubtedly includes many more individuals whose achievements and contributions to air safety investigation, to accident prevention, and to ISASI merit the esteem of their peers. But Fellow status is not bestowed: it is an earned status for which application must be initiated by members wishing to receive such recognition. To date, only a



“Ludi” Benner, Board chair.

small number of ISASI’s worthy members has submitted an application applying for this promotion. For those who

have not yet applied, the “Application for Promotion to Fellow” containing the qualifications for promotion to Fellow, and instructions for its use, are available on the ISASI website at http://www.isasi.org/about_fellow.html.

“Applications can be completed and submitted electronically. Applicants should be aware that none of the qualifications can be waived and incomplete applications or those lacking supporting documentation will not be accepted. The Board of Fellows determines from the application whether the applicant’s contributions and achievements merit promotion to Fellow.

“We encourage all ISASI members to be aware of the Fellow program, and to

Fellow Members

- | | |
|-------------------------|------------------------------|
| Ludwig Benner, Jr. | John Rawson |
| Dr. Robert O. Besco | Itzhak Raz |
| John G. Boulding | Ira J. Rimson |
| Ron Chippindale | Max Saint Germain |
| Kevin A. Darcy | Ken Smart |
| Frank S. Del Gandio | James P. Stewart |
| Barbara Dunn | Capt. Richard B. Stone |
| Dr. David S. Hall | A. Frank Taylor |
| Terry W. Heaslip | Frank E. Yeend |
| Capt. B. Victor Hewes | |
| Kevin Humphreys | Members of the Board |
| Curtis L. Lewis | Ludwig Benner, Jr., Chairman |
| Gary R. Morphew | Curtis L. Lewis |
| Capt. Lindsay A. Naylor | Lindsay A. Naylor |
| Capt. Mike P. Papadakis | Ira J. Rimson |
| John W. Purvis | A. Frank Taylor ♦ |

Continued . . .

either encourage other members who they think merit recognition to apply for Fellow promotion, or apply themselves to receive recognition for their own achievements. We look forward to receiving these applications.” ♦

Reachout Gains New Chairman

President Frank Del Gandio has appointed John Guselli chairman of the Reachout Committee and its highly



John Guselli

successful program of providing workshop in investigative methods. Guselli succeeds James Stewart, who served as the program's first chair and guided it through its

development, growth, and workshops that have reached more than 1,700 professionals in the aviation investigative field.

One of the new chairman's first tasks was to introduce himself to the ISASI corporate membership. In a letter to them, he said: "As the newly appointed chairman of the ISASI Reachout Committee, I wish to acquaint myself with the growing corporate membership of ISASI. The participation of your organization represents more than just a token cash contribution toward the Society. Indeed, it should be an active and mutual effort from which your organization receives a dividend in aviation system safety and ultimately the efficiencies that flow from it.

"The Reachout Committee is seeking new challenges. It is embarking upon a process of confirmation and alignment with the safety aspirations of our corporate sponsors. In simple terms, the

Committee wants you to determine priorities for your Committee to consider."

He went on to list the aims of the Committee:

- To provide inexpensive training to individuals and organizations in areas of the world where gains in accident prevention may be achieved.
- To advertise the availability of the Reachout program to target states through a variety of methods.
- To identify members who display advanced technical knowledge and who have a record of successful teaching.
- To ensure the high quality of materials and teaching tools prior to presentation.
- To solicit the needs of the recipient party and to structure and deliver the seminar to fulfill those needs.
- To develop methods of financing the seminars to maintain low costs.

He also notified corporate members that ISASI has "a broad base of current, confident, and competent instructors who are equipped with both experience and cultural sensitivity to provide services voluntarily in order to enhance aviation safety." Guselli may be contacted at jguselli@bigpond.net.au. ♦

Society Biennial Elections Complete

The Society's biennial election of its Executive and the U.S. and international councillor positions is complete, and all incumbents have been returned to office for a 2-year period.

Returned to office through 2010 were president, Frank Del Gandio; executive advisor, Richard Stone; vice-president, Ron Schleede; treasurer, Tom McCarthy; secretary, Chris Baum; U.S. councillor, Curt Lewis; and international councillor, Caj Frostell. ♦

Dues Notice

Invoices for the 2009 annual dues (January 1-December 31) to ISASI have been mailed. All individual members are asked to check individual identification information and update it, if necessary. Members are reminded that the deadline for payment is Jan. 31, 2009. A fee of \$20 will be assessed for late payments. Credit card payment may be made. See the mailed invoice for details. Checks should be made payable to ISASI and forwarded to ISASI, 107 E. Holly Avenue, Suite 11, Sterling, VA USA 20164-5405. ♦

Nominations Sought For the Jerome F. Lederer Award

The ISASI Awards Committee is seeking nominations for the 2009 Jerome F. Lederer Award. For consideration, the Committee chairman must receive the nomination letter before May 31, 2009.

In making the announcement, Chairman Gale Braden said: "Each year, at our annual seminar, we recognize positive advancements in the art and science of air safety investigation through the Jerome F. Lederer Award. The criteria for the Award is quite simple. The Lederer Award recognizes outstanding contributions to technical excellence in accident investigation. Any member of the Society may submit a nomination, and the nominee may be anyone in the world. The Award may be given to a group of people, an organization, or an individual, and the nominee does not have to be a Society member. The Award may recognize a single event, a series of events, or a lifetime of achievement. The ISASI Awards Committee considers such traits as duration and persistence, standing among peers, manner and techniques of operating, and, of course, achievements."

He added, "With nominations at an all-time low, I urge you to look at your associates in the field of aircraft accident investigation and determine if any meet the criteria of a nominee.

"Each nominee competes for three

New Members

CORPORATE

Safe Flight Solutions
Capt. Majeed Panahi, CEO
Hassan Al Mousawi, Advisor
Baines Simmons Americas
Jerry P. Allen, Managing Director
James W. Smith, Managing Director
Etihad Airways
John Downey, Head of Corporate Safety
Ahsan Naseer, Manager Safety Investigation
Pakistan International Airlines (PIA)
Capt. Mohsin A. Khan, Deputy General
Manager

INDIVIDUAL

Adamson, Judith, E., Etobicoke, ON, Canada
Ahmed, Riaz, Karachi, District Centre,
Pakistan
Aidukas, Sean, M. Lompoc, CA, USA
Anglin, Lori, M., Renton, WA, USA
Awbery, Natalie, Godalming, Surrey, United
Kingdom
Barth, Thomas, H., Denver, CO, USA
Battison, Irene J., Lake Country, BC, Canada
Beck, Steven, C., Samford, QLD, Australia
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Continued . . .

years unless selected. If not selected during that time, the nominee can be nominated after an intervening year for another three-year period. This is a prestigious award usually resulting in good publicity for the recipient and might be beneficial in advancing a recipient's career or standing in the community."

Nomination letters for the Lederer Award must be limited to a single page. Nominations should be mailed, or e-mailed, to the ISASI office or directly to the Awards Committee Chairman, Gale Braden, 13805 Edmond Gardens Drive, Edmond, OK 73013, USA; e-mail address, galebraden@cox.net. ♦

ISASI Participates in ICAO AIG/08 Meeting

ISASI participated in the all-important ICAO AIG/08 meeting in Montreal, Quebec, Canada, October 13-18 as an International Observer Organization. The meeting was attended by the majority of investigation authorities from around the world. The agenda included discussions on amendments and improvements to Annex 13 to the Chicago Convention and other important topics related to accident investigation and prevention. ISASI was represented by Ron Schleede, vice-president, and Olof Fritsch, former president of ISASI and former chief of the ICAO AIG Section. A summary report of the meeting will be prepared by Schleede and Fritsch for an upcoming issue of the *Forum*. Information regarding the meeting agenda and discussion items can be found at www.icao.int/aigdiv08. ♦

Collective Reachout Reports

Mumbai, India

A 4-day Reachout workshop program was held in Mumbai April 15-18. It was the second ISASI Reachout seminar to be held in India. Hosted by Jet Airways, the



O. Fritsch, left, and R. Schleede at their delegates table during the AIG meeting.

seminar was formally opened with a cultural ceremony involving the director general of civil aviation, K. Gohain; the joint director general of civil aviation, A.K. Chopra; Jet Airways chief executive officer, Wolfgang Prock-Schauer; and seminar coordinator, Capt. Hassan Al-Mousawi.

Workshop content included emergency response, safety management systems, human factors, and airline level investigations. John Guselli, Lindsay Naylor, and Brent Hayward from ASASI delivered the material.

Organizations represented included the Ministry of Civil Aviation, major Indian air carriers, air traffic control, the Airports Authority of India, Airbus Industrie, regulatory management, business and general aviation, flying training, service providers, and engineering and maintenance organizations. Attendees exceeded 100 each day.

Generous sponsorship was provided by Jet Airways in the form of the Reachout venue. This generosity extended to the

conduct and comprehensive administrative support for the seminar as well as travel and accommodation for John Guselli and Lindsay Naylor.

Manama, Kingdom of Bahrain

Conducted from May 25-29, Gulf Air hosted a Reachout on safety management systems and aircraft accident and incident investigation. The program was opened by Björn Näf, Gulf Air's chief executive officer, and Capt. Paolo Fitze, Gulf Air's vice-president of safety.

The lead ISASI instructors were Caj Frostell, Joe Jackson, and Mike Dorion. Topics included international requirements and obligations in ICAO Annex 13, planning and organization for a major investigation, the airline's role in a major accident investigation, accident site procedures and management, field investigation, TSB Canada procedures, crisis management, off-scene follow-up work, flight operations investigation, crashworthiness, human factors, witness interviewing, and other related topics.

ANZSASI 2009 Issues Call for Papers

The Australian and New Zealand Societies of Air Safety Investigators have issued their preliminary notice and Call for Papers for the 2009 regional air safety seminar to be held in New Zealand, June 6-7, 2009, at the Distinction Rotorua Hotel, Rotorua. The regional air safety seminars hosted alternately by the New Zealand and Australian Societies of ISASI have been very popular and successful.

Rotorua is at the heart of New Zealand's volcanic and thermal region and is a center of Maori culture. There is a wide range of adventurous activities available year round. Rotorua has good domestic air connections and is a pleasant 3-hour drive from Auckland.

Papers that address the challenges of modern air safety investigations, operational developments, and current thinking on safety management systems and associated subjects are needed for the seminar.

Persons wishing to submit a paper for consideration should provide an abstract (approximately 100 words) plus a brief biography by Feb. 1, 2009, to Peter Williams p.williams@taic.org.nz; Phone: +64 4 473 3112; Fax: +64 4 499 1510. (Please note that NZ time is UTC+13 hours until April, then UTC+12 hours.)

The abstract can be mailed to NZSASI, 40 Fergusson Road, Halcombe RD9, Fielding, New Zealand. ♦

A special half-day executive management introductory SMS briefing was presented to the CEO, vice-presidents, and 26 (of 30) senior managers. Full workshop instruction was given to 33 participants, who included safety managers from Bahrain Air, Bahrain Airport Services, Bahrain CAA, Bahrain Royal Flight, Royal Jet-Abu Dhabi, and Embraer Aviation Europe. Gulf Air provided full sponsorship for the workshop, including transportation, accommodations, and workshop lunches.

Jeddah, Kingdom of Saudi Arabia

Saudi Arabian Airlines hosted two ISASI Reachout workshops on safety management systems that spanned 5 days each from June 7-18. Capts. Talal Ageel, vice-president flight operations, and Essam Yeslam, general manager of flight ops standards and QA, opened the first workshop.

During the first workshop, ISASI instructors provided a one-hour executive management introductory SMS briefing to His Excellency, the director general of Saudi Arabian Airlines, Engineer Khalid Almolhem, and approximately 20 executive vice-presidents and vice-presidents. Completing the top-level presentation, the instructors returned to the general

workshop instruction provided by Mike Doiron and Caj Frostell. Workshop content included the ICAO requirements and principles for SMS, SMS lessons learned, SMS human factors in organizations, stress, fatigue, SMS incident review (including the SHEL model), incident reporting and in-house investigations as part of SMS, SMS hazard identification, SMS risk management, and other SMS-related topics.

The second SMS workshop was opened by Capt. Mohammed Ali Jamjoom, general manager of corporate safety for Arabian Airlines. Technical content of the workshop mirrored that of the previous instruction that began on June 7. Participants of both workshops totaled 47, representing different departments within Saudi Arabian Airlines, which provided full sponsorship of both workshops—including transportation, accommodations, and workshop buffet lunches.

Pakistan

Workshops were conducted in Hyderabad and Karachi in November 2007. Hosted by the Civil Aviation Authority of Pakistan, the training was done at the CAA Training Institute in Hyderabad and at Karachi (Jinnah) International Airport

for CAA management and service providers. ISASI instructors were Capt. Elaine Parker and John Guselli.

The CAA Safety and Investigation Board sought workshop content to develop an increased awareness of contemporary safety management system practices in a number of fields. Topic included ICAO SMS promulgation in Pakistan, establishment of a regional context for SMS use, translation issues, corporate interpretation of SMS, and instructor consolidation. In Karachi, instructional topics included safety management systems, safety management system implementation, and safety management system integration.

CAA Pakistan accounted for full sponsorship with strong support from Wing Commander Syed Naseem Ahmed, technical investigator, the Safety and Investigation Board, and Beyond Risk Management of Calgary, Canada, and JCG Aviation Services of Sydney, Australia. ♦

Changes Affect Three Regional Chapters

Three of ISASI's regional chapters have experienced changes of officers, who are now all in place. Changes include—

Dallas-Ft. Worth: President, Tim J. Logan; Vice-President, Toby Carroll; Treasurer, John Darbo; and Secretary, Erin Carroll.

Rocky Mountain: President, David W. Harper; Vice-President New Mexico, James C. Johnson; Vice-President Kansas, Donald F. Knutson; Vice-President Utah, Richard B. Stone; Secretary, Tracy G. Dillinger; Treasurer, vacant.

Southeastern: President, Robert J. Randzio; Vice-President, Jayme E. Nichols; Secretary/Treasurer, Dan M. McCune. This Chapter and the Florida Chapter merged, resulting in the reactivation of the Southeastern Chapter. ♦

Continued . . .

NTSB Updates 'Most Wanted' List of Safety Improvements

The National Transportation Safety Board on October 28 issued its 2009 "Most Wanted" list of safety improvements. Newly added to the list of 15 areas of concern were improve emergency medical services (EMS) flight operations, restrict use of cell phones by motorcoach drivers, and require electronic onboard recorders by all motor carriers. Among the aviation issues removed from the list was aircraft fuel tank flammability.

The Board believes that a concerted effort must be made to improve the

safety of emergency medical services flights. In 2006, the Safety Board issued a special investigation report addressing the safety issues involved in these operations. Although the Board has issued recommendations to improve EMS safety, the FAA has not implemented the changes. In the last 11 months, there have been nine EMS accidents resulting in 35 fatalities.

The Safety Board believes that implementing a safety system for ground movement with direct warnings to flight crews will improve runway safety. Also issued is a recommendation that would require pilots to conduct landing distance assessments before every landing based on existing performance data, actual conditions, and incorporating a minimum safety margin of 15 percent. A new recommendation was added that would provide pilots with information or alerts in the cockpit regarding attempted takeoffs from a taxiway or the wrong runway.

The Board believes that actions need to be taken to improve flight safety in icing conditions. The FAA has yet to complete efforts to revise icing certification criteria, testing requirements, and restrictions on operating in icing conditions. A recommendation added this year on deice boots addresses a widely held, but incorrect, belief that activation of deice boots be delayed rather than started immediately upon entering icing conditions.

Conventional CVRs and FDRs do not show the initial cockpit environment leading up to a crash. The Safety Board believes that image recording systems would provide critical information about the actions inside the cockpit and immediately before and during an accident.

The Board removed the area "eliminate flammable fuel/air vapors in fuel tanks on transport category aircraft" from the list.

The Board kept "improve crew resource management training for on-demand Part 135 carriers" on the list with no changes. ♦

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The General Aviation Manufacturers Association

(Who's Who is a brief profile of and prepared by, the represented ISASI corporate member organization to enable a more thorough understanding of the organization's role and functions.—Editor)

The General Aviation Manufacturers Association (GAMA) represents more than 60 of the world's leading manufacturers of fixed-wing general aviation airplanes, engines, avionics, and components. In addition to building nearly all of the general aviation airplanes flying worldwide today, GAMA member companies also operate fleets of airplanes, fixed-based operations, pilot/technician training centers, and maintenance facilities worldwide.

Headquartered in Washington, D.C., GAMA represents the interests of its members to government agencies throughout the world. These interests include legislation, safety regulations and standards, market access, development of aviation infrastructure, and aviation security.

GAMA also engages with the International Civil Aviation Organization (ICAO) on behalf of its members and works with national and international industry groups to promote the interests of general aviation worldwide.

Through its public information and education programs, GAMA promotes the better understanding of general aviation and the important role it plays in economic growth and in serving the transportation needs of communities, companies, and individuals worldwide.

As part of GAMA's active committee structure, the Accident Investigation Subcommittee is a proactive industry organization that aggressively promotes aviation safety through effective and ethical investigation of aircraft accidents, quality training, and education. This is accomplished by enhancing communication and technical excellence among GAMA members, government agencies, and other public organizations. GAMA also sponsors

and organizes the General Aviation Air Safety Investigators (GAASI) annual advanced technical workshop. The workshop provides general aviation air safety investigators with the most timely and useful training available on current trends and "best practices" in the field to ensure that investigators can perform their safety tasks as optimally as possible.

GAMA's highest priority is reducing the worldwide number of accidents involving general aviation airplanes. Using systematic, data-driven analysis of accident causes and factors, GAMA works diligently to identify adverse trends, develop and implement appropriate interventions, update training standards and materials, and disseminate safety information. GAMA also facilitates manufacturers' interaction with non-U.S. accident investigation authorities and works to improve the timely notification of accident occurrence and enhanced working relationships.

On other fronts, GAMA strives to refine the FAA's data collection for general aviation, including the General Aviation Air Taxi Activity and Avionics (GAATAA) survey, and the agency's general aviation forecast. Working with national aviation authorities, GAMA has also helped to identify accident

precursors and implement appropriate Safety Management Systems (SMSs).

GAMA believes in the value-added introduction of SMS for entities that have established organizational management structures while promoting risk-management tools for light general aviation.

The Association also works to modernize pilot training education standards, a key link in the aviation safety chain. Most recently, GAMA has been working to update pilot training to properly address the integrated "glass" cockpits in piston airplanes including working with the FAA on a comprehensive rewrite of its training handbooks, as well as working with the FAA to strengthen the biannual flight review requirements, including the recent issuance of a new biannual flight review aid.

General aviation manufacturers continuously invest in the development of new products and technologies that increase the margin of safety. Electronically controlled engines, anti-ice systems, enhanced and synthetic vision systems, satellite-based navigation and weather, terrain awareness warning systems, and new communications and surveillance technologies all significantly contribute to making general aviation safer. In fact, the FAA reported that in calendar year 2007, the number of fatal general aviation accidents dropped 6 percent, which is the safest year on record for general aviation since the FAA began tracking safety statistics. ♦



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