

# ISASI FORUM

**“Air Safety Through Investigation”**



**OCTOBER–DECEMBER 2006**

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### Volume 39, Number 4

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INCORPORATED AUGUST 31, 1964

## Welcome to ISASI and Cancun

By Frank Del Gandio, President

*(President Del Gandio's September 12 opening remarks to the delegates of ISASI 2006 have been abbreviated.—Editor)*

**W**e are honored with the presence of our host, Capt. Gilberto Lopez Mayer, director general of the DGAC of the Republic of Mexico. A special thanks to the people of Mexico, as well as the state of Quintana Roo and the city of Cancun, for inviting ISASI to this Caribbean paradise.

The people of Mexico should be very, very proud of the rapid recovery that they have achieved here in such a short time after the devastation of Hurricane Rita. My own country has learned just how difficult it is to rebuild an entire city after a devastating hurricane. I have a deep sense of personal satisfaction that ISASI is holding its annual seminar in Mexico, reinforcing our international stature.

ISASI and I personally have long hoped to improve our presence and our representation in Latin America—and here we are. We are especially pleased with the establishment of the Latin American Society of Air Safety Investigators. ISASI also has hosted two Outreach workshops in Latin America, one in Mexico and one in Chile. Each was very well attended by regional aviation professionals.

These events speak to the future growth of the Latin American Society of Air Safety Investigators and illustrate what I have always believed to be one of the core strengths of ISASI: the breadth and wealth of knowledge that our membership brings to the table. ISASI really is proud to assist all our aviation brethren in whatever modest way we can because we in aviation

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### **We are especially pleased with the establishment of the Latin American Society of Air Safety Investigators.**

accident investigation know better than most that aviation safety knows no borders. Aircraft recognize neither natural nor man-made borders—nor do they recognize awkward national fences.

The good news is that the aviation community around the world has continued to achieve higher and higher levels of safety. We have persistently eliminated more and more risk from the system. Air carrier safety has become so reliable, particularly the passenger jet system, that most of the world now finds itself trying to identify and minimize the risks of what have become very rare events.

This fact is reflected in the theme of this year's seminar, "Incidents to Accidents—Breaking the Chain." Its premise is that the aviation transport system now performs at such a level that we can no longer rely on accidents as our primary



**President Del Gandio welcomes delegates to ISASI 2006, Cancun, Mexico.**

source of learning how to improve safety.

Everyone here has seen the iceberg illustration in which serious accidents are literally the tip of the iceberg, while the water depths hide a mountain of incidents that all too easily could have led to accidents. At a minimum, that mountain of incidents beneath the water may obscure persistent and serious risks that remain part of our system every day. The notion of "breaking the chain" says we must learn much more from incidents so that we can identify interventions that break the chain of events before they lead to serious accidents.

To do this right, we will need to sharpen traditional investigative and analytical skills to understand visible, high-risk incidents that come to our attention. But, similar to major accidents, even these events are only a small part of the iceberg. Breaking the chain will likely require that we target a broader range of incidents on which to use our traditional investigative and analytical resources.

Already, the aviation safety community is moving rapidly toward a system that integrates aviation knowledge with information technology and detailed statistical analysis of routine flights and routine air traffic data. What seemed to be far off in the future just a few years ago has become reality today: conceptually at least, we can now model the entire operating system.

We also are seeing the rapid growth of voluntary reporting systems in which pilots, maintenance crews, and cabin crews can report incidents to their airline without the threat of punitive action. These efforts are providing a new wealth of insight into incidents and risk.

Yet, at least two challenges remain fundamental to this shift toward incident analysis.

First, it is not easy to do well or even to do it in a meaningful *(continued on page 30)*

# Safety Cannot Be Seen; It Must Be

By Capt. Gilberto Lopez Meyer, Director General of the Mexican General Directorate of Civil Aviation

*(Remarks presented by Capt. Lopez Meyer in his keynote address to ISASI 2006 delegates, on Sept. 12, 2006, Cancun, Mexico.—Editor)*

**G**ood Morning to everyone. It is with great pleasure that I welcome you to our country and to this beautiful city of Cancun.

Aviation safety and security are behind most of the civil aviation decisions being made in Mexico and around the world. Confidence in this safety and security come from the preventive, corrective, and timely actions that are being taken. Therefore, breaking the chain of incidents that produce accidents implies a group of action projects, programs, and concrete plans to avoid a multitude of unfortunate events whose frequency or gravity may let them become major aviation risks.

Safety cannot be seen, because its purpose is precisely to avoid the appearance of incidents and accidents. But it must be felt, when periodic controls, inspections, and evaluations are made.

Prevention means looking ahead, establishing norms, correcting errors, and maintaining a set of timely inspections, so that aviation can accomplish its mission of being safe and reliable.

We have to address the issue of "Incidents to Accidents—Breaking the Chain," where we all fundamentally coincide and where each point of view and each analysis and proposal will allow us to be a bit more effective in preventing accidents.

During this seminar, we will have the privilege of listening to presentations that will be given by distinguished experts from the international aviation community. We will hear very important opinions, studies, and points of view that will increase our knowledge in the area of safety and of how to guarantee it and to perfect it. From the agenda, I can acknowledge that the different speakers will address different aspects of accident reports, accident investigation, and analysis tools to help prevent these accidents.

Mexico, Canada, and the United States have been part of the North American Free Trade Agreement since 1994. This Agreement contains a special charter for aviation, called the North American Aviation Trilateral, that brings together three important organizations: Transport Canada, the Federal Aviation Administration, and the Mexican General Directorate of Civil Aviation.

During these more than 10 years of work, our three countries together have been developing various programs—those related to accident prevention being some of the most important. A very important tool was developed: a computerized database containing, in detail, the various elements of accidents reports from the three countries. The database contains a description of each accident. And after a detailed analysis, the root cause and secondary or contributing factors that led to the accident were established.

The database, thus, allowed us to work out statistics so that intervention strategies for each of the root causes could be devel-

oped. For example, approximately 500 air transport accidents that occurred in the three countries were analyzed. Eight main root causes were established, and intervention strategies to address them were developed. Those eight root causes were

1. not following proper procedures by operations.
2. equipment or component failure.
3. poor judgment by operations.
4. aircraft handling.
5. lack of crew coordination.

---

**O**ur work during the next few hours and days will be to break these [accident] chains, to analyze, to establish proposals, and to agree on control and preventive measures to try to eliminate those incidents. Aviation safety concerns us all—aviation companies, government authorities, airports, specialists, and technicians—all those that in some way or another participate in aviation industry decisions or in verifying compliance with domestic and international regulations.

6. not following proper procedures by maintenance.
7. diminished situational awareness.
8. lack of communications clarity.

Do these sound familiar?

From the analysis of these eight root causes, the following preventive strategies were established:

- Confidential safety reporting programs for airlines and employees.
- Pilot reexamination.
- ISO evaluation process (or equivalent internal quality assurance system such as ISO 9001-2000).
- Quality assurance programs.
- CRM courses.
- Line-oriented safety audits.

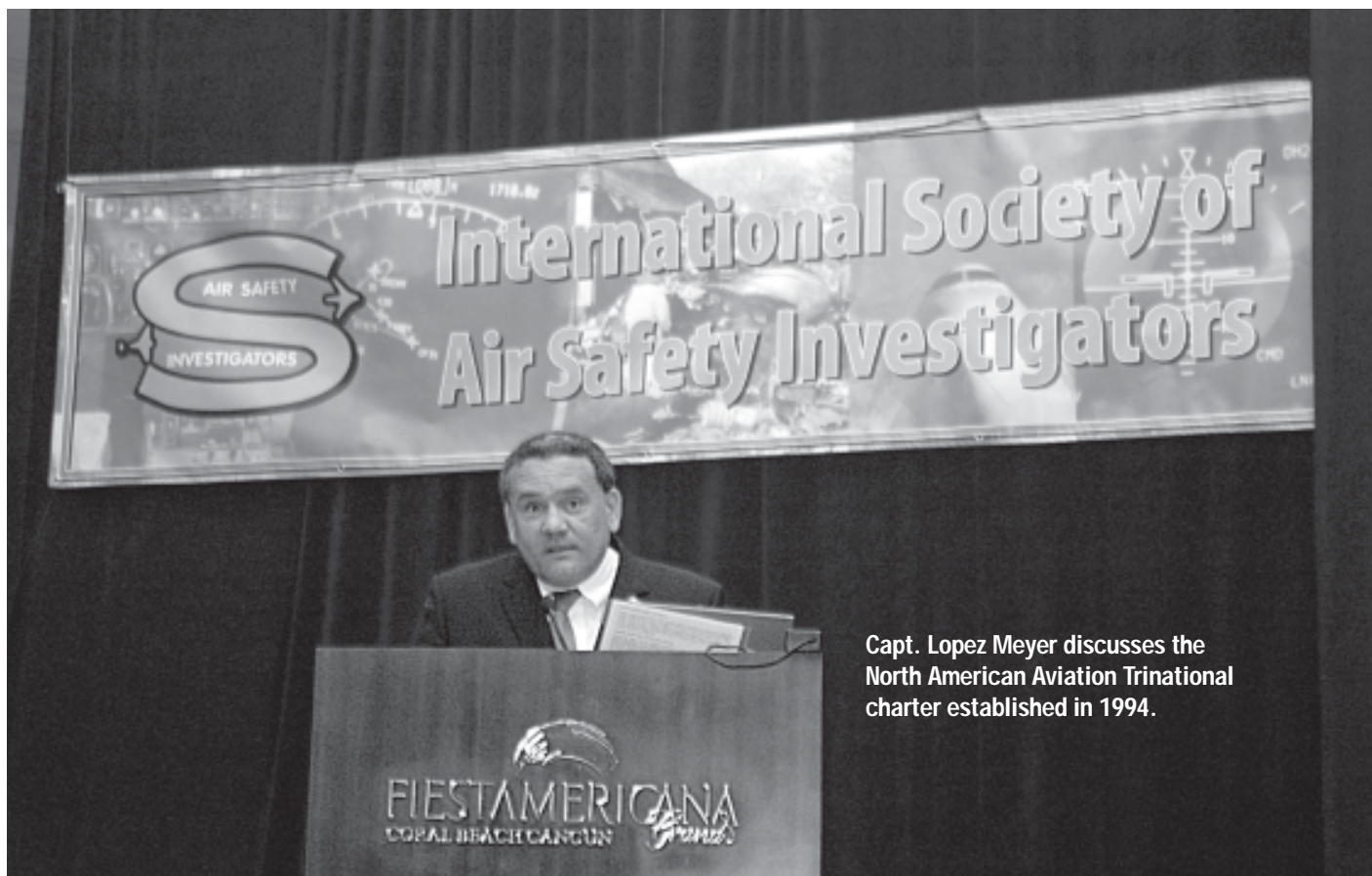
The same procedure was used for general aviation airplanes and for helicopter operations.

In Mexico, accident investigation is done in accordance with ICAO Annex 13, Mexican civil aviation law, and its regulations. It is interesting to note that aviation accidents are investigated by the General Directorate of Civil Aviation itself.

I may say that in Mexico we are actually in the middle of a discussion, trying to decide if the authority responsible for accident investigations should not be part of the civil aviation authority. It has been very interesting to me to find that there is not a simple



# Felt



Capt. Lopez Meyer discusses the North American Aviation Trilateral charter established in 1994.

E. MARTINEZ

and unanimous answer for this question—not even in countries that took the decision to separate both responsibilities many years ago. Maybe we will be able to learn some valuable experiences from the lectures that will be presented at this seminar during the next days.

Traditionally, the focus has been on accident prevention and avoidance and on establishing the necessary trilateral prevention strategies. Today, we are looking at something less dramatic, but just as important: incidents. And we must realize that when they often occur, they can lead to what we really want to prevent: accidents.

Our work during the next few hours and days will be to break these chains, to analyze, to establish proposals, and to agree on control and preventive measures to try to eliminate those incidents. Aviation safety concerns us all—aviation companies, government authorities, airports, specialists, and technicians—all those that in some way or another participate in aviation industry decisions or in verifying compliance with domestic and international regulations.

Thus, the audit and follow-up inspection and control programs and projects are fundamental within the framework of our safety

**The audit and follow-up inspection and control programs and projects are fundamental within the framework of our safety plans. Mexico's civil aviation authorities look with great interest to this international seminar, which we feel will greatly enhance our future decision, and we appreciate the effort that has gone into putting it together.**

plans. Mexico's civil aviation authorities look with great interest to this international seminar, which we feel will greatly enhance our future decision, and we appreciate the effort that has gone into putting it together.

On behalf of the Mexican federal government, thank you very much for coming to Cancun. ♦

# 'Incidents to Accidents—Breaking

**As air transportation in the world's skies reaches record levels of safe flight, the "tinkickers" of the world's aviation industry search ways to break the chain of accident-causing events to make flight even safer.**

By Esperison Martinez, Editor

The International Society of Air Safety Investigators' 37th annual international seminar, better known as ISASI 2006, drew 280 participants to its first seminar in Latin America since 1977. Held in Cancun, Mexico, the resort reputation of the location belies the professional adherence to work displayed by the men and women who "locked" themselves into a cavernous auditorium with fluctuating room temperatures for 3 days of penetrating presentations of why the investigation of aircraft "incidents" is so crucial to saving lives.

Capt. Gilberto Lopez Meyer, director general of the Mexican General Directorate of Civil Aviation, presented the keynote address to the delegates attending the seminar, which carried the theme "Incidents to Accidents—Breaking the Chain." The director general's presence solidly endorsed ISASI's decision to again break the hosting mold of its annual seminar practices by taking on the host duties with help from the Latin Society to provide an



**Barbara Dunn welcomes delegates.**

international accident investigation and prevention discussion "table" to Latin America. Barbara Dunn, ISASI Council member, served as chairperson for the overall seminar, and Jim Stewart acted as technical program chair.

The Cancun, Mexico, site, including the Grand Coral Beach Hotel, for the September 11-14 event proved excellent to encourage attendance by investigators and others from Latin American countries. The hotel provided all the work needs that allow an audience to readily absorb seminar discussions and be comfortable in post-meeting activities.

In his keynote address, Capt. Lopez Meyer noted that because confidence in air safety and security results from timely actions to prevent and correct events, "breaking the chain of incidents that produces accidents implies a group of action projects, programs,

and concrete plans to avoid a multitude of unfortunate events whose frequency or gravity may let them become major aviation risks."

He emphasized, "Safety cannot be seen, because its purpose is precisely to avoid the appearance of incidents and accidents. But it must be felt, when periodic controls, inspections, and evaluations are made."



**Stuart Matthews delivers his message.**

In defining the theme of the seminar he said: "Prevention means looking ahead, establishing norms, correcting errors, and maintaining a set of timely inspections, so that aviation can accomplish its mission of being safe and reliable. We have to address the issue of 'Incidents to Accidents—Breaking the Chain,' where we all fundamentally coincide and where each point of view and each analysis and proposal will allow us to be a bit more effective in preventing accidents." (See page 4 for the full text of the keynote address.)

Stuart Matthews, president and CEO of Flight Safety Foundation (FSF), in his seminar opening remarks, reminded the audience of investigators of the reality of their efforts. He said: "I don't have to remind you that commercial aviation is very safe. In fact, air transport is probably the safest form of mass transportation that the world has ever known. And it is constantly becoming safer as more advanced aircraft come into service, facilities are upgraded and improved, and procedures are adopted. Worldwide, based on a 10-year average, the hull loss accident rate is now about 0.7 per million de-



**Cancun welcomes ISASI.**



# the Chain'

partures and since things have been improving constantly during those 10 years, the rate at this very moment can only be much lower.

"Of course, the accident rate varies considerably from one region of the world to another. In North America and Europe, the current rate is about 0.2 per million departures, which means that if you took a flight every day for the rest of your life, some 14,000 years would elapse before you were ever involved in a fatal accident and even then, there is only about a 10% chance that you would be one of the fatalities. On the other hand, we do continue to have aviation accidents that keep you folks busy enough, and it is no secret that most commercial airline accidents occur to older aircraft in more primitive parts of the world."

He went on to detail some of the things that FSF has done to help further improve aviation safety. He spoke to



The audience gives full attention to the presentation by Horacio Larrosa from Argentina.

- FSF's approach-and-landing accident reduction (ALAR) toolkit that sets out everything one would ever want to know about avoiding an approach-and-landing or CFIT accident. The recommendations and best practices contained in the toolkit have been accepted by FAA and JAA (now EASA).
- Development of a corporate FOQA demonstration program that is being tested with good results. The goal is to have FOQA in widespread use in business and corporate aircraft.
- Commercial Aviation Safety Team (CAST), an industry and government team effort to achieve a national goal of reducing the U.S. fatal accident rate by 80% over a 10-year period from 1997. FSF has been a member of the CAST Steering Committee and an active participant since its inception. Nine years on, the team is looking to reach a 73% reduction by 2007.
- Smoke, fire, and fumes (SFF) reassessment after the Swissair 111 accident off Nova Scotia. Under FSF's neutral umbrella, representatives of the major stakeholders, including the major manu-



Tuesday a.m. panel members (left to right): H. Larrosa, C. Limon, and C. Garrio.

facturers, developed consensus on new guidelines and procedures to be followed in the event of an SFF encounter (see *Forum* July-September 2006, page 14).

- ICAO's Global Safety Roadmap and FSF's major role in the development of the Global Aviation Safety Roadmap. Developed for ICAO by the international industry, the Safety Roadmap sets out a framework of actions to systematically improve aviation safety in those areas of the world having the highest accident rate.

Matthews concluded his remarks with a discussion of the tendency for judicial authorities to interfere with aviation accident investigations and the need for protection of aviation safety data—a need that has been met with FSF-initiated action to amend ICAO Annex 13, which deals with accident investigation, to give priority and immunity to the investigation. He noted that after prolonged attempts, Amendment 11 to Annex 13 has emerged and was adopted by the ICAO Council on March 3, becoming effective Nov. 23, 2006.

## Traditional schedule

The 4-day program followed the traditional schedule: 1 day devoted to tutorial workshops and 3 days to a technical seminar. In



Wednesday a.m. panel members (left to right): J. Rakow, B. Ruitenberg, G. Liddy, R. Mumaw, G. Nicolas, and G. Algoïn.



Thursday a.m. panel (left to right): G. Morphew, N. Stoss, D. King, B. Kemp, D. Siewert, and C. Stephens.

all, 20 technical papers were presented to support the seminar theme. However, this year seminar planners set sub-themes for each seminar day. The first day was dubbed Latin American Day. It was moderated by Capt. Carlos Limon of ASPA, Mexico. For the most part, the program was devoted to presentations by persons from Argentina, Mexico, Chile, and Brazil. The second day's program, International Day, moderated by Graham Liddy from Ireland, Toby Carroll from the U.S.A., and Wing Keong Chan from Singapore, presented speakers from the U.S.A., France, the Netherlands, Australia, Norway, and Germany.

Investigator's Day was the third day sub-theme. It was moderated by David King of the AAIB, U.K. and Chris Baum of ALPA, U.S.A. Investigators from regulatory agencies of Canada and France, along with speakers from ALPA, the U.S.A./Canada pilots union, and the University of South Wales, Australian Defense Force Academy made presentations. A listing of speakers and paper topics is located elsewhere on these pages.

In post-seminar activity, Jim Stewart, technical program chairman, electronically wrote to all speakers, thanking them for their participation. His comments rather well described the impact of the papers presented.

He wrote: "I know it is not a light commitment you had to make to take on the responsibility. However, I believe, through your efforts, that we presented an impressive technical program and one that moved us back toward the core values of the Society. While those attending saw the final product and were very impressed with the quality of the papers and the presenters, I also was concerned with the administrative side of putting the program together and ensuring the preparation of the final program handout and sending the program to Gary Morphew of SCSI, who prepared the CD-ROMs for the delegates and took care of the program printing for us. I have never had such a good experience working with a group of presenters. Your papers were submitted on time and excellently formatted, which greatly reduced our workload and concern—no panic attacks for the planning committee.

"The highest compliments come from those who attended, and I will share just a few comments I received: 'Congratulations on an excellent technical program. It was of such quality that I stayed inside and away from the beach for the full program.' 'The technical program was one of the best we have had, and my compliments to all of the presenters and to your papers' committee.'"

Interspersed throughout the 3-day technical program schedule

were meetings of all available components that constitute ISASI's infrastructure, national societies, working groups, and committees. In addition, President Del Gandio conducted the required annual Society business meeting at which he made known the results of the biannual election of the Executive. He noted that all incumbents were on the ballot except for the office of secretary. All incumbents were returned to office for another 2 years, and Chris Baum was elected Secretary. Chris is with the Air Line Pilots Association, a corporate member, and took office at the seminar (see "Roundup" for biographical data).

## Tutorial I

The tutorial program is considered a separate endeavor from the technical program and requires separate registration by its attendees. This year 150 persons registered to attend the two workshops



Some of Tutorial I teams look over the "game board."

presented on the first day of the overall seminar timeframe. Both workshops proved innovative in their presentation approach. The first, "Investigation Management," used a simulation game format to instruct its participants. The second, "Safety Management Systems," relied on five investigators to shed light on the various investigative challenges they encountered in "breaking the chain."

The simulation game format was devised at Cranfield Univer-

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## Speakers and Technical Papers Presented at ISASI 2006

### LATIN AMERICA DAY—Tuesday, September 12

**Keynote Address**—Capt. Gilberto Lopez Meyer, DGCA Mexico

**Remarks**—Stuart Matthews, president and CEO, FSF

**Horacio Larrosa, JIAAC, Argentina**—*Accident and Incident Investigation in Argentina—One View about a Maintenance-Related Case*

**Capt. Carlos Limon, ASPA Mexico**—*A CFIT Accident: Lessons Learnt*

**Claudio Pandolfi, Chile**—*Advanced Qualification Program (AQP) as a Tool to Break the Chain of Accidents*

**Fabio Catani, Embraer, Brazil**—*Risk Analysis Methodology Application and Results for Product Safety Monitoring at Embraer*

**Victor Tejada, Embraer human factors specialist**—*The Human Factor to Break the Chain*

**Richard H. Wood, U.S.A.**—*Defining and Investigating Incidents*

### INTERNATIONAL DAY—Wednesday, September 13

**Randall J. Mumaw, Boeing, U.S.A.**—*Industry Working Group for Enhancing the Investigation of Human Performance Issues*

**Dr. Joseph Rakow/Dr. Alfred M. Pettinger, Exponent Failure Analysis Associates, U.S.A.**—*Failure Analysis of Composite Materials in Aircraft Structures*

**Guilhem Nicolas/Guillaume Aigoin, BEA France**—*Solving FDR Readout Problems: A Proactive Approach*

**Bert Ruitenbergh, Tower & Approach Unit, Schiphol Airport, the Netherlands**—*Using the Threat and Error Management (TEM) Framework as an Analytical Tool in ATC*

**Michael Walker, ATSB, Australia**—*The ATSB Approach*

*to Improving the Quality of Investigation Analysis*

**Dr. Kaare Halvorsen/Dr. Grete Myhre, AIB, Norway**—*An Investigation as to How Aviation Safety Will Be Maintained in the Light of the Major Change Processes Taking Place in the Norwegian Civil Aviation Sector*

**Johann Reuss, BFU, Germany**—*Incident Investigation: A Diversion of a Boeing B-747 Resulting in a Serious Low Fuel Situation*

**Wen-Chin Li/Don Harris, Cranfield University, U.K.**—*Breaking the Chain: An Empirical Analysis of Accident Casual Factors within the Human Factors Analysis and Classification System (HFACS)*

### INVESTIGATOR'S DAY—Thursday, September 14

**Nick Stoss, Transportation Safety Board of Canada**—*Major Investigation Management*

**William R. Kemp, TSBC, Canada**—*A Safety Issue Investigation into Small Aircraft Accidents Resulting in Post-Impact Fire: The Experience, Techniques, and Lessons Learned*

**Gary R. Morphew, SCSA, U.S.A.**—*Investigation into Turbulence-Related Accidents*

**Corey Stephens, ALPA USA/Dana Siewert, UND, U.S.A.**—*Polishing the Apple and the Investigator: Examining the Importance of Investigator Education Prior to an Investigation*

**Alain Agnesetti/Stéphane Corcos, BEA-France**—*Investigating a Minor Incident Using Lessons Learned from a Major Accident*

**Sue Burdekin, University of New South Wales, Australian Defense Force Academy**—*Listening to the Specialists: How Pilot Self Reporting Can Help Break the Accident Chain*

city's Safety and Accident Investigation Centre by Dr. Graham Braithwaite who led the team of facilitators: Dave King, AAIB/U.K.; Nick Stoss, TSB Canada; Ron Schleede, ISASI; and Dave Miller and Richard James, both from AAIB/U.K. The group was broken into four teams of 11 persons each, randomly selected to break any comfort zones that may have existed at tables.

The game resembles a board game, with huge action cards laid out on the floor in a specific pattern. Moves are controlled through the roll of a giant balloon-light die complete with its dotted six sides. Die roll determination: landing on a puzzle piece provides the issue to be resolved. The teams must then determine the on-site precautions to be taken, given the accident scenario received:

- What can you achieve between notification and deployment?
- What are your top-five priorities during your first hour on site?

- What do you wish to achieve by the end of your first group meeting?
- All technical and accredited reps have now arrived on site. How do you best integrate them into the investigation?
- The minister/secretary for transport has arrived on site and has asked that you give her a briefing.
- The news media is very keen to hear from the investigation team. You are about to hold a press conference for them.
- What are the top five factors that determine when the site phase is complete?

Dr. Braithwaite says the purpose of the simulation game is to create discussion and review how the investigation of specific accident scenarios may be managed and to discuss strategies for handling the major components of accident investigation in the matters discussed above. At the end of the exercise, in addition to developing practical approaches to the management of accident investigation, participants are expected to devise a list of the "top 10" things to remember in managing an investigation.

The interactive exercise proved to be a highly effective and a much-appreciated change to the traditional method of workshop instruction.

### Tutorial II

Although in a more traditional style, the second tutorial "Safety Management Systems (SMS), The Investigative Challenge," drew 90 persons who recognized the value of listening to five industry experts relate their experience with SMS on their properties. Jim Stewart, seminar technical committee chairman, opened the session and asked for "a moment of silence for those who died from many countries on September 11th, five years ago, and par-



Tutorial I team 3 discusses its strategy.



Some of the 90 delegates in Tutorial II listen to SMS details.

ticularly remember our aviation colleagues.”

John Guselli, ISASI chairman of the ATS Working Group, moderated the day-long exercise and concisely stated why so many persons were sitting in the room. We are here, he said, “to help each other, by sharing our collective experiences, to defend against the effects of incidents and accidents, to enhance operational productivity, and to meet contemporary safety obligations.” He defined a Safety Management System as “a documented process for managing risks that integrates operations and technical system with the management of financial and human resources to ensure aviation safety or the safety of the public.” The need for an SMS includes defense against adverse occurrences, greater productivity, and increased reliability, he noted.

Guselli added that among the key elements of an effective SMS is that safety is directed by senior management and contains processes for finding hazards, managing risks, and ensuring that competent personnel are involved.

With the properties of an SMS identified, the tutorial facilitators moved on to relate their experiences. The facilitators included Marcus Costa, ICAO; Danny Ho, EVA Air; Jim Stewart subbing for Michael DiLollo, Air Transat, who was unable to attend due to illness; and Bert Ruitenbergh, ATC human factors specialist.

Costa put the full room at ease with his admission that while he is the chief of ICAO’s AIG, no one knows what the “G” stands for as it has no twin in the title of his office: Accident Investigation and Prevention Section. He then tuned to the more serious. Although the management of safety varies, he noted, “Developed nations, developing nations, and undeveloped nations all must deal with the same aviation task—safety management is applicable to the whole world of aviation” In this regard, he noted that as of Nov. 23, 2006, ICAO requires States to establish a safety program in order to achieve an acceptable level of safety in the operation and maintenance of aircraft and the provision of air traffic services and aerodrome operations. He added that the acceptable level of safety to be achieved shall be established by the State(s) concerned.

Costa went on to discuss reactive versus proactive safety practices and explained ICAO’s new provisions for safety management outlined in the new Safety Management Manual (Document 9859) issued by ICAO in March 2006. The Manual provides guidance material on safety management by updating the Accident Prevention Manual and consolidating SMS provisions for incorporating

ATS, aerodromes, operators and maintenance, and taking a systems approach to managing safety.

Danny Ho spoke to the application and implementation of SMS from EVA Air’s perspective. He said discovering how to identify hazards and minimize operations and organizational risk has become a priority for safety management. He then proceeded to describe his organization’s approach to SMS and its implementation on the property. He noted that EVA Air thinks of a Safety Management System as the methodology by which a company manages safety throughout its organization, utilizing a systematic approach to ensure that all parts of business are addressed, and that all risks are identified and subsequently managed. To achieve such a system requires the safety commitment, support, and involvement from senior management that works to attain a comprehensive approach to safety; to establish an independent department



John Guselli casts a watchful eye during a Tutorial II exercise.

to perform the function of safety management; and to generate a positive safety culture throughout the organization.

After taking the audience through a detailed presentation of SMS at work within the property, Ho concluded by noting that the three cornerstones for an effective SMS are a comprehensive corporate approach to safety, an effective organizational tool to deliver safety standards, and a formal system for safety oversight. He left the group with this poignant thought to ponder: “Unless there is a dedicated SMS, safety is not a first priority regardless of intentions.”

Bert Ruitenbergh addressed the ICAO standards and requirements for safety management in an air traffic control (ATC) environment. His PowerPoint screen flashed: “Safety Management Manual (Doc. 9859) 2.1.3—To ensure that safety in the provision of ATC is maintained, the appropriate ATS authority shall implement formal and systematic safety management programs for the air traffic system under its jurisdiction. Where appropriate, ATS safety management programs shall be established on the basis of a regional air navigational agreement.” He then covered the safety management activities and requirements under PANS/ATM (Doc. 4444) and spoke to the effective factors in managing safety as listed in the Document 9859, calling attention to “systems to collect, analyze, and share safety-related data arising from normal operations.”

Ruitenbergh then introduced ICAO’s tool for monitoring safety in normal ATC operations: Normal Operations Safety Survey (NOSS). Although NOSS is modeled after LOSA, it is a unique

tool with unique characteristics, tailored for the ATC environment. In giving NOSS a face, he said: "It is a safety management tool based on Threat Error Management (TEM); it captures operational context data during everyday, routine operations and provides a TEM profile of the organization of data not available from conventional methods. It is, however, a diagnostic tool only and does not provide solutions."

In concluding his presentation, he expressed his belief that "NOSS appears to be a suitable tool for normal operations monitoring in ATS and that TEM is a useful framework for understanding operational performance in complex environments."

The effectiveness of the tutorial was measured by the active participation of all delegates in the case study workshop. This facilitated session permitted analysis, review, and consolidation of the SMS deficiencies associated with a recent major airline accident. It practically applied SMS theory to the facts in a way that highlighted the key elements of the tutorial.

## Networking activities

Networking opportunities is an essential element of any large business event; ISASI 2006 was no exception. Ample coffee/tea breaks were offered throughout the seminar day, and lunch periods offered a relaxed atmosphere to discuss the program or just to say hello to seldom-seen colleagues.

But perhaps the best opportunities came at the several evening events that permitted all to relax and mingle in large areas, taste delicate morsels, and meet and greet. By tradition, these receptions are not too lengthy. However, there is always one evening that is specially planned to be held away from the seminar hotel at an unusual and fun place. At Cancun, that was a ship cruise to the Isla Mujeres. Both the "going and the coming" on the vessel was a time of full merriment, thanks to the energetic antics and performance of the crew, who through taunting and cajoling soon had many of its passengers dancing and rhythmically swaying to rollicking music on the decks of the ship. Once docked, the enjoyment



**Stéphane Corcos (right) accepts from President Del Ganidio the Award of Excellence for the best technical paper delivered at the seminar. Alain Agnesetti was coauthor of the paper.**



**ISASI 2006 program committee accepts audience recognition at the awards banquet. Shown (left to right): A. Schull, B. Dunn, R. Schleede, J. Stewart, T. Ketchell, and J. Matley.**

continued with a marvelous "beach festivity," complete with banquet food, performances of native costumed talent, and stage-musical antics that captured the fun spirit of the entire group.

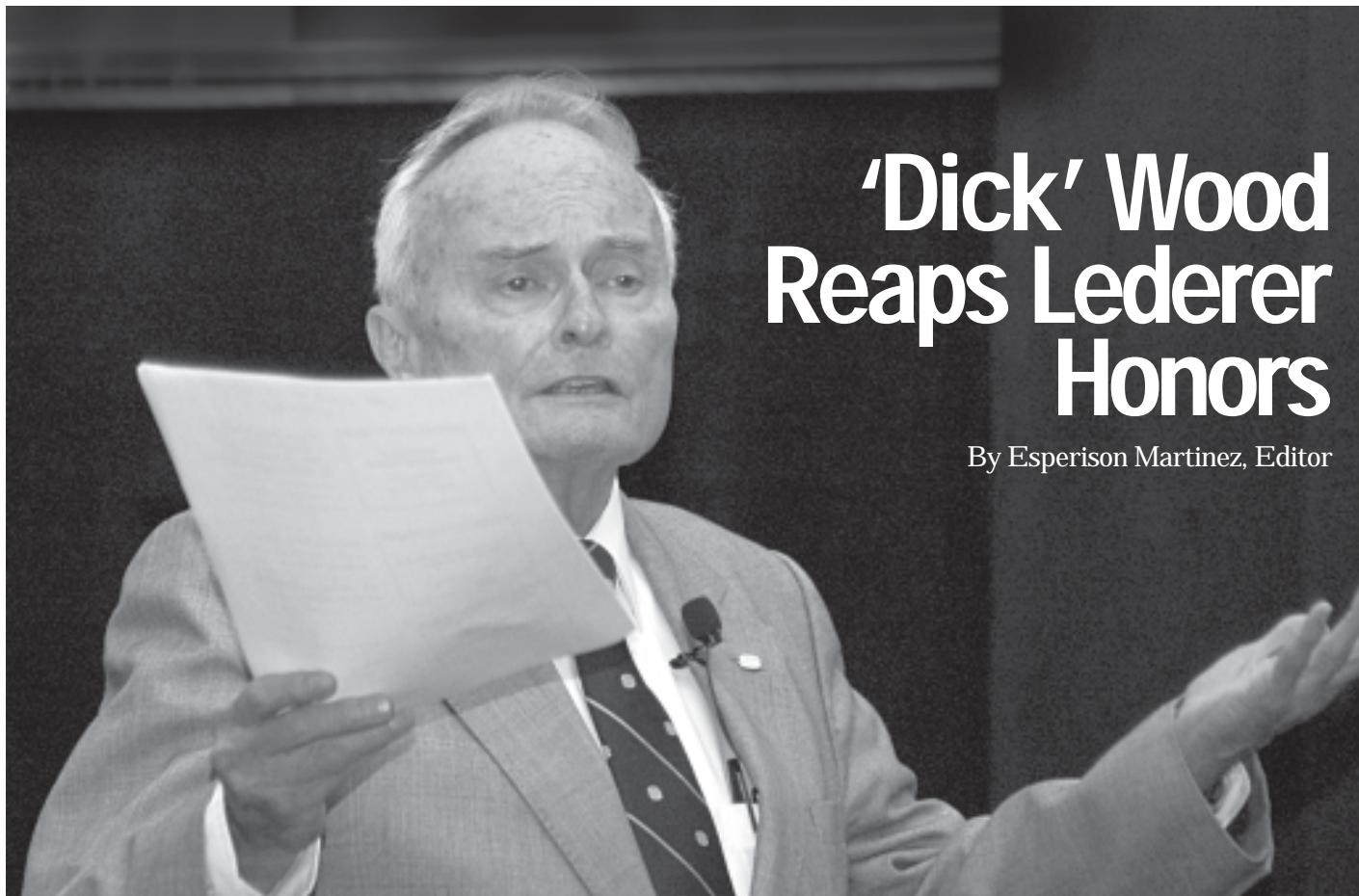
Nor are companions of delegates left on their own during the seminar sessions. Indeed, it is this group that gets to "tour" and see the landscape outside of the hotel walls. The group of 55 persons, mostly ladies, did a shopping tour of Cancun's city and lunched, according to reports, where the sounds, aromas, and tastes to the palate were pure Mexico. The day ended with a fabulous fashion show replete with exquisitely colorful native dress, music, and dance. Their second day took them to tours of several sites. The first was one of the most famous landmarks of the Mayan world—Tulum, a cliff-top archaeological site dating to A.D. 900-1512. The second was to Xel-Ha, the "place where the waters are born." There aquatic life abounds in crystal clear water. Marring the day, however, was record-breaking heat that sapped the vigor of many companions.

The 106 folks who took advantage of the post-seminar tour to Chichen Itza fared better, weather wise; still Mexico is Mexico, and the weather is hot. The bus trip to reach the Mayan site, founded in A.D. 514, was several hours long, with a stop at a large "flea market" along the way for some gift purchases. Arriving at the site, one has no inkling of what lies beyond the modern stone gate and tree-shrouded walking path. But as one walks along a path lined with pottery, jewelry, and wood carvings sold by vendors, the idea that the area was the capital of the Mayan kingdom is difficult to imagine. That is until one breaks out into the clearing and is impacted by the sight of the centuries-old stone edifices standing broken and mute in their coat of antiquity. A walking tour of all the stone, including its famed "El Castillo," by an English-speaking Mexican guide helps one to visualize the time, but does little to soften the idea of the human sacrifice of the day.

## Awards banquet

But before that post-seminar day tour happens, the "social" highlight of the seminar occurs: awards banquet night. This year 267 persons dressed in evening finery came together to honor those  
*(continued on page 29)*





# 'Dick' Wood Reaps Lederer Honors

By Esperison Martinez, Editor

PHOTOS: E. MARTINEZ

ISASI Life Member Richard H. Wood stood on the stage and fidgeted slightly as he listened to President Frank Del Gandio's lauding comments about the accident investigation and accident prevention contributions Dick has made over a lengthy career. It was those contributions that accounted for his standing before the crowd of 300 persons to be recognized as the recipient of the Society's prestigious Jerome F. Lederer Award for 2006.

At the lectern, President Del Gandio said: "Dick Wood truly fits ISASI's demanding criteria for the Lederer Award, standing tall among his peers for more than 50 years. Through his teaching, writing, and service to our profession, he has made significant contributions to aircraft accident investigation and aviation safety. His professional lifetime has been punctuated with countless contributions—both to ISASI and the industry—and those contributions continue to this day.

"A pilot with 6,000 hours of transport, general aviation, and military combat aircraft, Dick began his life's work in the U.S. Air Force rising through the ranks as he focused on a career in aviation safety. When he retired from the Air Force in 1978, Colonel

Wood was chief of the Safety Policy and Programs Division in the Directorate of Aerospace Safety office; while there, he replaced "the primary cause" concept of accident analysis with the "multi-cause" system in use to this day.

"He then joined the University of Southern California as a professor of safety science, developing and teaching courses in aviation safety program management, investigation, maintenance, photography, and other related subjects. He was also an active consultant in aviation safety and aircraft accident investigation. Later, he became director of USC's aviation safety programs, specializing in development and teaching of many programs, until he left to help form the Southern California Safety Institute (SCSI). There, he is a member of SCSI's boards of directors and advisors, and is a 23-year Executive Committee member of SCSI's Cabin Safety Symposium.

"Currently, Dick is a writer, lecturer, and consultant, specializing in aviation safety and aircraft accident investigation. He has participated in the investigation of more than 125 civil and military accidents, and has served as a technical consultant in count-

less others. He is truly a person who gives back to his profession through publications and hands-on teaching, with eight books and manuals to his credit, as well as 24 magazine articles. He recently released the second edition of the definitive textbook used throughout the world, *Aircraft Accident Investigation*, coauthored with the late Robert Sweginnis.

"Dick's service to ISASI has been outstanding. A member since 1972, he has held various offices and committee positions, including president of the Los Angeles Regional Chapter, twice. He has authored nearly 30 professional papers since 1978, most of which have been presented at ISASI seminars. Indeed, his latest paper, presented on Tuesday [see page 14], is another excellent example of his dedication. Dick's background, training, skill, and experience more than qualify him for the prestigious Jerry Lederer Award."

Then, turning to the now-calm figure next to him, Frank announced, "Dick, congratulations." As thunderous applause filled the room, the highly polished Lederer plaque set in deep mahogany wood, exchanged hands. The Jerome F. Lederer Award is conferred for outstanding lifetime contributions in the field of aircraft accident investigation and prevention. It was created by the Society to honor its namesake for his leadership role in the world of aviation safety since it infancy. Jerry Lederer "flew west" on Feb. 6, 2004, at age 101.

Somewhere in the "hereafter" Jerry probably smiled gleefully when Dick accepted the Award and said to himself: "I told you so!"

Why? Here is a story Dick, whose personal friendship with Jerry dates back to 1973, recounted in his acceptance remarks to the audience.

"In 1990 I was asked to become the chairman of the ISASI Awards Committee and held that job for seven years. In 1996 I received a letter in the mail. It was from Jerry Lederer. It was typewritten and it was formatted precisely the way called for by the Award nomination rules: typed, one page, one side only. I looked at it and recalled that Jerry Lederer did not own a typewriter; everything he wrote was pen and ink, so if he wanted something typed, he had to pay to get it done. Well, the letter looked like a nomination. I read it and discovered that Jerry was nominating *me* for the Lederer Award. I thought, 'Jeez, what am I going to do with this.'

"I picked up the phone and called Jerry, we talked often anyway. I said, 'Jerry, I'm chairman of the Awards Committee, I cannot accept this nomination!' He says, 'I know that, but I had to try.' Now here I am 10 years later, accepting this Award."

Is it any wonder Jerry may have been smiling?

Dick regaled the audience with other stories involving himself and Jerry, evoking feminine peals of delight and hardy male laughter. He then turned to the topic of the presentation.

In a crisp voice he thanked all of the persons who played a role in his selection: the person who nominated him, the Awards Com-



**ABOVE:** Dick Wood, right, accepts the Jerome F. Lederer Award from President Frank Del Gandio during ceremonies at the ISASI 2006 award banquet held in Cancun, Mexico.

**FACING PAGE:** Dick Wood displays his lively style of delivery during the presentation of his technical paper "Defining and Investigating Incidents" to the ISASI 2006 audience.

mittee members who are scattered throughout the world in a fashion that attempts to duplicate the distribution of the ISASI membership as closely as possible, and ISASI itself for having established such an award.

"I am very, very proud to receive this Award. But what am I going to do with it?" he asked rhetorically. "Well, in my condominium in Bellingham, Wash., I have an office in which the walls are filled with all the awards, decorations, and citations of 26 years in the military and 13 years in academia at USC. But this Lederer Award is going out in the front hall, close to the front door, because I want people who come to visit me to look at it and say: 'What's that?'"

With that, the audience burst into loud applause, over which Dick exclaimed: "That question will get them a free 10-minute lecture on what ISASI is and what it stands for and who Jerry Lederer was!" By now, the audience was on its feet making noise with shouts of glee, in appreciation for the expressed gratitude and implied veneration he holds for the meaning of the Award.

Then, a much more demure Award recipient whispered into the mike with a breaking voice, "I'm profoundly grateful to ISASI for giving me this reward; thank you," and the applause just got louder. ♦

# Defining and Investigating Incidents

**Cause factor: "One of the causes of this accident was failure to take action on a problem that has already been identified."**

By Richard H. Wood, PE, CSP (LM0598)

*(This article was adapted, with permission, from the author's presentation entitled **Defining and Investigating Incidents** presented at the ISASI 2006 seminar held in Cancun, Mexico, September 14-17, which carried the theme "Incidents to Accidents—Breaking the Chain." The full presentation including cited references index is on the ISASI website at [www.isasi.org](http://www.isasi.org). The author was the recipient of the ISASI Jerome F. Lederer Award for 2006.—Editor)*

**T**he title of this article comes from the theme of the ISASI 2006 seminar, "Incidents to Accidents—Breaking the Chain." I found this to be a very appropriate and intriguing theme. In my 40 plus years in the safety business, I've heard one idea over and over. "If we want to prevent accidents, we have to work on preventing the incidents first."

Is that true? Yes it is. If we don't do that, we have a correction program, not a prevention program. Have we ever done anything with incidents? Not with any regularity. There is, in fact, evidence that we have ignored incidents even as we were having our noses rubbed in them.



**Dick Wood** served 26 years as a U.S. Air Force pilot. He began investigating aircraft accidents in 1963 and retired in 1978 as the director of USAF Safety Policy and Programs. After retirement, he joined the faculty of the University of Southern California where he taught numerous aviation safety subjects. Following that, he joined the Southern California Safety Institute where he continued to develop and teach aviation safety courses. He is the author of *Aviation Safety Programs, A Management Handbook (3rd Edition)* and *Aircraft Accident Investigation (2nd Edition)*. He is a registered safety engineer and a certified safety professional.

Why? Let me suggest a couple of reasons.

First, we haven't adequately defined "incidents." We all think we know what an incident is. It's a little accident. Right? Wrong! An incident, properly defined, should be a precursor of a future accident. If you consult the various lists of incidents, you'll see that almost none of them are precursors of accidents all by themselves. They may be an initiating event or even a key factor in an accident, but there is always more to the accident than just that single event.

ICAO defines both "incident" and "serious incident" but gives no examples. Our National Transportation Safety Board (NTSB) has a list of reportable incidents, but, taken alone, none of them would qualify as an accident precursor. This is also true of our military incident definitions and lists of incidents compiled by many airlines. Most of them are just data-collection systems. Take engine failures. If an engine failure occurs on any aircraft and there is an accident, there must be at least two causes, maybe more. While an engine failure may be the initiating event, we just don't have many accidents that are solely the result of an engine failure. Thus engine failures or inflight engine shutdowns reported as incidents don't get a lot of attention.

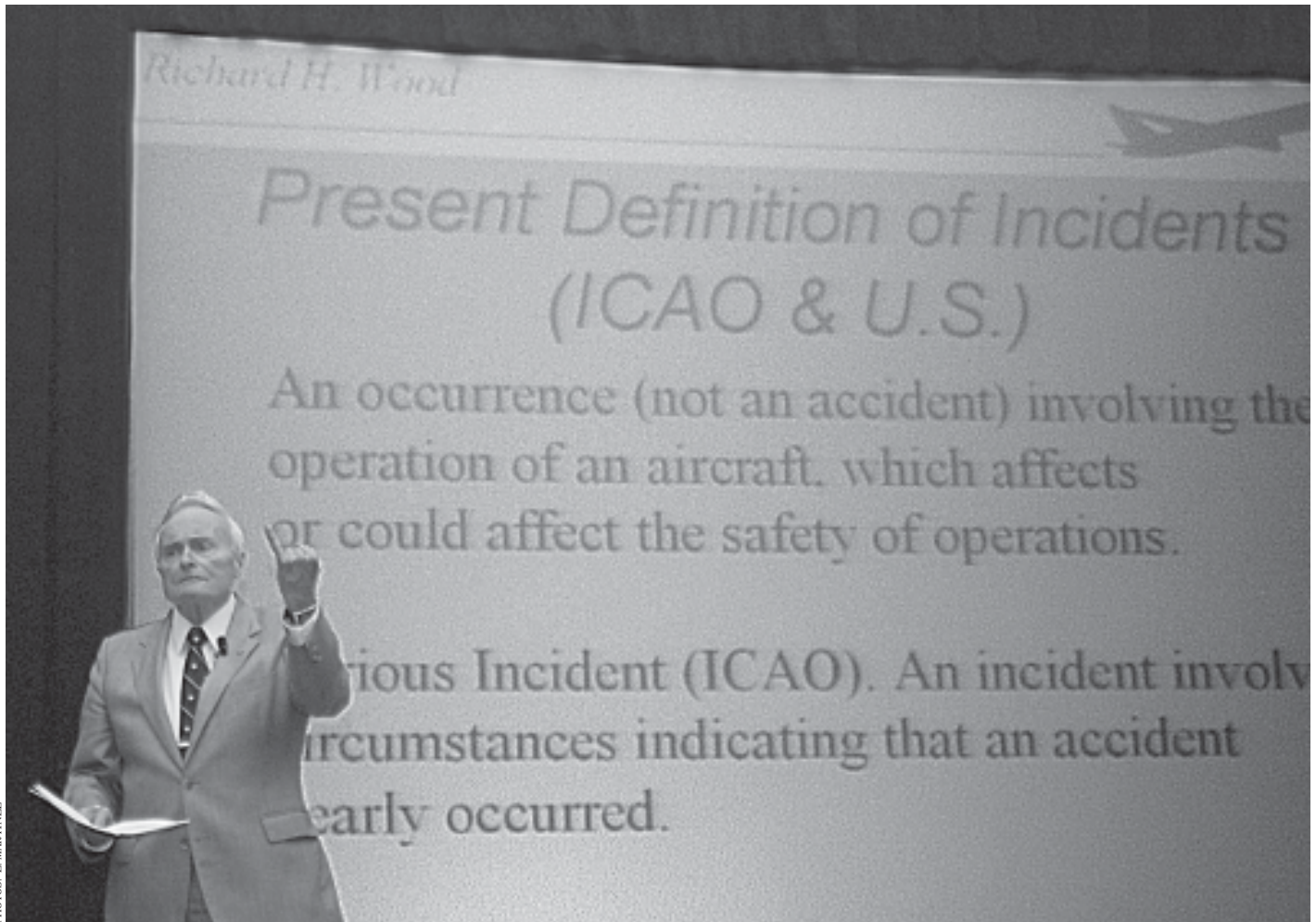
There is general agreement (NTSB excepted) that there are very few accidents with just a single cause. The NTSB is still mired in the mud of determining a single probable cause. According to the dictionary, "probable cause" is a legal term citing reasonable grounds for presuming guilt in someone charged with a crime. I don't find that helpful. In the accident business, insistence on a single probable cause tends to focus our actions on that cause alone.

Actually, almost all accidents have multiple causes, a lesson safety professionals learned about 70 years ago. A very workable definition of "cause" is any event that had to be present or there would have been no accident. Turning that idea around, we could say that preventing any of those events would have prevented the accident. In other words, we don't have to eliminate the "most probable cause" in order to prevent the accident. We can do that by just eliminating one of the lesser causes, particularly one that is almost always present in all accidents of that type. What's so difficult about that?

We have worked hard to develop an aviation safety system that is basically "single error safe." We started with the airplane itself. Much of the airplane design criteria are meant to provide a redundancy wherein the failure of any system or part of a system does not make the plane fall out of the sky. We've done quite well with that, and our present aviation safety record owes a lot to that concept.

Realizing the advantages of this, we have gone beyond the airplane itself and included everything that makes the plane fly. That includes the airport, the flight crew, the maintenance people, the air traffic control people, and a host of others. We now apply our single error safe concept to the entire system. Since incidents are usually defined as single events, malfunctions, or mistakes, they





PHOTOS: E. MARTINEZ

**ICAO defines both “incident” and “serious incident” but gives no examples. Our National Transportation Safety Board (NTSB) has a list of reportable incidents, but, taken alone, none of them would qualify as an accident precursor. This is also true of our military incident definitions and lists of incidents compiled by many airlines.**

are no longer precursors of accidents. We tend to ignore them.

That’s about where we are now. Our focus is on accidents, not incidents. We can also see situations that are not single error safe. In those cases, a single event, malfunction, or mistake can result in an accident and there is no recovery. Working to eliminate those situations is well worth the effort.

Here’s another reason our present system needs improvement. We have neither the time nor the resources to investigate everything that might be reported as an incident under current reporting rules. We can’t do it! An actual accident is the least likely result of a particular series of events. Take mid-air collisions as an example. For each actual collision, there were probably a few hundred near-collisions based on nearly identical circumstances. In studies of industrial accidents, we know that an accidental injury is a rare event. The exact same circumstances have occurred several hundred times without producing an injury. Because our ability to investigate everything is limited, we are in the position of

waiting for the least likely event to occur and then investigating it thoroughly. This is not a proactive approach to safety.

Here is what we need to do.

We need to be more selective on what we choose to call an incident. Starting with the idea that each reported incident should be a precursor of an accident, we should define a reportable incident to include all the factors found in actual accidents of that type. For example, let's take a specific type of runway incursion accident, one where an airplane has been cleared onto the runway to await take-off clearance and another airplane has been inadvertently cleared to land on the same runway. Has that ever happened? You bet, and the chances of it happening again are quite good. Let's take a look at the factors that are present in almost every accident of that type.

## Night or bad weather

One aircraft cleared "taxi into position and hold" (TIPH), while awaiting takeoff clearance. This aircraft is either making an intersection takeoff or is holding on the end of a displaced runway threshold. Sometimes it is actually "sitting on the numbers," so to speak. If so, there is a pretty good chance that the landing aircraft will notice it, because that's where those pilots are looking.

Another aircraft is cleared to land. The focus of those pilots is on the portion of the runway upon which they intend to land, not the threshold before it nor an intersection after it.

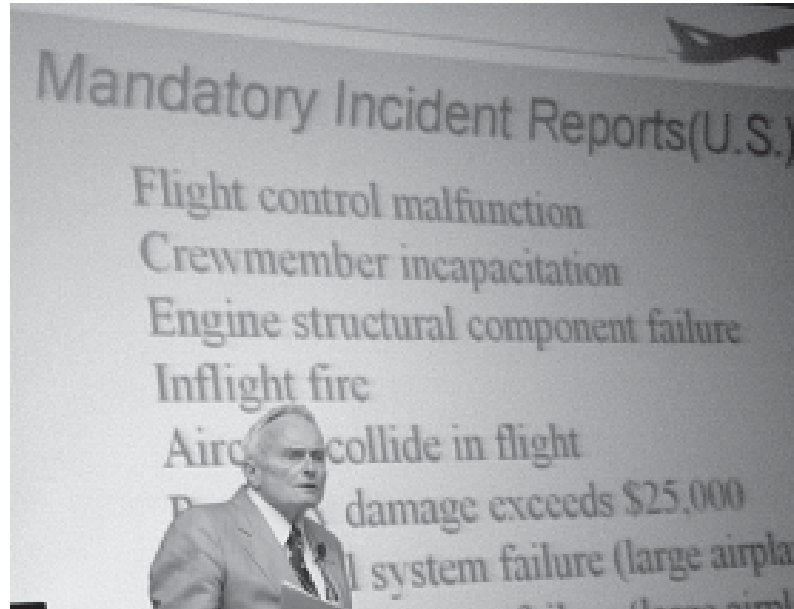
The crew of the plane parked on the runway "position and hold" cannot see the aircraft on landing approach. They have no rear view mirrors.

Obviously, a mistake has been made by an air traffic controller. If the mistake is not recognized, there will be a really bad accident because we have violated our single error safe policy. We have denied the crew in the aircraft on the runway the opportunity to avoid the accident by seeing the other plane, and we have created a situation that is not single error safe. We have left ourselves no alternative except to hope that the air traffic controller realizes the error or the pilots of the landing aircraft happen to see the other plane on the runway. That's wishful thinking, and we've had the accidents to prove it.

That scenario has existed since at least 1967, which is when I first encountered it. We are still having that type of accident based on nearly identical situations, and we have (effectively) done nothing about it.

To date, most of our actions have followed two paths. One is to eliminate all air traffic controller errors, which is not possible. They are humans. Humans make mistakes! The other path is to install expensive equipment that will detect and predict potential runway collisions in time for a human to act. That would be nice, but it is not going to happen in the near future.

My question is why don't we do something simpler than either of those? Why don't we eliminate TIPH clearances? You are not



cleared onto the runway until you've been cleared for takeoff. If there is a plane on final approach, you can see it. Position and hold is an anachronism left over from the 1930s. Then, we needed to park on the centerline for about a minute to set the directional gyros and stabilize the engine temperatures. We no longer need to do that. A modern airplane can start its takeoff from the hold line, adding power as it swings onto the runway centerline.

Eliminating TIPH is an example of eliminating one of the lesser causes mentioned earlier. That will eliminate a lot of those accidents even though no one would consider that the most probable cause of any of them. Better still, that could be done very quickly and wouldn't cost anything.

In March 2006, the FAA directed that TIPH clearances be eliminated by March 20, 2006. Hooray! I first recommended that in an article published in *Aviation Week and Space Technology* in 1991, about 15 years ago. The FAA, I thought, has finally realized the benefits of not putting an airplane on the runway until it is cleared for takeoff. Within a week, there was loud howling within the aviation community on how this would gum things up and slow things down. Not true! It can actually speed things up if you do it right.

Anyway, the FAA backed down somewhat and stated that airports wishing to continue using TIPH clearances must justify their use. Although TIPH clearances may be history by the time this paper is presented, I still think it is an excellent example of how a simple change to one of the lesser causes can prevent a really big accident.

But, let's take another example—runway overshoots. These happen with disturbing regularity, and they usually share some common factors.

- The length of the runway is marginal compared to the possible airspeed and gross weight of the landing aircraft.
- The pilot either landed long or the runway was contaminated with snow or ice.
- The overrun safety areas were either nonexistent or inadequate.

At some point, the pilot could neither stop the aircraft nor get it flying again and make a missed approach. The aircraft is going to depart the runway, and the result could be anything up to a serious accident. If there is no damage or injury, the event is not one of the mandatory NTSB incident reports. Because of that, we don't really know how often this has happened.

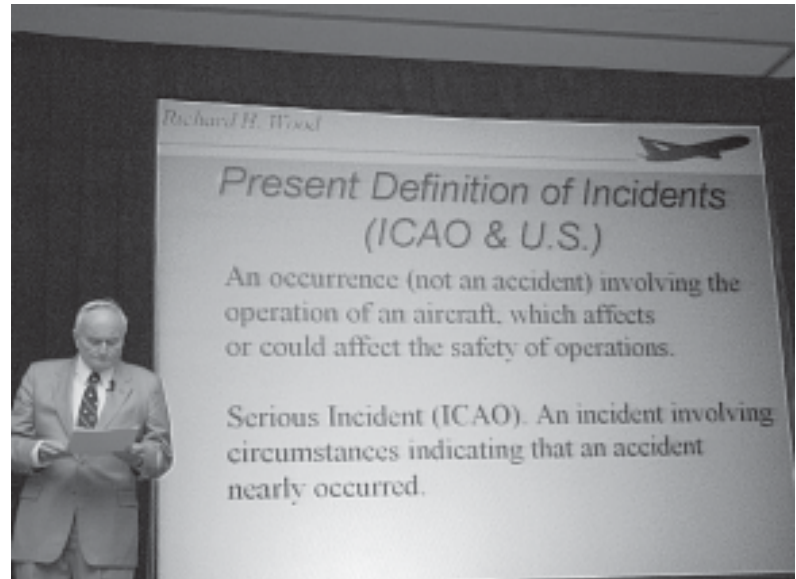
In the United States, we have nearly 300 commercial airports that do not have the required 1,000-foot safety zones at the ends of the runways. For a variety of reasons, they are going to stay that way. At this writing, the quickest and least expensive solution appears to be what we are calling EMAS, which stands for Engineered Materials Arresting System. These are located at the ends of the runways and made of bricks of cellular concrete materials that collapse under the weight of the aircraft. They provide rapid, but controlled, deceleration. So far, 18 airports have or will have that capability, which is certainly a step in the right direction. This won't happen overnight, and interim solutions involve better methods of calculating stopping distance and better measurements of runway surface condition. Those can be initiated fairly quickly at all airports. The FAA is working on both of those.

Let's now get back to the three factors listed above. Suppose we use those factors to define an incident that must be reported and investigated. We can call that an accident precursor, and that's where we should focus our investigative capabilities. There may be other actions we can take that may or may not be related to the most probable cause. Curing one of the other causes present may be the best solution immediately available.

Suppose we picked the top five or maybe 10 accident scenarios that occur with some regularity and analyzed them in terms of their common factors. Perhaps we would look at certain types of CFIT accidents or possibly events involving loss of aircraft pressurization. Those types of accidents do occur, and they all have certain things in common that would help us define our accident precursor.

Thus we now have five (or 10) incidents that are genuine accident precursors and will attract our attention. Can that be done? Certainly. Will it work? Only if we make it work. That means that we actually have to investigate these things. Can that be done? Yes, and it needn't be difficult or costly. After all, there was no damage or injury, and everyone is still alive to talk about it. That might take a single investigator an entire day to collect the facts and fill out the report. Initiating preventive action might take longer, but that's where we should be putting our efforts anyway.

Right now, we are in the awkward position of knowing that what-



ever accident we are currently investigating has probably happened before, but without all the injuries and damage. When teaching aircraft accident investigation, I tell each class that once they have figured out the causes of an accident, there are three questions that should always be asked.

- Have these events ever happened before?
  - Who knew about it?
  - What was done about it?
- Unfortunately, the answers to those questions are usually
- Yes. Several times.
  - Lots of people knew about it.
  - Nothing. No accident occurred and no action was recommended or taken.

Those answers should leave a bad taste in the mouth of any safety expert. The idea of waiting for an accident to happen before we do anything tells us that our investigation program is reactive, not proactive. As mentioned earlier, we're not preventing things; we are correcting things that have already happened. If prevention occurs, it is a byproduct of that process—not the process itself.

That leads me to my favorite cause factor, one that I have tried to list in many of the accidents I have investigated: "One of the causes of this accident was failure to take action on a problem that has already been identified." Would you like to know how often I have managed to get that cause included in the report? Never! Not even once!

Nevertheless, that cause belongs in a lot of today's reports. I don't think it would ever rise to the status of most probable cause, but that might be a good thing. Perhaps we should start with something a little easier like redefining incidents, creating some accident precursors, and seriously investigating them. ♦



# The Myth of the Unstable Approach

**A number of concepts and ideas are explored that may have value in seeding new taxonomies and techniques for accident and incident analysis.**

By Ed Wischmeyer, Ph.D., ATP/CFII (A05003)

*(This article was updated and adapted, with permission, from the author's presentation entitled "The Myth of the Unstable Approach" presented at the ISASI 2004 seminar held in Australia's Gold Coast region Aug. 30-Sept. 2, 2004, which carried the theme "Investigate, Communicate, Educate." The full presentation including cited references index and acknowledgements is on the ISASI website at [www.isasi.org](http://www.isasi.org).—Editor)*

Forty years ago, the term "pilot error" was commonly used in accident taxonomy. Eventually it was realized that this term, while technically correct, did little to explain accident causes or prevent recurrences. Pilot error then became an invitation to more deeply explore, to more carefully classify, and to eventually articulate and address the underlying phenomena. The generalization pilot error is now largely replaced by more concise, more useful, and better-understood concepts. The term "unstable approach" is now ready to begin that same evolution and is an invitation to new discovery.

In this article, we explore a number of interesting parallels between unstable approaches and pilot error. Next, multiple independent sources demonstrate that almost no unstable approaches end catastrophically, and thus it is inappropriate to consider unstable approach as a causal factor. Rather, unstable approach is almost always correctable and/or a symptom of other phenomena. Lastly, a number of concepts and ideas are explored that are first attempts to accept that invitation to more deeply explore, more carefully classify, and finally address the underlying phenomenon. These concepts and ideas may have value in seeding new taxonomies and techniques for accident and incident analysis.

Consider the following points of similarity between the pilot error concept of the 60s with the contemporary unstable approach concept (see Table 1).

No one doubts the operational benefit of a stable approach, just



**Dr. Wischmeyer** has 6 years of experience in direct flight safety research, 5 years of experience developing advanced FOQA systems, 20 years of software and user interface development experience, has observed 50 airline flights from the jumpseat, and has taught graduate-level safety and aviation safety courses. He now consults on flight training and flight safety training. His e-mail address is [edwisch@alum.mit.edu](mailto:edwisch@alum.mit.edu), and his website is [www.greatusermanuals.com](http://www.greatusermanuals.com).

as no one doubts that aircrew should not commit pilot errors—the issue is the value of the term unstable approach in safety analysis. Just because pilots should not make unstable approaches does not mean that this vague generalization is appropriately used in accident and incident analysis.

## Prevalence of unstable approaches

A number of diverse, independent sources all indicate that while unstable approaches may increase the risk of a bad landing outcome, that risk is still so low that the concept unstable approach can only rarely, if ever, be meaningfully used in accident and incident causal analysis.

The research on the prevalence of unstable approaches was performed at Boeing Commercial Airplane Group in 2001. My initial position was that unstable approaches were a direct cause of landing accidents and that providing an unstable approach alert would directly and immediately reduce accidents. Thus, the researcher's initial bias was in direct opposition to the final result. In fact, this unstable approach research was initially done strictly pro forma, as we all knew the "correct" outcome already.

The first data set examined was from NASA Aviation Safety Reporting System reports. Although it is well known that meaningful rate of occurrence statistics cannot be generated from voluntarily submitted reports, this does not mean that no meaningful statistical analyses can be performed. Rather, the analysis performed had two parts—

**Table 1**

	"Pilot Error"	"Unstable Approach"
		No, inclusive definition—Flight Safety Foundation's definition has nine elements
Definition succinctly defines what occurred?	No, inclusive definition	
Is an occurrence operationally acceptable?	No	No
Occurrence increases risk?	Yes	Yes
Happens all the time?	Yes	Yes
Is a premeditated pilot action?	No	Not always
Have to recover from it?	Yes	Yes
Pilots almost always get away with it?	Yes	Yes
Sounds good on television?	Yes	Yes
Usually a symptom of other factor(s)?	Yes	Yes
Indicates need to find those other factors?	Yes	Yes
Gave rise to a number of valuable studies?	Yes—CRM, fatigue, human factors	Not yet
Concept is still used for accident analysis?	No	Starting to fade

1. Determining what the motivating event was for each report submission. For example, an unstable approach would be a motivating event, but landing at O'Hare would not be considered motivating.
2. From sets of reports with the same motivating event, meaningful conditional probabilities could be generated with the condition being the presence of that motivating event.

Because I had the experience of working in the NASA ASRS office for several years, including performing the final check on several hundred reports before they were entered into the ASRS database, I was confident of my ability to determine motivating events and the integrity of the reports.

Reports were analyzed both where unstable approaches were the motivating event and in which unstable approaches were significant features of the narrative. Similarly, reports were chosen where the motivating event was a landing outcome unacceptable to the flight crew. Approach instability was tabulated by the altitude (if any) at which the approach became stable, and, similarly, the altitude at which the approach became unstable.

The results of these analyses were that bad landings (the motivating event) were frequently observed from stable approaches, and good landings were frequently observed from unstable approaches—and these initial, poorly understood observations were unsettling. These results also brought to mind a sampling theorem from quality control that states, in effect, if you are expecting a phenomenon to be rare (such as good landings from unstable approaches), but a small initial sample shows a high rate of occurrence (many good landings from unstable approaches in a small, initial sample set), then you can reject the hypothesis of rarity without further sampling.

The next step was to seek quantitative verification from FOQA data. A carefully worded e-mail to a David Wright in the CAA, who had access to large quantities of FOQA data, cautiously breached the possibility that approach parameters and touchdown parameters might not be well correlated. A few days later, a return e-mail said, in effect, “our data show that, too, and we don't believe it either.”

With quantitative verification in hand, it was time to generate plausible hypotheses to explain the unanticipated results. Three were prominent—

- Because the commonly accepted high correlation between unstable approaches and bad landing outcomes was generated from accident data only, that high correlation was a result of sampling bias, in the epidemiological sense.
- There is some other phenomenon present that is tentatively named “pilot involvement factor.” This hypothesized factor states that if the pilot flying was highly involved in flight path control, then appropriate skill and experience would be applied and the landing outcome would be successful regardless of approach stability. Conversely, if the pilot was inattentive or not completely in the loop, this state of low involvement could manifest itself in a bad landing outcome, regardless of the approach stability.
- Because many of the definitions of approach stability called for a go-around by at least 500 feet (150 meters) HAT (height above touchdown), if the approach was not stable, those definitions effectively ended at 500 feet. Yet, ASRS data (and later, accident and incident data) indicated that significant atmospheric effects would be encountered at 300 feet (100 meters) HAT and below. The perturbations caused by these low-level atmospheric effects would affect landing outcome statistics but would be encountered regardless of approach stability.

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**Multiple independent sources demonstrate that almost no unstable approaches end catastrophically, and thus it is inappropriate to consider “unstable approach” as a causal factor. Rather, unstable approach is almost always correctable and/or a symptom of other phenomena.**

All of these hypotheses were discussed with peers, colleagues, management, and company pilots. None of these hypotheses were widely accepted, perhaps because the underlying premise was contrarian. More significantly, there were no successful or even substantive challenges to these hypotheses.

A number of additional quantitative sources provided privileged information. Highlights of that privileged information include the following:

- Three independent sources of airline approach data, with no overlap of airlines sampled, report that the rates of occurrence of unstable approaches for each of these sources were 1.6%, 3%, and 15%.
- Data from one of these sources show that, for runway overruns, a stable approach is 60 times safer than an unstable approach, and a chi-square test shows this result is statistically highly significant. On the other hand, this same data show that if an unstable approach is used as a criterion to predict a runway overrun, it will give a false alarm 49,999 times out of 50,000.
- Data from one of these sources show that statistics generated on approach are very poorly correlated with statistics generated on landing, if at all. For some approach measurements, grouping that approach measurement would also group some landing parameters, but the distributions of those landing parameter groups overlapped so much that touchdown measurements could not be used to determine approach parameter measurements.

With ASRS and these three other sources all giving consistent results, and with plausible analysis to explain the observed results, it can be reasonably concluded that unstable approaches do not “cause” and do not useably predict bad landing outcomes. My management approved these results, and then asked—you've shown what can't be done, now show what can be done.

### **Ideas for future analysis directions**

Just as pilot error opened the doors to further research that brought into prominence human factors, fatigue, and CRM, unstable approach can and should open the doors for the safety community to identify new areas of study. The unstable approach research done to date suggests these interesting starting points for these new flight safety theories, or support for theories already under development—

- five sub-phases to replace “approach-and-landing phase,”
- severity-last event taxonomy,
- guidance vs. judgment,
- outcome taxonomy to replace “approach and landing,” “accident,” and “incident,” and
- unstable approach as a symptom.

*Five sub-phases*—Analysis of accident, incidents, and events suggests that the superficially convenient temporal grouping “approach and landing” in fact groups flight sub-phases with greatly differing characteristics. The five sub-phases listed in Table 2 are

**Table 2**

Flight Sub-Phase	Goal	Comments
Rollout and turnoff	Decelerate from touchdown speed, then transition to taxiing on the airport	
Flare and touchdown	Touchdown on runway within safety and comfort parameters, with room for rollout and touchdown	
Final visual alignment	Position the airplane visually for start of flare	In Cat. III, this phase does not appear—on a visual approach, this phase may be lengthy
Inside the final approach fix	Maneuver the airplane so that when visual contact is established, the flight crew can manually fly the airplane to a successful landing	
Outside the final approach fix	Maneuver to cross the final approach fix (FAF) at an acceptable speed and altitude	Crossing the FAF with excessive energy is common

in reverse chronological order. The goal of each sub-phase is to position the aircraft so that the subsequent sub-phase can be successfully completed (except the last sub-phase, of course.)

Unstable approach thus invites us to look more closely at approach and landing and to identify the variety of tasks and techniques that are encompassed. These five flight sub-phases will be shown to have value in flight analysis.

Linguistically, it may be appropriate to evolve the term “approach-and-landing *phase*” into “approach-and-landing *phases*.” However, this distinction may be too subtle to communicate the substantial difference in meaning.

*Severity-last event taxonomy*—Conventional practice groups events first by the severity of the adverse outcome and secondly by the kind of event. For example, “accidents” are the group of events most commonly analyzed for safety purposes, and after events are grouped into accidents, they are then subdivided into kinds of accidents, such as approach and landing. This research suggests that more meaningful analysis may be possible if events are first sorted by kind of event (e.g., touchdown, using the five sub-phases above), and secondarily by severity of outcome (excellent, acceptable, unacceptable, incident, accident).

There are perhaps several reasons why this kind of taxonomy has not already been implemented. First, it requires that significant bodies of nonaccident data be available, including LOSA, anecdotal reports, and possibly quantitative FOQA results. Because the value of nonaccident data is only slowly being recognized, and because (at least in the United States) of the reactive nature of public policy, there is insufficient motivation for meaningful incident and anecdotal data collection. GAIN seems limited in its potential because data are preselected and preprocessed before being shared, as opposed to sharing all of the raw data.

Secondly, there seems to be a common misperception that incidents are precursors to accidents in the sense that if only one more event

**Table 3**

Flight Sub-Phase	Goal	Comments
Rollout and turnoff	Visual cues—centerline and runway remaining, but no steering commands	Relies on pilot skill, judgment, and experience for steering and braking
Flare and touchdown	Visual cues only, neither position nor guidance data used during flare, except possibly radio altitude to start flare	Relies on pilot skill, judgment, and experience
Final visual alignment	Mostly visual cues, although flight instruments may be occasionally referenced or called out	Relies on pilot skill, judgment, and experience
Inside the FAF	Radio navigation technologies or radar vectors	Full guidance available with flight director; autopilot available
Outside the FAF	Radio navigation technologies or radar vectors	Full guidance available with flight director; autopilot available

**Table 4**

New concept	Includes
First ground contact off the runway, IMC	CFIT, unstable approach
First ground contact off the runway, VMC	Visual illusions, windshear, unstable approach
Damaged on touchdown	Prolonged flare, visual illusions
Off the end of the runway	Runway overrun, loss of traction
Off the side of the runway	Runway excursion, loss of traction or visual cues

were present in an error chain, there would have been an accident, and therefore incidents are of less analytical value than accidents. However, incidents frequently had all the ingredients to be accidents, but a “defense” (in the sense of Reason’s model) mitigated the event. In the case of unstable approaches, it seems likely that the “pilot involvement factor” hypothesized above may be a common defense against adverse consequences of unstable approaches.

*Guidance vs. judgment*—It is informative to look at what mechanized guidance (meaning both commands and raw data displayed in the cockpit) is available to the pilot during these five sub-phases (Table 3).

Table 3 makes clear that full guidance is not always available to the flight crew and that sometimes skill, judgment, and experience are required. Other situations that require such judgment include slam-dunk approaches, circling approaches, managing descent on nonprecision approaches, and visual approaches. Observe that these judgment situations are considered to be higher risk than guidance situations, such as ILS approaches. (It is also worth noting that contemporary alerting systems, such as windshear, TCAS, and complete uninhibited alerts [at least on Boeing aircraft] are less prevalent the closer you get to the runway.)

Just as pilot error was an invitation to seek greater understand-



**Table 5**

New concept	Common severity
First ground contact off the runway, IMC	100% fatalities, hull loss
First ground contact off the runway, VMC	Few fatalities, hull loss
Damaged on touchdown	Rare fatalities, major damage possible
Off the end of the runway	Rare fatalities, major damage possible
Off the side of the runway	Rare fatalities, minor damage

**Table 6**

New concept	Pilot flightpath information processing
First ground contact off the runway, IMC	Guidance
First ground contact off the runway, VMC	Judgment
Damaged on touchdown	Judgment
Off the end of the runway	Judgment
Off the side of the runway	Judgment

ing, the phrase unstable approach thus invites us to observe and study the guidance/judgment dichotomy in the five landing flight sub-phases.

*New outcome taxonomy*—New taxonomy is proposed to replace approach and landing, accident, and incident. The proposed new taxonomy for landing outcomes is shown in Table 4.

Recall the proposal that the severity of the outcome be secondary to the kind of untoward landing event. This is particularly apt when the common severity of these untoward landing outcomes is considered (Table 5).

It is also appropriate to look at whether guidance or judgment is employed during these events (Table 6).

Detailed analysis of runway overrun occurrences was performed, including accidents, incidents, and events. Because this analysis included both accidents and nonaccidents, it showed that the sole differentiator between an overrun event and an overrun accident was whether the airplane encountered an obstacle, such as an embankment, body of water, or obstruction. However, these obstacles, which are threats to operational safety, are typically not charted. The vice-president of one charting company told me that such data were not charted because overrun lengths could not be credited toward required landing distance.

His comment, in turn, brings up a second observation. Our profession commonly refers to “flight” safety and to “flight” simulators and to “flight” training. These linguistic idioms may reflect why ground operation safety, such as runway overrun obstructions, receives comparatively little safety and training emphasis.

Unstable approach thus invites us to look more closely at runway overruns and to make these observations for future study—

- Guidance vs. judgment in flight operations.

**The term “unstable approach,” like its great-grandfather “pilot error,” is a term worthy of retirement from the safety analyst’s vocabulary. However, unstable approach, like pilot error before it, is an invitation to new ways of articulating and then addressing important safety issues.**

- That study of nonaccident events shows the necessary ingredient for runway overrun accidents.
- That warning of such conditions is not necessarily available to flight crews.
- That, indeed, the common language of aviators and safety analysts (“flight safety” vs. “aircraft operational safety”) biases people to minimize consideration of surface hazards and threats.

### Unstable approach as a symptom

Don Bateman’s excellent book, *Flight into Terrain*, July 1997, documents 280 CFIT (controlled flight into terrain) and CFTT (controlled flight toward terrain) events during approach and landing. A manual tabulation of those events shows that for those flights where data were adequate to make a determination, the majority of those flights that crossed the final approach fix (FAF) failed to do so satisfactorily—they were too high or too low, for example.

This suggests at least these two points—

- What factor(s) were at work to cause the flight crews to inappropriately cross the FAF?
- For those flights in which the FAF was crossed inappropriately, labeling the rest of the approach as “unstable” contributes nothing to understanding what occurred. Worse, it diverts attention away from those unarticulated factors causing the failure to cross the FAF satisfactorily.

The term “unstable approach,” like its great-grandfather “pilot error,” is a term worthy of retirement from the safety analyst’s vocabulary. However, unstable approach, like pilot error before it, is an invitation to new ways of articulating and then addressing important safety issues. While the new concepts suggested in this article may or may not survive critical analysis by the flight safety community, their value is not to be measured by their survival, but by whether the flight safety community accepts their challenge to completely rethink unstable approach in the same way that pilot error was rethought, and whether this rethink ultimately reduces accident and incident rates.

Some of these new ways of analyzing flights for safety may include the following:

- five sub-phases to replace approach and landing,
- guidance vs. judgment analysis,
- severity-last taxonomy to replace accident and incident,
- unstable approach as a symptom of other phenomena, and
- pilot involvement factor.

This article demonstrates the clear and obvious value of using data from all of flight operations to improve safety analysis and, ultimately, the safety record of the industry. Failure to expand safety analysis techniques and data collection to new sources of data will result in failure to substantially improve flight safety. As the old adage states, “If you always do what you always did, you’ll always get what you always got.” ♦

# International Council Sets Annual Agenda



PHOTOS: E. MARTINEZ

In session, members of the Council listen to Ron Chippindale (right) make his report. Shown, left to right, are Max Saint-Germain, Chris Baum, Caj Frostell, and Lindsay Naylor.

(Adapted from minutes and notes of the May 11-12, 2006, International Council meeting. The full minutes can be found on the ISASI website at [www.isasi.org](http://www.isasi.org). —Editor)

The ISASI International Council meeting held May 11-12, in Herndon, Va., U.S.A., was attended by 18 members and guests and resulted in discussions and decisions dealing with budgets, bylaw changes, annual seminar locations through 2011, the Latin American Regional SASI, and reports from regional societies, committees, and working groups.

Treasurer Tom McCarthy outlined the general bookkeeping procedure and noted that in a typical year, expenses occur in all 12 months, but income is usually limited to the 2-3 months associated with the seminar. Council member travel costs exceeded the travel budget, and he raised the possibility of reducing Council meetings to one per year or making greater use of video (or other electronic) conferencing capability. A later discussion on this topic by the board determined that face-to-face meetings should continue, but that greater care in making travel arrangements should be taken.

In his written report, Tom noted that the 2007 budget will be presented at the fall 2006 meeting, that the current balance in the ISASI primary account is \$56,649.95, and that the Society's financial condition is good. He also pointed out a one-time expense of US\$12,000 for establishment of the ISASI website. Annual maintenance of the site is expected to be about US\$1,000. The *ISASI Forum* came in under budget.

## National Societies/Councilors

- ASASI—Lindsay Naylor reported that preparations continued for the June 2-4 ANZSASI 2006. The Society has 134 members, reflecting 5 new members and 12 non-renewals.

- CSASI—Barbara Dunn reported no net gain in total membership. CSASI conducted a well-received bloodborne pathogens (BBP) course for Transport Canada (TC). TC then developed an online BBP course for its employees. CSASI is investigating whether that course could be made available to ISASI. Further, CSASI is considering offering "scholarships" to support registration costs for two Latin American investigators or other safety professionals to ISASI 2006. Ron Schleede, MARC president, said MARC would look into a similar action, and John Darbo said the DFW Chapter would do likewise. These (and any other similar) funds will be forwarded to CSASI for distribution. Carlos Limon and Hector Cassanova of the Latin American Regional SASI will determine who the recipients should be.

- ESASI—Max Saint-Germain reported that ESASI is electing new officers. Ken Smart is organizing the elections, and Mike Hawkins is the elections officer. The newly elected officers will be installed at ISASI 2006 in Cancun. ESASI conducted a meeting in November 2005, hosted by Airbus, at which 32 members attended. A guided tour of the A380 production line occurred. Saint-Germain also announced his resignation as European Councilor.

- NZSASI—Ron Chippindale reported that Society Executive elections will be held at

its biannual meeting, results to be announced at the Cancun Council meeting. A highly successful seminar on composite materials was attended by 65 persons and strongly supported by Air New Zealand, Boeing, Airbus, and the New Zealand Defence Force. NZSASI is incurring a large cost by subsidizing membership fees (to offset international exchange rate fluctuations), upgrade of student memberships, and travel to Melbourne and Cancun for seminars. The Society is still planning a bid for the 2011 seminar.

- USSASI—John Darbo for Curt Lewis reported that USSASI is finalizing the ISASI 2005 seminar budget to be able to forward payments to ISASI. DFW Chapter elections are expected to be held in the fall.

- International Councilor—Caj Frostell said that his activity is closely aligned to Reachout seminars. He reported generally good turnouts, good reception by the audience, and good recruiting of corporate members at Reachouts in Greece, Cyprus, Saudi Arabia, and Finland.

Caj also mentioned the possibility for a GASIG meeting for Monday, Sept. 11, 2006, in Cancun. He noted a separate meeting dedicated to government personnel may strengthen government participation. There will be an updated GASIG directory on the ISASI website.

## ISASI Committees

**Awards**—would like to see more nominees for the Lederer Award. Most of the ones submitted have been from the United States, and it would be nice to see a more international pool of nominees. Most of the past recipients have been from North America.

**Bylaws**—reviewed the current bylaws, developed recommended updates, and received several suggested changes from outside the Committee as well. Lengthy discussion was held regarding language used in proposed changes. Darren Gaines, Committee chair, will continue to refine changes and submit them to the Council for review before the changes are submitted to the membership for approval.

**Membership**—Tom McCarthy reported that delinquent dues from individual and

corporate members represent nearly US\$18,000 in unrealized income. Buck Welch commented that the General Aviation Working Group has established a practice of assigning individuals to follow up with delinquent members. Society officers should probably be the ones to contact delinquent Corporate members. Since October 2005, 88 new individual members and 4 corporate members have been recruited, establishing a total of 1,287 members and 105 corporate members. Delinquency stands at 131 individual members and 22 corporate members.

**Board of Fellows**—Ron Chippindale presented several proposed changes to the application for Fellow. The Council agreed to endorse Committee-recommended changes. Ron offered that the Fellows Committee's intent was that specific occupations be neither explicitly included nor explicitly excluded as being qualifying for promotion to Fellow.

**Nominating**—Tom McCarthy discussed the new online voting capability and offered a live demonstration. Tom pointed out that the online system costs ISASI about 56 cents (U.S.) per vote, which equates to about US\$650 per election, compared with US\$1,500 for using paper ballots.

Council accepted the bid, establishing that ISASI 2009 will be held in Orlando, Fla.

Barbara Dunn briefed the Council on preparations for the 2007 seminar in Singapore. It will be held August 28-30 with tutorials conducted on August 27. The event will be held in the Swissotel The Stamford, Singapore, with room rates of approximately US\$145 plus \$15 tax. The member registration rate is expected to be approximately US\$400. She is confident that Singapore will put on a good seminar.

She also discussed preparations for the 2008 seminar. No formal bid has been presented, but consideration is being given to a major city in Eastern Europe. Prague is a possibility, but early indications are that it would be quite expensive, and it may be difficult working with the major hotels. Warsaw and Budapest have also been investigated without any clear advantage—Warsaw has no suitable hotel, and Budapest appears to be more expensive than Prague. Alternate locations in Canada (Halifax and Montreal) are also being researched.

For the year 2010 seminar, Japan cities are being considered. Early indications are that hotel space will be very expensive. A Japanese government investigator, Mr. Tomita, reports there is apparently good

## Working Groups

- Darren Gaines reported that the Air Traffic WG is having difficulty getting people to undertake projects. The Group is also interested in becoming more involved in Reachout activity.

- Barbara Dunn reported that the Cabin Safety WG has no specific projects but is currently involved in issues such as inadvertent slide deployment and flight attendant footwear (as a means of mitigating turbulence injuries).

- Buck Welch reported that the General Aviation WG has been active for 1 year now. The first meeting was in DFW at the ISASI seminar last year. The big project is an International Notification List, but this has encountered some difficulty in keeping information current. It has proved to be chronically difficult to get corporate contacts to update as people move on, companies restructure, etc.

- John Purvis reported that the Corporate WG has not had much recent activity and is experiencing poor attendance at seminars and meetings. The Group is considering a twice yearly newsletter to improve liaison and increase recognition of corporate contributors.

- Ron Schleede recapped highlights of cor-



**Executive Council in a farewell photo for Max Saint-Germain who, for health reasons, announced his resignation as European Councillor. Rear row, left to right, John Darbo, Tom McCarthy, John Purvis, Ron Schleede, Lindsay Naylor, Caj Frostell, Ron Chippindale, and Richard Stone. Front row, left to right, President Del Gandio, Barbara Dunn, Max Saint-Germain, and Ann Schull (office manager).**

**Annual Seminar**—Mike Klasing and Jayme Nichols (Florida Chapter) presented a proposal for the 2009 seminar to be held in Orlando, Fla., USA. The tentative theme is "Accident Prevention Beyond Investigation" and the dates will be Sept. 14-18, 2009. The venue is planned to be the largest conference facility in the state, the Walt Disney World Coronado Springs Resort. Rooms are expected to be less than US\$150 per night (single or double), and registration fees are expected to be about US\$500. The

support for the idea of Japan hosting the 2010 seminar. The Council notes that the prospective seminar locations shown below reflect a heavy Pacific venue and plans to look at the overall impact on the membership prior to confirming the schedule.

- 2007-Singapore
- 2008-Prague (or alternate, possibly Canada)
- 2009-Orlando
- 2010-Japan (unconfirmed)
- 2011-New Zealand (unconfirmed)

porate sponsorships. Both Boeing and Airbus are sponsoring at the US\$10,000 level. Ron is looking at ways to recruit committed, long-term contributors in North America and Europe.

- Frank Del Gandio reported that the Human Factors WG is undergoing change. Paula Venn will stay involved but her activity may be limited. The WG will be restructured, and a full report will be made at the September meeting. He named Dick Stone to head up an initiative concerning human factors in accident investigation which is strongly supported by Boeing. Further details will be made available at the September Council meeting. ♦



## 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, with the exception of the secretary, have been returned to office for a 2-year period.

This year the election ballots were opened to electronic voting in the hope that participation would increase. However, the final result of only 44 ballots being cast was a disappointment to election officials.

Returned to office for 2 additional years, thru 2008, were President, Frank Del Gandio; Executive Advisor, Richard Stone;



**Chris Baum**

Vice-President, Ron Schleede; and Treasurer, Tom McCarthy. Chris Baum of the Air Line Pilots Association (ALPA) was elected to fill the secretary position vacated by Keith Hagy, also of ALPA. Returned to the U.S. and International

Councillor positions, respectively, were Curt Lewis and Caj Frostell.

Chris is currently the manager of ALPA's Engineering and Operations section. He is responsible for staff technical support and coordination for the organization's involvement in accident investigation and airworthiness, performance, and airspace operations and modernization activities. He has previously held several positions on the ALPA Engineering and Air Safety staff, including staff engineer, senior staff engineer for the Aircraft Design and Operations Group, and manager of Operations & Air Safety.

Chris has participated in major accident investigations, as well as several ARAC and RTCA activities. He came to ALPA after 23 years in the U.S. Air Force. While in the Air Force, he served as a pilot, instructor, and flight examiner in the Boeing KC-135, and as a flight instructor in the Cessna T-37. He also

held staff positions in flight safety, accident investigation, airspace management, strategic planning, and as the Air Force liaison to the FAA Central and Great Lakes Regions.

The new ALPA secretary earned a B.S. in aerospace engineering from the University of Michigan in 1973 and an M.S. in human resources management from Houston Baptist University in 1980. He graduated No. 1 in his class from the University of Southern California's Flight Safety and Accident Investigation School in 1980. He is a commercial, instrument, multiengine-rated pilot. ♦

### European Society Elects New Executive

The European SASI newly elected Executive Committee took office on July 31, following a "handover" meeting with the outgoing officials. Newly elected officials include ESASI President, David King; European Councillor, Anne Evans; European Secretary, John Dune; and European Treasurer, Laurie Shaw.

The new Executive was announced by Ken Smart, outgoing president, in a letter to ISASI. He noted that both he and Max Saint-Germain, outgoing European Councillor, had earlier decided not to seek reelection. In his letter, Ken said: "Max and I are delighted that the new Executive is made up of some very well-known European investigators who will provide the essential continuity as well as the fresh ideas that come with all new teams." He also expressed thanks, for both parties, for all the past support and friendship shown during their long terms in office. Both will remain active in ESASI.

Background information made available for the newly elected officials follows:

**David King** is the United Kingdom's chief inspector of air accidents and head of the Department for Transport's Air Accidents Investigation Branch (AAIB) based in



Farnborough.

He joined the AAIB as an investigator in 1972 and was engaged in accident investigations throughout Europe, Africa, and North, Central and South America. As the investigator-in-charge, he has been responsible for both the conduct of investigations into a number of large public transport accidents and the published reports. These include the BAC 1-11 windscreen loss, the August 1993 Airbus A320 "floating" spoiler event, and the February 1995 Boeing 737 double-engine oil-loss incident. All of these investigations focused on and developed knowledge in the area of maintenance-activity-related human factors.

David obtained a master of business administration (MBA) from the City University in 1991, is a chartered engineer, and a Fellow of the Royal Aeronautical Society. In 1999 he was awarded the honorary degree of doctor of engineering by Kingston University in recognition of more than 25 years' contribution to aircraft accident investigation and recently he was appointed a visiting professor to Cranfield University. He holds a current multi-engine private pilots license with an unrestricted instrument rating. David is married to Patricia, and they have two sons.

**Anne Evans** is a senior inspector (engineering) with the Air Accidents Investigation Branch, U.K. She was graduated from Imperial College, London, and completed an undergraduate apprenticeship with



British Aerospace at Hatfield where she then worked as a flight development engineer on the certification of the BAe 146 and BAe 125-800 aircraft. She then joined the U.K. CAA where she was a

# PRELIMINARY NOTICE AND CALL FOR PAPERS

2007 Regional Air Safety Seminar, New Zealand  
James Cook Hotel Grand Chancellor, Wellington  
Friday, Saturday, and Sunday June 8-10, 2007

This seminar will be an educational event with emphasis on contemporary issues in aircraft operations and the investigation and prevention of aircraft accidents and incidents.

It will be held in Wellington, New Zealand's capital city, which, even in late autumn/early winter, is a city with a warm character.

Presentations are invited that address the challenges of modern air safety investigations, operational developments, and current thinking on Safety Management Systems and associated areas, including human performance.

If you wish to offer a presentation for

the seminar, please provide an abstract (approximately 100 words) plus a brief biography by Feb. 1, 2007 to

Peter Williams: p.williams@taic.org.nz

Phone: +64 4 473 3112

Fax: +64 4 499 1510

NZ time is UTC+13 hours until March, then UTC+12 hours.

Mailing Address:

NZSASI

Villa 8, Summerset Village

5 Aotea Drive

Porirua 5024

NEW ZEALAND

flight recorder data analyst responsible for the CAA participation in the Flight Operations Quality Assurance programs with U.K. airlines. She was also responsible for a research project to fit a quick access recorder to a Super Puma operating on the North Sea in order to gain operational data on helicopters.

In 1987 she joined the AAIB as an inspector of air accidents, specializing the replay and analysis of flight data recorder and cockpit voice recorder data. In 2000 she transferred to become an engineering investigator. During her time with the AAIB, she has participated in a range of civil and military accident investigations, including the Boeing 747 at Lockerbie, U.K. (1988), the Boeing 737 at Kegworth, U.K. (1989), an A320 in Ibiza (1998), a U.K. RAF Jaguar west of Eagle, Alaska (2001), and a Piper PA31 in Barbados (2003).

**John Dunne** is currently head of safety at Virgin Atlantic Airways.



He served an aeronautical engineering apprenticeship with BOAC at Heathrow. After his apprenticeship, he gained his CAA maintenance engineers license prior to serving

overseas, where he worked in aircraft maintenance and then engineering in a multicultural environment. More recently he was employed in the London insurance market, where as a loss adjuster he developed his incident/accident skills. John is a chartered engineer, CAA maintenance engineer license holder, FAA A&P holder, graduate of the Cranfield Aircraft accident course, graduate of the Swedavia Aircraft accident course, former chairman of the U.K. Flight Safety Committee, and is currently serving on the Council of the Royal Aeronautical Society.

**Laurie Shaw** joined BOAC, subsequently



British Airways (BA), in 1957, the BA Air Safety Branch in 1979, and ISASI shortly thereafter. He was a founding member and treasurer of ESASI, which was

formed in 1983 to host the very successful 1984 ISASI seminar in London. As a senior air safety investigator, he was responsible for the company investigation of many serious incidents and accidents and on several occasions acting for the state of occurrence. While he retired from

BA and the Air Safety Branch in December 1995, he has retained his interest in air safety by remaining a member of ISASI and as treasurer of ESASI. ♦

## ATS Working Group Sets New Agenda

The Air Traffic Services Working Group met during the 2006 conference in Cancun, Mexico, to set future directions of the Group as well as to review former initiatives.

In line with the 2006 conference theme of "Incident to Accidents—Breaking the Chain," the ATSWG elected to unshackle itself from traditional elements of the past and to recast the Working Group's effort into tangible issues in a current timeframe. This change in direction was generated by a diminishing input from the Group membership, which suggested a need for a renewed focus on education, research, and analysis.

A significant opportunity became available during the conference to align the ATSWG with the current human factors project under the direction of Dr. Randall Mumaw of Boeing. This international project relates to the establishment of an industry working group to develop better guidance for the investigation of human performance. The Group has elected to collaborate fully with Dr.

Mumaw and his international colleagues in this project. The ATSWG will try to do so through a collective review of the project drafts provided. ATSWG members will be directly canvassed by Secretary Bert Ruitenbergh for feedback.

Supplementary ATS safety initiatives associated with the ISASI Reachout program were raised and discussed. The Group agreed to support ATS safety orientation sessions on request from the ISASI Reachout Committee. Ladi Mika indicated that this initiative might even commence in Prague in 2008.

As a consequence of positive feedback to

Continued . . .

Bert Ruitenbergs's 2006 paper on threat and error management, David Lascelles suggested that the ATSWG commit to facilitating at least one quality ATC-specific paper to future ISASI conferences. This concept was unanimously agreed.

With the assistance of Darren Gaines and Torfinn Horn, the Group is currently exploring ways in which formal national agency investigation reports may be reviewed and converted into simpler formats with an ATS flavor. It is expected that this approach may be more easily distributed and accepted by an international ATS membership. John Guselli, chairman of the ATSWG, said, "Our Group remains happy to speak to anybody at any time with any suggestions to enhance system safety." ♦

## Cirrus Aircraft Readies First Responder DVD

Cirrus Aircraft Corporation has announced that its new cirrus first responder advisory DVD is ready for distribution. The DVD deals with ballistic parachute and inflatable restraint systems now being installed in general aviation aircraft, as well as accident site cautions regarding composite materials and ELTs. The DVD shows the various system components and advises the first responders what to do and who to call if they encounter these devices or components at the aircraft accident site.

Cirrus says the DVD is available free of charge to accident investigators and first responders by request through the Cirrus Air Safety Department, Mike Busch, Director Air of Safety Training, 4515 Taylor Circle, Duluth, MN 55811. Call 218-525-7227 or e-mail Mbusch@cirrusdesign.com.

ISASI presented the company a special "recognition plaque" during ISASI 2005 ceremonies for its work in developing first responder training seminars. ♦

## ISASI Annual Report 2005—Profit & Loss Budget

	Jan-Dec 05	Budget	\$ Over Budget	% of Budget
<b>Ordinary Income/Expense</b>				
<b>Income</b>				
601 Dues-New Individual Member	11,703.00	11,000.00	703.00	106.39%
603 Dues-New Corporate Member	6,600.00	6,000.00	600.00	110.0%
611 Dues-Renewal Individual Member	64,380.95	62,500.00	1,880.95	103.01%
613 Dues-Renewal Corporate Member	45,387.94	50,000.00	-4,612.06	90.78%
614 Dues-Late Fees	844.00	750.00	94.00	112.53%
615 Dues-Upgrade Fees	310.00	350.00	-40.00	88.57%
621 Contrib-Unres Membership	1,538.00	1,500.00	38.00	102.53%
622 Contrib-Unres Corp	0.00	200.00	-200.00	0.0%
625 Contribution-Other	10,000.00			
631 Publication Subscriptions	108.00	150.00	-42.00	72.0%
632 Publication Income	165.00	800.00	-635.00	20.63%
634 Library Services	32.06	150.00	-117.94	21.37%
642 Membership Services	291.11	200.00	91.11	145.56%
643 Membership Regalia Sales	336.72	750.00	-413.28	44.9%
650 Seminar-Proceedings	6,310.55	5,000.00	1,310.55	126.21%
651 Seminar-Net Proceeds	43,918.43	10,000.00	33,918.43	439.18%
652 Seminar-Reimbursed Advance	0.00	3,000.00	-3,000.00	0.0%
<b>Total Income</b>	<b>191,925.76</b>	<b>152,350.00</b>	<b>39,575.76</b>	<b>125.98%</b>
<b>Expense</b>				
6560 Payroll Expenses	0.00	550.00	-550.00	0.0%
700 Condo Fees	4,542.84	4,550.00	-7.16	99.84%
705 Mortgage Interest	5,380.71	6,000.00	-619.29	89.68%
711 Repairs and Maintenance	0.00	1,000.00	-1,000.00	0.0%
712 Storage Rental	1,620.00	1,650.00	-30.00	98.18%
801 P/R Exp-Office Mgr Salary	39,794.96	38,500.00	1,294.96	103.36%
802 P/R Exp-Health Insurance	11,928.00	9,000.00	2,928.00	132.53%
803 P/R Exp-SEPP	2,061.90			
804 P/R Exp-Trng Misc and Benefits	0.00	1,000.00	-1,000.00	0.0%
805 P/R Expense Employers FICA	3,044.31			
807 P/R Expense-VA UIC Tax	41.60			
811 Accounting-Payroll	1,024.88	950.00	74.88	107.88%
812 Accounting-Tax Prep	415.00	500.00	-85.00	83.0%
814 Insurance	1,861.00	1,700.00	161.00	109.47%
817 Licenses and Permits	100.00	35.00	65.00	285.71%
822 OPS-Telephone & Telex	3,465.34	3,000.00	465.34	115.51%
824 OPS-Equip Maint. & Repair	0.00	1,500.00	-1,500.00	0.0%
825 OPS-Other Utilities	3,247.92	3,300.00	-52.08	98.42%
826 OPS-Postage and Shipping	8,971.04	3,000.00	5,971.04	299.04%
827 OPS-Printing and Reproduction	2,505.39	2,200.00	305.39	113.88%
828 OPS-Office Supplies	2,705.37	3,200.00	-494.63	84.54%
830 OPS-Computer Tech. Support	12,259.65			
831 OPS-Equipment Purchase	0.00			
832 OPS-Equipment Lease	4,475.20	3,200.00	1,275.20	139.85%
835 OPS-Parking & Tolls	141.68			
840 OPS-Temp Help	292.00	500.00	-208.00	58.4%
844 Publications-Forum Expense	36,532.14	41,000.00	-4,467.86	89.1%

## Russian SASI Seats New President

Still another ISASI regional society has seated a new president. ISASI's President, Frank Del Gandio, was notified by electronic message that the Russian Regional Society's new president is Vsvolod E. Overharov. He may be contacted through his e-mail address orap@mak.ru.

In an unrelated action, Russia's prime minister on September 1 said its civil aviation industry must be overhauled to

reduce reliance on aging aircraft following three major crashes that killed more than 400 people, according to *Flight Safety Information*.

"We must now make decisions and take active measures," Prime Minister Mikhail Fradkov said at a Cabinet meeting that focused on flight safety. "We cannot wait for more tragedies."

Fradkov said that Russia needed to increase production of "new, modern planes" and noted that foreign companies would have a role to play in that process. "We do not have the right to lose our



# vs. Actual

	Jan-Dec 05	Budget	\$ Over Budget	% of Budget
<b>845 Publications-Proceedings</b>	6,378.80	5,000.00	1,378.80	127.58%
<b>848 Publications-Handbook Expense</b>	369.69	1,000.00	-630.31	36.97%
<b>856 Membership-Regalia Items</b>	0.00	1,500.00	-1,500.00	0.0%
<b>861 Membership-Service Expense</b>	2,424.79	3,500.00	-1,075.21	69.28%
<b>871 Library Expenses</b>	295.40	500.00	-204.60	59.08%
<b>881 Management Council-Travel</b>	25,525.31	15,000.00	10,525.31	170.17%
<b>882 Management Council-Admin Exp</b>	2,174.66	1,200.00	974.66	181.22%
<b>883 Management Council-Other</b>	737.07	2,000.00	-1,262.93	36.85%
<b>886 Management Council-Rep Travel</b>	220.94	400.00	-179.06	55.24%
<b>887 Management Council-Rep Admin</b>	0.00	200.00	-200.00	0.0%
<b>891 Rebate-Natl/Reg/Corp</b>	0.00	2,000.00	-2,000.00	0.0%
<b>901 Seminar-Advances</b>	0.00	3,000.00	-3,000.00	0.0%
<b>902 Seminar- Reimbursable Cur. Exp</b>	186,386.30			
<b>903 Seminar-Lederer Award</b>	173.25			
<b>905 Seminar/Reachout</b>	220.37	1,000.00	-779.63	22.04%
<b>906 Scholarship Fund</b>	1,085.00	500.00	585.00	217.0%
<b>911 Bank Fees</b>	512.85	400.00	112.85	128.21%
<b>912 Credit Card Charges</b>	9,334.32	2,500.00	6,834.32	373.37%
<b>Total Expenses</b>	382,249.68	166,035.00	216,214.68	230.22%
<b>Net Ordinary Income</b>	-190,323.92	-13,685.00	-176,638.92	1,390.75%
<b>Other Income</b>				
<b>661 Rent- Tenant Rental Income</b>	9,490.00	8,760.00	730.00	108.33%
<b>671 Interest-Checking Acct</b>	1,174.74	100.00	1,074.74	1,174.74%
<b>681 Other Income-Miscellaneous</b>	72.00	200.00	-128.00	36.0%
<b>682 Other Income-Refunds</b>	403.34			
<b>683 Other Income-Reimbursements</b>	182,377.32			
<b>685 Memorial Scholarship Fund</b>	180.00			
<b>Total Other Income</b>	193,697.40	9,060.00	184,637.40	2,137.94%
<b>Other Expenses</b>				
<b>926 Penalties</b>	160.00			
<b>930 Depreciation</b>	4,094.00			
<b>Total Other Expense</b>	4,254.00			
<b>Net Other Income</b>	189,443.40	9,060.00	180,383.40	2,090.99%
<b>Net Income</b>	<b>-880.52</b>	<b>-4,625.00</b>	<b>3,744.48</b>	<b>19.04%</b>

#### Treasurer Notes on the following lines:

902 Seminar reimbursable  
 683 Other reimbursements are vehicles we use for member seminar registration fees  
 830 Computer tech support was a one-time expense to establish new website  
 925 Contribution to establish award for seminar presentation  
 930 Depreciation is an accounting device to depreciate real estate and equipment  
 Value of property has actually appreciated over 100%

aviation industry. This is inarguable," the RIA Novosti agency quoted him as saying. "This does not exclude working with foreign partners, but it must be harmoniously combined with the interests of our manufacturers and our consumers."

He called for a balanced approach, saying it would be wrong to focus narrowly on designing new aircraft at the expense of existing factories, just as it would be wrong to favor new, foreign-made jets. "No one will forgive us if we waste time and funds to create new aircraft and simultaneously lose our existing production capacities.

And no one in the country will forgive us if we make flight safety our greatest priority, but rely on imported aircraft alone," Fradkov said. ♦

## Major Changes at NTSB; ISASI Member Gets Nod

Two major changes took place at the National Transportation Safety Board in mid-August. One of the changes involved ISASI member Robert L. Sumwalt, who was appointed vice-chairman of the Safety Board, following a day's earlier



**Robert L. Sumwalt**

appointment of the its new chairman, Mark V. Rosenker.

Chairman Rosenker became a member of the Board in March 2003 and was designated by President Bush as vice-chairman of the Board that April. In March of 2005,

Rosenker became acting chairman, a position he has held until his permanent appointment on Aug. 11, 2006.

Since coming to the Board, Chairman Rosenker has been the member on scene for a number of Safety Board investigations, including the December 2005 crash of a seaplane in Miami that killed all 20 persons on board; the October 2005 capsizing of the passenger vessel *Ethan Allen* in Lake George, N.Y. that also took 20 lives; and two derailments involving Metra commuter trains in Chicago last year.

Robert L. Sumwalt was sworn into office on Aug. 21, 2006, as a member of the National Transportation Safety Board. His term of office will run until Dec. 31, 2011. President Bush also has designated him as vice-chairman of the Board for a 2-year term.

He has 24 years of airline pilot experience, logging more than 14,000 flight hours and earning type ratings in five aircraft. He retired from US Airways in 2005. He has extensive experience as an airline captain, airline check airman, instructor pilot, and air safety representative. He served as a member of Air Line Pilots Association's (ALPA) Accident Investigation Board from 2002 to 2004, and also worked with ALPA's Aviation Weather Committee on improving the quality of weather products available to pilots. He has chaired ALPA's Human Factors and Training Group and was a co-founder of

Continued . . .

that organization's Critical Incident Response Program, which provides guidance to airline personnel involved in traumatic events such as accidents.

A trained accident investigator, Sumwalt participated in the NTSB's investigation of the crash of US Air Flight 427 in 1994 near Aliquippa Pa., and the Canadian Transportation Safety Board's investigation of the accident involving Swissair Flight 111 off the coast of Nova Scotia in 1998.

At ISASI 1997, held in Anchorage, Alaska, he presented his coauthored paper "Human Factors in Accident Investigation: A New Look" to the assembled delegates. In recognition of his contributions to the aviation industry, Sumwalt received the Flight Safety Foundation's Laura Taber Barbour Award in 2003 and ALPA's Air Safety Award in 2004. ♦

## ISASI Reachout Adds Instructors

Vic Gerden, who recently retired from the Transportation Safety Board of Canada and was the investigator-in charge of the Swissair Flight 111 investigation, has

### Who is Where?

**Jurgen Whyte** has been appointed chief inspector of Air Accidents, Department of Transport, Ireland.

**Frank Todd**, the first director of the NTSB (1970), died of renal failure on Aug. 20, 2006.

**Stuart Matthews** has retired from FSF.

**William Voss** has been appointed CEO of FSF.

**Mark V. Rosenker** has been appointed chairman of the NTSB.

**Robert L. Sumwalt** has been named NTSB member and appointed vice-chairman.

## New Members

### Individuals

Aaron, Jr., Robert, F., MO5330, Golden, CO, USA  
Afacan, Mustafa, MO5276, 80600 Etiler, Istanbul, Turkey  
Alfiyadh, Khalid, MO5334, Riyadh, Saudi Arabia  
Alghamdi, Abdullah, A., ST5288, Port Orange, FL, USA  
Anemodoura, Natalia, FO5314, Athens, GREECE  
Antoniou, Antonis, MO5310, Limassol, CYPRUS  
Asensio, Ricardo, J., AO5315, Wichita, KS, USA  
Beebe, Andrew, J., ST5289, O'Fallon, IL, USA  
Bird, Randall, K., MO5323, Winnipeg, Canada  
Boprie, Gerald, M., AO5331, Waterford, MI, USA  
Brooks, Jonathon, M., AO5282, Christchurch, New Zealand  
Brussaard, Martin, MO5326, Koog aan de Zaan, Netherlands  
Buckley, Russell, J., AO5281, Rangiora, New Zealand  
Cable, Antony, N., MO5283, Camberley, England  
Demetriou, Panayiota, AO5292, Nicosia, Cyprus  
Demosthenous, Evangelos, AO5308, Nicosia, Cyprus  
Docog, Joel, J., AO5285, Houston, TX, USA  
Fisher, Lee, G., MO5291, South Bend, IN, USA  
Foullis, Andreas, ST5300, Pyrgos, Cyprus  
Foullis, Eraclis, AO5299, Pyrgos, Cyprus  
Galley, Alexander, M., AO5318, Nairobi, Kenya  
Georghiou, George, C., AO5312, Nicosia, Cyprus  
Hadjinicolaou, Andreas, AO5307, Nicosia, Cyprus  
Hill, Brian, D., FO5319, Ormond Beach, FL, USA

Hodgson, Andrew, N., MO5267, Palmerston, ACT, Australia  
Hoffman, Holger, MO5272, Hofheim, Germany  
Ioannou, Andreas, CH, AO5304, Iseri, Cyprus  
Jagnow, William, L., ST5270, Jacksonville, FL, USA  
Karaoghlanian, Aaron, MO5301, Larnaca, Cyprus  
Kefalas, Ilias, AO5311, Athens, Greece  
Kipp, Steve, J., ST5278, Daytona Beach, FL, USA  
Klasing, Elena, M., ST5287, Casselberry, FL, USA  
Kozian, Frank, MO5329, Uebach-Palenberg, NRW, Germany  
Kraus, Jeffrey, J., AO5338, St. Louis, MO, USA  
Kristoffersen, John, FO5336, Tromsø, Norway  
Krugler, Steven, A., MO5277, Rockford, IL, USA  
Kyriakides, Christos, A., AO5293, Larnaca, Cyprus  
Lau, Stuart Kipp, FO5284, Louisville, KY, USA  
Lazarou, Kyriacos, AO5309, Limassol, Cyprus  
Loukopoulos, Loukia, D., MO5306, Athens, Greece  
Mailloux, James, L., AO5280, San Diego, CA, USA  
Mateou, Andreas, AO5294, Nicosia, Cyprus  
Mattison, Patricia, D., MO5328, Juneau, AK, USA  
Mazier, Marines, J., ST5337, Putten, Netherlands  
McCune, Sheena, D., ST5316, Ormond Beach, FL, USA  
McFarlane, Rick, J., FO5268, STONY PLAIN, AB, Canada  
Michael, Photis, AO5303, Nicosia, Cyprus  
Michaelides-Mateou, Sofia, AO5295, Nicosia, Cyprus  
Miller, Edward, J., ST5313, Memphis, TN, USA  
Muftee, Sabahat, A., AO5332, Rawalpindi, Punjab, Pakistan ♦

recently joined the ISASI Reachout Committee, the chairman of ISASI Reachout, Jim Stewart announced. Also joining the Reachout Committee is Steve Corrie, long-time ISASI member, who has recently retired from the Air Line Pilots Association. At their own expense, Steve and Jim recently were accredited by ICAO as Safety Management Systems instructors, having attended the ICAO SMS standardization course in Montreal. "It has been a long time since I wrote a closed book exam," said Stewart, as he reported that he and Corrie achieved the same mark on the exam. "Anything different would have given one of us bragging rights for years," he concluded. The ICAO-approved instructor rating will prove beneficial in developing and delivering international sessions on SMS.

"I plan to introduce Vic and Steve to a Reachout program as soon as possible to make use of their experience and knowledge," the chairman stated. "We have some new workshops on the horizon that may be excellent opportunities to use our new members. With Ron Schleede and Caj Frostell, this gives us a very qualified and experienced pool of instructors as a foundation for future workshops."

## FSF Changes CEO's; Matthews to Voss

ISASI corporate member Flight Safety Foundation announced the retirement of

13-year CEO Stuart Matthew and the appointment of William Voss as CEO of the organization, effective October 1.

One of Stuart's final acts was to make opening remarks at ISASI 2006 (see page 6) in September in which he applauded the vital work of accident investigators "as an essential ingredient in the constant effort to further aviation safety." Stuart was lauded by FSF Chairman Ed Simpson as deserving "tremendous credit for solidly positioning his organization for growth and advancing its impeccable international reputation."

Bill Voss, formerly director of Air Navigation for ICAO, oversaw development of major international safety initiatives. Prior to going to ICAO in 2004, he spent 23 years at the FAA, focusing on air traffic management and control. ♦

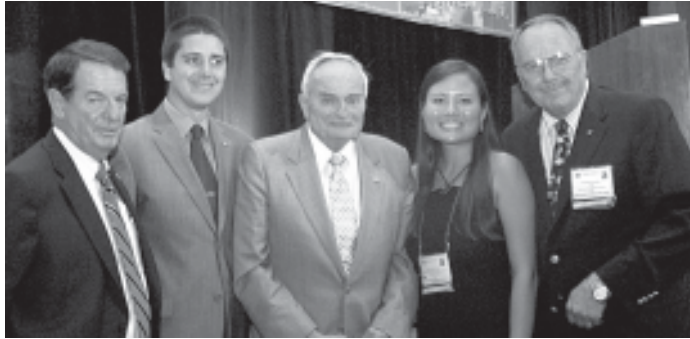
## NZSASI Executive Returns To Office, 2 year term

The New Zealand SASI election return shows that all incumbents will return to office. Incumbents are President, Peter Williams; Vice-President, Russell Kennedy; and Secretary/Treasurer and NZ Councillor, Ron Chippindale.

NZSASI will host the annual regional air safety Seminar in Wellington, June 8-10, 2007. This popular event is a joint NZSASI-ASASI seminar that attracts safety professionals from the Asia-Pacific region and beyond. ♦

who were to be specially recognized by their peers.

In the course of the evening, President Del Gandio recognized Leonardo Ferrero, Politecnico di Torino, Italy, and Sheena D. McCune, Embry-Riddle Aeronautical University, Florida, U.S.A., as the 2006 recipients of the ISASI Rudy Kapustin Memorial Scholarship (see *Forum* July-September, page 22). The program was established in memory of all ISASI members who have died, and was named in honor of the former ISASI Mid-Atlantic Regional



**Posing for a “trophy” photo are (left to right): President Del Gandio; L. Ferrero, scholarship winner; D. Wood, Lederer Awardee; S. McCune, scholarship winner; and R. Schleede.**

Chapter president. He also inducted Barbara Dunn and Max Saint-Germain into the honored “Fellow” membership class of the Society. They make only the 21st and 22nd members to hold the coveted status.

Another special recognition was the “Best in Seminar Award” established through an anonymous donation by an ISASI member who wished to acknowledge a paper at the annual seminar that made an outstanding contribution to the advancement of technical methodologies in aircraft accident investigation. This year the winning presentation was Stéphane Corcos and Alain Agnesetti’s paper detailing the French BEA’s investigation of a serious incident that had many parallels with a previous fatal accident investigation. The judges said, “The content was a fascinating insight into the application of a systemic investigation approach in a part of the industry where the ‘virtual airline’ presents growing challenges for safety professionals.”

President Del Gandio then welcomed ISASI’s new corporate members and awarded plaques to Erick Mayett, Colegio De Pilotos



**One of the 30 dinner table groups enjoying the awards banquet.**



**Companions get a taste of Mexico in the city of Cancun.**

Aviadores De Mexico; Savik Ramkey, Skyservice Airlines Ltd.; Capt. Cedda Angelo, Alitalia Airlines; Karl Rosenlund, SAS Braathens; Jeremy D. Katt, Parker Aerospace; Ericsson Nengola, Directorate of Aircraft Accident Investigations, Nambia; and Anus I. Ozoka, Nigerian Ministry of Aviation and Accident Investigation Bureau. Not present for the presentation was a representative from Qwila Air (Pty) Ltd., Lanseria, South Africa.

Presentation of the prestigious Jerome F. Lederer Award is always a crowning finale to the evening of peer recognition. President Del Gandio hushed the room and began: “Dick Wood truly fits ISASI’s demanding criteria for the Lederer Award, standing tall among his peers for more than 50 years. Through his teaching,



**With the imposing El Castillo in the background, an ISASI group gets a full explanation of the Chichen Itza history.**

writing, and service to our profession, he has made significant contributions to aircraft accident investigation and aviation safety. His professional lifetime has been punctuated with countless contributions, both to ISASI and the industry, and those contributions continue to this day.” The lauding comments led to highly enjoyed acceptance remarks by Richard Wood (see page 12 for presentation ceremony), ending in a rousing ovation for the awardee.

In closing the evening, President Del Gandio paid special thanks to the industry sponsors of ISASI 2006 and to the participants who traveled from 34 nations to attend a truly “international” event. As always, the closing seminar action was the transfer of the “cow bell” to Wing Keong Chan and Chow Wah Chong of the Ministry of Transport, Singapore, and hosts of ISASI 2007. ♦



way. For example, voluntary reporting systems now introduce the challenge of finding that needle in a haystack that might really be worth understanding. Even with digitally recorded data and systems modeling, we still need to know what questions to ask so that we know which data parameters to record and analyze.

The second major challenge is to make sure we don't forget lessons already learned.

**Despite the need to retain what we already know, breaking accidents chains by improving both our understanding and our awareness of incidents is the direction that our profession must take.**

We must avoid the temptation of plunging into the brave new world of incident analysis and digital data at the expense of what we already know to be critical elements in aviation safety.

For example, we had eight major catastrophic fatal jet accidents in the past year. While this is a remarkably low number compared to just a decade ago, we are reminded that risk is not zero, but we also are reminded that most major accidents are caused by very well established and well understood risks. In September last year, a Mandala Airlines B-737-200 crashed on initial climbout when the aircraft was misconfigured for takeoff (no flaps); 104 people on the airplane and 47 people on the ground were killed.

In October, Bellview Airlines lost control when one of its B-737-200 crew tried to fly around thunderstorms at night on initial climbout from Lagos; all 117 people on board were killed. In December, Solsoliso Airlines crashed on approach due to windshear associated with nearby thunderstorms; 109 people were killed. In May of this year, Armavia from Armenia crashed during a go-around in poor weather at night near Sochi, Russia; all 113 on board were killed. On July 9, an A310 operated by Sibir Airlines landed long in bad

weather and tailwinds at Irkutsk, then overran into a concrete wall and buildings, killing 131 of 203 occupants.

The following day, a Fokker F27 operated by Pakistani International crashed on climbout from Multan, Pakistan, after an engine failure; all 45 occupants were killed. On August 22 a Tu-154 operated by Pulkovo Airlines crashed in a thunderstorm. All 170 occupants were killed. On August 27 a CRJ operation by Comair crashed while approaching takeoff at Louisville, Ky., killing 49 of the 50 persons on board. Two other major accidents last year involved an Air France A340 that landed long in heavy rain and overran at high speed in Toronto. The aircraft caught fire, but all occupants escaped. In December last year, Southwest Airlines landed long and overran onto a city street in Chicago, killing a young boy in a passing vehicle.

None of these events involved either new or subtle risks, and none involved risks that were difficult for operators to identify before the accident scenarios began. Again, we must not forget the lessons learned.

Yet, despite the need to retain what we already know, breaking accidents chains by improving both our understanding and our awareness of incidents is the direction that our profession must take. Perhaps we could have identified something in the data before Southwest overran at Midway. Perhaps future approach-and-landing accidents can be averted by identifying an abnormal frequency of high-energy or unstable approaches on a particular approach to a particular runway. Perhaps we can identify, with real data, certain aircraft performance characteristics that invite mistakes by pilots, or identify particular portions of airspace that invite inadequate aircraft separation.

During this seminar, several papers will be presented that outline some of the challenges and some of the successes in this transition to making better and more systematic use of incidents to break the chain. Be prepared to learn something about incidents to accidents and breaking the chain. Again, if anyone is seeking to understand more about any issue related to aviation safety, this seminar is a great place to start. ♦

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## CORPORATE MEMBERS

Accident Investigation Board, Finland  
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Air Accident Investigation Bureau of Singapore  
Air Accident Investigation Unit—Ireland  
Air Accidents Investigation Branch—U.K.  
Air Canada Pilots Association  
Air Line Pilots Association  
Air New Zealand, Ltd.  
Airbus S.A.S.  
Airclaims Limited  
Aircraft Accident Investigation Bureau—  
Switzerland  
Aircraft Mechanics Fraternal Association  
Aircraft & Railway Accident Investigation  
Commission  
Airservices Australia  
AirTran Airways  
Alaska Airlines  
Alitalia Airlines—Flight Safety Dept.  
All Nippon Airways Company Limited  
Allied Pilots Association  
American Eagle Airlines  
American Underwater Search & Survey, Ltd.  
ASPA de Mexico  
Association of Professional Flight Attendants  
Atlantic Southeast Airlines—Delta Connection  
Australian Transport Safety Bureau  
Aviation Safety Council  
Avions de Transport Regional (ATR)  
BEA-Bureau D'Enquetes et D'Analyses  
Board of Accident Investigation—Sweden  
Boeing Commercial Airplanes  
Bombardier Aerospace Regional Aircraft  
Bundesstelle fur Flugunfalluntersuchung—BFU  
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Cavok Group, Inc.  
Centurion, Inc.  
China Airlines  
Cirrus Design  
Civil Aviation Safety Authority Australia  
Colegio De Pilotos Aviadores De Mexico, A.C.  
Comair, Inc.  
Continental Airlines  
Continental Express  
COPAC/Colegio Oficial de Pilotos de la  
Aviacion Comercial  
Cranfield Safety & Accident Investigation Centre  
DCI/Branch AIRCO  
Delta Air Lines, Inc.  
Directorate of Aircraft Accident Investigations—  
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Directorate of Flight Safety (Canadian Forces)  
Directorate of Flying Safety—ADF  
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Dutch Transport Safety Board  
EL AL Israel Airlines  
EMBRAER-Empresa Brasileira de  
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Embry-Riddle Aeronautical University  
Emirates Airline  
Era Aviation, Inc.  
European Aviation Safety Agency  
EVA Airways Corporation  
Exponent, Inc.

Federal Aviation Administration  
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Flight Attendant Training Institute at  
Melville College  
Flight Safety Foundation  
Flight Safety Foundation—Taiwan  
Flightscape, Inc.  
Galaxy Scientific Corporation  
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Global Aerospace, Inc.  
Hall & Associates, LLC  
Hellenic Air Accident Investigation  
& Aviation Safety Board  
Honeywell  
Hong Kong Airline Pilots Association  
Hong Kong Civil Aviation Department  
IFALPA  
Independent Pilots Association  
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Interstate Aviation Committee  
Irish Air Corps  
Japan Airlines Domestic Co., LTD  
Japanese Aviation Insurance Pool  
JetBlue Airways  
KLM Royal Dutch Airlines  
L-3 Communications Aviation Recorders  
Learjet, Inc.  
Lockheed Martin Corporation  
Lufthansa German Airlines  
MyTravel Airways  
National Air Traffic Controllers Assn.  
National Business Aviation Association  
National Transportation Safety Board  
NAV Canada  
Nigerian Ministry of Aviation and Accident  
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South African Airways  
South African Civil Aviation Authority  
Southern California Safety Institute  
Southwest Airlines Company  
Star Navigation Systems Group, Ltd.  
State of Israel  
Transport Canada  
Transportation Safety Board of Canada  
U.K. Civil Aviation Authority  
UND Aerospace  
University of NSW AVIATION  
University of Southern California  
Volvo Aero Corporation  
WestJet ♦

## SAS Braathens Founded in 2004

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

The airline industry has evolved dramatically during the past decade with new carriers starting from scratch challenging the well-established airlines with big administrations.

Airlines not realizing the ongoing change quickly enough have had a hard and long struggle. While the extreme high level of safety has become a matter



of course to the average passenger, the airlines need 100% focus on safety at all times. The level of safety is the result of hard and dedicated work by airline employees throughout the organization.

SAS Braathens was founded in 2004 after a merger between Braathens SAFE (South American and Far East) and the Norwegian branch of Scandinavian Airlines System (SAS). Both companies have a history going back to 1946. During the years prior to the merger, SAS and Braathens shared the domestic traffic, while SAS served most of the European and intercontinental routes.

Since the merger, SAS Braathens has been divided into four separate airlines, one airline covering domestic and European routes for each participating country (Norway, Sweden, and Denmark), and one airline serving intercontinental routes. SAS Braathens serves

some 65% of the domestic traffic and 40% of the international (European) traffic within and out of Norway.

Financially, SAS Braathens has been profitable since its establishment, transporting more than 10 million passengers a year on its 450-500 daily departures serving more than 40 destinations. SAS Braathens operates 52 Boeing 737s (-400/-500/-600/-700 and -800s) and 6 Fokker 50s. The airline has 2,800 employees, excluding maintenance and ground handling (separate companies).

SAS Braathens is a member of the International Air Transport Association (IATA), Flight Safety Foundation (FSF), and is now a corporate member of the International Society of Air Safety Investigators (ISASI). SAS Braathens performed a line oriented safety audit (LOSA) in 2004 as the first European airline and an IATA Opera-

tional Safety Audit (IOSA) in 2005. Both the LOSA and IOSA will be repeated in 2007. The company is annually represented at the European Aviation Safety Seminar, International Air Safety Seminar, Cabin Safety Symposium, and/or the ISASI seminar.

SAS Braathens is a Joint Aviation Authority (JAA) operator with a Norwegian Air Operator Certificate (AOC). The vice-president of the Quality and Safety Department reports to the accountable manager. The Quality and Safety Department consists of three units: Safety, Quality/Operations, and Quality/Maintenance. In addition, the Safety Department oversees the Safety Management System, including the Occurrence Reporting System, Flight Data Monitoring (FDM)/FOQA, risk assessment, company investigations, and safety information distribution. Flight data monitoring has been a part of the airline's safety toolkit since the beginning of the 1970s.

The company's Investigation Group investigates aviation occurrences, demonstrating an increased safety potential. The Group consists of a leader and three investigators. The investigations are performed in accordance with ICAO Annex 13, and the reports are distributed internally as well as to national authorities.

ISASI membership is a natural choice and development for SAS Braathens, which believes strongly that while traditional reactive safety work can never be terminated, the high road to achieving increased levels of safety is through proactive safety analyses and occurrence investigations—both of which are heavily advocated by ISASI. ♦



**ISASI**

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