

# ISASI FORUM

“Air Safety Through Investigation”

OCTOBER–DECEMBER 2010



**This issue is devoted to  
ISASI 2010 Sapporo events**



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Lederer Award winner Michael Poole (right) smiles as he accepts the ISASI 2010 Jerome F. Lederer Award from ISASI President Frank. Del Gandio. Photo: Esperison Martinez, Editor



### Volume 43, Number 4

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## ISASI 2010: *Konichiawah*

By Frank Del Gandio, ISASI President



*(President Del Gandio's opening remarks to the delegates of ISASI 2010 have been abbreviated. His entire presentation is available in the ISASI Proceedings 2010, which will soon be available on the ISASI website at [www.isasi.org](http://www.isasi.org).—Editor)*

*Konichiawah*, good morning, and welcome to ISASI 2010, and to the beautiful city of Sapporo. I thank our hosts, Japan's Transportation Safety Board, and especially Dr. Yuki Kakimoto, who co-chaired the Technical Committee. Dr. Kakimoto showed great patience when dealing with us from 8,000 miles away. She is a talented and gracious person.

This is ISASI's first seminar in Japan, but its third seminar since 2002 in Asia and our fourth in the Asian-Pacific region. Our Japanese colleagues have selected a beautiful setting for this seminar. It is a city known for its parks and its mountains. Those mountains explain Sapporo's status as an Olympic city, having hosted the 1972 Winter Games. The same mountains explain why Sapporo is the home of a world-famous Snow Festival, or "Yuki Matsuri." If you are not familiar with the Snow Festival, search the Internet because you will see that the snow sculptures at this festival are truly stunning.

For the next few days, you will be treated to a seminar that is full of high-quality presentations. Each year the technical program at our annual seminar gets better and better. ISASI Sapporo will be no exception. The theme that our Japanese hosts selected for the seminar does a very nice job of defining basic objectives for any accident investigation: Accurate, Speedy, Independent, and Authentic, or ASIA.

Investigations indeed need to be technically sound, and *accurate*. They also need to be accomplished *as quickly as possible*, but without threatening the technical integrity of the investigation. Integrity also requires that investigations remain *independent* of political pressure and free of criminalization if they are to be credible and if the knowledge gained from the investigation is to help prevent future accidents.

ISASI has always advocated the independence of accident investigations. We recently emphasized this by issuing our first formal endorsement of a public policy. In that endorsement, we joined several other international aviation organizations to advocate for the universal decriminalization of aviation accidents. Criminalization of accidents or, for that matter, overt political influence in an investigation damages our ability to prevent future accidents and therefore is not in the public interest.

Finally, investigations need to be *authentic*. They need to be more than accurate; they need to be thorough, with all possibly pertinent issues examined, and with the use of all techniques necessary to ensure that we fully understand an accident. You

will hear multiple presentations this week that directly address these requirements.

For example, several presentations will address recovery technologies and innovative tools and techniques for understanding what happened and why. Other papers will explore the analysis of operational data and confidential reporting systems that apply the knowledge gained in order to prevent future accidents. Other papers will focus more narrowly on aviation issues, trends, and challenges in Asia. I am confident that you will not be disappointed in the topics nor in the quality of the presentations.

Prevention obviously is the reason we investigate accidents.



**Prevention obviously is the reason we investigate accidents. Otherwise, our investigations would have no point. We will never reach a level of zero risk, and we know that although the system continues to get safer year after year in most of the world recent experience tells us that we still have work to do.**

Otherwise, our investigations would have no point. We will never reach a level of zero risk, and we know that although the system continues to get safer year after year in most of the world recent experience tells us that we still have work to do.

Actually, the recent accident record has been somewhat mixed. In 2009, the world aviation community had the fewest hull losses, by far, in the history of civil aviation. Measured by hull losses, the world accident rate in 2009 was 30 percent lower than the previously best year on record. Yet, fatal hull losses rose slightly in 2009, and the number of fatalities increased significantly compared to 2008. So when measured by hull loss rates, 2009 was the safest year ever. Yet, we had more fatal hull losses in 2009 than in 2008, and the number of fatalities exceeded 2008 by more than 200.

At this point, 2010 appears to be developing with a similar story. We can expect the number and rate of hull losses to be even lower than in 2009. However, the number of fatal hull losses and the number of fatalities both are likely to be higher than in 2009. By the end of August, we already had Ethiopian Airlines in Beirut with 82 fatalities, Afriqiyah in Libya with 103 fatalities, Pamir Airways in Afghanistan with 44 fatalities, Air India Express in India with 158 fatalities, 12 fatalities on an Antonov 24 in Russia, Airblue near Islamabad with 152 fatalities, 42 fatalities in the recent Henan Airlines accident

in northeastern China, plus several fatal cargo hull losses that killed almost 20 crewmembers.

We also had a non-fatal hull loss in late July at Riyadh that illustrates why everyone in aviation safety needs to be cautious about preliminary information. The early information we received at the FAA on this accident included the following:

“The airplane was a Boeing 747; the flight was a scheduled passenger service; the aircraft had suffered a severe inflight fire; the flight crew had declared an emergency; and the ensuing crash led to multiple passenger fatalities.”

All of this was wrong. The aircraft was an MD-11; it was a cargo flight with just two pilots on board, not a passenger flight; it involved a hard and bounced landing with no inflight fire; no emergency was declared; and, finally, rather than “multiple passenger fatalities,” the only injury was a non-life-threatening injury to the first officer.

This accident produced an unusual amount of misinformation early on. We often receive wildly inaccurate information

immediately after an accident, whether the accident occurred in the United States or elsewhere.

The fatal accidents I mentioned here, plus the non-fatal case in Riyadh, make two simple points that I always note at ISASI seminars: again, accident investigators still have work to do, and we need to remain professional, with open minds that are not biased in any way by early reports. This seminar will help all of us here to do our jobs just a little bit better.

I will close with my usual recommendation. Please take advantage of all the knowledge that is in this room. We have real expertise from all over the world on all kinds of aviation and investigative issues. If you want a better understanding of some aircraft system, of an operational issue, of some safety process, or a particular accident, someone in this room can help you. If you cannot find the person, we can try to help find the right person to answer your question. Please take advantage of the knowledge that is all around you, and please share your own knowledge with others in this room. ♦

## V.P.'S CORNER

# Looking Forward

By Paul Mayes, ISASI Vice-President



I am very pleased to take over the vice-president role again. Ron Schleede has done an excellent job, and the changing of the “baton” is no reflection on his performance. He has been a very active and successful VP, and I hope I can be as useful to ISASI and the members. I also hope that Ron will continue to be an active member of ISASI, especially in the role of encouraging sponsorship for our seminars and supporting the education and training of safety professionals.

I have two main aims for my role as VP, in addition to the ongoing support for the president and the International Council. Firstly, I would like to build our membership with members from a wider background in safety-related positions, and encourage continued membership. Each year we have a significant number of members who do not renew their membership. Of course, there are members who are forced to resign because of health, changing work, or lifestyles, etc., but there are many who just opt out of renewing their membership. I would like to find out why we “failed” these members and what we can do to encourage members to renew their membership. If you have any ideas or opinions, please contact me. I welcome any constructive input or discussion.

On the same theme, our student members are very important and the industry leaders of the future. We have made good progress in building our student numbers, but I think we could do more. For example, we could encourage student participation from the aviation colleges by having local representatives, or student councillors. Any ideas, especially from our student members, would be welcome.

The second aim is one that I was very much involved with when I was previously vice-president, that is the development of air safety investigation as a profession and recognition of

the role of ISASI in the major safety forums. I was able to represent ISASI on several technical committees and working groups. My aim is to develop that contact again.

In addition, I made a presentation at this year’s ISASI international seminar in Sapporo on the role of investigations and reporting. It is interesting to reflect on the fact that glob-

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**We need to concentrate on how to identify the areas for safety improvements and accident prevention. This is not easy to do in practice, but I believe it is the area in which we can get the best return for aviation safety. I welcome your comments and feedback on any of these issues or safety matters.**

ally we have millions of safety reports in various databases in different organizations, government agencies, and countries. And we continue to report safety incidents, safety concerns, and hazards by the thousands. It is how we deal with these reports and analyze them that should give the safety profession ideas to improve “safety.” We are still very much a reactive industry with vast experience in safety investigations of complex accidents, and we have made significant advances in safety through the lessons from accidents. But we cannot continue to accept repeat accidents such as runway excursions, overruns, and loss of control. These are preventable.

We need to concentrate on how to identify the areas for safety improvements and accident prevention. This is not easy to do in practice, but I believe it is the area in which we can get the best return for aviation safety. I welcome your comments and feedback on any of these issues or safety matters. ♦

## IN MEMORIAM

# Truman 'Lucky' Finch

April 20, 1925–Aug. 23, 2010

ISASI Life Charter Member 003

**O**n Aug. 23, 2010, Truman "Lucky" Finch, the founder of our Society, passed away after a brief illness. His death was unexpected and came as a shock and great surprise to all who knew him. ISASI President Frank Del Gandio was close to him, as were members of his chapter, the Dallas-Fort Worth Regional Chapter, which in memory contributed \$500 to the ISASI Scholarship Fund.

In a eulogy given at the ISASI 2010 awards banquet, President Del Gandio recalled that Lucky and his wife, Virlene, were frequent attendees at the annual seminars and that they had planned to be in Sapporo. He recounted conversations and laughter he shared with Lucky. Then he related a bit of Lucky's past.

Del Gandio said: "Lucky, while working for the Civil Aeronautics Board, Bureau of Safety, later the NTSB, became the original founder of the Society of Air Safety Investigators and holds member number 003. He joined CAB 9 days after being released from active military duty following 16 years as a Navy fighter pilot with service during World War II and the Korean Conflict. Lucky was in the same squadron and flew with Donald Engen, who later became a rear admiral in the Navy and an NTSB Board member and administrator of the FAA. Lucky was based at the CAB Fort Worth, Tex., office.

"In July 1963 he was selected as one of the four original senior air safety investigators (team captains) and transferred to Washington, D.C., to serve as investigator-in-charge of major catastrophic aircraft accidents. He subsequently became the manager of the NTSB's Fort Worth field office, where he retired in 1986.

"Lucky was known to many around the world. It was the contribution and vision from early pioneers such as he that transformed aviation into the ultra-safe form of transportation that exists today. And while Lucky may have left us, his memory will always be reflected in the numerous achievements he has left behind.

"Please, let's have a moment of silence in memory of our colleague, benefactor, and friend."

\* \* \* \*

Lucky was an ISASI devotee. An indication of his love for the efforts and aims of the organization he formed is evident in this e-mail he sent to ISASI headquarters on Aug. 1, 2010,



at 8:47 p.m. He wrote: "I have wanted to do this for some time and finally decided that I had better do it while I could still remember time and names. See you in Sapporo."

The following is the story he wanted all to know:

### **Creation of the International Society Of Air Safety Investigators**

By Truman "Lucky" Finch

These are the circumstances surrounding the creation of the Society of Air Safety Investigators (SASI), which later became ISASI. After 16 years' active duty as a fighter pilot in the U.S. Navy during World War II and the Korean War, including

attendance in 1956 at the Aviation Safety Officers School at the University of Southern California, I was released from active duty. In April 1959, 9 days after my release from the Navy, I went to work for the Civil Aeronautics Board (CAB), Bureau of Safety (BOS) as an air safety investigator in the Fort Worth, Tex., field office. In July 1963, I was selected as one of the four original senior air safety investigators (team captains) and transferred to Washington, D.C., to serve as investigator-in-charge of major air carrier catastrophic-type accidents. The other three senior investigators were Bill Lamb, Dick Baker, and Lee Martin. At that time, Joe Fluet was chief of the investigation division, and Jack Faries was assistant chief. Several months after my arrival in Washington, Jack Faries had a major heart attack and was unable to work for a considerable length of time. Joe Fluet moved me into his office, into Jack Faries' desk, and I did my job and Jack's.

In the winter of 1963–64, Joe received a telephone call, which I overheard, in which he became highly irate. The conversation lasted a considerable length of time and ended with him slamming the receiver down. I asked, "What was that all about?" He replied, "The chief of the field office called and said three of his investigators were in the process of forming a union." Ever since I got into this business, I have felt strongly that aviation safety should not be jeopardized by unionization. I said, "Why don't we create an organization devoted strictly to promoting aviation safety with no side issues involved?" Joe said, "That's a great idea. Get started on that."

I selected the name. After considering Association of Air  
*(continued on page 30)*

# ASIA.

## ...the four pillars of air accident investigation were the theme of ISASI 2010, Sapporo

By Esperison Martinez, Editor

**S**apporo, Japan, has similar weather patterns to Milwaukee, Wisc., and Munich, Germany. And in September that means, unpredictable! But for the 200 accident investigators (AIs) and related professionals from 30 countries attending ISASI's 41st annual air accident investigation conference and listening intently to other AI's revelations of techniques used during investigations, the weather outside didn't matter much—they seldom were in it.

Because of ISASI's worldwide membership, exotic-sounding conference venues often occur. In truth, it is more in the companions' favor, for the conference days begin early and end late. And that's what the attendees want. Their days are packed with PowerPoint presentations of well-known accident investigations; lesser-known incident investigations, and updates on ongoing regulatory situations.

The schedule of ISASI 2010 held true to form: one full day of tutorial workshops, 3 days of a technical seminar, 2 evenings of social networking, an awards banquet, and an optional day trip to complete the week.

ISASI 2010 was hosted by Japan Local Seminar Committee under the auspices of the Japan Transport Safety Board (JTSB). Mamoru Sugimura served as

the Seminar Committee's chairperson. Hideyo (Bob) Kosugi served as his right hand man. Other members included, Technical Program: Yukiko Kakimoto and Robert Matthews; Sponsorship: Koichi

with the introduction of bigger aircraft into airline fleets and an increased influx of Asian passengers. From the investigators' standpoint, it is imperative to understand local culture, customs, and peoples' senti-



From left, F. Del Gandio, N. Goto, and M. Sugimura prepare to open ISASI 2010 Sapporo.

Saito and Ron Schleede; Companion Program: Masaru Chiba; Website: Keiji Omura. And there were many unnamed volunteers that contributed greatly to the seminar's success. This is the third ISASI annual seminar to be held in Asia since 2002. For the JTSB, the decision to host was predicated upon the assessment that the environment surrounding air accident investigators has dramatically changed

ments to overcome cultural differences and language barriers to better cope with severe accident situations.

With particular emphasis on Asia overcoming cultural and language problems, conference planners selected "Investigating ASIA in Mind—Accurate, Speedy, Independent, and Authentic" as the conference theme.

Considering the worldwide slumping

# ACCURATE, SPEEDY, INDEPENDENT, AUTHENTIC...



**ABOVE: Tutorial 1 attendees listen to speaker M. Denton. LEFT: T. Nakada addresses the T-2 group.**

the city and its surrounding attractions. Sapporo is the capital of the island of Hokkaido and is located at the north end of Japan, near Russia.

From a delegate cost standpoint, as discussed in the International Council meeting held a day prior to the tutorial program, ISASI's annual conference is judged to be of very high value. Delegate and companion registration costs are low in comparison to the costs of other organizations' conferences of equal length and inclusive benefits—namely, a 3-day technical program complete with ample breaks with supplied coffee and snacks; all breakfasts, lunches, and most dinners; two no-cost social evenings with refreshments and food; and an awards banquet that is always a regaling evening. All the social

economy, attendance by 227 persons, 200 delegates and 27 companions was considered excellent by the planners. The Royton Sapporo Hotel proved its merits in serving the needs of the delegates. The companions discovered the delights of

events are planned to create a networking atmosphere. Companions' programs are equally low cost when considering what is included: two full-day tours and all delegate social events. The planning committees strive to keep other out-of-pocket expenses as low as possible and begin planning hotel arrangements years in advance of the actual seminar. For example, ISASI 2010 planning began 4 years before its start.

## Tutorial workshops

Tutorial workshops are intended to be interactive events between speaker and audience. The goal is in-depth discussions of the topic so that the workshop becomes a "learn and take away idea event," said a planner of a past tutorial session. But even in those instances when segments of the tutorial are more lecture than interactive, the topic holds attention.

Such was the case for the two 8-hour tutorial workshops that filled the day preceding the start of the 2010 technical program. Workshop attendance requires a separate registration from the technical program. Ninety-eight persons enrolled, many of them staying on for the technical program, too. The T-1 program, "Investigating Human Factors: The Human/Machine Interface," was presented in three morning sessions starting at 8:30 a.m. and four afternoon sessions, closing at 5 p.m. T-2, "Aircraft Numbers Are Increasing Worldwide—How Do We Prevent Accidents?" mirrored T-1 in format and time.

In all, 14 presentations were made at the two tutorials. Each fit into the appropriate theme. For example, Boeing Japan President Michael Denton addressed the topic T-1 theme by speaking about the considerations Boeing makes when bringing a new airplane to market. He noted the Boeing baseline requirement in designing new airplanes: Build it as safe as or safer than the airplanes that came before them. So the B-787 design drives were operational commonality, simplicity, and growth and technology. He said pilot feedback was integral to the design process. Results were dual headup displays, vertical situation displays, and synthetic airspeed and geometric altitude displays. Some of the significant commonality with the Boeing 777 includes checklists, non-normal procedures with recall, flight maneuvers, and normal procedures. Simplicity was addressed by designing more-standard airplanes and using new



**The “Recent Accident” panel answers questions. Shown, from left, are Lorenda Ward, Olivier Ferrante, T.K. Dodt, Mark Smith, and Brian McDermid.**



**The panel on “Investigating Tools and Lessons” answers audience questions. Shown, from left are, Frederico Machado, Matthew Greaves, Michael Guan, Christophe Menez, and Hiroto Kikuchi.**

technology to drive down costs throughout the life of the airplane. Some of the key technology includes composite materials, more-electric systems, advanced aerodynamics, and modern engines. By the end of his presentations, attendees had a good understanding of the complex nature of the considerations made when bringing a new airplane to market.

Takafumi Nakada, representing the Civil Aviation Bureau of Japan, addressed the T-2 theme with the subject of shifting to more intelligent air traffic systems. He described the Bureau’s long-term vision of future air traffic systems in Japan through the development of Collaborative Actions for Renovation of Air Traffic Systems (CARATS). He noted that for effective and efficient work on future air traffic management systems (ATMs), collaboration is needed among industry, academia, and government; between operators and air navigation service providers; internationally to realize seamless air traffic; among co-users of air space; and with local communities.

He continued, saying, “Safety continues to be a major prerequisite in designing and establishing future air traffic systems.”

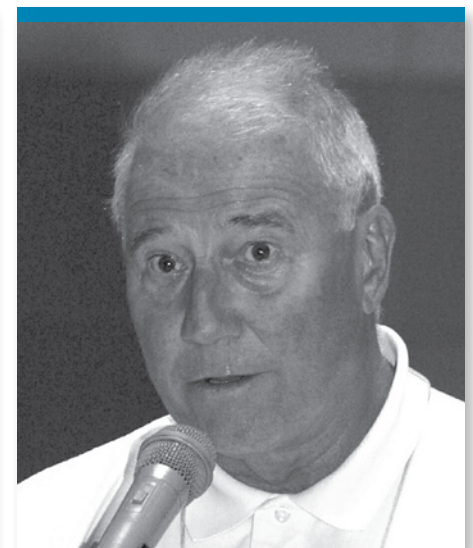
Then he outlined the safety goals: CAR-ATS should focus on the countermeasures against accidents attributable to human errors, meteorological factors, inadequacy of information sharing among stakeholders, and lack of situational awareness. In terms of crisis management, security measures and contingency measures must be secured to provide continuous stable



air navigation services. For continuity of operation, the systems should be reliable and invulnerable to external factors. In summing up his entire presentation, he said: “To make our future system harmonize with and interoperable with others, we will continue to have dialogues with overseas counterparts to secure harmonization, contribute to international standardization activities through the ICAO framework, and work on the regional ‘seamless sky’ initiative with the Asian/Pacific states.”

### **Technical session**

ISASI 2010 Sapporo Committee Chairman Mamoru Sugimura opened the 41st annual event with a gracious welcoming talk. He noted that the technical papers were collected “from all parts of the world,” closely examined for relevancy before selection, and that seminar events were planned to bring “wonderful content” to the seminar.



**Questions are posed to panel members.**





**Delegates take advantage of the break time designed for networking.**

He said event preparations have been ongoing for 4 years but that the unstable economic climate had affected the total number of attendees. Still, he predicted that everyone would gain a deepened sense of air safety from attending the seminar and would depart with a better understanding of Japanese culture.

ISASI President Frank Del Gandio's welcoming remarks noted that this was the Society's first seminar in Japan. He extolled Sapporo's mountains, parks, and friendliness. Turning to the "high-quality presentations" attendees would hear, he lauded their adherence to the established seminar theme saying, "papers will address recovery technologies and innovative tools and techniques for understanding what happened and why. Some papers will explore the analysis of operational data and confidential reporting systems, while others will focus more narrowly on aviation issues, trends, and challenges in Asia. This seminar will help all of us to do our jobs just a little bit better." (See "President's View," page 3, for his full remarks.)

Keynote speaker Norihiro Goto, chairman of the JTSB, outlined the Board's makeup, responsibilities, and future tasks. Among these, he noted, is meeting the challenge to decrease the "absolute number of aircraft accidents." To do that, attention must be given to "causes of aircraft accidents," which he identified mainly as the "broad category of human factors": pilot error; weather- and mechanical-related pilot error; and other human error. He also addressed "cooperation and coordination." Using the Aug. 20, 2007, China Airlines Flight 120 as an example,

he noted the international makeup of the investigation team. He concluded that the probable cause finding resulted from the knowledge and experience of each team in the investigation party. He said, "international cooperation and coordination are very important factors in carrying out a successful investigation.... I hope that through this presentation, air safety will be enhanced further." (See page 12 for his full remarks.)

When opening remarks concluded, Master of Ceremonies Hideyo (Bob) Kosugi initiated the start of the technical presentations. The 3-day program allowed for 24 papers to be presented. Each morning and afternoon session carried its own subtopic: Tuesday a.m.—Authentic Investigations; p.m.—ASIA: Trends and

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Issues; Wednesday a.m.—Innovative Uses of Data and Intellectual Models; p.m.—Preparing for Investigations; and Thursday a.m.—Investigative Tools and Lessons; p.m.—Recent Accidents: Lessons Techniques and Challenges (see page 29 for speakers and topics). Each morning and afternoon, breaks were designed for coffee and tea networking time between the delegates, and ample demonstrations of this existed throughout the 3 days of presentations.

And while the delegates were seat bound from 8 a.m. to 5 p.m., evening hour social events such as the president's reception and the casual dinner provided respite from the rigors of sitting, listening, and absorbing information. Especially enjoyable, according to an attendee, was the evening event at the Sapporo Bier Garten. Sapporo is well known for the flavorful beer it brews. One appreciative expert confided that the fine brew is a result of the city's latitude matching that of other beer capitals of the world, namely Milwaukee, Wisc., and Munich German, making it ideal for growing perfect beer-making ingredients.

The dinner evening was an introduction to a Sapporo "barbeque" night at the

## Logo Defined



The ISASI 2010 logo symbolizes a paper crane.

Red-crested white cranes can be spotted in the field of Hokkaido, where the city of Sapporo sits, and they are loved by the Japanese people because of their elegant figure. People fold paper cranes for good occasions or when praying for something, such as for early recovery of loved ones from ailment or for peace on Earth, etc. The paper crane on this year's logo also embodies the Society's wishes for flight safety signified by the crane's soaring posture. ♦



**The ISASI Rudy Kapustin Scholarship winners are shown receiving their certificates. Shown, from left, are L. Dunn, M. Wong, President Del Gandio, and L. Jones.**

city's famous Bier Garten. Long tables were graced with small hibachis and platters of salmon, squid, shrimp, scallops, beef, onions, corn, peppers, and other vegetables—all awaiting to be skewered and roasted. Toasting with golden-colored liquid was also much enjoyed!

Earlier that day, the lady companions were taking advantage of the first day of preplanned tours to some of the exquisite locations in Sapporo, along with served lunches of local fare. As was expected, some of the local cuisine was passed over for more Western-style tidbits. Shopping time was included in the tour, as were some instruction periods. For example, on the second day, an option existed for instruction in flower arrangement or kimono wear. Flower arrangement is certainly an art form. Many companions also discovered that preparation for kimono wear should also be considered an art form, considering the time and intricate preparation the final dress required. But expressions of delight came forth as the kimono-dressed ladies viewed themselves in mirrors. The delegate assembly was treated to a view by a group of the Kimono-clad companions.

### **Awards banquet**

The culminating event, and perhaps the most enjoyable, of the annual seminar is the awards banquet, which closes the 3 days of technical talk. It is the evening that the dress finery is shaken free of wrinkles and

donned in honor of those persons to be recognized during the evening. As the 216 attendees flowed into the large banquet hall, chamber music by a duo of kimono-dressed performers resonated throughout. China and crystal elegantly dressed each dinner table, which stood ready for the six-course dinner that would be served. Costumed local dancers performed, delighting the wine-sipping audience.

After dinner, President Del Gandio took the stage, welcoming everyone and dedicating the evening to the Society's 46th year of existence. One of his first orders of business was to introduce the newly elected vice-president of ISASI,

Paul Mayes. Other officers in attendance were introduced, and a short note of regret for his non-attendance was read for Ron Schleede. This was followed by a short eulogy for ISASI's founder "Lucky" Finch, who "flew west" on August 23. Before calling for a moment of silence, Del Gandio said: "We in ISASI and the world aviation community, as well as the billions of worldwide passengers, are deeply indebted to Lucky.... While Lucky may have left us, his memory will always be reflected in the numerous achievements he has left behind." (See "In Memoriam," page 5.)

Appreciation for the seminar's outcome was very apparent as Del Gandio introduced the many who were responsible: organizers, event planners, fundraisers, behind-the-scenes workers, hotel management, the 24 co-host sponsors, and 10 booth sponsors.

Next he recognized new corporate



**H. Kosugi receives unexpected ISASI regalia ware from President Del Gandio for his seminar efforts.**



**The entire ISASI 2010 Sapporo committee gets well-deserved recognition.**



**Companions model the result of their kimono instruction.**

members. Although such members may have joined sometime during the year, it's at this banquet in which they are awarded their recognition plaques. Lauding the support of corporate members, Del Gandio reminded the audience that without such memberships the Society could probably not continue to conduct seminars in the fashion that it does. The recognized new members were Flight Data Services Ltd., FedEx Express, the Australian and International Pilots Association, the Korea Air Force Safety Center, the Finnish Military Aviation Authority, and the Irish Air Corps. On hand to receive the plaques were Capt. Mike Bender for FedEx and First Officer Troy Pirotta for AIPA.

The three college students selected to receive a 2010 ISASI Rudolph Kapustin Memorial Scholarship were then called to the stage for proper recognition of their



**M. Sugimura, right, gleefully passes the "seminar chime" to Barbara Dunn, chair of ISASI 2011.**

feat. Maggie Wai Yee Wong, Embry-Riddle (ERAC); Logan Jones, Institut Supérieur de l'Aéronautique et de l'Espace (ISAE); and Leigh Dunn, Cranfield Safety and Accident Investigation Centre, Cranfield University (see *Forum* July-September

## An Attendee's Ode Expresses His Feeling About ISASI 2010

### Sayonara Japan

Morning of 05 Sept 2010,  
I opened my eyes in Japan,  
The land of the rising sun.

Participating in ISASI 2010,  
Sharing accident investigation,  
Data, tricks, and dissertations,  
With the best of civil aviation.

An honour to visit this nation,  
Where hospitality is a tradition,  
In politeness a lesson we learn,  
Sushi, sashimi, and kaiseki ryori,  
The palette will always yearn!

I travelled through Sapporo,  
The great bier and hot bath!  
Enjoyed the gardens of Tokyo,  
Mt. Fuji, and fog covered path!  
Prayed at shrines of Kyoto,  
Shed a tear at Hiroshima's past!

Every minute of the trip an elation,  
In this great Japanese nation,  
Arigato Gozaimasu O Japan,  
It was an education vacation!  
Sayonara Japan, I will visit again!

—Capt. Samir Kohli, Head  
of Safety, Saudi Aviation Flight  
Academy

2010, page 11). They were initially introduced to the delegates during the seminar's opening sequence, but now they received the crowd's well-deserved applause as they accepted the symbolic scholarship plaque from President Del Gandio.

The newly designated winners also served as a judging panel to select the technical paper that would receive the Society's Award of Excellence for "Best Seminar Paper." This year that award went to Michael Guan, director of the investigation lab, Aviation Safety Council, Taiwan, and Christophe Menez, head of the Engineering Department, Bureau d'Enquêtes et d'Analyses, France, for their paper *Close Cooperation in Investigations Has Improved Technical Partnership* (see page 18). The Award was 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. The Excellence selection carries a US\$500 prize. The authors announced they were contributing the \$500 to the ISASI Rudolph Kapustin Memorial Scholarship Fund.

As the duo descended the platform steps, President Frank Del Gandio said: "This is the time when we give away the coveted Jerry Lederer Award [see page 16]." When he called Mike Poole forward, the crowd noise drowned out amplified words as Mike walked his way through the maze of dinner tables to the speaker's platform.

The Society presents its annual Jerome F. Lederer Award for outstanding lifetime contributions to technical excellence in furthering aviation accident investigation and achieving Society objectives. Jerry, as he preferred to be called, joined ISASI in 1965 and was long recognized as the "Father of Aviation Safety."

Del Gandio traced Poole's career through 15 years of accomplishments with the Transportation Safety Board of Canada. He covered Poole's technical innovations and software developments that have proven very instrumental in arriving at correct conclusions in aviation accident investigations.

In presenting the Award, Del Gandio said, "Mike is a long time-member of ISASI and has presented papers at many (continued on page 29)

## A JAPAN TRANSPORT SAFETY BOARD

# Air Safety View

By Norihiro Goto, Chairman, JTSB



*(Remarks presented by Chairman Norihiro Goto in his keynote opening address to the ISASI 2010 air accident investigation seminar delegates on September 7 in Sapporo, Japan.—Editor)*

**G**ood morning everyone. It is my honor to be able to deliver a keynote address to our colleagues, ISASI members.

It is well known that ISASI is ever pursuing air safety through accident investigation. And together with this objective of ISASI, the Japan Transport Safety Board (JTSB) is aiming to prevent the recurrence of an accident or a serious incident and is also aiming to mitigate damage caused by an accident even if it unfortunately recurs. These preventions and mitigations are addressed based on the found causes of an accident or a serious incident.

### The JTSB

The JTSB was established on Oct. 1, 2008. It originated from the Aircraft

Accidents Investigation Commission (AAIC), which was established in 1974. This establishment of the AAIC was urged then because more than a couple of very serious aircraft accidents, including a midair collision, occurred during the

aviation, railway, and marine. Figure 1 shows a recent accident example in each mode. We have eight regional offices across Japan: from north to south at Hakodate, Sendai, Yokohama, Kobe, Hiroshima, Moji, Nagasaki, and Naha as



**Figure 1. Recent accidents in Japan in three modes.**



**Author Norihiro Goto, chairman of the JTSB and keynote speaker at ISASI 2010.**

several years before 1974. Meanwhile, railway accidents continued to occur. And two serious railway accidents in 1991 and 2000 motivated the then AAIC to include the investigation of railway accidents and serious incidents, and the AAIC eventually became the Aircraft and Railway Accidents Investigation Commission (ARAIC) in October 2001.

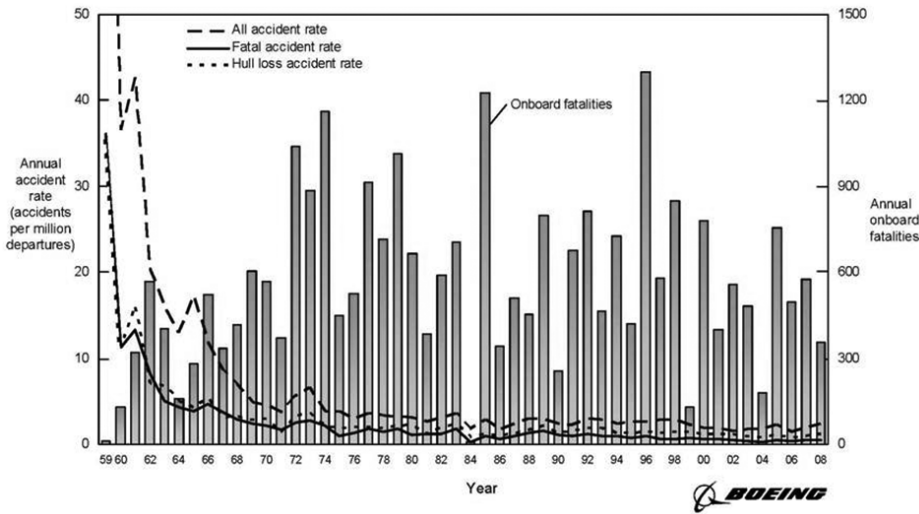
In January 2010, the International Maritime Organization adopted the Casualty Investigation Code, which prescribes separating the cause finding and the disciplinary function, into the Safety of Life at Sea (SOLAS) Convention. The ARAIC was reorganized by merging with the Cause Finding Portion of the then Japan Marine Accident Inquiry Agency, which was established in 1949, into the current system, the JTSB.

The JTSB deals with three modes—

seen in Figure 2. These regional offices treat marine accidents and incidents, but they also have the responsibility to offer

**Figure 2. JTSB regional offices.**

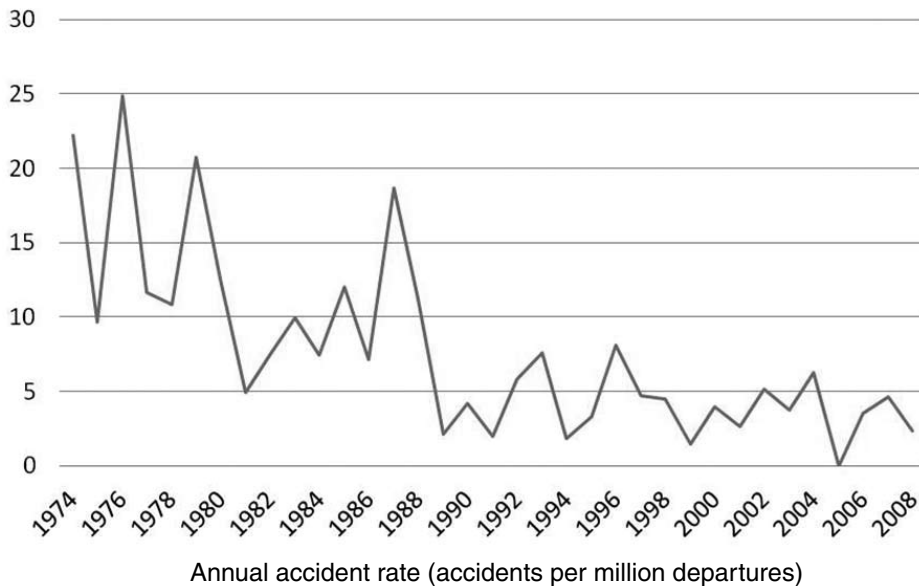




**Figure 3. Worldwide accident rates.** ([http://www.boeing.com/aboutus/govt\\_ops/reports\\_white\\_papers/commercial\\_jet\\_airplane\\_accidents\\_statistical\\_summary.pdf](http://www.boeing.com/aboutus/govt_ops/reports_white_papers/commercial_jet_airplane_accidents_statistical_summary.pdf))

### Accident Rates 1974–2008

Aircraft with a certificated maximum takeoff mass of more than 5,700 kg operated by a Japanese carrier



**Figure 4. Domestic accident rates in Japan.**

help, such as logistic supply, to investigations in other modes.

#### The JTSB

1. conducts investigations to determine the causes of aircraft, railway, and marine accidents/serious incidents and damage caused by the accidents.
2. provides recommendations or opinions, based on the findings of the investigations, to relevant ministers or parties involved concerning the measures to be taken to prevent the recurrence of accidents/incidents and to

mitigate damage caused by accidents.

3. conducts research and studies to fulfill the above-mentioned duties.

Regarding these three duties, everyone here understands what they mean, and can correlate them with what each one is working for. There is one problem, though, among these three duties. That is with regard to the third duty. Each investigation board or committee or commission has a number of investigators with a number of specialties. However, there are various accidents, and there may be some that

present investigators find quite difficult to handle in terms of specialty and field. A particular specialty is needed sometimes, and at other times especially deep professionalism is required to look into the cause of an accident. Every once in a while, we do not find appropriate investigators, or we do not have research facilities capable of a particular analysis. For such a case, we have to rely on the cooperation of research institutes and/or universities. In our case, the cooperation of national research institutes is encouraged by law in the phase of tests and research.

In addition, we have to pay attention to the attributes that accompany a so-called public investigation in order to carry out those duties. As the NTSB chairman mentioned at the previous ISASI meeting in Orlando, Fla., there are three critical attributes: transparency, accountability, and integrity. We want to raise the bar in all three of these important areas. But we also have to consider the extent to which the bar could be raised, depending on the boundaries that each country has. This is a very complicated problem, which continues to be addressed in terms of culture and the judicial system of a country. I hope discussion will take place here regarding this issue.

#### Tasks for the future

Figure 3 shows the accident rates of the worldwide commercial jet fleet from 1959 through 2008. Boeing compiled these statistics for jet aircraft heavier than 60,000 pounds, and they do not include non-fatal injuries resulting from atmospheric turbulence. You can see that the annual accident rate, accidents per million departures, is converging to a certain constant. On the other hand, Figure 4 shows the domestic Japanese statistics for 1974 through 2008. These statistics are for commercial aircraft heavier than 12,700 pounds and include non-fatal injuries resulting from atmospheric turbulence.

As far as Japanese domestic statistics

## CAUSES OF ACCIDENTS

### 1.1 Pilot Error

Includes pilot incapacitation

### 1.2 Pilot Error (weather related)

Pilot error brought about by weather-related phenomena

### 1.3 Pilot Error (mechanical related)

Pilot error brought about by some type of mechanical failure

### 1.4 Other Human Error

Includes air traffic controller errors, improper loading of aircraft, fuel contamination, fuel starvation, and improper maintenance procedure

## 2 Weather

Includes lightning

## 3 Mechanical Failure

Includes design flaws and cargo hold/cabin fires

## 4 Sabotage

Includes explosive devices, shoot downs, and hijackings

## 5 Other Causes

### Figure 5. Causes of accidents.

which such manual control was not successful because of other effects such as turbulence and/or downdraft, which led to an accident at the approach, flare, and landing phase.

At an upper level is rule-based behavior

are concerned, there have not been any fatalities since 1986 for the commercial aircraft included in Figure 4. It should be emphasized that we have been very fortunate because we've had serious accidents during this period, including the belly landing accident of a Bombardier-8-402 at Kochi Airport on March 13, 2007, and the aircraft fire accident of a Boeing 737-800 at Naha Airport on August 20, 2007. These accidents fortunately resulted in no fatalities because of the crews' and passengers' calm and composed handling of the situations.

Although these Japanese statistics looks quite bumpy because of a different treatment of the population, the average trend for the past 20 years looks the same as the worldwide statistics: both are converging to certain constants. This points out that if we take into consideration the tendency for increases in annual departures the absolute number of accidents is increasing.

What we have to keep challenging should be the decrease in the absolute number of aircraft accidents. So we want to direct our interest to the causes of aircraft accidents.

Causes of accidents are diverse as seen in Figure 5. The broad category of human factors from 1.1 through 1.4 remains the leading cause of aircraft accidents.

As a result of J. Rasmussen's work, pilots' control behavior can be modeled and classified into three levels as seen in Figure 6.

The lowest level shows skill-based behavior (SBB). SBB is essentially represented by manual control, and is observed in the takeoff and landing phases or in the phase in which automatic flight control systems (AFCSs) are disengaged because of such effects as turbulence. But for freight cargo planes, for instance, pilots sometimes report in interviews that they at times disengage AFCSs intentionally and employ SBB for training in order to keep their manual control skills within a certain level.

It seems that there have been cases in

(RBB). If a pilot employs RBB correctly, together with engaging the AFCS, a commercial flight can be carried out smoothly. But note that the success of a flight with RBB relies on the normal operation of all the flight equipment, including computers and sensors on board.

If a pilot has trouble with flight systems or experiences unexpected changes in flight environments, knowledge-based behavior (KBB) is required. In a KBB situation in which a pilot cannot expect a flight management computer system to work normally, the pilot is required to behave more intellectually and creatively. Situational awareness is most important, and it is acquired with the help of crew resource management. Based on situational awareness, the pilot determines how to cope with the situation. One problem a pilot faces in such a situation is that if the AFCS is not working, then the AFCS counteracts the pilot's action to cope with the trouble. This conflict led to the idea of the so-called human-centered automation. An example of this is when a pilot exerts a control force

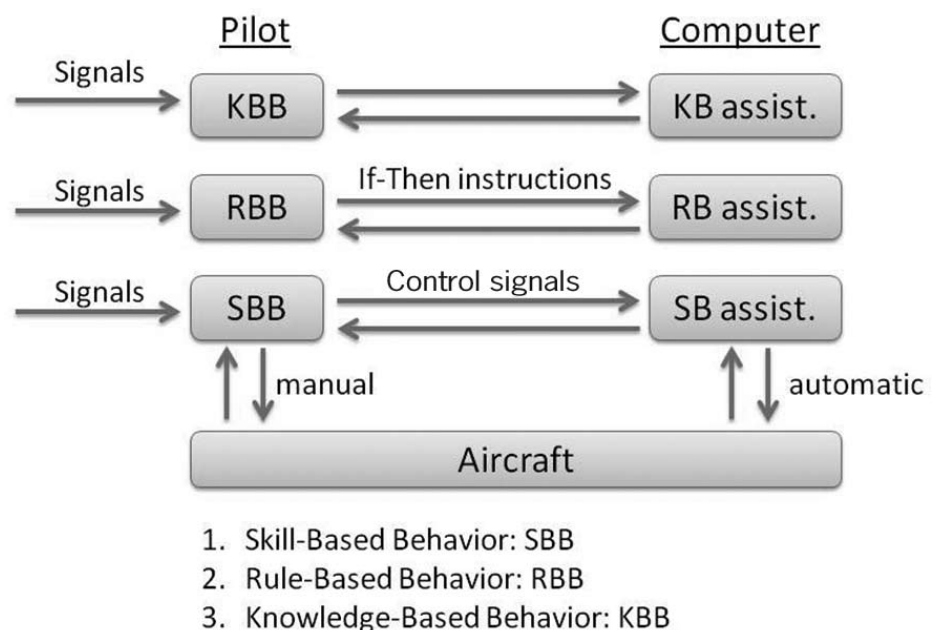


Figure 6. Hierarchical pilot behavioral model (J. Rasmussen, 1986).



**Figure 7. An aircraft fire accident, Aug. 20, 2007, Naha, Okinawa, Japan.**

greater than a certain amount to a control column or wheel, a relevant automatic control system in operation is disengaged so that the control is returned to the pilot's charge. But is this the only way to realize human-centered automation? Is there another way? This question might be one we'd like to discuss at ISASI.

### Cooperation and coordination

Now I would like to move to a different topic that is very important to an accident investigation: cooperation and coordination, especially international cooperation and coordination of related countries to find out the causes of an accident. I'd like to use a real example to talk about this topic. Take a look at Figure 7.

This accident occurred on Aug. 20, 2007, at Naha Airport in Okinawa, Japan. China Airlines scheduled Flight 120, a Boeing 737-800, landed at Naha Airport (from Taiwan Taoyuan International Airport). Immediately after the engine shut down, fuel that was leaking from the right wing caught fire and the aircraft was engulfed in flames.

On board the aircraft were the captain, seven crewmembers, and 157 passengers, including two infants. All evacuated safely, and no one suffered fatal or serious injuries. However, the aircraft was consumed by fire leaving only a part of the airframe intact.

The fire started around the No. 2 engine, but because of the wind direction

from right to left, the left side of the aircraft suffered the greatest damage.

An investigation was started. Because the aircraft was manufactured in the U.S., the operator was Taiwanese, and the accident happened in Japan, the investigation team inevitably had an international make-up, just like many other aircraft accident investigations.

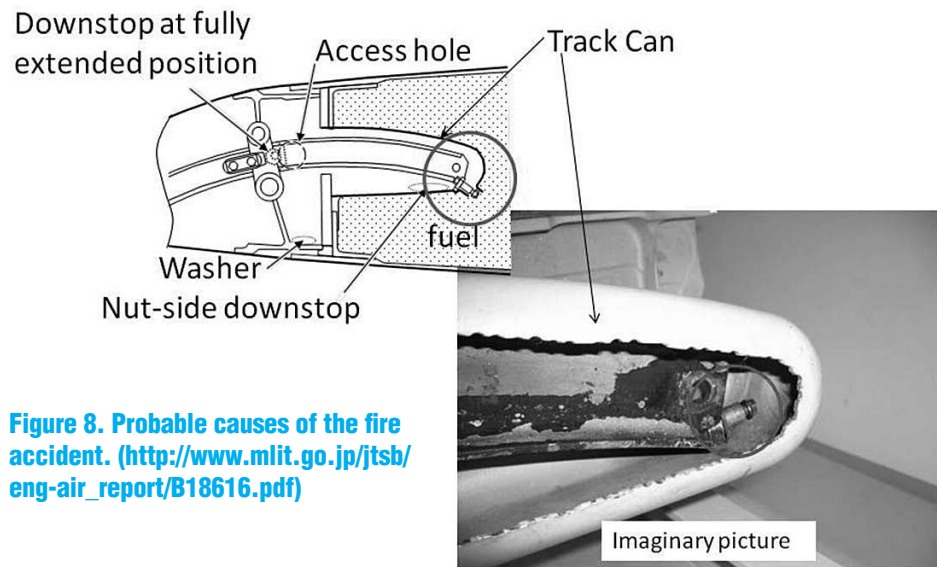
The Aviation Safety Council (ASC) of Taiwan investigators joined the on-site investigation on the second day, and the U.S. NTSB joined the investigation on the third day.

As the result of this international in-

vestigation, the cause of the accident was determined. A downstop assembly of the slat deployment mechanism escaped from the aft end of the main track, falling off to the base of the can. Due to the slat retraction, the assembly was pressed against the track can wall, which protruded into a wing fuel tank, eventually creating a hole through which fuel leaked. This fuel leak was finally ignited by the hot engine exhaust gas. Figure 8 illustrates the probable causes. Contributing to this finding were the knowledge and experience of each of the teams that consisted of the international investigation party. As shown in this example, international cooperation and coordination are very important factors in carrying out a successful investigation.

The JTSB is developing such international coordination by signing written agreements with the BEA (France), the ATSB (Australia), the KARAIB (Korea), the CAAC-AS (China), the ASC (Taiwan), and the AAIB (Singapore). We hope that the number of countries will increase in the future.

I hope that through this presentation air safety will be enhanced further. ♦



**Figure 8. Probable causes of the fire accident. ([http://www.mlit.go.jp/jtsb/eng-air\\_report/B18616.pdf](http://www.mlit.go.jp/jtsb/eng-air_report/B18616.pdf))**

# MIKE POOLE

## 2010 Jerome F. Lederer Award Recipient

**“Many people in aviation are really dedicated, and ISASI exemplifies this quality....”**

By Esperison Martinez, Editor

**P**resentation of the Lederer Award is a major highlight of the Society’s annual seminar and the main event of the awards banquet marking the close of the seminar. And the ISASI 2010 Sapporo banquet was no exception. The evening was filled with gaiety, rekindling of tin-kicking friendships, and abundant peer respect. The elegantly served meal was a napkin dab away when President Frank Del Gandio said: “This is the time when we give away the coveted Jerry Lederer Award.”

The Society presents its annual Jerome F. Lederer Award for outstanding lifetime contributions to technical excellence in furthering aviation accident investigation and achieving Society objectives. ISASI is an organization dedicated to enhancing aviation safety through the continuing development and improvement of air accident investigation techniques. Jerry, as he preferred to be called, joined ISASI in 1965 and was long recognized as the “Father of Aviation Safety.” His aviation lore stretches back to the time of wooden wings and iron men and forward to NASA and manned space flight. He “flew west” at age 101 in 2004.

In calling ISASI member Michael Poole forward as this year’s recipient of the Jerome F. Lederer Award, President Del Gandio recounted some Lederer lore. He said, “I’m sure many of you in this room don’t know about Jerry and never met him. I can remember the time when some students attending a seminar got the chance to sit and talk to him. Later they said it was the most exciting point of their lives. Jerry had that effect on you.

“I know, because that’s the way I was touched. Way back in ’82 I heard the old guys, like I am now, talk about Jerry. I thought, “Just to shake his hand, that would be enough.” In ’86 I was Society secretary and the only Society officer at the Munich, Germany, seminar. I got to talk to him every day. It was an enduring and everlasting connection. He called me often. And if I didn’t hear from him for a month, I called him to make sure he was still alive.”

Del Gandio continued to regale the dinner group with “Jerry” stories, including the time when then FAA Administrator Marion Blakey, speaking at a Society seminar, presented Jerry a plaque,



**Michael Poole, right, accepts the ISASI 2010 Jerome F. Lederer Award from President Frank Del Gandio.**

only to overhear the ever funster say, “I would rather have a kiss.” She obliged.

Remembrances over, President Del Gandio said that the 2010 nominations garnered five entries for consideration by the 12-member Award Committee, chaired by Gail Braden. The review process ended with selection of Michael Poole, a member of the Canadian Society.

Del Gandio then turned to the recipient standing by his side and with a broad smile said, “It is my pleasure to introduce you to Michael Poole, our Lederer Award winner.” He continued with Michael’s background.

“Mike is a professional engineer with a current pilot’s license and is recognized inter-

ternationally as an expert in the field of flight data analysis. He started his career in the field of accident investigation in 1977 and worked for more than 20 years with the Transportation Safety Board of Canada. During his years at the Board, his accomplishments contributed to a better understanding of the issues involved with flight data analysis. For the last 15 years of his career at the TSB, he developed and was the head of the flight recorder and performance laboratory. He was the Flight Recorder Group

chairman on behalf of the TSB on all major accidents in Canada, including Swissair 111 as well as several international accidents.

“Mike was the researcher and author of the light bulb filament impact dynamics study. This research was presented to ISASI in 1986 and is the international standard within ICAO on how to analyze light bulb







PHOTOS: ESPERSON MARTINEZ

filaments to determine if they were on or off during impact forces. He then shifted gears to flight recorders and was responsible for initiating and driving the development of the Recovery Analysis and Presentation System (RAPS) for flight data analysis in his early days at the TSB.

“Mike’s innovative and unique ap-

proach to using software to decode the black box instead of relying on the recorder manufacturer’s interface was the first system in the world that enabled investigators to accurately recover data dropouts. In 1986, he became the first person worldwide to use flight data to develop an interactive 3-D flight animation on a mini-computer. He was a leader in the use of animation systems and the ethics of how they should be used objectively so as not to be misleading since ‘seeing is believing.’

“The software developed under his leadership was used to recover data on Tornados for the German Air Force in 1989 as prior to this data were lost every time the aircraft executed a high ‘g’ turn. This technology was also used for the first time on a major civil accident—1991 Bangalore, India A320—to recover data initially lost during the first impact. This radically changed the outcome of the investigation as the investigators initially suspected engines to be a factor; which was subsequently discounted when the missing data were recovered. He was also a pioneer in applying digital audio analysis techniques to cockpit voice recordings.

“Ever creative in business solutions, Mike created a ‘specific purpose account’ in Canada whereby Germany, the U.S., France, and Australia contributed to co-fund the development of the unique TSB software replay system culminating in international collaboration on the software development and its eventual commercialization to Flightscape in late 2001 to enable other countries to use the TSB technology. Mike was a co-founder of Flightscape and is now a member of the executive management team at CAE Flightscape, after CAE acquired Flightscape in August 2007.

“The Flash Air accident in Egypt was the first accident in history in which the state of occurrence (investigating authority), state of manufacturer, state of passengers, and the aircraft manufacturer all used the same flight data analysis software supplied by Mike’s company, significantly improving the investigation progress and trust. Mike assisted several countries with the development of their lab capabilities both from when he was at the TSB and in the private sector. He has represented Canada at ICAO on the FLIREC (Flight Recorder Panel) where he succeeded in establishing FOQA as an ICAO standard. He has also represented the TSB at EUROCAE for international flight recorder standards.

“Mike is a long-time member of ISASI and has presented papers at many seminars. He is a long-time friend of mine and of this organization. Mike, it is my great pleasure to present you

the 2010 ISASI Jerry Lederer Award. Congratulations!”

When the thunderous applause had quieted, Poole, standing at the lectern, looked out at the audience and said, “This is indeed a surprise and an honor.” He then looked down at his tropical stark white linen vested suit and said, I want to start off by explaining why I am dressed like this! He went on, “I wasn’t planning on being here. I was on my way to Nigeria....” He, of course, was unaware that he had been selected to receive the Lederer Award. But Barbara Dunn, president of the Canadian Society, knew and when she discovered he was going elsewhere on a business trip

**“Mike’s innovative and unique approach to using software to decode the black box instead of relying on the recorder manufacturer’s interface was the first system in the world that enabled investigators to accurately recover data dropouts. In 1986, he became the first person worldwide to use flight data to develop an interactive 3-D flight animation on a mini-computer. He was a leader in the use of animation systems and the ethics of how they should be used objectively so as not to be misleading since ‘seeing is believing.’”**

she e-mailed him this message: “You have to come. You have to come. You HAVE to come.” But she didn’t tell him why.

Mike, always independent minded, ignored her plea and headed for Nigeria via France for some informal meetings. In France, he discovered the person he was to meet in Nigeria (chairman of the AIB, Dr. Sam Oduselu) wanted to also go to ISASI in Sapporo. Mike contacted Dunn and said, “It looks like I am coming to Japan after all.” But he still did not know what awaited him. Thus he had not packed a traditional business suit, instead packing for very hot weather in Nigeria. Once the white tropical suit was explained, Mike answered the proverbial question: How did I get into aviation? He said: “My father was a fighter pilot, and it’s in the blood.” Then he added the real story, which follows in extracts from his acceptance speech:

“When I was about 15 years old..., I was in a school yard and met a young man who was taxiing a radio-controlled airplane around the parking lot. I couldn’t believe it—it was just amazing. I started talking to him and I asked, ‘Are you going to fly it?’ He said, ‘I don’t know how to fly.’ I said to him ‘the winds are light, visibility is 93 million miles (we could see the sun). How hard can it be?’ He then proceeded to advance the throttle and then came that magic moment when an airplane takes off. I say a ‘moment’ because it literally was a ‘moment’ as 8 seconds later we had what is called in our industry a major hull loss! I got my first taste of accident investigation due to this accident. I was the investigator; I was the primary witness, and as it turns out, I was also a primary cause, having persuaded him to fly when he should not have!”

His interest never waned. His college years were dedicated to aerospace engineering study and an internship with the Canadian Aviation Safety Bureau. The internship didn’t come easy, and it wasn’t glamorous. “But I got exposed to many cool things. One of them was the ground work in light bulb filament study.”  
*(continued on page 30)*

## Close Cooperation in Investigations Has Improved Technical Partnership



*(In publishing the winner of the “Best of Seminar Award of Excellence” for technical papers presented at ISASI 2010 in Sapporo, Japan, on September 9, Forum is departing from its usual style format and is publishing this paper in its technical paper format as accepted by the ISASI 2010 Seminar Technical Committee.—Editor)*

### Introduction

#### About the ASC and its laboratory

Compared to Australia, Europe, and North America, aviation safety investigations and safety studies in Taiwan started to develop in the relatively recent past, about 20 years ago. The Aviation Safety Council (ASC) was established in May 1998 as an independent government agency in Taiwan, ROC, responsible for the investigation of civil, public, and microlight aircraft accidents

By Michael Guan, Director of the investigation lab, Aviation Safety Council, Taiwan, and Christophe Menez, Head of the Engineering Department, Bureau d`Enquêtes et d`Analyses, France

and serious incidents (Aviation Occurrence Investigation Act 1, 2), as well as issuing safety recommendations directly to the premier and following them up. Since its creation, the ASC has investigated 68 occurrences, among these 33 cases involving large transport aircraft (MTOW > 15,000 kg) and encountered many technical difficulties and challenges.

The ASC investigation lab, with a staff of six persons, is in charge of providing technical support to aviation occurrence investigation. This includes but is not limited

to site survey, flight recorder reaudit, flight path reconstruction, radar data and GPS data processing, performance analysis, and visualization. The lab also undertakes underwater location of wreckage, structural examinations, and failure analysis.

The ASC investigation lab has been involved in several foreign investigations, for which the ASC appointed accredited representatives. In addition, in order to build experience in flight recorder readout and analysis, the ASC also provides technical assistance for other agencies. In 2009, the ASC investigation lab worked on 10 CVR and 35 FDR/QAR, 7 animation sets, and 21 sets of GPS/radar data and satellite map superposition. The detailed list is shown in Figure 1.

#### About the BEA and its laboratory

The BEA (Bureau d`Enquêtes et d`Analyses pour la sécurité de l`aviation

*Dr. Guan Wen-Lin (Michael) holds a master of science and a Ph.D. from the Institute of Aeronautics and Astronautics of Cheng-Kung University in Taiwan. In addition, he also holds a BSc from the Aeronautical Engineering of Tamkang University in Taiwan. Dr. Guan started his investigation career in July 1998, at the time of the establishment of the Aviation Safety Council (ASC). ASC is Taiwan’s investigation agency responsible for civil aviation accident investigation. In the early stage of his career with ASC, he received a 4-week training program on aircraft accident investigation at the Southern California Safety Institute in April 1999. He has undertaken internships at the ATSB, the BEA, the NTSB, and the TSB. Dr. Guan was responsible for setting up the investigation laboratory at the ASC. Currently, Dr. Guan is the director of the investigation laboratory, responsible for the readout of flight recorders, airplane performance studies, as well as leading the site survey and weather hazard research teams.*

*In his 12-year career with ASC, he has participated in four major investigations (SQ006-runway excursion, CI611-inflight breakup, GE791-inflight icing, GE536-runway excursion) that occurred in Taiwan. He has published about 60 technical papers to share his experience in investigation techniques at various seminars/forums all over the world.*

*Christophe Menez graduated in 1998 as an engineer from the Ecole Polytechnique after an internship at California Institute of Technology). He received a masters degree in aeronautics from the French National Civil Aviation School (ENAC) in 2000 after a one-year exchange with Sydney University. He worked for the French Civil Aviation Directorate (DGAC) for 3 years and joined the BEA in 2003, where he became head of the Engineering Department at the beginning of 2006. He has participated on site in a number of international investigations, including the Flash Airlines B-737 (January 2004,*



**President Frank Del Gandio, center, presents the Award of Excellence to Michael Guan, left, and Christophe Menez, right.**

*Sharm el Sheikh, Egypt) and the Armavia Airbus A320 (May 2006, Sochi, Russia). He is also involved in European working groups such as EASA’s EFRPG.*

### ASC Investigation Occurrence

	CVR	FDR/QAR	ANI	GPS/Radar	Total
2006	2	4	4	2	12
2007	2	4	5	2	13
2008	4	5	4	4	17
2009	5	2	1	6	14
2010.07	2	5	1	0	8

### Technical Assistance

	CVR	FDR/QAR	ANI	(GPS/RDR, GIS, DB)	Total
2006	5	14	5	(0, 6, 3)	33
2007	5	6	7	(0, 22, 8)	48
2008	0	22	8	(9, 8, 18)	65
2009	5	33	6	(2, 3, 10)	59
2010.07	1	32	3	(15, 4, 6)	61

**Figure 1. Summary of flight data readouts.**

civile) is the French body responsible for technical investigations of civil aviation accidents and incidents; it was originally created shortly after World War II. Following the dispositions of ICAO Annex 13 and the European directive for accident investigations, a French law (Law 99-243 of March 29, 1999) brought changes to the status of the BEA and confirmed the independence of safety investigation.

The Engineering Department of the BEA, comprising a staff of 25 people, is in charge of providing technical support to investigations in various fields. It is made up of two divisions: the Recorders

and Avionic Systems Division, which undertakes work on flight recorders, avionic systems, radar data, and performances analysis, and the Structure Equipment and Engines Division, which is in charge of wreckage, engine and metallurgic examinations.

The Engineering Department is usually involved in investigations conducted by the BEA, as well as investigations abroad for which the BEA has appointed an accredited representative as per Annex 13 requirements. It also provides technical assistance to other states conducting an investigation, when, for example, they do

not have the capacity to read out flight recorders. In 2009, the Engineering Department worked on 75 flight recorders, 97 electronic devices (half of these being certified avionics equipment), 33 sets of ATC data (radar and communications), 40 wreckage examinations, and 27 metallurgical examinations. Investigators from the Department also take part in examinations performed outside of the BEA's facilities.

### Common issues which both agencies face

Any state willing to conduct investigations under the SARPs of ICAO Annex 13, shall [standard 5.4] have independence in the conduct of the investigation and have unrestricted authority over its conduct, consistent with the provisions of Annex 13. The state must be well prepared to manage the conduct of accident investigations, which by their very nature always occur in different contexts, require qualified staff with experience, significant financial resources, the ability to ensure coordination between participants, most of the time on an international level, the status to ensure independence, and clear rules regarding interactions with the judicial authorities.

Among these requirements, the agency conducting the investigation should have enough technical capacity and knowledge to perform examinations or supervise them so that it can comply with the standard 5.6 stating that *the investigator-in-charge shall have unhampered access to the wreckage and all relevant material, including flight recorders and ATS records, and shall have unrestricted control over it to ensure that a detailed examination can be made without delay by authorized personnel participating in the investigation.*

The provisions of Annex 13, which relate to participants in an investigation, often result in having several states working together, though they may have very different experience in conducting an investigation, different resources, and be faced with the challenge of overcoming cultural differences and language barriers. The ASC and the BEA have had to work together in such contexts and in doing so tried to make an efficient and complementary use of each others experience and capabilities. However cooperation, forced on us by circumstances, has

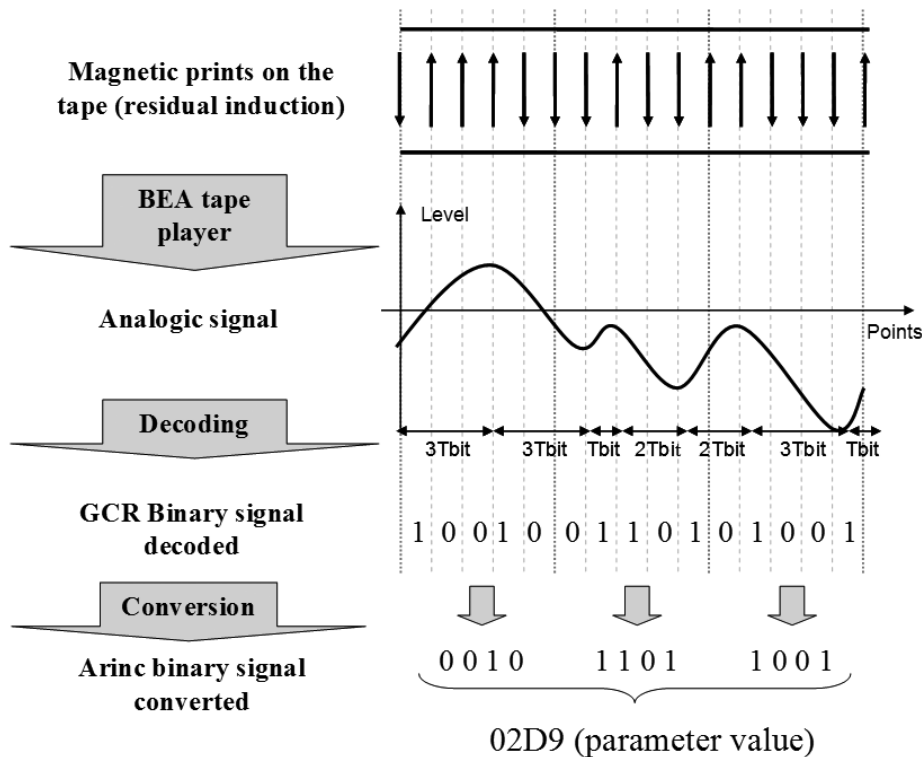
## Award of Excellence

Michael Guan and Christophe Menez earned the ISASI Award of Excellence for their paper *Close Cooperation in Investigations Has Improved Technical Partnership*, which was judged to be "Best Seminar Paper" of those papers presented at the ISASI 2010 seminar on aviation accident investigation held in Sapporo, Japan, Sept. 6-9, 2010.

The Award was 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. The

Excellence selection carries a US\$500 prize. The authors have announced that they are contributing the \$500 to the ISASI Rudolph Kapustin Memorial Scholarship Fund.

The ISASI 2010 judging panel was composed of the three selectees to receive the 2010 ISASI Scholarship Award: Maggie Wai Yee Wong, Logan Jones, and Leigh Dunn. The three were selected as judges to bring a youthful, fresh perspective to the judging process. The Award is judged on applicability to the seminar theme, oral presentation, graphic support of the paper, and presentation within the time allotted. ♦



**Figure 2. F800 readout principles.**

been extended to a longer term technical partnership, which is presented in the next part of the paper.

### Cooperation and technical partnership Investigation into an ATR 72-200 accident in Taiwan in 2002

On Dec. 21, 2002, an ATR 72-200, a cargo flight number GE791 to Macau, departed from Taipei at 01:05 local time (UTC+8). During cruise at FL180 with autopilot engaged and airspeed around 200 knots, prolonged exposure to severe icing conditions forced the crew to continually activate the airframe deicing. Ice accretion caused a loss of control of the aircraft, which crashed into the Taiwan Strait near Penghu Islands, with both pilots missing (see Reference 1).

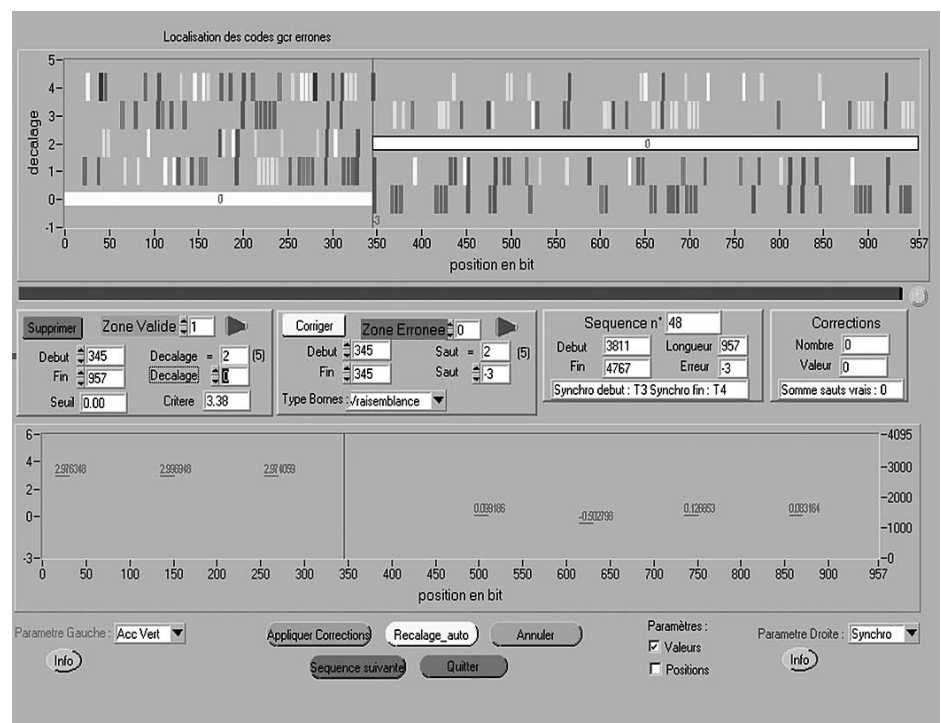
The ASC immediately formed a team to conduct the investigation to which, in accordance with article 84 of Taiwan Civil Aviation Law and ICAO Annex 13, the BEA was invited to participate to represent the state of manufacture, assisted by advisors from the ATR 72 manufacturer. The BEA sent five investigators to participate in the on-scene investigation and the underwater searches, and provided technical assistance to the ASC regarding some of the technical issues encountered

during the investigation: the retrieval of the flight data from the damaged magnetic FDR (Loral F800), icing performance analysis, and the identification of audio warnings.

The flight recorders were both recovered 22 days after the accident and trans-

ported to the ASC investigation laboratory for disassembly and readout. The CVR readout required careful cleaning because of water penetration in the protected module of the recorder, but the tape was read out successfully. For the FDR tape, from whose casing a lot of water flowed out during opening, a detailed examination showed some discolorations and wrinkles on the tape, especially the portions exposed to the outside or in contact with the mechanism, including some severe wrinkles near the end. The ASC used a modified NAGRA-T recorder to play back the FDR tape and then used the Recovery Analysis and Presentation System (RAPS) to translate the original wave signal into engineering data. However, due to the severe wrinkle damage on the tape, the last 7 seconds of the accident flight recording could not be retrieved using RAPS.

In order to recover this important data, the BEA proposed to read out the tape again, using a dedicated tape reader associated with decoding software, both developed by the BEA investigators (see Figure 3). In magnetic FDRs, the data are recorded by transforming the binary signal coding for the parameter's values into an analog signal, since the magnetic tape cannot directly record a binary signal; during the readout the signal waveforms recorded on the tape are converted back into the binary coding for the parameter



**Figure 3. BEA software for F800 readout.**

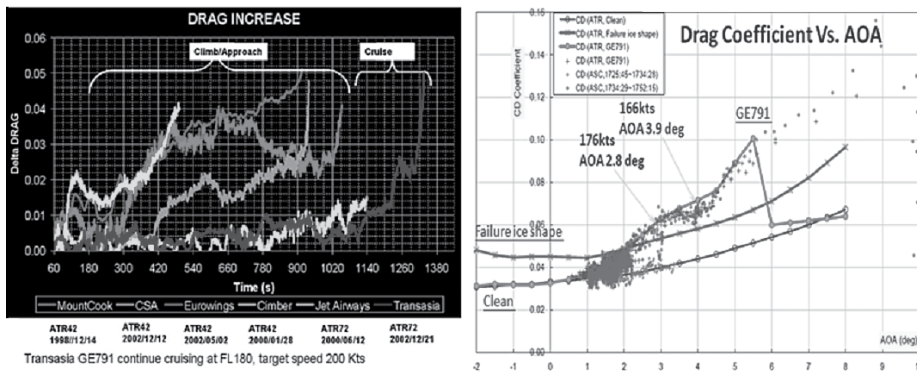


Figure 4. Results of GE791 icing performance analysis.



Figure 5. Readout of corroded memory chips from a flight recorder.

values. In addition to that, for the Loral F800 model, before being converted to analog, the binary signal is first modified with a code called GCR to transform a series of four bits into corresponding series of five bits, therefore increasing the size

analysis indicated that the accident aircraft's drag increased 4 minutes prior to autopilot disengagement and reached a value of +170% of drag in normal flight condition (see Figure 4). Ten seconds before the roll upset, the longitudinal and lateral stability

investigative agency at this time, was interested in learning more about investigative tools used at the BEA, among them the tool developed for F800 magnetic tape readout. The BEA offered to have investigators from the ASC spend some time in its Engineering Department; this was the beginning of a technical partnership between the two organizations.

Work related to aviation occurrence investigations is of a kind that often requires tools that are not commercialized on a wide scale, which require some specific training and experience to be used efficiently, or which have simply not yet been developed at the time of the investigation. One example of this is the field of flight recorders. Accidents are still rare enough that no one, including investigative agencies, has ever dealt with all the possible problems that can be encountered in reading out a damaged flight recorder. Manufacturers offer training for the investigation community in order to better understand the way recorders work and the major checks and operations to be performed during readout (investigators from the ASC and the BEA have, for example, followed a common session of such training at L3 Communication and Honeywell). These training courses are very useful, even essential, and they complement the experience of the investigative agencies that deal on a regular basis with damaged flight recorders in which in certain cases special techniques have to be applied to solve a readout problem. Difficulties have often been encountered with magnetic tape recorders, and even if new technology recorders are more reliable, difficulties still arise at times. In 2009, for example, the BEA had to deal with a flight data recorder whose electronics board had been exposed to severe corrosion due to prolonged water immersion, and the investigators had to apply specific techniques to read out the memory chips one by one and reconstruct the binary file (see Figure 5).

The cooperation between the ASC and the BEA has continued for many years. This includes formal seminars organized between the two agencies in Taiwan in 2003, 2007, and 2009. The BEA very much appreciates the interest that the ASC has shown to newly developed tools and the capacity of the ASC laboratory to develop new tools as well.

Recently, for example, important engineering developments at the ASC include

**Work related to aviation occurrence investigations is of a kind that often requires tools that are not commercialized on a wide scale, which require some specific training and experience to be used efficiently, or which have simply not yet been developed at the time of the investigation.**

of the file. When the recorders are read (see Figure 2), errors in the readout of the tape result in creating series of bits that do not exist in the GCR system, thus enabling investigators to locate problems on the magnetic tape and locally correct the conversion. Using the BEA's tape reader and decoding software, it was possible to decode and validate the 7 last seconds of the recording that were missing at the first readout.

With the help of the BEA, the ASC conducted a full flight simulator (FFS) at ATR and analyzed data related to previous similar ATR 42/72 occurrences involving severe icing conditions. Performance anal-

were greatly affected by the significant quantity of ice that had accumulated on the wings. Prior to autopilot disengagement, the aerodynamic behavior of the aircraft (lift/drag) was degraded by about 40%. Based on the recorded data from the CVR, FDR, and performance analysis, the ASC concluded that the GE791 had probably encountered severe icing conditions that were worse than the icing certification requirements of FAR/JAR 25 Appendix C (see Reference 1, Reference 2).

### Sharing technical resources

After this experience of working together the ASC, which was a relatively young

the Occurrence Investigation Management Information System (OIMIS), the Engineering Failure Analysis System (EFAS), and the “TRK2KML” program, which uses Google Earth as a data visualization tool. Some specific features are summarized below.

- The Occurrence Investigation Management Information System (OIMIS), which integrates multi-data sets (ground scars, wreckage distribution, CVR/FDR data, radar tracks, SIGMET charts) into a 3-D GIS, to visualize the sequence of events of the occurrence. It contains four analysis modules: flight recorder readout management, flight path reconstruction, wreckage database, and flight recorder underwater localization system (see Figure 6, Reference 4).
- The Engineering Failure Analysis System (EFAS), a system that use a precise optical scanner and Finite Element Analysis (FEA) program assistance to determine the root cause of structure failure modes (see Figure 7, References 5 and 6).

For considerations of cost effectiveness, accurate mapping, and fast presentation of the sequence of events of an aviation occurrence, the ASC has developed the TKM2KML program to visualize flight paths on Google Earth, which is available and free for worldwide investigators (see Figure 8, Reference 7).

Like the NTSB in the U.S., the AAIB in the UK, and the MAK in Russia, the BEA has developed its own software for decoding and analyzing flight data, a tool called LEA. This choice comes from the fact that tools available commercially for airlines to perform flight analysis do not exactly correspond to the needs of investigators. An airline analyzes the safety risks associated with a large number of flights, whereas an investigative agency concentrates on one particular event and often wants to perform detailed calculations on the data, such as the calculation of parameters not originally recorded by the airplane. In 2008 the BEA and the ASC decided to install the LEA program at ASC facilities in Taiwan, which was effective in April 2009. The ASC thus benefits from being able to freely use a tool developed by the BEA, but the BEA also benefits from it by receiving feedback from the ASC that will help to improve the software.

Now that the ASC is a more experienced investigative agency, it is also tak-

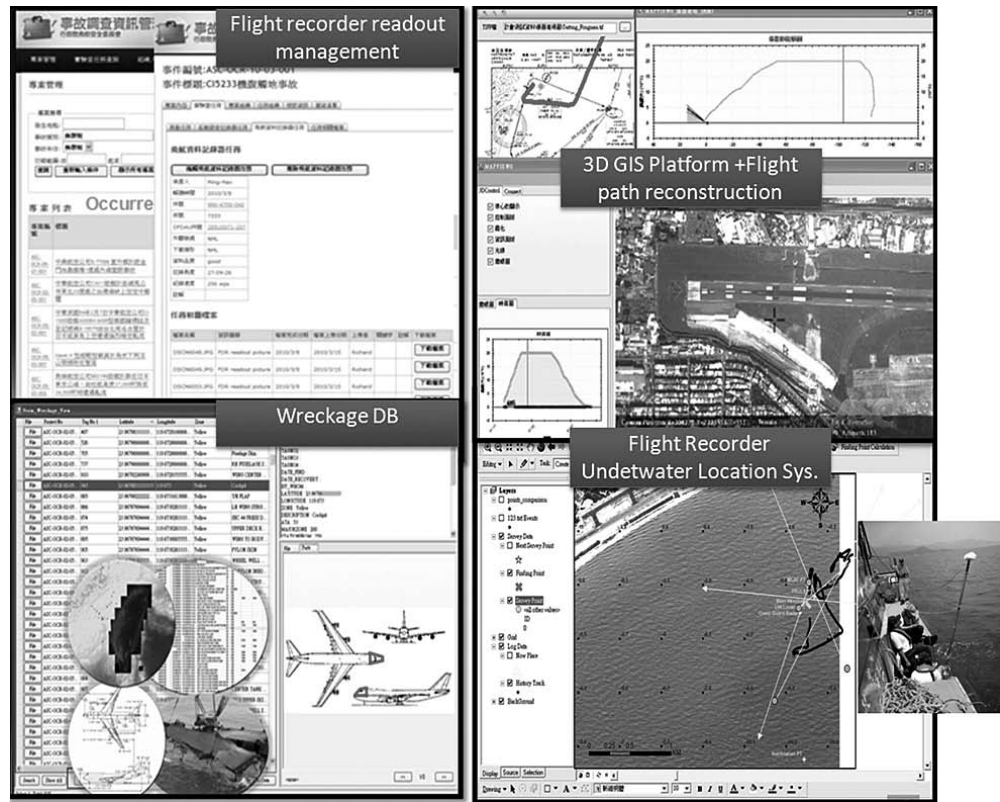


Figure 6. Major analysis modules of the OIMIS.

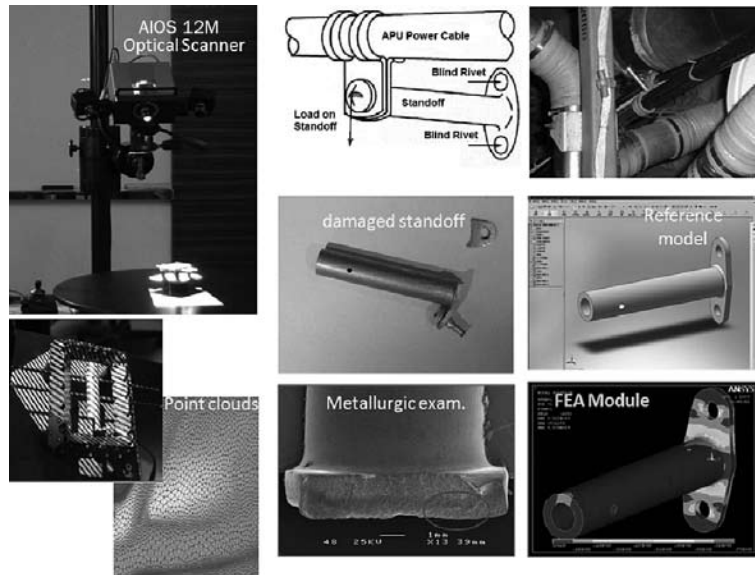


Figure 7. Operational procedures of the EFAS.

ing an active part in providing solutions to problems encountered by investigators. Recently, the ASC has developed a partnership with Garmin (through its branch in Taiwan) to get assistance with the readout of damaged GPS units and the decoding of files extracted from memory chips on these units to use them as a source of data for investigations. This partnership includes the development of an investigation kit to recover data from damaged Garmin portable GPS receivers (GPS MAP 96/96C/196/296/396/495/496). Using this partnership with Garmin, the

ASC has helped the BEA to decode some of the files that had been extracted from Garmin GPS units at BEA’s avionic laboratory. For some of the most recent units, the data are encrypted and can not easily be decoded without technical assistance from the manufacture. (For more details about issues related to the extraction of data from damaged electronic units, see Reference 3.)

However, ASC’s contribution to the safety community outside of Taiwan is, of course, not limited to the BEA. After benefiting from contact with more experienced

investigative agencies, the ASC is willing to play a role in turn within the international safety investigation community.

### Beyond the bilateral partnership Accident investigator recorder meeting (AIR)

In 2004 the AAIB, the ASC, the ATSB, the BEA, the BFU, the NTSB, the TSB, and other national investigative bodies initiated an annual Accident Investigator Recorder (AIR) meeting to share experience in technical fields such as the handling and readout of damaged recorders, flight data analysis, flight path reconstruction, avionics systems examination, and underwater recovery. Most of the investigative agencies take part in this annual meeting, which one of them hosts each year, and have the opportunity to compare each other's way of solving technical issues encountered during investigations, as well as to decide common action from the group for future solutions. This group is also a good place to discuss regulatory activities because several members participate individually at various levels (ICAO, the FAA, EASA) and define harmonized positions when needed.

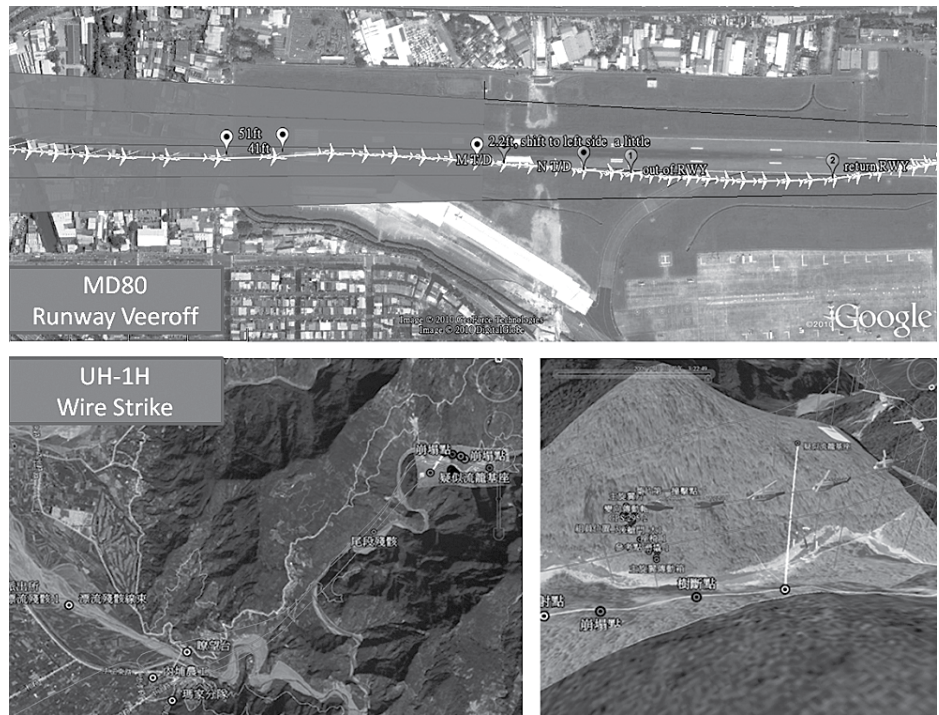
Shortly after its creation, the group felt

**Investigators will always need to work with manufacturers, airlines, and experts from various fields; however, the only way for investigative agencies to be able to perform truly independent investigations is to maintain a good level of expertise and modern technical capabilities.**

the need to have a dedicated website for exchanging data and continuing discussions between each annual meeting. The ASC proposed to set up this website (<http://irig.asc.gov.tw>) and continues to maintain it.

### Conclusion

Conducting Accurate, Speedy, Independent, and Authentic investigations requires knowledge, financial resources, dedicated tools, and the capacity to adapt to the specificities of each occurrence.



**Figure 8. Flight paths of two cases: an MD-80 runway veer off and an UH-1H wire strike.**

In order to raise the level of their investigative capabilities, agencies usually get training from manufacturers or other training courses provided by investigation agencies. These training courses can be very beneficial but are insufficient for investigators, since there are always differences between theories and a real occurrence.

The ASC was once a young investigative body and could gain benefits from help from more experienced agencies such as the BEA, which was confronted with a large number of occurrences. Today the ASC is also providing help to the safety community and is giving technical assistance in several fields such as flight recorder readout. Bilateral and regional cooperation between safety agencies is necessary. We believe that sharing information and techniques is valuable, even though it implies a greater effort of adaptation to each other's culture and requires some language barriers to be overcome.

Building technical partnerships and exchanges between aviation safety investigation agencies, through MOUs (memorandums of understanding) or through multilateral groups, is an effective way of overcoming the limitations in resources or technical capabilities, as well as sharing difficulties encountered during investigations in order to work together to design suitable tools to overcome them.

Investigators will always need to work with manufacturers, airlines, and experts from various fields; however, the only way for investigative agencies to be able to perform truly independent investigations is to maintain a good level of expertise and modern technical capabilities. ♦

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# OVERCOMING CULTURAL DIFFERENCES AND LANGUAGE BARRIERS

By Ikuo Takagi, JTSB Investigator-General for Aircraft Accidents

The main theme of this year's seminar is "Investigating ASIA in Mind—Accurate, Speedy, Independent, and Authentic." I think these are very important elements for governing investigation policy, especially in the event of a serious accident in which a bilateral or multilateral investigation with other states is necessary. Of course in such a case, it is quite certain that "Over Cultural Differences and Language Barriers," this year's sub-theme, plays an important role.

I would like to share my experience with you on this issue illustrating a cooperative investigation with the U.S.

In the early morning of March 23, 2009, FedEx Flight 80, upon landing at Narita International Airport, rolled over and was engulfed in flames. The sole two crewmembers on board were killed. Japan was the state of the occurrence of the accident. It was not the state of registry, operator, design, nor manufacture. Therefore the cooperation with the U.S. was essential to effectively proceed with the investigation process.

A U.S.-accredited representative and his advisors, consisting of people from the FAA, FedEx, Boeing, and ALPA [the Air Line Pilots Association] per the party system, participated in the on-site investigation. The number amounted to as many as 20. The number of all the Japan Transport Safety Board (JTSB) aircraft accident investigators is just 22, including myself. I assigned five investigators under me to the team, which was far too small compared to the size of the U.S. team. However, for us it was a large team composition considering the seriousness of the accident. The JTSB doesn't employ investigation methods such as the party system. I had some knowledge about it, in which even the relevant persons to the accident, such as the operator, the manufacturer, or even the pilots' association participate in the investigation. I also knew that this fact aroused some disputes and embarrassment among the news media.



The author, Ikuo Takagi, JTSB investigator-general for aircraft accidents.

Our investigation became a bilateral, a cooperative one with the U.S. from the beginning. The advisors dispatched from the U.S. were all highly skilled and experienced in many areas. They were very cooperative. However, my investigators, not being familiar with an investigation of this style, were put under a communicative stress because of their English skills. Also, the news media coverage centered on our progress was stressful.

Investigation of an accident seemingly caused by the combination of many complex factors like this needs many related materials. For example, we may need a computer model to simulate the aircraft maneuver or design data for a detailed structural analysis. These data should be obtained from the manufacturer through the accredited representative of the state of design/manufacture, as well as the flight crew's training record or the related operations manuals through the accredited representative of the State of the Operator. Of course, they can be obtained directly from the

manufacturer or the operator by the state conducting the investigation. However, in the case of a cooperative investigation with another state, it is recommended that these be requested through the accredited representative to reduce possible conflict caused by the misunderstanding and to share the information. However, this method poses a disadvantage making the investigation longer than direct information acquisition.

Our investigation has been going well thanks to each mutually respecting the other's situation. However, the cultural differences between the states put the investigators under stress. For example, I apologize in advance if I misunderstood it, but the U.S. assumes the position of releasing any factual information found during the investigation as early as possible. On the other hand, we secure uncertain information, and worry that the cause of the accident could be misleading due to partial information and create a biased image of the accident by the news media. Therefore, when we release information during the investigation, we take the position of limiting the amount of information that is mostly certain, excluding misleading information.

After careful coordination of the differences of the position, we released an interim investigation report of the accident because one year has passed since it occurred. The accident investigation has so far been conducted successfully by mutually recognizing the cultural differences.

My experience tells me that the most important thing in an internationally cooperative investigation is that all the people participating in the investigation, not just the government investigators, but all advisors from the manufacturer or the operator, build a reliable relationship and have the same objective of preventing the occurrence of a similar accident by finding the cause of the accident as early as possible. I believe that an investigation will be successful if we stick to the motto "Investigating ASIA in Mind." ♦



## ISASI 2011 To Be Held in Utah, USA

Salt Lake City, Utah, has been selected as the venue for ISASI 2011. The seminar hotel is the Salt Lake City Marriott Downtown located in the heart of downtown. Plans for the upcoming 42nd annual air accident investigation semi-

stone@msn.com; Registration, Barbara Dunn, avsafe@shaw.ca; Technical Program, Jim Stewart, stewji@rogers.com; Sponsorship, Ron Schleede, ron-schleede@cox.net; Exhibitors, Barbara Dunn, avsafe@shaw.ca; and Compan-

countries, should review the "Call For Papers," sidebar.

Organizations wishing to exhibit their products at this international gathering of safety professionals should contact Barbara Dunn at avsafe@shaw.ca for details. ♦

### ISASI Issues 'Call for Papers'

ISASI is the world's premier organization for professional aircraft accident investigators and analysts, with members in more than 60 countries. ISASI's 42nd annual seminar will be held in Salt Lake City, Utah, from Sept. 12-15, 2011. The theme is "Investigation—A Shared Process."

Papers are invited that address the theme of the seminar and that would benefit an international audience with the goal of improving aircraft accident investigation success. Papers should focus on any aspect of the investigative and analytical process and may cover any aspect of aviation and should be timely, display technical competence, and

reflect your intellectual and personal integrity.

Please submit an expression of interest no later than Feb. 1, 2011, to stewji@rogers. Include a working title for your presentation, the summary of your planned subject matter, the benefits to ISASI members, your professional affiliation, and a short biography of your aviation and investigative or analytical experience. *Only e-mail submissions will be considered.* Full abstracts must be submitted by *March 1, 2011*, to be considered by the Papers Selection Committee. If your proposal is selected for presentation, you will be advised via e-mail by May 1, 2011. Your final paper will be due July 1, 2011. ♦

nar are well under way. Registration is expected to be open early in 2011. The seminar website will open soon and may be accessed through the ISASI website: [www.isasi.org](http://www.isasi.org).

Salt Lake is located in northern Utah and sits in a large valley between two mountain ranges, the Wasatch on the east and the Oquirrh on the west. Salt Lake is the home of the Mormon Tabernacle Choir. Getting to Salt Lake has never been easier. All of the major airlines fly into Salt Lake. Half of the U.S. population is located within a two-and-a-half-hour flight from Salt Lake, and two major interstates, I-15 and I-80, intersect in Salt Lake City.

The Seminar Committee is composed of: Seminar chair, Richard Stone, rb-

stone@msn.com; Registration, Barbara Dunn, avsafe@shaw.ca; Technical Program, Jim Stewart, stewji@rogers.com; Sponsorship, Ron Schleede, ron-schleede@cox.net; Exhibitors, Barbara Dunn, avsafe@shaw.ca; and Compan-

ions, Ruth Stone, rjustynas@nsn.com. Persons interested in presenting technical papers at the seminar of the world's premier organization for professional aircraft accident investigators and analysts, with members in more than 60

### Correction

In the July/September 2010 issue, page 20, William Jeffrey Edwards was incorrectly listed as a *pilot* flying A6 Intruders. Edwards reports that he was a *bombardier navigator* flying A6 Intruders. We regret our error and apologize to member Edwards. ♦

### Northwest Chapter Meeting Discusses B-777 Accident

The Pacific Northwest Regional Chapter continued its series of technical meetings in September at the Boeing training facility in Renton, Wash. This meeting included a presentation by Mark Smith of the Boeing Company. Mark reviewed the British Airways B-777 accident at Heathrow in which both engines lost power during approach. The presentation was well-attended and created considerable discussion among the members as to both the details of the accident and the ramifications for other airliners.

The PNRC plans to continue its technical meetings. Guests from other regions are always invited to attend any of the Chapter meetings. Details on the exact times and locations for these presentations can be obtained directly from Chapter President Kevin Darcy at [kevin.darcy@rtiforensics.com](mailto:kevin.darcy@rtiforensics.com). ♦

### Cabin Safety WG Supports New Investigative Tool

The ISASI Cabin Safety Working Group (CSWG) has been presented with a proposal concerning a multilingual passenger questionnaire (MLPQ) for use in occurrence investigations. The Working Group feels strongly that this is an important initiative and is hopeful that ISASI members are willing to support the KLM initiative. The essence of the presentation follows:

Jochem Weeink, a flight safety inves-

Continued . . .

tigator at KLM Royal Dutch Airlines in the Netherlands, noted that following a serious aviation incident or accident, an extensive investigation will be conducted including an in-depth look at the survivability aspects of the occurrence. To gather as much information as possible, a questionnaire will usually be issued to all passengers either in person, over the phone, or by mail.

Weeink said a few standard, generic questionnaires can be found on the Internet and the many different ones are currently in use by the various accident investigation groups around the world. But he pointed out that they are too generic in nature and most times...in English only. Precious information may get lost as a result of the lack of understanding on the part of the passenger—as there are some 6,800 spoken languages and some 2,261 written languages.

He believes that a standard questionnaire may not provide all the answers as no accident is “standard.”

As a member of a large accident investigation team working in 2004, he authored and used a multilingual passenger questionnaire consisting of questions in English, Spanish, and Dutch. Passengers were able to respond in their mother tongue. The response rate to that questionnaire was relatively high (34%), and for many on the team it was an “eye-opener” to see that the success of the questionnaire lay in the use of more than one language. Passenger comfort levels were obviously enhanced.

Weeink proposed the idea of providing a web-based “master” list of hundreds of questions and aviation nomenclature (single words) in English, suitable for the broadest spectrum of accident investigation involving survivability issues: fire, smoke, evacuation, turbulence, decompression, security, and so on. That master list would then be translated into an endless number of languages.

The ultimate goal is a non-commercial

website accessible to all investigators. The investigator would select the relevant question or word in the desired language(s) and then easily compile a passenger questionnaire tailored to the accident.

If you are interested in becoming involved in the process by providing translations, please contact Jochem Weeink at [Jochem.weeink@KLM.com](mailto:Jochem.weeink@KLM.com). ♦

## GASIG Working Group Meets in Sapporo

Thirty-two Government Air Safety Investigators (GASIG) Working Group members met on September 8 during the ISASI conference in Sapporo, Japan. They enthusiastically discussed the topics of the agenda for the meeting, which included: 1) GASIG Terms of Reference, 2) transition from ICAO USOAP to a continuous monitoring approach, 3) downloading of flight data recorder (FDR) information, 4) data sharing between investigation authorities and manufacturers, 5) the development of an ICAO safety management annex.

In brief, the Group was informed that the Terms of Reference for GASIG would be sent to its members, who were asked

to consider the need for any changes. The transition from ICAO USOAP, due to end in 2010, to a continuous monitoring approach to auditing is due to occur between 2011 and 2013.

The Group was reminded that the GASIG was a forum through which the need for urgency to access FDR data could be highlighted under the provisions of Annex 13, as there was a need to access FDR data as soon as possible to enable timely identification of potential airworthiness issues. In the discussion of data sharing, concern was expressed that there was an imbalance, in favor of the investigative body, in the information flow between investigation authorities and manufacturers. The GASIG was also informed about the early discussions regarding the development of an ICAO safety management annex, and members were asked to reflect on its development in relation to Annex 13. ♦

## ICAO Reaches ‘Historic Agreement’ on Aviation Safety

The International Civil Aviation Organization (ICAO) said it has reached a



Marcus Costa, GASIG Working Group chair, meets with members of the WG in Sapporo, Japan.

ESPERSON MARTINEZ

## ANZSASI Issues 'Call for Papers'

The Australian and New Zealand Societies of Air Safety Investigators has issued its "Call for Papers" for the 2011 regional air safety seminar to be held in the Rydges Hotel, Christchurch, New Zealand, June 11-12, 2011. The regional air safety seminar is hosted alternately by the New Zealand and Australian Societies. The 2010 seminar drew more than 100 attendees.

Papers are invited that address the challenges of modern air safety investigation, operational develop-

ments, and current thinking on safety management systems and associated subjects. If you wish to submit a paper for consideration, please provide an abstract (approximately 100 words) plus a brief biography by Feb. 1, 2011, to Ian McClelland: i.mcclelland@taic.org.nz; phone: +64 3 322 6957 (please note that NZ time is UTC+13 hours until early April, then UTC+12 hours); or mail to ANZSASI c/o 32 Hyndhope Rd., Kennedy's Bush, Christchurch 8025, New Zealand. ♦

"historic agreement" on aviation safety, security, and aircraft emissions.

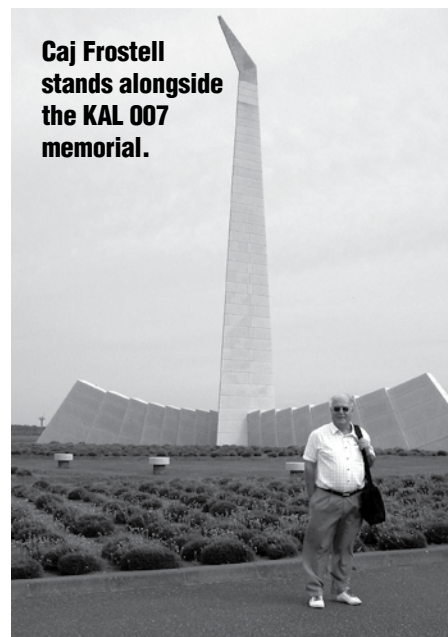
The deal reached by the 190 members of the Montreal-based United Nations organization at its 37th general assembly "builds on achievements since the last ICAO Assembly in 2007," the communiqué said, "which included a global goal of 2% annual fuel efficiency improvement up to the year 2050, a global framework for the development and deployment of sustainable alternative fuels for aviation, and a target of 2013 for a CO2 standard for aircraft engines." The 2-week conference also yielded "important advancements in aviation safety and aviation security."

But ICAO conceded that "some states (expressed) reservations and (called) upon the ICAO Council to continue its work on specific aspects of the agreement" regarding the environment. New initiatives include the development of a framework for market-based measures (MBMs), a feasibility study on the creation of a global MBM scheme, and guiding principles for states to use when designing and implementing market-based measures for international aviation, all of which will be reviewed at the next Assembly in 2013. ICAO signed a memorandum of understanding with the U.S., the European Union, and the International Air Transport Association to create a Global Safety Information Exchange. ICAO will coordinate the collection, analysis, and exchange of aviation safety information among exchange members and disseminate the information to the global aviation community."

The goal is to adopt a "safety strategy based on the sharing of critical safety information among governments and industry stakeholders. Greater availability of information in a transparent process improves the ability to better analyze and predict safety risks and to take action before issues result in accidents. Acting proactively on risk indicators can help to significantly reduce the accidents in all regions of the world." (Source: Flight Safety Information Oct. 13, 2010) ♦

## International Councillor Visits KAL 007 Memorial

Caj Frostell, ISASI International councillor, visited the Korean Airlines memorial erected in memory of the



**Caj Frostell stands alongside the KAL 007 memorial.**

Boeing 747 that crashed into the Sea of Japan on Sept. 1, 1983. The following is his account of the visit.

"I had learned that the Japanese KAL 007 memorial was on the northern tip of Hokkaido Island, just some 50 km south of the southern tip of Sakhalin Island in Russia, and thus quite close to the impact site at sea of the Korean Airlines Boeing 747 in 1983. The KAL 007 memorial was only a 45-minute bus ride from Wakkanai in Cape Soya (the northernmost cape on Hokkaido). Following the ISASI seminar, my wife, Raila, and I took the train for 6 hours from Sapporo to the Hokkaido's northernmost city of Wakkanai.

"In Wakkanai, we were joined by Professor Victor Ujimoto and his wife, Mutsuko, both from Toronto, Canada. They, too, had attended ISASI 2010 in Sapporo; he as a delegate, his wife as a companion.

"At Cape Soya, the KAL 007 memorial is situated on a hill overlooking the ocean and literally pointing to the area where the flight was shot down by a Soviet fighter aircraft just north of Hokkaido and southwest of Sakhalin Island on Sept. 1, 1983. It is a most beautiful site. The memorial lists the names of the passengers.

"I was a member on the ICAO KAL 007 investigation team in 1983 and the leader of the ICAO investigation team in 1993 when Russia made the flight records available to ICAO. The occurrence and its surrounding circumstances have had a profound effect on my life. It was probably the most important investigation that I was involved in. My thoughts and condolences have often gone out to those affected by the occurrence.

"It was a unique experience, and it was important to me to visit the KAL 007 memorial site on Hokkaido so that I could have the opportunity to pay my respect to the victims and their families (U.S. and Canadian), whom I have come to know." ♦

# ISASI ROUNDUP

Continued . . .

## LARSASI Reports Life Member 'Flies West'



**Carlos Jose Bondio**

ISASI's Latin American Society reports that ISASI life member Carlos Jose Bondio (LM 2120) passed away on May 29, 2009, in Río Ceballos, Córdoba province, Argentina. He was a founder of ISASI in Argentina.

Horacio Larrosa, LARSASI treasurer, noted that Gordoba, born in Córdoba, on April 22, 1922, was an aeronautical and mechanical engineer and developed his career in the Argentine Air Force in aircraft



**Corporate members that join ISASI through the year receive their membership plaques at the annual seminar awards banquet. Shown are, left to right, First Officer Troy Pirota, Australian and International Pilots Association; Capt. Mike Bender, FedEx Express; and ISASI President Frank Del Gandio, who made the presentation.**

maintenance and the foreign purchase office (NY) up to his retirement. He then continued his activities at the Civil Aviation Authority in Buenos Aires and began to be deeply involved with air safety when he was nominated as chief of the Technical Department of the Junta de Investigaciones de Accidentes de Aviación Civil (JIAAC, Argentina) on March 14, 1980, remaining later as technical adviser there and in the same position in the Córdoba regional office up to April 1, 2002. ♦

## Corporate Member CAAS Receives ANSP of the Year Award

ISASI corporate member the Civil Aviation Authority of Singapore (CAAS) has been named the Air Navigation Services Provider (ANSP) of the Year by the Center of Asia Pacific Aviation (CAPA). This inaugural award recognizes CAAS' leadership role in the industry and its promotion of efficient air traffic management in the region.

The new award seeks to recognize the increasingly vital role that air navigation services providers (ANSP) and their governments can play in improving air traffic management, thereby supporting airline operational efficiencies and reducing emissions.

CAAS provides air navigation services in the Singapore flight information region and at civil airports in Singapore, including Changi Airport. Handling more than 230,000 aircraft movements per annum, CAAS air traffic services

serves more than 80 airlines operating at Changi Airport. Today, Changi Airport handles more than 4,800 weekly services, connecting Singapore to more than 190 cities in 60 countries. In June, CAAS was named

"Best ANSP 2009" by the International Air Transport Association (IATA).

"We are honored to receive this award. It is another endorsement of our continuing efforts in ensuring efficient air traffic flow in Singapore and the region, thus enabling airlines to reduce operational costs and benefiting the environment. Besides initiatives to further improve the efficiency of aircraft movements at Changi Airport, CAAS will continue to work in close partnership with ICAO, IATA, and other stakeholders to identify and implement air traffic management initiatives in the region," said Yap Ong Heng, director-general of civil aviation, about the CAPA award. ♦

## U.S. Transportation Fatalities Drop in 2009

Transportation fatalities in the United States decreased by 9.2% in 2009 from 2008, according to preliminary figures released by the National Transportation Safety Board on October 6.

The data indicate that transportation fatalities in all modes totalled 35,928 in 2009, compared to 39,569 in 2008, although highway, rail, and aviation deaths declined, pipeline and marine fatalities showed an increase.

Aviation deaths decreased from 574 to 538. Nearly 90% of aviation fatalities occurred in general aviation accidents (471), but they still represented a decrease from the previous year (494). Rail fatalities decreased 4% from 781 to 751. The vast majority of these fatalities were persons struck by a rail vehicle. ♦

## MOVING? Please Let Us Know

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seminars. He is a long-time friend of mine and of this organization. Mike, it is my great pleasure to present you the 2010 ISASI Jerry Lederer Award. Congratulations!”

Again a thunderous applause erupted and as it subsided, Mike, standing there in a tropical stark white linen vested suit, looked out over the room with a boyishly mirthful expression and said he wanted to explain why “I am dressed like this!” He told them he was dressed for Nigeria and had no intention of being in Japan. Award recipients are not generally notified of their selection; so at times

absences may occur. Serendipitously, his plans were changed. Mike, a lighthearted, independent individual, took the audience through a quick tour of his aviation career—how it started, the thorns and the roses, the lessons, and the results. All these descriptions were delivered in tones that brought forth eruptions of laughter as he moved the audience through his professional life.

But he also had his serious moments, such as when he spoke of his award. “It’s a great honor, but it also means I’m getting older and I would like to think wiser.

Maturity has given me a very valuable and broad perspective, and ISASI has significantly influenced the way I think professionally and in my personal life. For that, I’m very thankful.... I stand before you wiser and older. But it’s about you, the members of ISASI whom I deeply respect. Having received this award from my peers and colleagues is quite rewarding. I do thank you very much.”

Closing the evening was the traditional “passing of the gong,” the chime used to summon seminar attendees back into session after breaks. 2010 Chair Mamoru Sugimura handed off the gong to Barbara Dunn and urged all to attend ISASI 2011 in Salt Lake City, Utah. ♦

## Speakers and Technical Papers Presented at ISASI 2010—Sapporo, Japan

### TUESDAY, SEPTEMBER 7

Master of Ceremony Hideyo Kosugi  
Welcome Remarks—Mamoru Sugimura,  
Sapporo ISASI Chairperson

Opening Address—Frank Del Gandio,  
President, ISASI

Keynote Address—Norihito Goto,  
Chairperson, Japan Transport Safety  
Board

ICAO Status Report—Marcus Costa,  
Chief of Accident Investigation and  
Prevention, ICAO

#### Authentic Investigations

“How Can We Have an Authentic  
Investigation?”—Guo Fu, Deputy Director,  
Aviation Safety Office of East China  
Regional Administration

“A Quarter Century and Still Learning—  
Lessons from the JAL 123 Accident  
Investigation”—John Purvis and Ron  
Schleede, Former Directors of Accident  
Investigation at Boeing and NTSB.

#### Asia—Trends and Issues

“Leading Just Culture Toward Pragmatic  
Application in Japan”—Hiromitsu  
Mizutani, Japan Aircraft Pilot Association,  
ANA Corporate Safety Captain

“A Review of Aviation Recorder  
Development and Challenges in China”  
—Yang Lin, Senior Engineer for Aviation  
Recorders, Civil Aviation Safety Technical  
Center, CAAC China

“Accident Trends in Asia: Major  
Improvement and Remaining  
Challenges”—Robert Matthews, Senior  
Analyst, Accident Investigation and  
Prevention, FAA

“Social-Technical Systems and Proactive  
Accident Prevention”—Yu-Hsing Huang,  
Assistant Professor, National Pingtung  
University of Science and Technology,  
Taiwan

### WEDNESDAY, SEPTEMBER 8

#### Innovative Uses of Data and Intellectual Models

Comments from Directors of National Accident  
Investigation Authorities

“AAIB’s Use of Data Mining in the  
Investigation of the 777 Fuel-Icing Accident:  
Innovative Outcomes and Challenges  
Faced”—Mark Ford, Senior Inspector of Air  
Accidents, AAIB UK

“The Contribution of Safety Reporting and  
Investigations to Safety Management  
Systems”—Paul E. Mayes, Investigation  
and Analysis, Safety Risk and Environment,  
Cobham Aviation Services, Australia

#### Applying Intellectual Models

“Limitations of ‘Swiss Cheese’ Models and the  
Need for a Systems Approach”—John Stoop,  
Delft University of Technology and Sidney  
Decker, Lund University

“Was It Really Pilot Error: A Case Study of an  
Indian Military Helicopter Accident”—Capt.  
Samir Kohli, Head of Safety, Saudi Aviation  
Flight Academy

#### Preparing for Investigation

“Planning for Sea Search and Recovery  
Operations—A Small Investigation Agency  
Perspective”—Pang Min Li, Air Accident  
Investigation Bureau of Singapore

“Hazards at Aircraft Accident Sites: Training  
Investigators in Line with the ICAO Circular  
315 Guidelines”—Nathalie Boston, Safety  
and Accident Investigation Centre, Cranfield  
University

“Mental Health Aspects of Aircraft Accident  
Investigation: Protecting the Investigator”  
—Brian Dyer, Nevis Disaster Management  
Department, and Anthony Brickhouse,  
Assistant Professor of Aviation Safety, Embry  
Riddle Aeronautical University

“Investigating Accidents Related to Errors  
of Aeronautical Decision-making in Flight  
Operations”—Li, Wen-Chin, Head of the  
Graduate School of Psychology at the National  
Defense University and Visiting Fellow at  
Cranfield University, Prof. Don Harris, Dr.  
Yueh-Ling Hsu, and Thomas Wang

### THURSDAY, SEPTEMBER 9

#### Investigative Tools and Lessons

“The Use of Commercial Satellite Imagery  
in Aircraft Accident Investigation: Results  
from Recent Trials”—Graham Braithwaite  
and Matthew Greaves, Safety and Accident  
Investigation Centre, Cranfield University

“Lessons Learned from Cooperation in Major  
Investigations”—Christophe Menez, Head  
of Engineering, BEA, France, and Michael  
Guan, Director of Aviation Lab, Taiwan

“Terrain Profile Analysis Using Radar  
Altimeter Data from FDR”—Frederico  
Machado and Umberto Irgang, Air Safety  
Department, Embraer

“Useful Human Factors Investigative  
Techniques: A Case Study of a Fatal King  
Air Accident in Canada”—David Ross,  
Operations Investigator, TSB, Canada

“Effects of Mental Stressors During Flight  
on Prosodic Features of Speech and  
Autonomic Nervous Response”—Hiroto  
Kikuchi, Japan Air Self Defense Force

#### Recent Accidents: Lessons, Techniques, and Challenges

“British Airways 777 Accident  
Investigation—What We Know and What  
We Don’t Know About Ice in Jet Fuel”—  
Mark H. Smith, Air Safety Investigation,  
Boeing Commercial Airplanes

“Heathrow 777: Challenges in  
Understanding Unusual Properties in  
Aviation Fuel and Problems in Conducting  
Tests to Determine the Vulnerability  
of an Aircraft’s Fuel System to the  
Accumulation and Release of Ice”—Brian  
McDermid, Air Accident Investigation  
Bureau, United Kingdom

“Undersea Search Operations: Lessons and  
Recommendations from Flight 447”—Alain  
Bouillard, Head of Safety Investigations,  
and Olivier Ferrante, Head of Recovery  
Group, BEA, France

“Colgan Flight 3407: Achieving the Delicate  
Balance Between Timely and Thorough  
While Staying True to the Investigative  
Process”—Lorenda Ward, Accident  
Investigator, NTSB, USA ♦

## Lederer Award Winner, *continued from page 17*

Unbeknownst to him, that exposure was his career grail.

Down that career road, the exposure led to winning a light bulb filament impact study contract that required heavy research looking at light bulb filaments with a scanning electron microscope. That work led to development of a paper presented at an ISASI seminar in the mid 80s. The subject created a lot of interest and he caught the attention of the then executive director of the Canadian Aviation Safety Bureau (now the TSB) who was at the ISASI meeting where Mike presented. "Before I left for the ISASI conference, I asked about a job at the Bureau, but I was told that it didn't look too good—hiring freezes. When I got back home, I had a letter that told me I won a competition, which I never remember applying for, and that was the start of my TSB career." And that opened the doors to all his achievements and outstanding service to aviation that was outlined by President Del Gandio.

Mike also spoke to his association with ISASI: "In 1985 in Phoenix, my first ISASI, I was 25 years old and what did I see: I saw an opportunity to learn from a lot of experts. I saw an opportunity to hear a lot of diverse views. And I saw a truly multicultural, inter-

national organization. Mostly, I saw a community that I wanted to be part of. Since '85 I think I have missed maybe four seminars. Many people in aviation are really dedicated, and that's what I really like about ISASI. ISASI exemplifies this quality."

Throughout his shared recollections, Mike kept his narrative light, causing eruptions of laughter at some of his more humorous descriptions, especially when he took a few moments to poke fun at some of the highlights of the seminar. But he also had his serious moments, such as when he spoke of his award. "It's a great honor, but it also means I'm getting older and I would like to think wiser. Maturity has given me a very valuable and broad perspective, and ISASI has significantly influenced the way I think professionally and in my personal life. For that, I'm very thankful.... I stand before you wiser and older. But it's about you, the members of ISASI whom I deeply respect. Having received this award from my peers and colleagues is quite rewarding. I do thank you very much."

Mike received a standing ovation and enjoyed the personal thanks that followed from the many people who have had the pleasure of his friendship over the years. ♦

## In Memoriam, *continued from page 5*

Safety Investigators (AASI) or Air Safety Investigator Association (ASIA), I determined that the membership should be pledged to or dedicated to aviation safety rather than associated with aviation safety and the name Society would be more appropriate. I selected Society of Air Safety Investigators (SASI), and Joe agreed.

I designed the logo. I wanted to emphasize safety, thus the large golden "S" surrounding the entire blue sky with aircraft entering and exiting the sky. They represent the past, the present, and the future. Additionally, they represent general aviation and commercial aviation. Joe concurred with the design.

A young attorney in the CAB by the name of Charlie King volunteered and agreed to do all the legal work. We determined the content of the original by-laws and what they should reflect, and Mr. King composed them. In the

spring of 1964, SASI was approved as an organization.

Joe Fluet appointed himself president and I was assigned to be the secretary-treasurer. Joe assigned the membership numbers giving himself Charter Member 001, Bobby Allen, director of the Bureau of Safety, Charter Member 002, and assigned me Charter Member 003. The original dues were \$10. Two of the original honorary members were Alan Boyd, chairman of the Civil Aeronautics Board, and Najeeb Halaby, administrator of the Federal Aviation Administration.

I returned to Fort Worth in 1969 and was not involved with the organization becoming international. I am eternally grateful to anyone who had anything to do with it becoming international as safety issues definitely are international. I was chief of the Fort Worth field office of the NTSB for 10 years and retired in 1986. ♦

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Flight Data Services Ltd., United Kingdom  
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Interstate Aviation Committee  
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U.K. Civil Aviation Authority  
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Volvo Aero Corporation  
WestJet ♦



## WHO'S WHO

# Pakistan International Airlines

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

**P**akistan International Airlines (PIA), Pakistan's flagship airline, has been an air travel pioneer since its inception in 1955. PIA has many firsts to its credit and continues to soar with its fleet of young airplanes and commitment to innovation. It all started on Oct. 23, 1946, when a new airline was born as Orient Airways Ltd. On Jan. 10, 1955, Orient became part of a newly formed state-owned airline, Pakistan International Airlines.

PIA became the first airline to receive certification (initial certification) on safety management systems (SMSs) by Pakistan's Civil Aviation Authority (CAA). The CAA Air Navigation Order (ANO) 91.0032 issued in September 2008 requires all airlines operating in Pakistan to have SMS. In July 2008, well before the issuance of this ANO, PIA initiated SMS awareness and implementation. The CAA awarded PIA initial SMS certification on Feb. 27, 2009.



In April 2004, PIA's engineering and maintenance became one of the very first non-European organizations to qualify as an EASA Part 145 approved maintenance organization. PIA's engineering and maintenance not only passed its renewal audit in March 2006, but also received approval to perform heavy maintenance on state-of-the-art B-777s. The approval also includes light and heavy maintenance of B-747s/737s and Airbus A300s/A310s, including maintenance on most of their components at shop level.

The PIA training center is a leading airline training institution that delivers the highest standards for aviation training, approved by local and international regulatory authorities including the CAA, ICAO, and IATA. The PIA training center provides training to professionals from more than 30 airlines and global agencies.

PIA is among the few developing countries whose airlines are compliant with IATA's operational safety audit (IOSA) requirements and standards. The standards body for IOSA is based in Montreal, Canada. A typical IOSA certification audit is based on a checklist

of more than 900 IATA standards and recommended practices. Each IOSA audit is valid for 2 years, and an airline must pass a series of periodic recertification audits to retain its IOSA registration status as per IATA standards. PIA has successfully renewed its IOSA certification through June 24, 2011. IOSA registration demonstrates PIA's commitment to meeting the highest international operational safety standards in critical areas, including flight operations, cabin operations, aircraft engineering and maintenance, flight planning and dispatch, ground handling and ramp operations, cargo operations, operational security services, and corporate organization and management systems.

PIA has launched the health, safety, and environment (HSE) initiative to mature the airline's HSE systems to a level that will eventually lead to OHSAS-18001 and ISO-14001 certification. As part of this program, PIA plans to conduct organization-wide HSE training, develop HSE objectives, implement HSE system procedures, and manage reviews to assess the continual effectiveness of the HSE system. These accomplishments will make PIA an even safer airline, paving the way for OHSAS and ISO certification. ♦