ISASI FORUM

OCTOBER–DECEMBER 2004

"AIR SAFETY THROUGH INVESTIGATION"

CONTENTS

FEATURES

Special Section—ISASI 2004

DEPARTMENTS

ABOUT THE COVER

The ISASI 2004 logo was a well-recognized emblem throughout the 5-day event for the 407 persons who participated in all its activities. John Yialeloglou, Graphics designer at DFS-ADF, designed the logo and all credit should go to him.

ISASI FORUM

"Air Safety Through Investigation"

Volume 37, Number 4

Publisher Frank Del Gandio
Editorial Advisor Richard B. Stone
Editor Esperison Martinez
Design Editor William A. Ford
Associate Editor Susan Fager
Annual Report Editor Ron Schleede

ISASI Forum (ISSN 1088-8128) is published quarterly by International Society of Air Safety Investigators. Opinions expressed by authors do not necessarily represent official ISASI position or policy.

Editorial Offices: Park Center, 107 East Holly Avenue, Suite 11, Sterling, VA 20164-5405. Telephone (703) 430-9668. Fax (703) 430-4970. E-mail address isasi@erols.com; for editor, espmart@comcast.net. Internet website: www.isasi.org. ISASI Forum is not responsible for unsolicited manuscripts, photographs, or other materials. Unsolicited materials will be returned only if submitted with a self-addressed, stamped envelope. *ISASI Forum* reserves the right to reject, delete, summarize, or edit for space considerations any submitted article. To facilitate editorial production processes, American-English spelling of words will be used.

Publisher's Editorial Profile: *ISASI Forum* is printed in the United States and published for professional air safety investigators who are members of the International Society of Air Safety Investigators. Editorial content emphasizes accident investigation findings, investigative techniques and experiences, regulatory issues, industry accident prevention developments, and ISASI and member involvement and information.

Subscriptions: Subscription to members is provided as a portion of dues. Rate for nonmembers is US$24 and for libraries and schools US$20. For subscription information, call (703) 430-9668. Additional or replacement *ISASI Forum* issues: members US$3, nonmembers US$6.

Investigate, Communicate, and Educate

By Frank Del Gandio, President

(President Del Gandio's opening remarks to the delegates of ISASI 2004 have been abbreviated.—Editor)

As anyone in our business knows, Australia is the country where the aviation regulator, CASA, and the safety investigative authority, the ATSB, are world-class organizations. Each of these agencies is a regional leader in its field, and each has an influential voice worldwide among the aviation safety federations. Australia's enviable safety record is the best testimony to the professionalism of CASA, the ATSB, and the industry.

Thanks to Lindsay Naylor's sound guidance and the diligent industry of his team, I know that the quality of this year's seminar will reflect the professional quality of Australia's aviation community.

This year's seminar will carry the theme of "Investigate, Communicate, and Educate." The issues that compose the theme are appropriate for ISASI. Aviation in much of the world faces the difficult challenge of continuing to improve on an already very low fatal accident rate. Since we last met in Washington, D.C, USA, we have had the usual mixture of evidence that things are continuing to get better but, on the other hand, that we still have work to do. The good news is that the world airline industry has had a relatively small number of major accidents since our meeting in Washington. Though the precise definition of "major accident" might vary a bit, I believe we had a maximum of five such events in the past year. The most significant accidents were

- December 2003—an apparently overloaded B-727 crashed on takeoff in Benin, killing at least 140 of 160 or more occupants.
- January 2004—a B-737-300 crashed on departure from Sharm-el-Sheikh, killing all 148 occupants.
- January 2004—a Yak-40 crashed on landing at Tashkent, killing all 37 occupants.
- February 2004—a Fokker F-50 crashed on approach in the Arab Emirates, killing all 46 occupants.
- May 14, 2004—an Embraer 120 crashed on descent into Manuas, Brazil, killing all 33 occupants.

To some degree we are the victims of our own success. As good as the safety record has become, the public has long judged our performance against a de facto standard of zero accidents. Every incremental improvement in the rate may well require an exponential increase in effort.

Five major accidents worldwide is a relatively low number, but it is not zero. At least three of the five, and perhaps all five, at least partly indicate basic issues about physical or regulatory infrastructures. Clearly, the only way we can hope to address these types of issues is through international cooperation. That cooperation needs to include active international assistance with infrastructure, training, etc., plus international efforts to increase the knowledge base of responsible officials. Cooperation is "not a sentiment—it is a economic and safety necessity."

The cooperation function is the type in which ISASI can help, and can help a lot. In fact, the theme that our hosts selected for this year's seminar actively reflects ISASI's capacity to help strengthen the required knowledge base: Investigate, Communicate, and Educate.

"This year's seminar will carry the theme of "Investigate, Communicate, and Educate." The issues that compose the theme are appropriate for ISASI. Aviation in much of the world faces the difficult challenge of continuing to improve on an already very low fatal accident rate."

Investigation certainly will remain part of these efforts. However, in order to constantly improve upon an already strong record, we and other segments of the aviation safety community must communicate our knowledge effectively. We must use our communal knowledge base to inform and, indeed, to educate not just those of us who already are a seasoned part of aviation, but also those who are at the threshold of aviation.

Education will continue to include traditional issues, such as basic flight skills, aircraft systems, etc. However, we will find aviation education focusing more and more on issues such as standard operating procedures, safety culture, governance, and all those other issues that wear the cloak of ambiguity. Indeed our profession will be a major contributor to the overall effort of making the exponential increases to achieve incremental improvement.

I sincerely hope each of us in this room, over the next several days, takes advantage of this seminar to improve his or her own knowledge base. I think many of you will agree with me when I say that our seminars get more and more substantive each year. I am sure this year's seminar will be no exception. ◆

Kapustin Scholars Attend ISASI 2004

By Ron Schleede, Vice-President

ISASI 2004 was a huge success!

The ISASI 2004 committee deserves special thanks and congratulations. The high professional level of the technical program particularly impressed me. I have never attended a seminar in which the seminar lecture hall was continually full from early morning to afternoon closing, reflecting intense delegate interest—despite some serious distractions, such as the beach and sunshine.

Also noteworthy is that the first two recipients, Noelle Brunelle and Michiel Schuurman, of the ISASI Rudolf Kapustin Memorial Scholarship awarded at ISASI 2003 attended ISASI 2004 at their own expense. It was wonderful to see them taking part in the program and interacting with other members, including Shannon Harris, recipient of the 2004 scholarship (see page 11). I believe the self-paid presence of Noelle and Michiel is a testament to the goals and objectives of the Kapustin family and to the mission of the Society. This method of fostering the student membership corps and bringing youth into ISASI is one of the most commendable ever initiated by ISASI. I look forward to seeing all three of our scholarship winners in Ft. Worth next fall, as well as introducing the 2005 selectee(s) and greeting future winners.

Michiel has already begun providing input into the working of ISASI. He mentioned that the wording of the scholarship application requirements might be overly restrictive and could preclude some students from applying. Specifically, he noted the requirements strongly implied that the student must be enrolled at an institution that has a specific aviation safety or occurrence investigation program (department). Michiel pointed out that some institutions do not have such programs, but do have aviation-safety-related courses in engineering, psychology, etc, and there are ISASI student members at both types of institutions.

Since it was the Scholarship Committee's intent to draw from the entire pool of students taking aviation-safety-related courses applicable to the work and mission of ISASI, one portion of the eligibility criteria has been revised as follows: *"All members of ISASI enrolled as full-time students in a recognized [note: ISASI-recognized] education program, which includes courses in aircraft engineering and/or operations, aviation psychology, aviation safety and/or aircraft occurrence investigation, etc., with major or minor subjects that focus on aviation safety/investigation, are eligible for the scholarship."* (See "ISASI RoundUp" for the full application requirements.)

Regarding the continued viability of the ISASI Rudolf Kapustin Memorial Scholarship, I urge individual and corporate members of ISASI to consider additional donations to the scholarship fund. Our budget for future scholarships is small. We would like to expand it so more students can be selected. Donations may be made in cash, or in kind, such as complimentary travel, lodgings, or seminar registration. For example, Emirates Airways applied one of its free seminar registrations (available because of its generous donation to ISASI 2004) to Shannon Harris. This contribution, coupled with the scholarship award, assisted Shannon in attending ISASI 2004.

Again, I believe that the initial results of the ISASI Rudolf Kapustin Memorial Scholarship are very encouraging and reflect the true mission and goals of our Society. I am confident that the Kapustin family is pleased that Rudy and other ISASI members who have died are being recognized in such a worthwhile manner. Please help ISASI make this important program continue to grow with your donations. Donations to the scholarship fund are welcome in any amount. Checks should be made out to ISASI Rudolf Kapustin Memorial Scholarship and forwarded to the ISASI national office. Other means of payment are also welcome. For U.S. citizens and corporations (and perhaps elsewhere), such donations are tax-deductible. If anyone has any questions or suggestions about how to improve the program, contact myself, Capt. Dick Stone, or any other Council member. ◆

E. MARTINEZ, EDITOR

Kapustin scholar Shannon Harris (2nd from left) poses with R. Schleede, Scholarship Committee co-chair; F. Del Gandio, ISASI president; and Noelle Brunelle and Michiel Schuurman, 2003 Kapustin scholars, during ISASI 2004.

Welcome To Australia

By Bruce Byron, Chief Executive Officer, Civil Aviation Safety Authority (CASA), Australia

(In his opening and welcoming address to the accident investigators attending ISASI 2004 at Australia's Gold Coast region on August 31, the author explains the role and functions of CASA and issues challenges to air safety investigators to expand the horizon of their roles and functions to meet the needs of today's changed industry.—Editor).

Thank you for inviting me to be with you for what I know is one of the more significant aviation gatherings in the international calendar for 2004. May I welcome you, and for those of you from beyond these shores, welcome to Australia.

I believe the last such seminar in this country was more than a decade ago. As elsewhere, the Australian aviation industry has seen profound changes in that time, and I am sure this gathering will be an opportunity for you to gain some insight into those changes and the implications they may have for aviation safety investigation.

As the chief executive of Australia's aviation safety regulator, it is probably sensible that I say a few words about where CASA fits into the aviation safety framework in this country. And to do that I need to say something about the functions we are required to perform by the legislation under which we operate. I would also like to give you some food for thought.

If you ask the public or indeed members of the aviation industry what the role of an aviation safety regulator is, you will never get the same answer. I know—I've tried it. Some would have us exercise dominant control of industry organizations while others would prefer we leave industry players to get on with it without "interference." Like most issues where there is a range of opinions, or options, the right answer is somewhere in the middle. A careful look at the legislation that empowers CASA provides that clarity, and in my view, strikes the right balance.

Now, reviewing legislative matters is a dry subject at the best of times, so I promise to be brief, but these are the things we are required to do by law, so they are a proper starting point for an understanding of our place in the aviation safety system. We are required to perform, or take account of, a whole range of statutory functions in pursuing our legal obligations. Most of them are fairly standard and have parallels in most international jurisdictions, so I won't subject you to them.

But there are a few that I would like to highlight because it should explain the basis for directions we are planning to take CASA in the near future. Section 9 (1)(f) of the Civil Aviation Act says we have the function of "conducting comprehensive aviation industry surveillance, including assessment of safety-related decisions taken by industry management at all levels for their impact on aviation safety." This part of the legislation is where we get our "head of power" to conduct surveillance of the industry. What is particularly noteworthy here is that the only specific item of surveillance activity highlighted here does not target technical areas, but asks us to put the spotlight on safety-related decisions by management. I'll come back to this later.

In 9(1)(g) we have the responsibility of "conducting regular reviews of the system of civil aviation safety in order to monitor the safety performance of the aviation industry, to identify safety-related trends and risk factors, and to promote the development and improvement of the system." Some interesting points of focus here are the need to look at the "system," and specifically the safety performance of the industry. Again, I'll talk more on this in a moment, particularly in the context of management's contribution.

And under 9(3)(a) we have the formal function of "cooperating with the Bureau of Air Safety Investigation in relation to the investigation of aircraft accidents and incidents." BASI is, of course, now the Australian Transport Safety Bureau, and the ATSB's Kim Bills will be talking to you shortly. To take this last one first, in one sense it should hardly be necessary for there to be a formal provision in our functions requiring the regulator to cooperate with the independent aviation accident investigator. It just makes good sense, and we would be crazy to even think of having some other model. In our case, the cooperative process is facilitated because both organizations operate within the same ministerial portfolio, and at a practical level the relationships between our people are good. But it is important not to get complacent, and we need to regularly review the relationship between the accident investigator and the regulator to make sure it is optimal, while being sensitive to the necessary points of independence within the respective roles.

And in this context, I should recognize that it is not just the relationship between the statutory regulator and the statutory investigator that is important. The industry has significant aviation safety investigation skills and experience, and we need to be sure that arrangements are in place

for that knowledge to be part of the overall aviation safety management framework, in other words, part of the system. We have to avoid the idea that only the government-based organizations are the sole repositories of skills and knowledge. We are all in this together.

The other statutory functions I highlighted are interesting in the context of this gathering in that one of them gives us a statutory function of reviewing the overall aviation safety system, and this must include the contributions made to that system by the various players, including, of course, air safety investigators.

What I am clearly saying here is that the task of investigation is unquestionably part of the system—you don't sit passively outside looking in all the time. In the same way that decisions and actions taken by pilots, mechanics, chief pilots, maintenance controllers, operational managers, and CEOs can affect safety outcomes, so, too, can the content of an investigation process and the recommendations that flow from that activity.

In reviewing the system, we should constantly test each component for the quality of the outcomes and the contribution made to the full system. In your case, I would encourage you to ask those questions of yourselves during the next few days.

Now this requirement for CASA to review the system has not been an area of our responsibilities that has been front and center for us in the past, but we are changing that. It is easy for all of us to be focused on the things that are immediately in our face, that come out of left field and have to be responded to. But ensuring that the overall aviation safety system is in the best possible shape is very important, and it is something to which I intend to give some focus.

There have been many accidents and incidents investigated and a lot of very good data have been generated. But we need to be sure the process is not seen as an end in itself, that an accident is investigated, that a complex range of contributing factors is identified, probable cause findings are reached, and we declare victory and ride off to tackle the next investigation. We need to be sure that the results of your work do translate into improved safety, otherwise they become simply interesting technical exercises.

It follows that we need to have an overall safety system in place that ensures that the outcomes of accident investigations do feed into the system, and in particular that conclusions and recommendations that impact on systemic issues are tested, recognized by all those who need to take action, and are in a form that is amenable to action being taken.

Most importantly, it is vital that all the good material that you produce does not fall into some electronic black hole or database—without being used by the decision-makers in the system. Your information needs to be constantly trended, assessed, and compared with data from other sources—not every decade, not every year, but all the time.

E. MARTINEZ, EDITOR

Chief Executive Officer Bruce Byron, Civil Aviation Safety Authority, Australia, delivering his opening and welcoming address to the accident investigators attending ISASI 2004.

At the risk of being controversial, I think we have a bit of work to get this one perfect. A good start would be to ensure that the terms, definitions, parameters, safety measures, and health indicators used by operators, manufacturers, regulators, and investigators are the same. This is one item of our system, here in Australia, that CASA has identified as needing attention.

I am encouraged to see that your code of ethics includes a provision requiring the application of facts and analysis to develop findings and recommendations that will improve aviation safety—a sensible outcome-based approach perhaps, but one that is important not to lose sight of.

And I am further encouraged to see that your seminar papers include titles such as "Investigate, Communicate, Educate: Are We Doing All Three with the Same Energy?" and another title, "Lessons Learned in the Investigate, Communicate, Educate Cycle." These titles suggest to me that the issue of how we go beyond the investigation stage is one that is alive and well in this gathering, and that is a very good thing.

For our part, that is CASA, we have already commenced a review of the system, with modest beginnings, but this will increase as we expand our research capabilities. I look forward to some of this work being conducted industrywide, and I hope some will be able to be undertaken in association with the industry and academic bodies, not just within government.

And I should touch on the remaining statutory function I highlighted, the one that mentions looking at safety-related decisions taken by aviation industry management. This one highlights an issue for us at CASA, and I suspect it may also be one for you. Our people have a lot of good technical skills and experience, and so do you. In your case it particularly relates to the skills and experience needed to analyze accidents and incidents and to come up with sensible conclusions and recommendations. In the last 25 years we have added people with behavioral or human factor expertise to the well-tested group of people with technical background in aviation operations.

But where do we all stand when we push the envelope beyond the immediate technical issues associated with an accident and start to get involved with an organization's management processes? In my experience with large organizations, particularly where they have a duty of care for the safety of people, I have seen evidence of potential deficiencies in management decision-making. This is nothing new, but we need to be confident we have the skills to objectively review management processes and procedures that may be somewhat removed from the technical fields with which we are most comfortable.

This may mean we need to involve people with no aviation experience, but who have well-developed management

(continued on page 31)

G'day ISASI!

The robustly traditional Australian greeting rang out in speech and manner to all of the 407 persons who took part in ISASI 2004.

By Esperison Martinez, Editor

Australia's Gold Coast

GOLD COAST TOURISM BUREAU

The golden beaches and blue skies of Australia welcomed the attendees to ISASI 2004 at the annual seminar's location on southeastern Australia's Gold Coast. Although many delegates arrived tired and suffering from jet lag, they departed with professional pride from a solid technical program, high spirited from good peer interaction and relaxed from the atmosphere found in "Surfers Paradise," the seminar township of choice.

Bruce Byron, chief executive officer, Civil Aviation Safety Authority (CASA), Australia, opened ISASI's 35th annual air safety seminar on August 31, at the ANA Hotel Gold Coast, Queensland, Australia. The appearance of the nation's highest aviation safety official indicated the respect for and interest in this annual gathering of international aviation safety investigators, held by this nation so heavily involved in efforts to make the world's skyways safe.

In addition to his welcome wishes, he said "the task of investigation is unquestionably part of the system—you don't sit passively outside looking in all the time. In the same way that decisions and actions taken by pilots, mechanics, chief pilots, maintenance controllers, operational managers, and CEOs can affect safety outcomes, so, too, can the content of an investigation process and the recommendations that flow from that activity…. But where do we all stand when we push the envelope beyond the immediate technical issues associated with an accident and start to get involved with an organization's management processes? …In your case, you tend to be involved after the event. You have a tradition of providing excellent technical skills, but I suggest you also need to ensure you have the skills required to assess safety systems, management approaches, and so on." (See page 5 for the full text of the welcoming address).

The "ANA," as attendees quickly dubbed the hotel, is located just off the sugar-fine sandy beach ebbed by a pounding surf and minutes away from a busy resort living/shopping sector filled with towering hotel and apartment edifices, leisure-clad shoppers, and beachwear strollers. The conference auditorium, owing to the heavy attendance, was crowded, but offered good viewing and acoustics to the 334 registered delegates.

The theme for the seminar, "Investigate, Communicate, Educate" brought forth sessions filled with explanations of the investigative process used in past investigations and the outcomes of the recommendations made as a result of the investigations. Exclusively the speakers used PowerPoint imagery, and the impact left by many of the images that flashed on the viewing audience's screen was sufficiently commanding to keep the conference room filled from the start of the day to the end of the day—every day. Indeed, Ron Schleede, ISASI vice-president, observed, "I have never attended a seminar in which the seminar lecture hall was continually full from early morning to afternoon closing, reflecting intense delegate interest—despite some serious distractions—such as the beach and sunshine."

In addition to the 334 delegates attending the 3-day technical program, 73 companions were accommodated. In all, 32 countries, or half of the Society's member state representation, were present. As usual, the overall seminar time schedule was 5 days, August 30 to September 3. The first day was devoted to intense "tutorial" programming, and the last day to touring countryside scenery.

Tutorials

The two daylong separate tutorials were conducted simultaneously. Mike Walker (ATSB) and Brent Hayward (Dedale Asia Pacific) presented "Interviewing," and Al Bridges (CASA) presented "Communicating and Educating." The two programs attracted 162 persons.

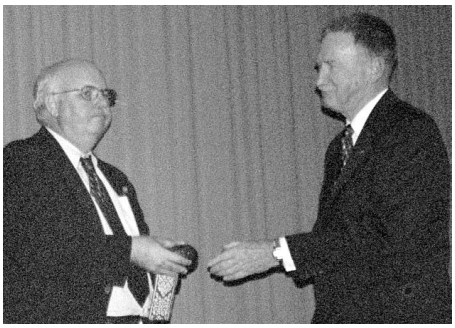
Interviewing: Walker and Hayward presented their three-part program without distraction while stepping into and away from relevant discussion of the subject at hand. The room full of seasoned investigators heard that a major source of inaccuracy in extracting eyewitness testimony occurs during the testimony interview. They took in good stride that the cause is often "interviewer-induced bias," meaning that recall of a witness can be dramatically influenced by "biases, expectations, prior knowledge, or simply the ineptitude of the interviewer." More to the point, attendees learned that research has shown that many of them do not use good interviewing techniques, that interviewing is not a natural skill for most investigators, and that developing

PHOTOS: E. MARTINEZ

and honing that skill requires "time, practice, and motivation."

The objective of the program was to outline techniques that prospective witness interviewers may find useful in gathering evidence in interview situations. A major influence in developing the tutorial handout "Some Interviewing Guidelines for Safety Investigators" was the "cognitive interviewing" method developed by Ron Fisher and Edward Geiselman.

According to the handout, cognitive interviewing is based on scientific principles of memory and communication and also on careful analysis of investigation interviews with eyewitnesses. The principles of cognition are converted into a number of specific techniques that help interviewees improve their memory performance. These techniques include encouraging the interviewee to concentrate, recreating the event context, explicitly requesting detailed descriptions, and focusing on obtaining as much information as possible about the topic that the interviewee is thinking about before moving on to another topic. The principles of communication are consistent with the guidelines provided in many other sources. While the three segments of the tutorial—overview, general principles of investigative interviewing, and stages of an interview—sound sober enough to cause mental weariness, the elements that make up the segments are mental nudging and were eagerly received by those who would be using them.



Top: **ISASI in session.** ***Above:*** **Curt Lewis, left, chair of ISASI 2005, accepts the "Call to Order Bell" from ISASI 2004 chair Lindsay Naylor.** ***Left:*** **President Del Gandio (right) presents "well done" gift to Lindsay and Jean Naylor for their leadership in producing an "outstanding seminar."**

Communicating and Educating: In this tutorial Al Bridges quickly placed the challenge before the group by flashing on a screen this quote *"[D]uring discussions with several aviation safety officials, I learned that they had not read or understood accurately the safety message contained in recently issued official accident reports."* It was taken from a Ron Schleede column in the January-March 2003 *ISASI Forum* in which Schleede expressed concern over an apparent lack of effective communication among safety officials in the in-

ISASI 2004 Corporate Sponsors

Platinum
Emirates Airline
Silver
Boeing Commercial Airplane Company
Airbus Industries
jetBlue Airways
Air New Zealand
Qantas
National Jet Systems PTY LTD
EMBRAER
Directorate of Flying Safety ADF
Bronze
AirServices Australia
Southwest Airlines
Australian Transport Safety Bureau
Australian Civil Aviation Safety Authority
AVIS
Cranfield University
Flightscape
Honeywell
Pratt & Whitney
Air Safety Foundation of Australia
AQD ◆

Delegates' rapt attention shown here was evident throughout the seminar.

dustry. Bridges's ultimate aim was to implant the idea that one needs to "communicate to educate." Throughout the tutorial, in which Bridges engaged heavy audience participation and extensive work groups, the attendees worked their way through old and new ways of communicating, through the three "Cs" (communication, commitment, culture) and how those elements interacted in the education process. In addition, Bridges made clear that education and training, although often used in the same context, are two different processes. His handout notes that "The main aim of education is to cause changes to or reinforcement of the attitude of the student at completion of the course." Also, that "training and training objectives are primarily concerned with the student being able to perform certain functions under prescribed conditions at the completion of the lessons, making it a skill-based program, with emphasis on applied theory."

The tutorial concentrated on the messages that were important to attendees, be they safety specialists, company pilots, engineers, or passengers. Bridges brought forth those messages applicable to each of the groups and how the messages should be communicated.

Main program

The main program day began on August 31, and, like the 2 days to follow, buffet breakfast began at 6:30 a.m and was laden with fruit and a variety of food to satisfy every taste bud. The speakers' program generally began at 9 a.m., allowing for 20-minute presentations, on the average, for each of the 30 on the schedule. Each day a buffet lunch was provided, as were several coffee and tea breaks, supplemented by cakes and sweets. But the overriding aspect of these breaks was the interaction that took place among attendees.

Ken Lewis, Australian Society of Air Safety Investigators, president and host of the seminar, urged, in welcoming remarks, the audience not to be shy. He said, "If you hear something you don't understand, ask a question, or even if you just want more information, again, just ask a question—because, generally, the person sitting next to you or several rows down also wants to ask the same or a similar question."

In his remarks, ISASI President Frank Del Gandio noted that international cooperation is needed to address issues dealing with physical or regulatory infrastructures. He added that "cooperation is not a sentiment, it is an economic and safety necessity." He also said, "The cooperation function is the type in which ISASI can help, and can help a lot. In fact, the theme that our hosts selected for this year's seminar actively reflects ISASI's capacity to help strengthen the required knowledge base: Investigate, Communicate, Educate." (See page 3 for his full address.)

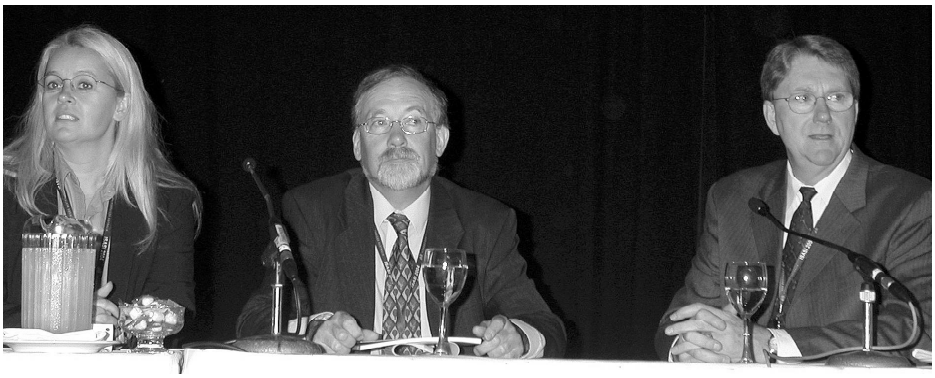
Before introducing a short video in celebration of Jerry Lederer's life produced by ISASI members, Del Gandio announced and introduced Shannon Harris as the recipient of the $1,500 ISASI Rudolf Kapustin Memorial Scholarship for 2004. The scholarship honors the memory of "tinkicker extraordinaire" Rudy Kapustin who served for years as the ISASI Mid-Atlantic Regional Chapter president. Last year's selectees, Noel Brunelle and Michiel Schuurman, were also in attendance at the seminar.

He then called up to the on-stage podium Ron Chippindale, ISASI's New Zealand Councillor. Just as Chippindale reached the podium, a smiling ISASI president turned to him and said, "I'd like to introduce the winner of the Jerry Lederer Award!" Shocked surprise registered on Ron's face, as an immediate and boisterous applause filled the large hall. (See page 14.)

The emotionally moving 12-minute video in celebration of Jerry Lederer's life then took command of the room that quickly became as still as a tomb. Images of Jerry in all walks of his life flashed on the screen—and in all he was always smiling, cherub eyed, and alert, evoking memories of his presence at many ISASI's seminars. Following the poignant video, Del Gandio softly murmured, "Farewell Jerry. For all the millions of flyers who have benefited, farewell."

Technical sessions

Under the theme of "Investigate, Communicate, Educate," 30 topics were delivered (see adjacent listing of speakers and topics). Topics were grouped into 11 paper sessions with a Q-&-A panel after morning or afternoon sessions. Each paper session was led by a moderator and usually consisted of three



Panel 6, left to right, are L. Ward, P. Coombs, and E. West.

Al Bridges distributes a work group exercise.

speakers. Several moderators also presented topics that related to the session (all presented papers will appear in the upcoming *ISASI Proceedings 2004)*.

Rob Lee, moderator for paper session 4, reminded the audience that while air safety investigation is of vital importance, it is but one component of an integrated approach to the systemic management of safety within aviation. He said, "Both civil and military aviation are moving rapidly toward a properly structured and fully integrated approach to the management of safety—that is, of organizational risk."

Commenting on ICAO Annexes and IATA's systemic proactive approach to safety management, he said, "CASA … will almost certainly become the first aviation regulatory authority in the world to mandate an integrated safety management system as a requirement for the granting of an air operators certificate."

He also noted that the Australian Defence Force launched a new integrated safety management system last December. Such systems offer many benefits to an organization: enhanced safety, efficiency and profitability, and the preservation of assets—in particular, through the prevention of accidents and incidents. He continued, "While the specific circumstances of individual accidents may be different, the same underlying systemic factors, such as training or communication, may be common to many different accident and incident scenarios."

He reemphasized that the process of accident investigation is but one vital element of a total system of safety management, and asserted that "means we must strive to rectify the present situation by working harder to ensure that air safety investigation becomes part of a more integrated and proactive overall approach to aviation safety."

All speakers kept very well to their time schedules, which allowed ample time for the Q-&-A panel, composed of all speakers in a paper session, to be quizzed by the audience. Sprinkled throughout the speaking schedule were meetings of

Speakers and Technical Papers Presented at ISASI 2004

Réal Levasseur, Transportation Safety Board of Canada—*Investigate, Communicate, Educate: Are We Doing All Three with the Same Energy?*

Dr. Robert Matthews, Federal Aviation Administration, USA—*Past, Current, and Future Accident Rates: Achieving the Next Breakthrough in Accident Rates.*

Dr. Kay Yong, Aviation Safety Council, Taiwan—*Facts and Lessons Learned from the CI611 Accident Investigation.*

Michael Bartron and Mike Gamlin, Pratt & Whitney, USA & Rolls Royce plc, UK—*Accident Investigations Involving Engine Consortiums and Alliances—New Opportunities and New Boundaries.*

Johann Reuss, German Federal Bureau of Aircraft Accidents Investigation (BFU)—*Airborne Collision Avoidance System: ACAS/TCAS from the Accident Investigation's Point of View.*

Olivier Ferrante, Jean-Claude Vital, Bureau d'Enquêtes et d'Analyses, France—*Sea Recovery Operation after the Flash Airlines FSH 604 Accident at Charm El-Cheikh.*

Dr Alan Hobbs, SJSU/NASA-Ames Research Center, USA—*Latent Failures in the Hangar: Uncovering Organizational Deficiencies in Maintenance Operations.*

Robert Vandel, Flight Safety Foundation—*Ramp Damage: Its Impact on Air Safety Investigators.*

Richard Batt, Australian Transport Safety Bureau—*Ansett Class A investigation.*

Comodoro (R) Luis Ortiz, Argentine Air Force & Universidad Nacional de Buenos Aires, Argentina—*Juridical and Technical Aspects in the Investigation of Aviation Accidents and Incidents in Argentina and Latin America.*

James M. Burin, Flight Safety Foundation—*Protection of the Sources of Safety Information.*

Yannick Malinge, Airbus Industrie, France—*A300B4 Loss of All Hydraulics, Baghdad.*

Eric West, Federal Aviation Administration, USA—*When an Aircraft Crash is Not an Accident: Experiences of an Air Safety Investigator at Ground Zero.*

Lorenda Ward, National Transportation Safety Board, USA—*The Size of the Aircraft Doesn't Matter?*

Peter R. Coombs, Air Accidents Investigation Branch, UK—*Fatal Double Engine Flame-Out on a Commercial Twin Turbo-Prop Aircraft.*

Simon Barter, Defence Science and Technology Organisation, Australian Transport Safety Bureau, & Directorate of Flying Safety ADF, Australia—*Field Investigation of the Accident Involving an Ilyushin IL-76 Transport Aircraft in East Timor in 2002.*

Chris Baum and Corey Stephens, Air Line Pilots Association, International, USA—*WYSIWYG—Or Is It?*

Neil Campbell, Australian Transport Safety Bureau—*Computer Graphics Animations Using Limited Data Sets—Recent Case Studies.*

Professor Drew Dawson, Director, Centre for Sleep Research, University of South Australia—*Investigating Fatigue-Related Aspects of Safety Occurrences.*

Dr. Scott A. Shappell, Civil Aerospace Medical Institute & University of Illinois at Urbana-Champaign, USA—*HFACS Analysis of Military and Civilian Aviation Accidents: A North American Comparison.*

Dr. Steven T. Shorrock, The University of NSW, Australia, & Cranfield University, UK—*Who Moved My (Swiss) Cheese? The Evolution of Transport Safety Investigation.*

Dr. Arjen Romeyn, Australian Transport Safety Bureau—*Analysis of Aircraft Propulsion System Failure.*

Dr. Ed Wischmeyer, Embry-Riddle Aeronautical University, USA—*The Myth of the Unstable Approach.*

Werner Naef, Air New Zealand—*Human Factors in Stressful Team Situations: A View from an Operational and Training Perspective.*

WGCDR Peter Wood, Directorate of Flying Safety, Australian Defence Force—*Maintaining an Aircraft Accident Investigation Capability in the Military.*

Robin Tydeman, Air Accidents Investigation Branch, UK—*The Use of Flight Simulators in Accident Investigation.*

Dr. Robert R. Crispin, Embraer-Empresa Brasileira de Aeronáutica S/A, Brazil—*Air Safety Investigation in the Information Age.*

Keith McGuire, National Transportation Safety Board, USA—*Advanced Techniques for Using Physical Evidence to Solve Mid-Air Collision Angles.*

Dr. Graham Braithwaite, Cranfield University, UK—*Reinventing (with Wheels, Wings and Sails)—A New Look at Transport Accident Investigator Training.*

Dr. Paul Werner & Richard Perry, Sandia National Laboratories, USA—*The Role of Lessons Learned in the Investigate, Communicate, Educate-Cycle for Commercial Aviation. [Paper was submitted but not orally presented.—Editor].*

Kym Bills, Executive Director Australian Transport Safety Bureau—*Aviation Investigation in Australia: Sex, Drugs, Rock 'n roll, and the Law. (Presentation was in PowerPoint format without text narrative.—Editor]*

***Above:* Surfers Paradise at night.**
***Left:* A Surfers Paradise pedestrian street mall.**

working groups, committees, and societies. Of particular importance was the annual membership meetings conducted by President Del Gandio. He reported on the installation of the new Executive, the financial health of the organization, and some of the details from the International Council meeting conducted just prior to the start of the seminar. He continued to encourage volunteer participation in the working groups to ensure the stability of the professional side of the organization.

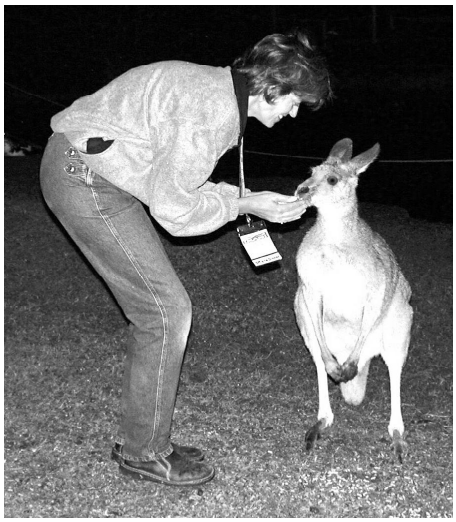
Social activities

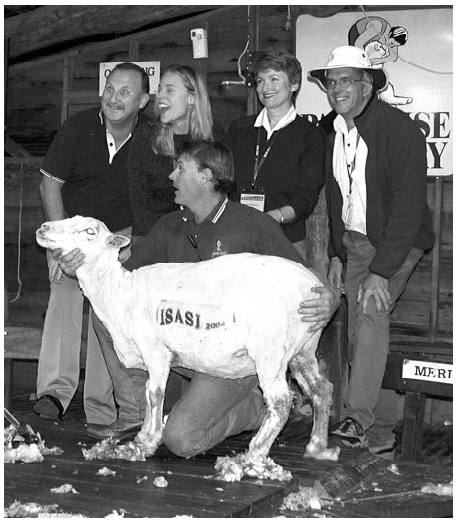
Planners of days' long seminars are quite aware that to keep the attention of the audience, meaningful distractions are needed. At ISASI 2004, this was amply provided by the location for private and individual treks and organized ones as well. Companions, too, were well looked after with tour activities planned for 2 of the 3 days the seminar was being conducted. Companions got a taste of the aquatic as they toured the inland waterway. On yet another day, they visited Springbrook National Park with its commanding views, a glowworm habitat, rainforest walks, and its bric-a-brac shopping areas.

As always, on the evening before the start of the general session, a casual-dress welcoming reception was held to let attendees shake off travel weariness and to greet and meet friends. Following the first day's presentations, and with only 30 minutes to make the change to casual dress, delegates and companions boarded busses for an evening of "a slice of the Outback," at a recreational area known as Paradise Country. Unfortunately, many of the outdoor events were marred by a light rain and chilly weather. Still, strolling on walking paths among tree-branch-hugging koalas, feeding free-roaming joeys, watching whip-cracking horse riding demonstrations, and boomerang-throwing spectacles can take away a lot of chills. Even more absorbing was a showman's demonstration of "range" sheep shearing, especially when ISASI visitors "volunteered" to handle the wool. The most rousing activity of the evening was the indoor barbecue, complete with an evening of dances displayed by indigenous dancers, followed by raucous "boot scootin" music to which the merrymakers danced the evening away.

Once the technical sessions ended, the final day was devoted to pure relaxation. Two busses carried ISASI fun seekers to Tamborine Mountain, with its breathtaking views and where leisurely walkers through rain forests viewed ageless ferns and trees of very unusual sizes and shapes, and water so pure it could be gulped from the stream. During the day, a stop was made at the Albert River Winery. Wine tasting preceded a sumptuous lunch at the winery's Varandah restaurant. During the tasting, the wine master dispelled some myths often held about wine: Wine is not laid on its side to preserve its quality, but to save storage space. Cork is not the best material to use as a bottle cap, aluminum scores highest. Uncorking a bottle does little to let the wine breath, as air cannot penetrate the liquid. By the end of the day of mountain strolling and wine tasting,

Morning and afternoon coffee and tea breaks are an important part of the seminar's "talk time."





Left: **Feeding time.** ***Center:*** **Koala country.** ***Right:*** **Shearing volunteers reveal hidden message under sheared wool.**

ISASI visitors enjoyed the tour bus trip to the hotel.

Awards banquet

The Awards banquet, at which the coveted Jerome E. Lederer Award is presented, is always the main social event of the seminar. The occasion is also used to recognize those who provide value to the Society throughout the year.

But before the official activity occurs, comes the crowd mixing, entertainment, and dinner. The banquet room seated some 400 people at round tables set for 10 persons each. Lavishly filled buffet tables lined the room, and bottles of refreshment, white and red, were placed on each table. Following the meal, a comic entertainer, who concentrated his skits on the differences between men and women, kept the crowd in laughter and agreement either from the men or women in the audience, depending on which sex was being gored.

Later, President Del Gandio formally introduced the winner of the 2004 Jerome E. Lederer Award: Ron Chippindale.

Following the presentation, and keeping to his character, Ron made a few brief remarks (see page 14), which included thanking all ISASI members. He expressed it this way: "I discovered the advantages of the ISASI fellowship early in my career. No overseas or domestic mishap in which I was involved was without generous support from one or more state agencies or manufacturers, often obtained in a large measure from contacts made through our Society. The Lederer Award will most certainly take a place of honor in our home, and the memory that it is given in respect of aviation's 'Father of Aviation Safety' fills us with humble pride."

President Del Gandio also presented newly designed ISASI Fellow pins to Curt Lewis and Ron Chippindale. The other 13 ISASI Fellows will receive pins by mail. He also noted that it is corporate membership that helps account for a great deal of what ISASI is able to accomplish. He announced the new Corporate members: BEA-Bureau d'Enquêtes et d'Analyses, University of North Dakota-Aerospace, South African Civil Aviation Authority, Aircraft Accident Investigation Bureau-Switzerland, State of Israel Ministry of Transport-Aviation Incidents and Accident Investigation, and the German Federal Bureau of Aircraft Accidents Investigation (BFU).

The closing ceremony of ISASI 2004 was the traditional passing of the "Call to Order Bell" to ring the opening of ISASI 2005. Lindsay Naylor presented the bell to Curt Lewis, whose Dallas-Ft. Worth Regional Chapter will host ISASI 2005 at Ft. Worth, Sept. 10-17, 2005. ◆

Above and left: **Banquet night is always the social event most looked forward to. And ISASI 2004 did not disappoint its revelers.**

The Challenges For Air Safety Investigators

By Shannon Harris (ST4983)

(Shannon Harris, from Embry-Riddle Aeronautical University (ERAU), Florida, USA, was selected as the recipient of the 2004 ISASI Rudolf Kapustin Memorial Scholarship. Her winning essay superbly identifies the challenges ASI's face during their investigations. —Editor)

The profession of air safety investigators is inherently challenging. The purpose of all aircraft accident investigations is to solve two crucial questions, "Why did this accident occur?" and "How can we keep this accident from occurring again?" Air safety investigators must put together the pieces of a puzzle to come up with solutions to these simple, yet challenging, questions. Unfortunately, the puzzle pieces are sometimes missing or very small and difficult to comprehend. This creates the main challenge that all air safety investigators must face.

When learning of an accident, investigators don't really know what to expect until they reach the site. This is where air safety investigators meet their first challenge. The wreckage may be located in any number of places, terrain, or climates. Any of these factors can cause difficulties when trying to examine wreckage. The first thing that must be accomplished is securing the site. Unfortunately, an investigator may be too late, and there may have been tampering with evidence, hazardous materials present, or ephemeral evidence that was not readily saved. There are so many numerous factors that can affect investigations; it is hard to pinpoint just one.

If an investigator is lucky enough to have the accident witnessed, interviewing the witness can be a challenge in itself. Witness interviews are challenging because the investigator must be unbiased and refrain from asking leading questions. The witnesses must feel at ease if they are to impart what they know. Investigators must be able to talk to all different kinds of people at any time. They must also speak with the witness before the news media do. The media tend to ask leading questions of witnesses. This can put ideas into witnesses' heads that they may later remember as being fact.

Being able to deal with all sorts of people is also important for choosing parties to the investigation. Parties to the investigation should be people who are representatives from the company that built the aircraft and powerplant and government officials. Investigators should be wary of people who have their own agendas in mind, such as [professions with personal gain at stake]. Parties to the investigation are supposed to be helping to solve the problems, not increasing workload.

Another problem that investigators face is technology. Technology is rapidly progressing into commercial, as well as general aviation, cockpits. Glass cockpits and digital readouts may look flashy and pilots may want to fly with them, but glass cockpits pose a serious problem for air safety investigators. The analogue gauges, sometimes known as steam gauges, that were utilized in the past are much more useful because they can tell a story. Analogue gauges can capture needle readings on the glass front of the instrument. The entire instrument can be sent back to the manufacturer. While there, the instrument can be tested to see if it was operational at the time of the accident and, if so, was the instrument displaying accurate readings. Digital readouts cannot capture this. Unless the aircraft is equipped with a flight data recorder, the data [of the type recorded] at the time of the accident are gone.

The surge of glass cockpit productions isn't the only problem facing modern investigators. Another rather recent challenge for air safety investigators revolves around composite materials. Manufacturers have started to turn to composites because they are cheaper to make, lighter than metal, yet just as strong, and can be molded into complex, compound curves with greater ease than metals. Problems start to arise during accident investigations in which composites have burned. They release microscopic, electrically charged fibers into the air. These fibers pose a serious threat to investigators. Sharp fibers can damage lungs and cause extreme discomfort if they become lodged into the skin. Electronics are also at risk. When the fibers come into contact with electronics, such as a laptop, the equipment will be shorted out and will no longer function.

Composites are also harder to investigate because they do not "have a memory" as metals do. Metal fatigue is easier to spot than composite fatigue. Composite fatigue is often on the microscopic level when it hasn't been manufactured properly, so investigators can-

(continued on page 31)

About the Author:
Shannon Harris, a student ISASI member, is currently a senior at ERAU and working toward a B.S. in human factors psychology with a minor in aviation safety. At the time of her essay writing, she was enrolled in an aircraft crash survival analysis and design course. She lives in Daytona Beach, Fla., and her tutor and academic supervisor is Don Hunt, also an ISASI member.

Ron Chippindale: 2004 Lederer Award

By Esperison Martinez, Editor

The International Society of Air Safety Investigators (ISASI) bestowed upon Ron Chippindale, a Society Fellow, the coveted 2004 Jerome F. Lederer Award. ISASI President Frank Del Gandio made the presentation at the Awards dinner on the last evening of ISASI 2004, the annual air safety seminar, held on Australia's Gold Coast. The Award is conferred for outstanding lifetime contributions in the field of aircraft accident investigation and prevention and was created by the Society to honor its namesake for his leadership role in the world of aviation safety since its infancy. Jerry Lederer "flew west" on Feb. 6, 2004, at age 101. Awarded annually by ISASI, the Lederer Award also recognizes achievement of the Society's objectives and technical excellence of the recipient.

Chippendale's short acceptance speech exemplifies the characteristics of his demeanor and accident investigative manner known to so many of his peers: short on banter and long on meaningful action. Upon addressing the near 400 persons attending the Awards dinner he said: "We have made many good friends in the 30 some years we have been attending ISASI seminars. Since I joined ISASI in 1971, I have been in awe of those who have been nominated for the coveted Jerry Lederer Award. To have myself been selected for this honor is rather overwhelming. From very early on, Jerry and his wife, Sarah, exchanged views with my wife, June, and me whenever we met at a seminar. We will miss this contact.

"I discovered the advantages of the ISASI fellowship early in my career. No overseas or domestic mishap in which I was involved was without generous support from one or more state agencies or manufacturers, often obtained in a large measure from contacts made through our Society.

"Stress has been referred to several times in the course of this seminar, and from my experiences in the controversy surrounding the outcome of the investigations into the major air carrier accident known to many as 'Mt. Erebus,' I can attest to emotions one experiences from stress. In this respect, I should like to express my appreciation for the support June and I received from so many ISASI members and their partners.

"Ladies and gentlemen, this award culminates a career involving June and me in nearly 40 years of accident investigation. The Lederer Award will most certainly take a place of honor in our home, and the memory that it is given in respect of aviation's 'Father of Aviation Safety' fills us with humble pride. Thank you."

In presenting the awardee to the audience, President Del Gandio said, "Ron Chippindale exemplifies the highest level of professionalism in the field of accident investigation and is truly worthy of receiving this year's Jerome F. Lederer Award." The Award citation read, "Presented to Ron Chippindale for outstanding contributions to technical excellence in accident investigation."

President Del Gandio noted that one of Ron's most illustrious investigations was the 1979 crash of a Air New Zealand DC-10 that descended into an ice field near Mt. Erebus killing 257 Antarctica sightseers. "As investigator-in-charge (IIC) of the accident, his work on that case has been described as nothing short of brilliant, gaining for him international attention and respect. With a very small team, he managed an investigation that is said to be New Zealand's equivalent of TWA 800. The investigation was conducted in a very difficult environment, both politically and culturally. Political pressures challenged his findings, but he survived, steadfastly expressing himself and standing by his principles on behalf of safety," said Del Gandio.

Chippindale serves as New Zealand Councillor to ISASI. As such, he is a sitting member of ISASI's International

"We have made many good friends in the 30 some years we have been attending ISASI seminars. Since I joined ISASI in 1971, I have been in awe of those who have been nominated for the coveted Jerry Lederer Award. To have myself been selected for this honor is rather overwhelming."
—Ron Chippindale

Council, which sets direction and policy for the Society. "His contributions have added extra dimension to ISASI's deliberations and issues resolution, providing valuable international perspective. A quiet demeanor often disguises his technical and leadership skills, and his associates always appreciate his ability to think 'outside the box,'" Del Gandio told the audience. A member of ISASI since 1971, Chippindale has been an active participant in its operations. In 1986 and in 1996, he led groups that hosted the

i Recipient

ISASI international seminars in Rotorua and Auckland. Since 1971, he has attended every ISASI seminars, except for three, and was instrumental in developing regional seminars in connection with the Australian Society of ISASI. He is a Fellow in both ISASI and the prestigious Royal Aeronautical Society (RAeS).

His aviation career began in the Royal New Zealand Air Force where he served for 23 years as a transport and instructor pilot. He was the flight safety officer during his last 9 years with the military. This introduced him to the world of accident investigation.

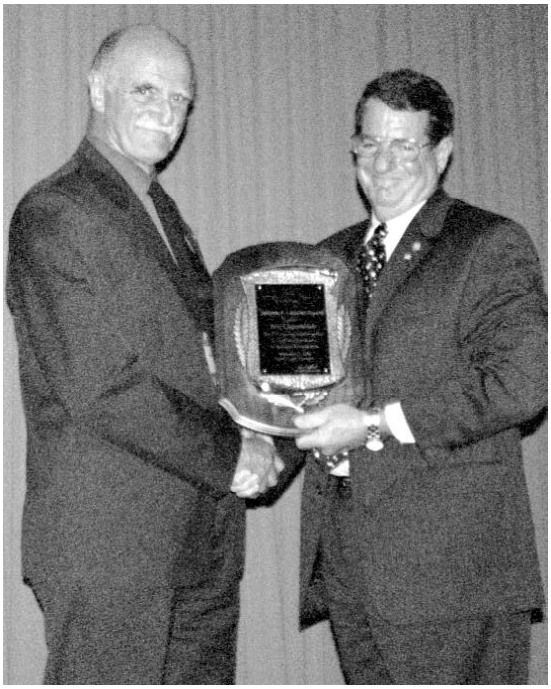
In 1974 he started his career with the government's civil aviation Office of Air Accidents Investigation. He subsequently was promoted to chief inspector and manager of the office. When the office was disbanded in 1990, he became the chief inspector of the new multimodal Transport Accident Investigation Commission and acted as the chief executive of the Commission for its first 2 years of operation. Before retiring in 1998, Ron was the investigator-in-charge of 48 aircraft, marine, and rail accidents and incidents and overall responsible for more than 400 investigations.

Recognizing the long-term investigator's expertise, ICAO has developed a long-standing relationship with him. In 1986 he worked with the ICAO Technical Cooperation Bureau, assisting in the South African investigation where a TU314 aircraft, operated for Mozambique by the Russians, was lost, resulting in the death of the president of Mozambique. In 1993, when the Russian Federation finally made the flight recorders available to ICAO in the shoot down of the Korean Airlines B-747 Flight KLA 007, over Sakhalin Island, ICAO assigned him to the team in the reopened investigation. He has been an enthusiastic supporter of the ICAO AIG meetings, and has served several times as a consultant assisting in various projects including the development of the ICAO circular on family assistance and enhancement to the ICAO ADREP data system.

The presentation of the 2004 Lederer Award to Chippindale marks the first selection of someone outside North America since 1998. Equally as meaningful was that the seminar was being conducted in Australasia close to the selectee's own "territory," where his prominence as an air safety advocate is so well appreciated. Indeed, it was the years of experience that created such prominence and demonstration of that experience to which President Del Gandio's alluded in his presentation comment: "I am truly honored to bestow the prestigious Jerry Lederer Award to Ron Chippindale, who exemplifies the highest qualities of an air safety investigator." ◆

Past Lederer Award Winners

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



E. MARTINEZ, EDITOR

Ron Chippindale, left, recieves the 2004 Jerome F. Lederer Award from ISASI President Frank Del Gandio at the Awards dinner during ISASI 2004.

CT Aids Investigating Dilemma

Should an accident investigator test components first and then disassemble the units, or disassemble then reassemble and test? Computer tomography (CT) helps answer the question.

By Scott A. Warren
National Transportation Safety Board

(This article was adapted, with permission, from the author's presentation entitled Use of Computed Tomography Imaging in Accident Investigation *presented at the ISASI 2003 seminar in Washington, D.C., USA, August 2003. The full presentation is available on the ISASI website at* www.isasi.org.*—Editor)*

Investigators for the National Transportation Safety Board (NTSB) have recently started using computed tomography (CT) scanning (formally known as computer-aided tomography or CAT scanning) to provide images of the internal workings of selected components. The use of these images has allowed investigators to better understand the internal condition of the components of interest and make better decisions regarding the "test first" or "tear down first" questions.

The use of computed tomography imaging in accident investigation has come about from a need to determine a part's exact condition after it is recovered from an accident scene. The primary goal of the aircraft systems investigator is to determine if a part was malfunctioning at the time of the accident. Once reasonably intact parts are recovered, systems investigations typically follow one of two paths. The parts can either be tested immediately and then disassembled, or they can be disassembled first, then reassembled and finally tested.

Both testing and disassembly are activities that can help the investigation, but regardless of which path is chosen first, the part becomes irrevocably altered for later parts of the sequence. Immediate testing can lead to damaging the part or shifting the positions of internal components away from their accident positions. Immediate disassembly can alter the internal arrangement of the part so that subsequent testing after reassembly is not representative of the part as it was recovered.

Previously, the only technological aid available to an investigator who needed to look inside a part was a simple X-ray, also known as a radiograph. While useful in many cases, radiographs do not allow an investigator to get a complete sense of the internal condition of a part. The use of computed tomography or CT scanning has allowed for a quantum leap in information for the investigator. This is due to the greatly improved resolution inherent in that process and the image enhancements available through digital processing.

Basics of radiology

A standard X-ray image or radiograph is the type of image with which the general public is most familiar. This is the type of image most often used by doctors when they order an X-ray (radiograph) of a broken bone. It is made by illuminating a component using an X-ray source and measuring the attenuation of the X-rays after they emerge from the other side. In general, high-density materials within the component will absorb more X-ray energy than low-density materials. The resulting image shows a two-dimensional projection of the X-ray attenuation (or density) variations within the part.

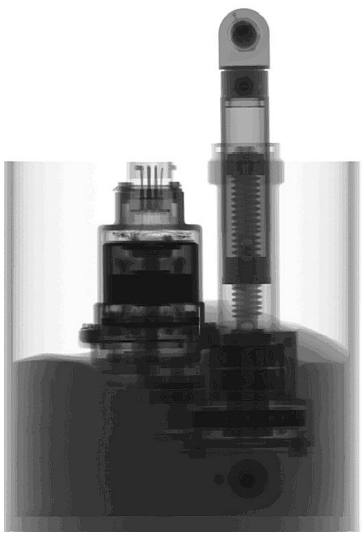


Figure 1

Generally, in industrial radiographs (as opposed to medical radiographs) darker items in a radiograph represent higher X-ray attenuation or high-density material, and the lighter items represent less X-ray attenuation or low-density material. In most components, this density

About the author: Scott Warren *is the team leader for the aircraft systems investigators at the National Transportation Safety Board, where he has worked since 1997. He has been involved in numerous accident investigations including the space shuttle* Columbia, *Sen. Paul Wellstone accident, TWA Flight 800, SilkAir Flight 185, and EgyptAir Flight 990 investigations. He came to the Safety Board after spending 11 years developing and conducting flight test programs for the U.S. Navy. He holds a B.S. degree in aeronautical and astronautical engineering from Purdue University and is a graduate of the U.S. Navy Test Pilot School.*

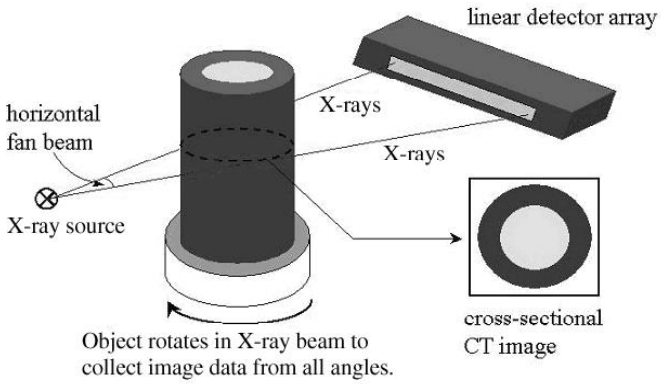


Figure 2: CT image creation.

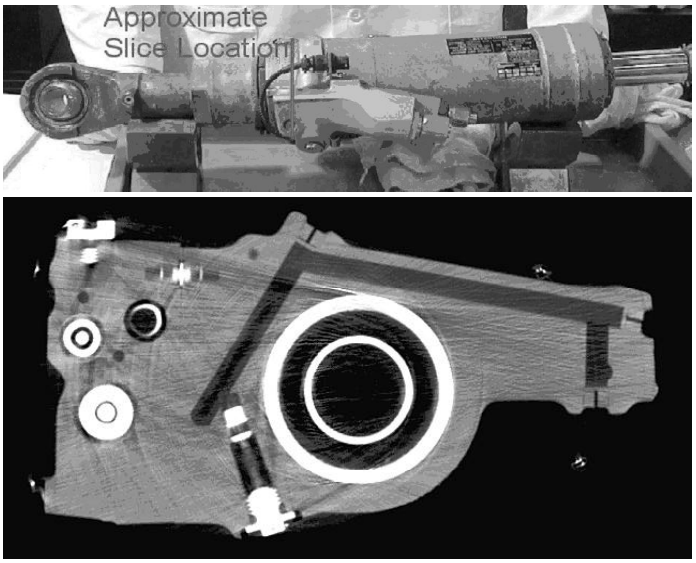


Figure 3: Airbus A300 servoactuator (top), axial slice CT image (bottom).

variation type of image can be interpreted to show the internal arrangement of the part.

In Figure 1, the internal arrangement of a screw-type actuator (from the Airbus A300 directional control system) can be determined. In the image, items such as the actuating screw, wires for the connector, and the connector pins can be readily distinguished. At the bottom of the image, it is more difficult to distinguish items such as gears and shafts.

A radiograph may be produced either as a conventional radiograph or a digital radiograph. The difference between the two involves the recording medium used. A digital radiograph uses a photo-detector to record the X-ray intensities while a conventional radiograph is recorded on film. The resulting images are similar in many ways, but a digital radiograph can be processed and enhanced using computer software.

In any case, the limitation of a radiograph is clear—there is no way to determine the complete spatial relationships between the different components from the image. The image presents a two-dimensional "shadow projection" of the part with all of the internal components superimposed on each other.

Computed tomography

Computed tomography (CT) scanning is a process where an image is produced by assembling a large number of X-ray

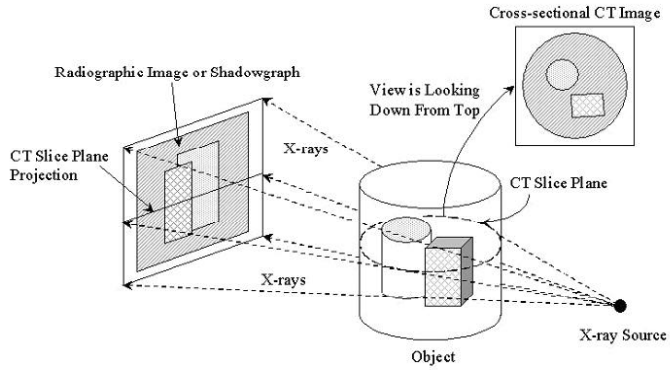


Figure 4: CT and radiograph image creation.

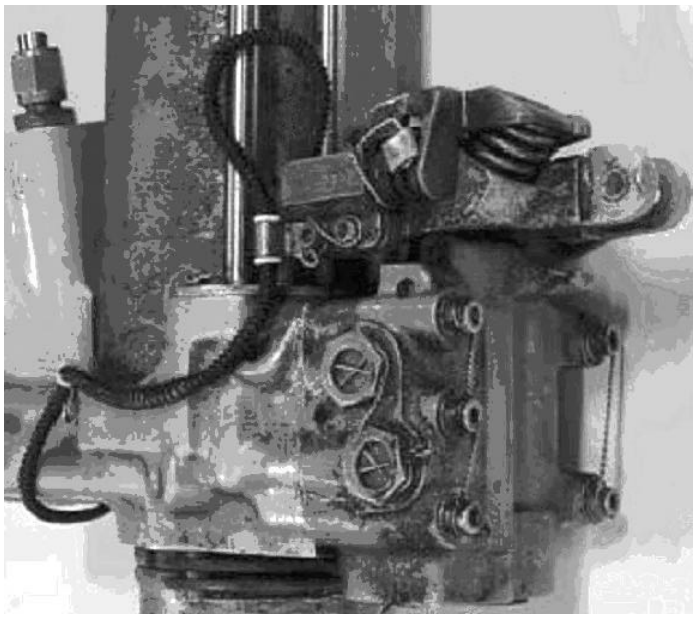
projections taken from many different angles around an object. The process of reconstructing an image based on multiple projections has been understood on a theoretical level since the early 1900s. The Austrian mathematician Radon provided the mathematical framework for the concept. Dr. Godfrey Hounsfield developed the first practical application of CT imaging, and he shared a Nobel Prize for this work with physics professor Allan MacLeod in 1979.

A CT image is produced using equipment similar to that used to produce a radiograph. An X-ray source is used to illuminate the object, and then a detector is used to record the resulting X-ray intensity. The X-ray source is designed to produce a very thin beam of X-rays so that only a small slice of the object is illuminated at any one time.

The use of computed tomography or CT scanning has allowed for a quantum leap in information for the investigator. This is due to the greatly improved resolution inherent in that process and the image enhancements available through digital processing.

After each image is taken, the object is rotated slightly to produce another image from a slightly different direction. Each image is stored in a computer as a single projection. After a complete 360-degree rotation of the object is completed, the computer reassembles the complete CT slice image based on the information contained in each individual projection image. The resulting CT slice image is a thin cross-section of the item being scanned (see Figures 2 and 3).

The differences between the radiograph and the CT images can be further explained by referring to Figure 4. In this figure, differences in viewpoints between the two imaging methods are clear. The radiograph produces a shadowgraph



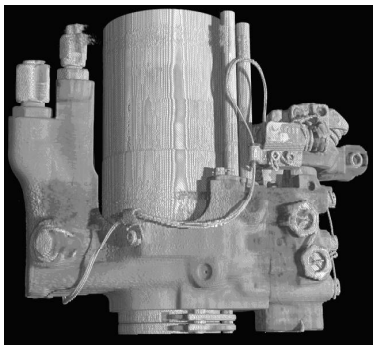


Figure 5: Airbus A300 servoactuator reconstructed from individual slice image (left) and photograph (above).

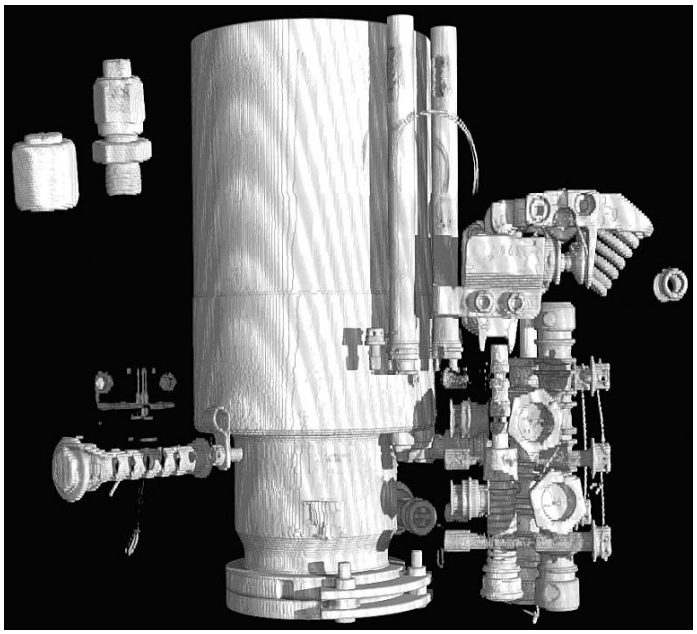


Figure 6: CT image of servoactuator with low-density materials digitally removed.

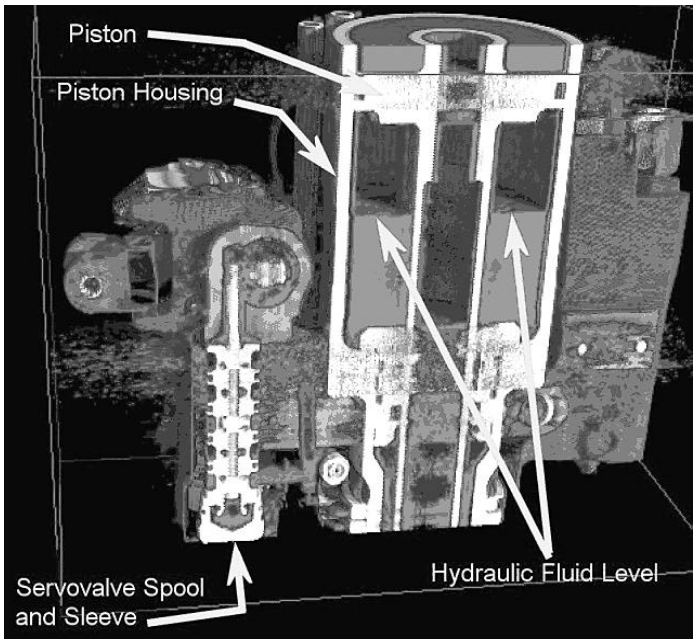


Figure 7: Servoactuator with front portion digitally removed.

containing superimposed images, while the CT image contains an "overhead" view of a single slice of the objects.

In creating the image, the computer assigns a digital gray level value to each image pixel (picture element) based on the X-ray attenuation values. The pixel size is dependant on the field of view of the detector and the number of pixels in the image. Typically, images used by the NTSB have pixel sizes on the order of 0.25 millimeters. Since a CT image represents a slice of finite thickness, each pixel in the image represents a very small volume of the object being scanned. The slice thickness, combined with the pixel area, creates a volume of material represented by the brightness value assigned to each pixel. When discussing CT images, the term "voxel," meaning volume element, is commonly used instead of the term pixel.

The CT scan equipment can be adjusted to create slices of various thicknesses. A thin slice (on the order of millimeters or even a fraction of a millimeter) is desired since the image properties (gray level value) for each location within the cross-sectional image are based on an average of that location's material properties throughout the entire thickness of the slice. Images created using thick slices will have brightness values assigned to a given voxel based on a wide range of densities contained in the slice. Thinner slices have a smaller range of material densities contained within them, so the gray level values assigned to each voxel provide better resolution. Typically, images used by the NTSB have slice thicknesses on the order of 1 mm or less.

By combining many of the slice images together, a three-dimensional image can be created. Since each slice represents a thin volume of the object being scanned, software can be used to reconstruct the full object's volume. The upper image in Figure 5 is an example of a CT image of an Airbus A300 rudder servoactuator that was created by combining more than 250 slice images. Each slice in this image was approximately 0.95 millimeters thick. The lower image in Figure 5 is a photograph of the same servoactuator from a slightly different angle.

Enhancing CT images

The CT image shown in Figure 5 demonstrates the level of resolution and detail that a CT image can provide. Small items such as electrical wires, wire clips, and safety wire can easily be seen. However, a view of the outside of the object is not particularly useful in an investigation. It is the ability to create

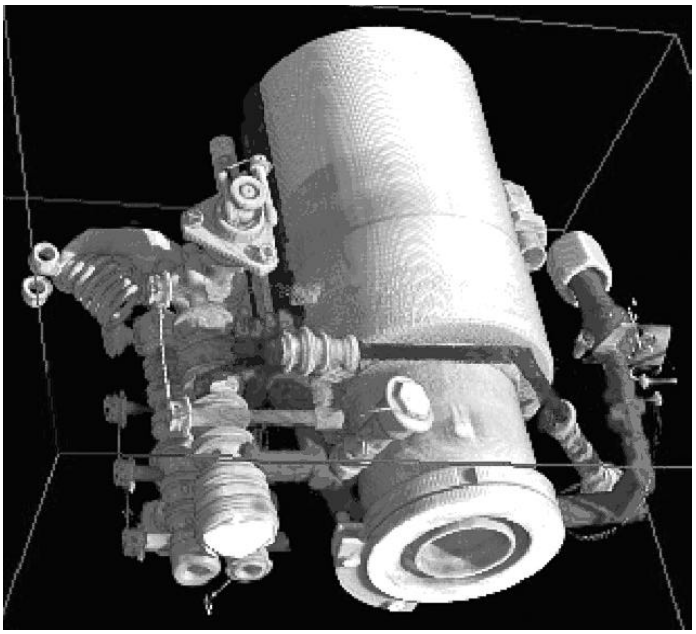


Figure 8: Hydraulic passage in the Airbus A300 rudder servoactuator.

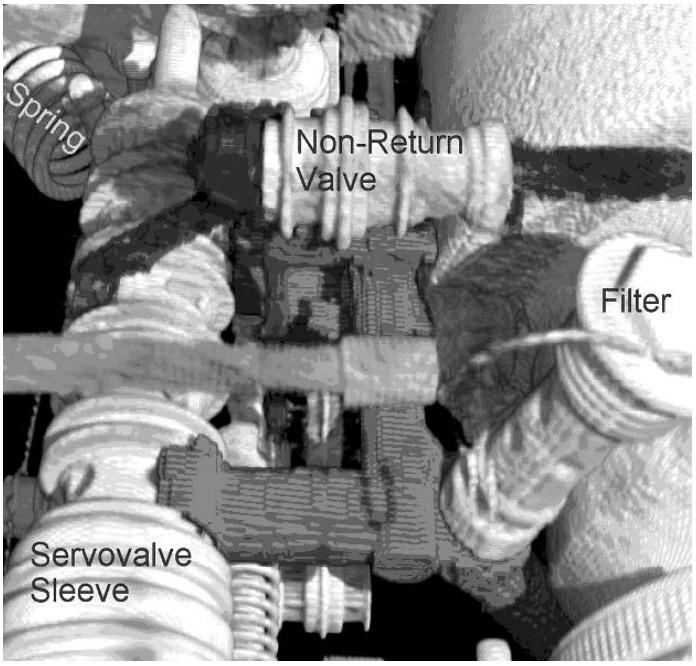


Figure 9: Close-up view.

useful views of the inside of the object that makes CT images so valuable.

Since the CT image is created digitally, software can be used to enhance the investigator's use of the information contained in the scan. Different materials in the scanned object create different X-ray attenuation levels at the detectors, and these differences can be used to classify and select different parts of the image based on their material properties. The aluminum manifold housing and other lower density items create a very different X-ray attenuation value than the steel inner mechanisms in the actuator pictured in Figure 5. If the low-density items are digitally subtracted from the image, the steel inner mechanisms remain. The resulting image is shown in Figure 6.

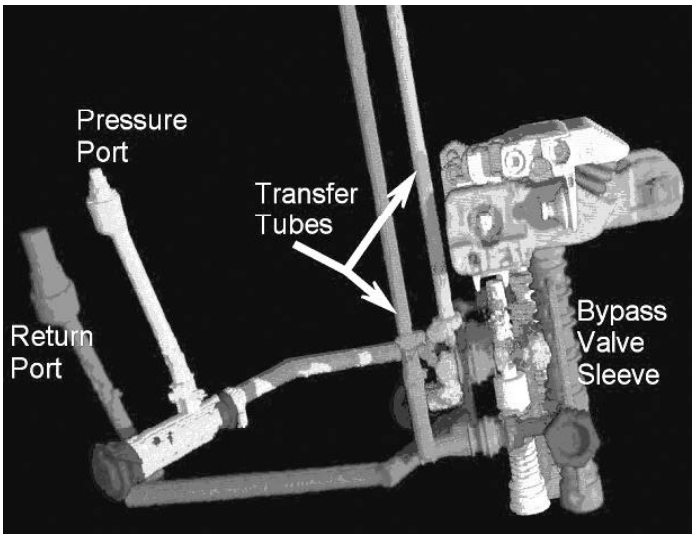


Figure 10: View of a network of hydraulic passages in the Airbus A300 rudder servoactuator.

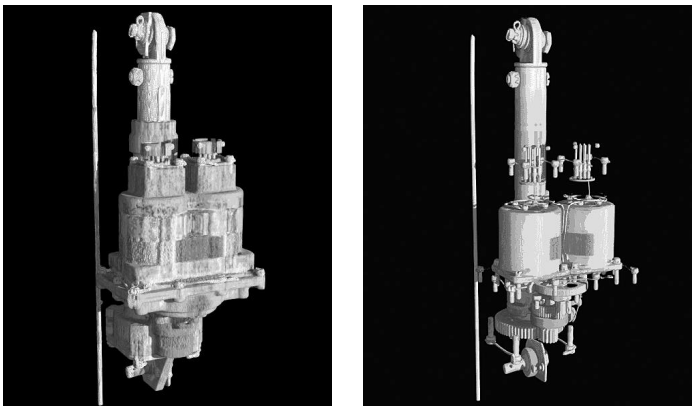


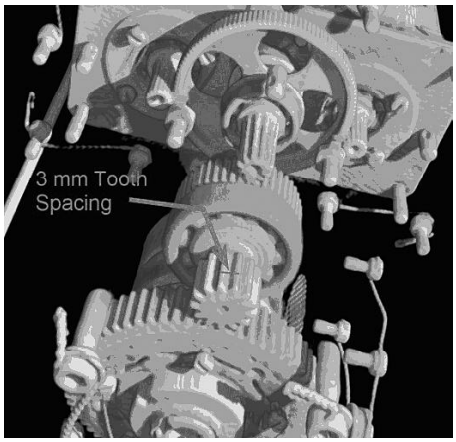
Figure 11, 12: CT image of A300 variable stop actuator, left, and same with low-density housing removed, right.

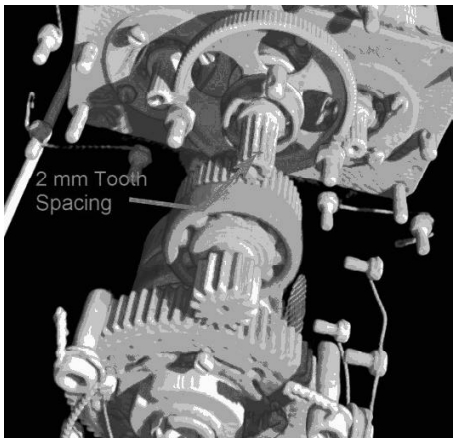
The view of the inside of an object can be further enhanced through the use of color and through the use of cut planes, which digitally slice through an object and let the investigator view a cutaway view of an object. In Figure 7, the hydraulic fluid (and other low X-ray attenuation items) in the servoactuator are colored red, and the manifold housing is colored green. The highest density parts (parts with the highest levels of X-ray attenuation) are colored white.

The view in Figure 7 shows how the servoactuator appears when the front half of the unit is digitally removed. The piston housing and piston are visible as are the main servovalve spool and sleeve. Looking carefully within the piston housing, the level of hydraulic fluid can be determined.

Case studies

Hydraulic fluid passages—The hydraulic fluid passages in a servoactuator can be visualized with CT imaging. Hydraulic fluid is represented on CT images with a specific range of attenuation values. By processing the image based on that range, the complete set of hydraulic fluid passages can be created in an image. This can be of value to an investigator trying to determine either if there are blockages in the hydraulic passages (which may appear in the images as an ab-





Figures 13, 14, 15: CT images of gear train showing 3, 2, and 1 mm tooth spacing.

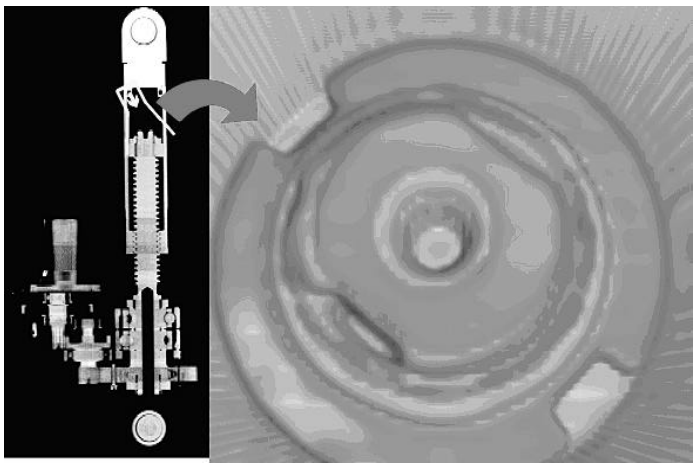


Figure 16: CT image of end fastner assembly from inside the screw housing.

sence of fluid) or if there are any cracks or leaks in the servo-actuator. The visualization of hydraulic fluid passages is shown in Figures 8, 9, and 10.

When trying to look for hydraulic fluid passage blockages, the investigator must be aware of what digital processing is being done. Low-density blockages can be inadvertently removed when noise is digitally subtracted from the image. In addition, the range of values to use for hydraulic fluid should be carefully constructed. Too large a range could lead to inadvertently including the blockage in the image, and too small a range could lead to inadvertently giving the appearance of a blockage. Obviously, the presence of excessive noise in the image will make the job of creating a viable range much more difficult.

Gear train examination—One of the benefits of CT scanning's high resolution is the ability to examine the details of a part's gear train. The alignment of the gears, the absence of teeth in a gear, and the rotational position of a gear set can all be determined in a CT scan.

The NTSB examined a screw-type actuator from the A300 directional control system that was driven by electric-motor-powered gears. The overall view of the actuator is shown in Figure 11. Once the low-density housing is digitally removed, the components of the gear train are visible (see Figure 12). Zooming in on the gear train, the individual teeth of each gear can be examined. As shown in Figures 13, 14, and 15, individual teeth with spacings down to 1 mm can be seen in the images.

An additional benefit of the digital nature of CT scans is that they allow for observations from viewpoints that would be extremely difficult to reach, even if the part was disassembled. The CT image viewing software used by the NTSB contains the capability to use a camera and viewing vector system to allow the investigator to virtually view the component from any angle. In Figure 16, the "camera" (arrow) has been placed inside the screw housing of the actuator, and the field of view (lines spreading out from the arrow) has been pointed at the fastener on top of the screw. This viewpoint allows the investigator to determine if the fastener is present, and to possibly determine if it is fastened properly.

Drawbacks of CT scans

There are some drawbacks to using CT scans in accident investigation. One of the principal drawbacks is the amount of time required to acquire the scan. Since there are not very many organizations with the capability to perform these scans, the parts must sometimes be transported long distances. The organization doing the scan then has to fit the components into its schedule. Finally, the scans themselves can sometimes take several hours or even 1 or 2 days to perform.

Once the scans are complete, the reviewing investigator must continually keep in mind that even though the images are photographic in nature, they are not photographs. Unlike a photograph, the CT images have been digitally enhanced to provide specific views. These enhancements, while making some parts of the image stand out, can also inadvertently filter out important information. It is important that the investigator using CT imaging take the time to understand the process and be aware of the digital manipulations being done to the image.

Computer tomography imaging provides significant benefits when compared to standard X-rays or radiographs. NTSB investigators have used these capabilities to examine hydraulically driven servoactuators as well as electrically driven screw-type actuators with complicated gear trains. The use of CT imaging has allowed the investigators to gather significantly more information when trying to decide if testing the part first or disassembling the part first is the appropriate course of action. ◆

The Silent Killer

Aircraft accident investigators have failed to define a serious "failure-to-feather" mode of the full feathering propeller, which has spawned a silent killer.

By Jack C. Lipscomb (MO2290), Richard H. McSwain (MO3273), and Mark B. Hood

Many aircraft accidents have occurred involving twin-engine aircraft following a malfunction of one of the engines. Generally, the circumstances surrounding the accident indicate that the aircraft should have been flyable with a single engine combined with proper use of emergency procedures. More often than not, the post-crash accident investigation revealed that the propeller on the failed engine was not feathered at the time of ground impact. In one such accident that occurred in Florida, the Cessna 421 pilot who survived a "failure to feather" was adamant that he could not feather the engine.

After a French aircraft accident that occurred on Nov. 7, 1996, involving a Cessna 421C with McCauley Model 3FF 32 C501-A propellers, the French government made recommendations concerning "blocked" propellers. It found that the right-hand engine suffered a rupture in the crankshaft while the aircraft was cruising at Flight Level 200. This resulted from a crack that had developed on rod journal No. 5. Additionally, it found that below 600 RPMs, the propeller governing system prevented the pilot from being able to feather the propeller.

The French report made a safety recommendation that the FAA require Cessna to modify the emergency procedures to take into account that it may be impossible to maintain level flight in the event of a seized propeller in a Cessna 421. It also recommended that the FAA require Cessna to modify the engine restart procedures to allow the pilot to determine the preconditions for continuing flight in the event of a propeller blockage. The French report also recommended that the FAA and other airworthiness authorities extend these measures to all aircraft equipped with propeller governing systems of the same design.

The FAA responded by releasing an airworthiness alert dealing with this issue. The FAA worked with the manufacturer and came to an agreement that the manufacturer would emphasize or duplicate the information already contained in the POH and AFM on the critical operational configuration of the windmilling/blocked propeller on an inoperative engine. The FAA is encouraging airplane manufacturers to consider expanding information in the POH and AFM to increase pilot awareness of the importance of verifying the capability of the propeller to feather during preflight checks as well as providing additional information on in-flight operations involving a windmilling/blocked propeller.

Investigative authorities and industry representatives have been quick to blame failure-to-feather accidents on the failure of the pilot to follow emergency procedures—specifically, failing to feather the propeller on the failing engine, which will normally preclude the aircraft from maintaining level flight. These findings by investigative authorities are troubling when considered in conjunction with the fact that most of these pilots were high-time, well-trained, and recently experienced in the aircraft. It is difficult to believe that experienced pilots are simply forgetting to feather the propeller as they work through their emergency procedures.

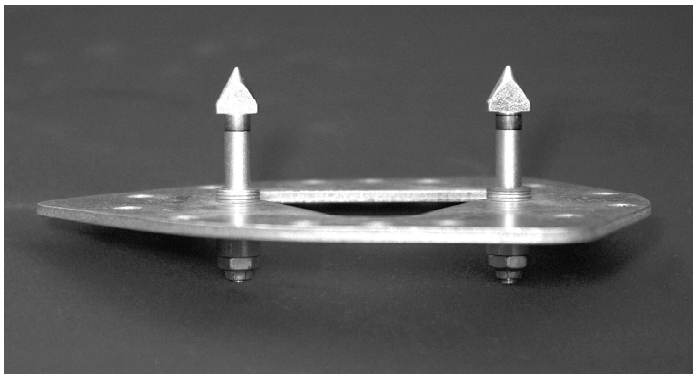
A common thread in most accident investigations involving unfeathered propellers is the absence of any inquiry as to whether the failure of the propeller to feather and the ensuing accident were due to a mechanical, rather than an operational, cause. In other words, could the feather mechanism have failed to operate despite the pilot's efforts?

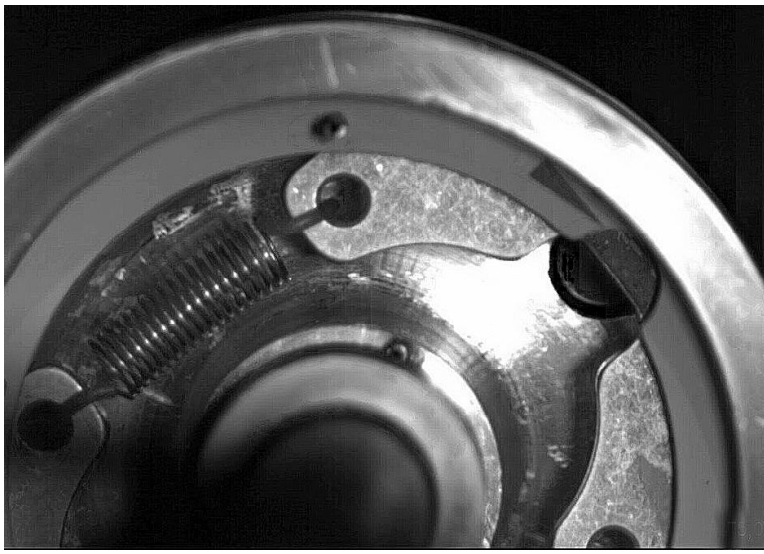
A project was undertaken by Lipscomb & Associates and McSwain Engineering, Inc., to determine potential failure modes that could prevent a propeller from being feathered following an engine malfunction. The McCauley propeller was chosen as a propeller typically installed on a Cessna twin-engine aircraft. This propeller, of the constant-speed and full-feathering type, is a single-acting unit in which hydraulic pressure opposes the forces of springs and counterweights to obtain the correct pitch for engine load. The propeller is feathered by removing the hydraulic pressure from the piston when commanded by the pilot. This is accomplished by dump-

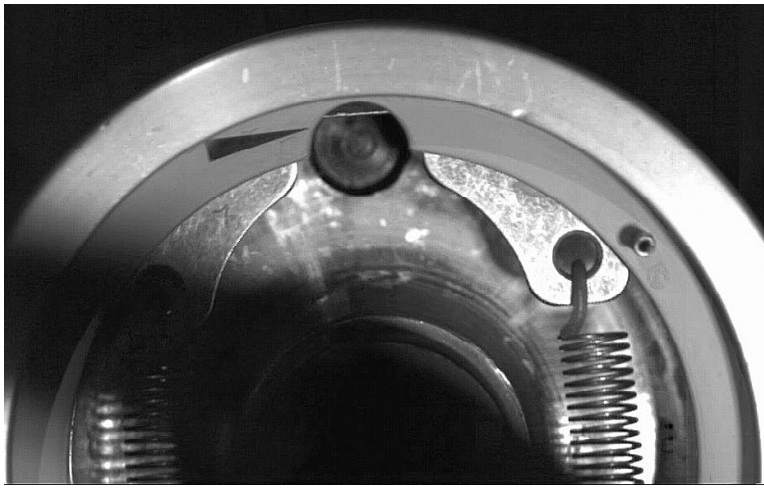
About the authors: Jack C. Lipscomb *has served as a consultant/expert in aircraft accident investigation and reconstruction since 1980. A former NTSB air safety investigator and senior instructor at the agency's National Accident Investigation School, he holds an ATR with commercial privileges aircraft and rotorcraft.*

Richard H. McSwain, Ph.D., P.E., *has worked in the materials engineering and materials failure analysis field continuously for the past 27 years. He holds a doctorate in materials science and engineering from the University of Florida and a bachelors of materials engineering and a masters of science from Auburn University. He is a registered professional metallurgical engineer in the sate of Florida and holds memberships in numerous technical societies, including ISASI. He is currently the president of McSwain Engineering, Inc, a failure analysis and engineering investigation firm located in Pensacola, Fla.*

Mark B. Hood, P.E., *has worked as a materials engineer for the last 20 years. He holds a bachelor of materials engineering degree from Auburn University. He is a registered professional metallurgical engineer in the sate of Florida and holds a level III certification in five areas from the American Society of Nondestructive Testing. Hood holds memberships with the American Society for Nondestructive Testing, SAE International, and ASM International. He is currently a consulting engineer with McSwain Engineering, Inc.*







Above: Photo shows arrowheads that hold the piston at low pitch when the weights are in.
Top right: Photo shows weight that is <u>in</u> as a result of vibration load being introduced. (High-speed video)
Below right: Photo shows normal position of weight before vibration is introduced. (High-speed video)

ing the pressurized oil to the crankcase. There is a centrifugal latch group in the propeller that allows the propeller to be held in the low-pitch condition when the engine is shut down to aid in the restart of the engine.

Propeller latch group

The latch group consists of a latch plate assembly and the piston, with two centrifugal flyweights. The flyweights move in and out depending on the magnitude of the centrifugal force as the propeller rotates. The flyweights are free floating and held to each other by springs. The latch plate assembly has two latch posts that protrude into the interior of the piston when the piston is in the low-pitch location. The flyweights move inward at low rpm and latch behind the latch posts when the oil pressure is reduced during the engine shutdown. This holds the piston in the low-pitch condition for engine restart. The system is designed such that the centrifugal weights move outward and are clear of the latch posts at approximately 750 RPM propeller speed. The windmilling speed of the propeller is generally much higher than 750 RPMs, which should preclude any mechanical interference.

It was determined during the project that the only mechanical malfunction possible was between the centrifugal flyweights and the latch posts. The only parts of the centrifugal latch group that move are the piston in the longitudinal plane and the centrifugal latch weights in the radial plane. The piston, moved by oil pressure, is not acted upon by an external force. However, the weights are moved by centrifugal force. The external forces that can affect the centrifugal weight location at the higher RPMs are torsional loads, vibratory loads, or any combination thereof.

A dimensional analysis of the propeller system with the weights in their outermost position shows that the clearance between the weights and the latch posts is approximately 0.030 inches.

Vibratory loads

The magnitude of the vibratory load that may cause a flyweight interference problem will vary depending on the orientation of the vibratory load and the plane of movement of the centrifugal weights. A much smaller vibratory load is required if it is applied in the same plane as the movement of centrifugal flyweights. The introduction of a vibratory load can occur at any angular relationship of the propeller to the engine, and can occur numerous times per second.

Mechanical lockup of the propeller is a random event and occurs when the pilot attempts to feather the propeller at the moment when vibratory loads have moved the centrifugal weight inward far enough to interfere with the latch post. The pilot is then faced with trying to maneuver an aircraft with a windmilling propeller.

Laboratory testing was conducted by McSwain Engineering, Inc., to determine the feasibility of this mechanical lockup theory. The initial testing demonstrated that vibratory forces could cause centrifugal fly weight movement that would interfere with the latch post during feathering at propeller speeds as high as 1,400 RPMs. The application of vibratory loads to a rotating plane is quite complex. The vector component that is in plane with the centrifugal weight can be the result of a large out-of-phase vibratory load or a small in-phase vibratory load.

Dynamic testing was conducted in an attempt to define the relationship between the magnitude and phase of the vibratory load with reference to the plane of movement of the centrifugal weights. The complexity of the dynamic load testing led to the testing of the vibratory load solely in the plane of

latch weight movement. These tests demonstrated that a vibratory load in the plane of the latch weight movement can cause interference and lock up. The magnitude of the load was well within the magnitude expected from a typical vibrating engine. A 300+ pound engine that is rocking in the engine mounts, for whatever reason, will introduce adverse loading into the propeller system. Dynamic movement of the engine that is arrested by engine mounts will introduce large "g" loads into the entire system.

Erroneous conclusion

In the past, aircraft accident investigators have concluded that if the propeller is on the latches at the time of ground impact, the arrowheads on the latch posts will be broken. However, this is simply not the case. The fracture of the arrowheads is a function of how the propeller is damaged during the accident sequence. Each accident has to be evaluated individually.

In general, a blade in flat pitch with no power being produced by the engine will have its blades twisted toward the low-pitch position during the impact sequence, and the propeller latches will be intact. A blade in flat pitch with the engine under power will be subjected to movement of the blade in both directions at different times and RPMs. The propeller latches may or may not be damaged depending on the movement of the centrifugal weights during the impact sequence.

> "This 'inability-to-feather' mode of failure with the full feathering propeller has been ignored during past aircraft accident investigations. Investigators tend to depend on the aircraft accident/incident data systems and the M&D reports to define a problem in the industry."

The fact that the latch posts are undamaged is not a basis to determine that the propeller was not hung on the latches prior to impact, especially with a failed engine. This erroneous theory has been purported in many cases where the propeller was unfeathered at ground impact and the aircraft had experienced a known engine failure. The conclusion has often been "pilot error."

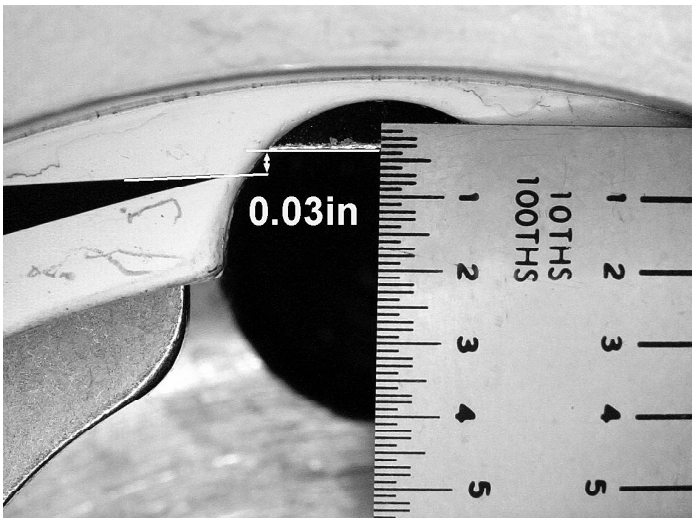


Photo showing the maximum clearance of weight during operation.

Random occurrence

The flyweight anti-centrifugal "g" load event is definitely a random occurrence. Because it is a random occurrence, the pilot can take action to alleviate the situation. A windmilling propeller usually has sufficient oil pressure to allow the pilot to cycle the propeller lever and raise the weights off of the latch posts before attempting to feather the propeller again. Since it is a random event, the pilot should continue to cycle the propeller lever until the propeller feathers. The unfeathered propeller on a frozen engine has no resolution other than pilot realization that the drag is much less than that caused by a windmilling propeller. This "inability-to-feather" failure mode of the propeller is unknown to most, if not all, multiengine pilots. Pilot knowledge of this failure mode will save lives.

The effect of vibratory loads from a malfunctioning engine on the feathering capabilities of the propeller should have been considered during the certification phase of propeller development. No data supporting the consideration of vibration during certification of the McCauley propeller have been uncovered to date.

This "inability-to-feather" mode of failure with the full feathering propeller has been ignored during past aircraft accident investigations. Investigators tend to depend on the aircraft accident/incident data systems and the M&D reports to define a problem in the industry.

However, the lack of data concerning the failure to feather is limited because it has not been addressed in prior accidents. There are a number of cases reported where twin-engine aircraft crashed as a result of an engine failure and the propeller was not feathered. The pilot is usually designated as the culprit in these cases. How can this event happen with so many highly experienced aviators involved? It is engrained in multiengine pilots that "if you don't feather, you crash."

Have we, as aircraft accident investigators, fallen short in our investigations because we have not identified this serious problem? ◆

Council Sets Officers, Seminars, 2005 Budget

(Adapted from minutes and notes of the International Council meeting recorded by Keith Hagy, Secretary.—Editor)

The ISASI International Council, at its August 29 general meeting held in Queensland, Australia, in conjunction with ISASI 2004, received the certified new ISASI Executive Officers and Councillor ballot counts and selected the venues for ISASI 2006 and 2007, among other actions.

Reelected to office for another 2-year term are Frank Del Gandio, president; Ron Schleede, vice-president; Keith Hagy, secretary; and Tom McCarthy, treasurer. Caj Frostell was reelected to the position of International Councillor, as was Curt Lewis to the office of U.S. Councillor. The new officers have been installed. There were a total of 362 ballots certified.

The Council also approved annual seminar locations for years 2006 and 2007. Cancun, Mexico, received 2006 approval, while Singapore received provisional approval for 2007. Further information of these events will be found in the report below.

The submitted 2005 budget, which reflects a negative cash flow of $4,625, received unanimous approval. This is against the 2003 yearend audit that shows a yearend net assets/fund balances of $81,298. The sharp balance increase from 2002 is credited to the highly successful ISASI 2003 held in Washington, D.C. The Council will review the 2005 budget at its spring meeting in May 2005 and make any necessary adjustments.

Reporting activities of the Council meeting follow:

President—Frank Del Gandio reported that member Darin Gaines has accepted appointment as chairman of the By-Laws Committee and Robert Matthews has done the same for the Human Factors Committee. In addition, Del Gandio announced that Shannon Harris from Embry-Riddle Aeronautical University is the recipient of the Rudolf Kapustin Memorial Scholarship Fund award. He also reported that Curt Lewis has started an ISASI general aviation initiative and that ISASI member William (Buck) Welch volunteered to chair the General Aviation Working Group. Welch is with Cessna Aircraft Company. Lastly, Del Gandio noted that ISASI membership now extends to 64 countries.

Treasurer—Tom McCarthy was unable to attend the meeting. His written submission reported that ISASI 2003 financial records received a full internal audit, and the auditor recommended an external audit be done annually. The Council elected to consider the recommendation, naming a committee of two to pursue examination of the issue.

PHOTOS: E. MARTINEZ, EDITOR

Above: Members and persons attending the Council meeting include Row 1, left to right, A. Schull, F. Del Gandio, B. Dunn, J. Matley, M. Saint-Germain, and C. Frostell. Row 2, left to right, L. Naylor, K. Smart, R. Chippindale, S. Corey, D. Gaines, R. Schleede, and C. Lewis. Left: The Council is shown in session during the August 2004 meeting.

Reports of National Societies/ Councilors

ASASI—Lindsay Naylor said that most of his activities since the last Council meeting have been in preparation for ISASI 2004.

CSASI—Barbara Dunn reported that the Canadian Society was in sound financial condition and that membership had increased to slightly more than 100 members. In her role as ISASI seminar chairperson, she reported receiving bids from Singapore and Hong Kong for ISASI 2007. Following presentations by both groups, the Council gave conditional approval to Singapore pending clarification on how the finances will be handled for the seminar and development of an ISASI Regional Society in Asia to support the seminar. Regarding ISASI 2006, Dunn reported

NEW MEMBERS

Corporate
Bundesstelle fur Flugunfalluntersuchung-BFU (CP0225)
Wilfried Schulze
Johann Reuss

Individual
Ahsan, Imran, MO5045, MacDill, FL, USA
Alghamdi, Ali, G., AO5048, Jeddah, Saudi Arabia
Almotairy, Ayedh, N.D., MO5051, Jeddah, Saudi Arabia
Anderson, Tahlia, J., ST5072, Palmerston North, New Zealand
Aycox, Earl, J., AO5084, APO, AE, USA
Bagsair, Sameer, S., MO5043, Jeddah, Saudi Arabia
Barden, David, W., MO5052, Jeddah, Saudi Arabia
Binyousef, Hussein, I., MO5055, Jeddah, Saudi Arabia
Blais, Pierre, F.J., MO5071, Bruce, ACT, Australia
Brady, Jr., Paul, F., MO5080, Medway, MA, USA
Brickhouse, Anthony, T., MO5069, Port Orange, FL,USA
Cawthra, Joshua, D., ST5068, Euless, TX, USA
De Silva, Anoma, AO5064, Mirihana Nugegoda, Sri Lanka
Dore, Louis, B., AO5087, Prevost, PQ, Canada
Doxey, Justin, M., MO5063, Lancashire, England
Fearon, Rod, G., MO5058, Mt. Warren Park, OLD, Australia
Frey, Peter, S., MO5081, Danbury, CT, USA
Georges, Robert, J., MO5082, York, PA, USA
Guo, Fu, MO5089, Shanghai, P. R. China
Haider, Abdulaziz, A., AO5050, Jeddah, Saudi Arabia
Hansen, Brad, J., FO5090, O'Fallon, MO, USA
Hughes, Kerri, L., FO5060, Higgins, ACT, Australia
Hunter, Skye, A., FO5039, Terrigal, NSW, Australia
Iqbal, Javed, MO5067, Karachi, Pakistan
Jorgensen, Rickard, D., AO5070, Norrkoping, Sweden
Khan, Tanzeem, A., MO5044, MacDill, FL, USA
La Roche, Gloria, R., AO5085, Highland Park, IL, USA
Larrain, Monique, C., ST5040, Daytona Beach, FL, USA
Liu, Tzu-Wei, J., ST5077, Sydney, NSW, Australia
Lohmar, John, S., AO5054, St. Charles, MO, USA
Mahmood, Suheli, AO5065, Dhaka, Bangladesh
Menniti, Maximo, AO5038, Rome, Italy
Millan, Angel, M., ST5073, Port Orange, FL, USA
Murray, Patrick, S., MO5075, Monterey Keys, OLD, Australia
O'Sullivan, Paul, S., FO5076, Pymble, NSW, Australia
Patton, William, R., MO5088, Lexington Park, MD, USA
Pelletier, Francois, AO5086, LaSalle, PQ, Canada
Puggaard, Martin, F., MO5056, Roskilde, Denmark
Roberts, Cameron, J., MO5057, Ocean Reef, WA, Australia
Saowan, Bunthorn, ST5079, Randwick, NSW, Australia
Scott, Vernon Len, MO5093, Boerne, TX, USA
Sefton, Adam, R., AO5042, Thornton, CO, USA
Shappell, Scott, A., MO5092, Edmond, OK, USA
Shehab, Ahmad, T., AO5047, Jeddah, Saudi Arabia
Siddiqui, Tahir, H., MO5091, Karachi, Pakistan
Siska, Frankie, J., MO5062, Nowra, NSW, Australia
Strubl, Pavel, MO5074, 250 02 Stara Boleslav, Czech Republic
Sukkhasantikul, Chayanin, ST5078, Randwick, NSW, Australia
Wadud, Abdul, MO5066, Dhaka, Bangladesh
Watson, James, R., MO5053, Friendswood, TX, USA
White, Glenn,G., MO5083, Sharpsburg, GA, USA
Wood, Mark, A., AO5041, Boulder, CO, USA
Younes, Mohamed Hany, A., AO5049, Jeddah, Saudia Arabia
Young, Steven, D., FO5061, Macgregor, ACT, Australia
Zahid, Rana Farooq Ali, MO5046, MacDill, FL, USA

about on-site visits to Cancun, Mexico, naming Coral Beach as the first choice. She noted that ISASI national would organize the seminar with cooperation from the Associacion Sindical De Pilotos Aviadores de Mexico. Capt. Eric Mayett Moreno attended the Council meeting as a representative of the pilots' organization. Seminar dates would be the first or second week of September. The proposal cited the outstanding conference hotel and local environs for the event. The Council accepted the bid and approved the location. All efforts will be made to get the ISASI Latin American region and Central American members involved.

ESASI—Ken Smart reported that the European Society gained two new corporate members—German Federal Bureau of Aircraft Accident Investigation (BFU) and Volvo—and that KLM Royal Dutch Airlines resigned its membership. He also said that the expected bid for an annual seminar to be held in Prague is not yet ready for submission.

NZSASI—Ron Chippindale reported the election results for NZISASI: President: Peter Williams, Vice-President: Russell Kennedy, NZ Councillor and Secretary/Treasurer: Ron Chippindale. Heavy effort is being placed on organizing the Australia and New Zealand (ANZSASI) seminar, June 10-12, 2005, in Queenstown, South Island, NZ. Registration is $280 NZ dollars. A Pacific Cabin Safety Group meeting will be held with the ANZSASI seminar.

USSASI—Curt Lewis reported there have been two ISASI 2005 planning meetings and two DFW Chapter meetings. The ISASI 2005 website is www.isasi2005.com. He and John Darbow, who is credited with doing most of the promotion work for ISASI 2005, made a presentation on the seminar to be held September 10–17 in Ft. Worth, Tex.

ISASI Committees

By-Laws—Darin Gaines is the new chairman of the By-Laws Committee. He noted that his first job is to write up a section in the By-Laws on the By-Laws Committee and International Councillor. He will submit the sections to the next Council meeting.

Membership—Tom McCarthy provided a written report stating that the current ISASI membership status stood at 1,366 individual members of which 99 were delinquent in dues. There are 107 corporate members of which seven were delinquent in dues. To date, ISASI has gained six corporate members and 107 individual members. Recruitment goals for 2005 include 200 new individual members and 10 new corporate members.

ReachOut—Jim Stewart recognized Caj Frostel and Ron Schleede for their work and leadership in the ISASI ReachOut program. He reported on the overall success of the program, but spoke in particular of the May 2004 workshop held in Beijing, China (see *ISASI Forum* July-September page 29). The seminar was completely covered by ICAO Cooperative Development of Operational Safety and Continuing Airworthiness Program (COSCAP) North Asia. ReachOut planners believe that a meeting held with China's Transport minister and vice-minister in China will result in placing ISASI in a good position to effect change in aviation safety in China. Stewart added that in ICAO, ISASI ReachOut is a known product, and documentation exists as to the relationship between ICAO and ISASI, which may ease a formalization of the relationship between ISASI and ICAO.

In a related ReachOut report, Barbara Dunn reported on ISASI's first Cabin Safety ReachOut workshop. It was held during the week of May 17 in Delhi and then in Karachi the following week. Dunn and Ivan Noel facilitated the classes, and they both found it a very positive experience. Attendees came from India, Pakistan, Nepal, the

Continued . . .

Maldives, Sri Lanka, and Bangladesh and represented all the airlines and civil aviation authorities from the region. There were just more than 30 attendees in Delhi and approximately 40 in Karachi. In addition, four new ISASI members were recruited from the region at this program. Dunn also expressed appreciation to the sponsors of the program: ICAO, Boeing, Air India, Pakistan International Airlines, the Civil Aviation Authority in India, the Civil Aviation Authority in Pakistan, and COSCAP—South Asia.

ISASI Web—Corey Stephens, web master, reports that work is being completed with Communications by Design to finish the database work on the ISASI website. The vendor is waiting for a computer to be ordered by ISASI so that the databases will be on a dedicated machine. He will also seek a way to place corporate members on the website's new membership directory.

Seminar—See Barbara Dunn report under "Societies."

Working Groups

Positions—Ken Smart reported that the biannual positions review is on track for submission to the May 2005 Council meeting. He commented on the cockpit image recording public hearing conducted by the NTSB. Noting the various positions taken by organizations, including that of the Air Line Pilots Association, he queried the Council about the need for an ISASI position. The Council expressed agreement as to a need, so Smart will work with his Committee to draft a Position for presentation to the May Council meeting. ◆

ISASI Annual Report 2003

	Jan.–Dec. 2003	Budget	$ Over Budget	% of Budget
Ordinary Income/Expense				
Income				
601 Dues—New Individual Member	12,255.00	10,000.00	2,255.00	122.55%
603 Dues—New Corporate Member	5,356.00	4,800.00	556.00	111.58%
611 Dues—Renewal Individual Member	58,290.00	65,000.00	-6,710.00	89.68%
613 Dues—Renewal Corporate Member	39,854.00	50,000.00	-10,146.00	79.71%
614 Dues—Late Fees	1,245.00	1,000.00	245.00	124.5%
615 Dues—Upgrade Fees	190.00	350.00	-160.00	54.29%
621 Contrib—Unres Membership	1,625.00	1,400.00	225.00	116.07%
631 Publication Subscriptions	88.00	600.00	-512.00	14.67%
632 Publication Income	983.83	700.00	283.83	140.55%
634 Library Services	156.06	100.00	56.06	156.06%
642 Membership Services	193.37	300.00	-106.63	64.46%
643 Membership Regalia Sales	1,134.00	500.00	634.00	226.8%
650 Seminar—Proceedings	0.00	5,000.00	-5,000.00	0.0%
651 Seminar—Net Proceeds	21,761.48	10,000.00	11,761.48	217.62%
652 Seminar—Reimbursed Advance	0.00	3,000.00	-3,000.00	0.0%
Total Income	143,131.74	152,750.00	-9,618.26	93.7%
Expense				
6560 Payroll Expenses	555.17			
700 Condo Fees	5,702.61	2,650.00	3,052.61	215.19%
705 Mortgage Interest	6,030.10	9,552.00	-3,521.90	63.13%
711 Repairs and Maintenance	3,864.38	1,000.00	2,864.38	386.44%
712 Storage Rental	1,620.00	800.00	820.00	202.5%
801 P/R Exp—Office Mgr Salary	37,280.40	36,660.00	620.40	101.69%
802 P/R Exp—Health Insurance	9,025.00	6,000.00	3,025.00	150.42%
803 P/R Exp—SEPP	0.00	1,760.00	-1,760.00	0.0%
804 P/R Exp—Trng Misc and Benefits	0.00	300.00	-300.00	0.0%
808 P/R Expense—Bonus	0.00	500.00	-500.00	0.0%
811 Accounting—Payroll	934.78	800.00	134.78	116.85%
812 Accounting—Tax Prep	399.00	500.00	-101.00	79.8%
813 Audit Expense	0.00	200.00	-200.00	0.0%
814 Insurance	191.00	1,400.00	-1,209.00	13.64%
816 Legal Fees	0.00	200.00	-200.00	0.0%
817 Licenses and Permits	25.00	125.00	-100.00	20.0%
822 OPS—Telephone & Telex	3,351.38	1,200.00	2,151.38	279.28%
824 OPS—Equip Maint & Repair	1,497.00	2,200.00	-703.00	68.05%
825 OPS—Other Utilities	3,371.31	3,400.00	-28.69	99.16%
826 OPS—Postage and Shipping	5,724.91	6,400.00	-675.09	89.45%
827 OPS—Printing and Reproduction	2,342.56	2,000.00	342.56	117.13%

ATS Working Group Marks 'Top Ten' Progress

The ATS Working Group continues to progress with ideas and safety initiatives. Despite the tyranny of distance for a number of the international membership, 12 members from Europe, North America, Asia, and Australia met during the successful Australia ISASI 2004 to review the targeted "top ten" ATS safety issues that have been developed since the Taipei conference of 2002. "Immediately following the conference," said Chairman John Guselli, "we were fortunate to receive an offer of voluntary support from Scott Dunham of the NTSB. This means that we have six of our top ten issues being facilitated by active members. Their discussion papers will be available for debate by the membership by November 15."

The issues currently under research, the responsible members, and their contact details are as follows.

- Review of ATS Working Group terms of reference (John Guselli, jguselli@bigpond.net.au).
- Review and update of investigator guidelines (K.F. Chou, kfchou@asc.gov.tw).
- ATS Safety Management Systems (Geoff Dickie, Geoff.Dickie@

	Jan.–Dec. 2003	Budget	$ Over Budget	% of Budget
828 OPS—Office Supplies	3,414.58	3,000.00	414.58	113.82%
830 OPS—Computer Tech Support	0.00	250.00	-250.00	0.0%
832 OPS—Equipment Lease	3,223.90	3,500.00	-276.10	92.11%
833 OPS—Petty Cash	0.00	200.00	-200.00	0.0%
840 OPS—Temp Help	165.50	300.00	-134.50	55.17%
844 Publications—*Forum* Expense	35,745.33	38,000.00	-2,254.67	94.07%
845 Publications—Proceedings	5,767.00	5,000.00	767.00	115.34%
848 Publications—Handbook Expense	417.01	1,800.00	-1,382.99	23.17%
856 Membership—Regalia Items	0.00	1,000.00	-1,000.00	0.0%
861 Membership—Service Expense	4,758.83	1,500.00	3,258.83	317.26%
871 Library Expenses	0.00	1,000.00	-1,000.00	0.0%
881 Management Council—Travel	12,796.20	16,000.00	-3,203.80	79.98%
882 Management Council—Admin Exp	1,215.75	2,000.00	-784.25	60.79%
883 Management Council—Other	1,922.42	1,000.00	922.42	192.24%
886 Management Council—Rep Travel	0.00	750.00	-750.00	0.0%
887 Management Council—Rep Admin	0.00	100.00	-100.00	0.0%
891 Rebate—Natl/Reg/Corp	600.00	2,000.00	-1,400.00	30.0%
901 Seminar—Advances	0.00	3,000.00	-3,000.00	0.0%
903 Seminar—Lederer Award	0.00	500.00	-500.00	0.0%
905 Seminar/ReachOut	5,005.34	1,000.00	4,005.34	500.53%
911 Bank Fees	414.00	300.00	114.00	138.0%
912 Credit Card Charges	9,289.58	2,000.00	7,289.58	464.48%
Total Expense	166,650.04	161,847.00	4,803.04	102.97%
Net Ordinary Income	-23,518.30	-9,097.00	-14,421.30	258.53%
Other Income/Expense				
Other Income				
661 Rent—Tenant Rental Income	5,485.00	8,520.00	-3,035.00	64.38%
671 Interest—Checking Acct	24.41	1,500.00	-1,475.59	1.63%
Total Other Income	5,509.41	10,020.00	-4,510.59	54.98%
Other Expense				
926 Penalties	16.72			
922 Misc—Other Reimb Exp	-6.50			
925 Misc Refunds	140.00			
Total Other Expense	150.22			
Net Other Income	5,359.19	10,020.00	-4,660.81	53.49%
Net Income	-18,159.11	923.00	-19,082.11	-1,967.4%

AirservicesAustralia.com)
- TCAS/ATC interface and procedures (to be advised).
- Runway safety (Ladislav Mika, Czech Republic, ladislav.mika@mdcr.cz).
- Radio telephony issues 1) English as the sole language in ATS, 2) Phraseology enhancements, 3) Microphone technique, pitch, and delivery speed (to be advised).
- Visual perception issues in the ATC environment (to be advised).
- Post-implementation issues of CNS/ATM (to be advised).
- Organizational safety management and ATC (interim responsibility—Chris Sullivan, Australia, Chris.Sullivan @atsb.gov.au).
- IFR terrain clearance provision by ATC (Scott Dunham, dunhams@ntsb.gov).

On a safety positive note, the ATS WG received an update from Jim Stewart on the status of the ISASI ReachOut program, with emphasis on ATS issues. Discussions ensued as to a potential blending of ATS Working Group participation by the group with the existing elements of ReachOut. Participation within this program will represent a tangible contribution to ATS safety at the international level.

In the course of the meeting, Working Group Vice-Chairman Ladislav Mika announced an upcoming training session in ATC investigation by the Southern California Safety Institute (SCSI) in conjunction with the Ministry of Transport, Czech Republic, in Prague during April 2005.

Any ISASI member wishing to comment, contribute, or actively support the ATS Working Group agenda may contact Chairman Guselli at jguselli@bigpond.net.au or Secretary Bert Ruitenberg at b_ruitenberg@compuserve.com. ◆

Kapustin Scholarship Issues 2005 Application Call

The ISASI Rudolf Kapustin Memorial Scholarship Committee has issued its call for scholarship applications to universities and colleges whose students are eligible to participate in the program, according to the Fund's administrators, Richard Stone, ISASI Executive Advisor, and Ron Schleede, ISASI vice-president. The deadline for applications is April 1, 2005.

The goal of the Fund is to encourage and assist university and college-level students interested in the field of aviation safety and aircraft occurrence investigation. All members of ISASI enrolled as a full-time student in an ISASI-recognized education program, which includes courses in aircraft engineering and/or operations, aviation psychology, aviation safety and/or aircraft occurrence investigation, etc., with major or minor subjects that focus on aviation safety/investigation, are eligible for the scholarship. A student who has once received the annual ISASI Rudolf Kapustin Memo-

Continued . . .

rial will not be eligible to apply for it again. One or more students will be selected in this process.

Application requirements

- A full-time college or university student in courses in aircraft engineering and/or operations, aviation psychology, aviation safety and/or aircraft occurrence investigation, etc., with major or minor subjects that focus on aviation safety/investigation of minimum duration of 1 year. The student must be a member of ISASI.
- The student is to submit a 1,000 (+/– 10 percent) word paper in English addressing "The Challenges for Air Safety Investigators."
- The paper is to be the student's own work and must be countersigned by the student's tutor/academic supervisor as authentic, original work.
- The papers will be judged on their content, original thinking, logic, and clarity of expression.
- The student must complete the application available at the university or at ISASI headquarters and submit it to ISASI with their paper by April 1, 2005.
- Completed applications should be forwarded to ISASI, 107 Holly Ave., Suite 11, Sterling, VA 20164-5405 USA. E-mail address: isasi@erols.com; Telephone: 703-430-9668.
- Applicants will be notified of ISASI's decision by May 1, 2005.
- The judges' decision is final. ◆

PNRC Meeting Hosts NTSB Presentation

The Pacific Northwest Regional Chapter (PNRC) hosted Keith McGuire of the Seattle NTSB office at its September meeting and received an absorbing presentation on incident investigations. The meeting was well attended with both members and guests. McGuire did an overview of the importance of incident investigations, stressing how differently they need to be handled compared to accident investigations. A lively discussion about how to better use incident investigations to improve safety followed the presentation. The meeting was held at the Boeing Longacres facility in Renton. In addition, the Chapter also donated $500 to the Robert Sweginnis scholarship fund at ERAU.

The PNRC will be continuing its technical meetings throughout the coming year. Guests from other regions or individuals interested in aviation safety 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 kdarcy@safeserv.com or from Leo Rydzewski at leo.j.rydzewski@boeing.com. ◆

From the Arizona Chapter

By Bill Waldock, Chapter President

I regret that I must deviate from the normal Arizona Chapter report and inform the membership of ISASI of the following:

The fall term at Embry-Riddle Aeronautical University started with a tragedy. On August 28, we lost the chief flight instructor and the chairman of our Aero Science Department in a mid-air collision. Mike Corradi and Bob Sweginnis were practicing a routine for the upcoming Prescott Air Show in two American Champion Decathalons. They collided in flight and both were killed. Both men were retired Air Force lt. colonels who served in Vietnam.

Quite a few of you knew Bob Sweginnis. He was a long-time aircraft accident investigator and a long-time member of ISASI. For me, he was a good friend. ERAU-Prescott held a memorial in their honor on Thursday, September 2, at our flightline. More than a thousand people came to remember and celebrate their lives and contributions to aviation. Embry-Riddle has established a memorial scholarship in their names. It is the Corradi/Sweginnis Memorial Scholarship, C/O ERAU, 3700 Willow Creek Rd., Prescott, AZ 86301.

The Arizona Chapter itself is getting back to normal. The student section remains the largest component of the Chapter. We are currently meeting biweekly, and student interest remains high. We are also lucky to have Capt. Denny Lessard (MO3576), retired United Airlines, on board as a faculty member and faculty advisor for the student section.

Also of note, several members of the Arizona Chapter and I were guests at the July meeting of the Dallas/Fort Worth Chapter. The meeting was interesting, informative, and dinner was good. We were able to observe and interact with DFRC Chapter members and learn about the upcoming seminar in Fort Worth. All in all, the Arizona Chapter is healthy and growing. ◆

2005 Australasian Safety Seminar Calls for Papers

The New Zealand and Australian Societies of Air Safety Investigators 2005 Asia-Pacific regional seminar has been scheduled for June 10-12, 2005, at the Copthorne Hotel and Resort, Queenstown, New Zealand, and the group has issued the "Call for Papers."

This seminar will be an educational event, building on the success of the ISASI 2004 seminar held at Surfers

Paradise, Australia, in September 2004. There is no seminar theme, but emphasis is expected to be on contemporary regional issues in aircraft accident investigation and prevention. The Asia-Pacific Cabin Safety Working Group will meet on Friday, June 10.

Persons wishing to offer a presentation for the seminar are asked to provide an abstract (approximately 100 words) plus personal details by Feb. 1, 2005, to John Goddard, E-mail: j.goddard@taic.org.nz; Phone: +64 3 358 9801; Fax: +64 3 358 9194; Post: TAIC, P.O. Box 14-025, Christchurch Airport, New Zealand. Further information regarding the seminar may be obtained by contacting Peter Williams, prwilly@xtra.co.nz or Ron Chippindale, rc1@xtra.co.nz. ◆

New Zealand and Australian Societies of Air Safety Investigators

2005 Asia-Pacific Regional Seminar

Copthorne Hotel and Resort, Queenstown • Friday, Saturday, and Sunday, June 10-12, 2005

REGISTRATION FORM

Preferred Name for Badge _____

Last Name _____

E-mail Address _____

Street Address _____

Suburb _____

State or District _____

Post Code _____

Country _____

ISASI Membership No. _____

Registration Fee* (Circle)	**ISASI members**	**Non-members**	**Partners**
	NZ$295	NZ$315	NZ$125
Registration Fee (after April 30, 2005)	NZ$325	NZ$345	NZ$125
Total	_____	_____	_____

Partner's Name for Badge _____

*Payment in Australian dollar equivalent by check is acceptable. Make check payable to NZSASI and forward to Treasurer NZSASI, 18 The Crowsnest, Whitby, Porirua 6006, New Zealand. (No credit card facilities will be available for the seminar except for hotel reservations, which will be handled by the hotel.)

Cabin Safety Conducts First ReachOut

ISASI conducted its first Cabin Safety ReachOut workshops during May in Delhi, India, and Karachi, Pakistan, said Barbara Dunn, ISASI, one of the two workshop facilitators. The other facilitator was Ivan Noel.

Attendees at the two separate workshops were from India, Pakistan, Nepal, the Maldives, Sri Lanka, and Bangladesh and represented all the airlines and civil aviation authorities from the region. Just more than 30 persons attended in Delhi and approximately 40 in Karachi.

PHOTOS: REACHOUT PROGRAM

Above: Attendees at the Karachi ReachOut numbered more than 40. Left: Attendees at the Delhi Cabin Safety ReachOut workshop.

Topics covered included ICAO regulations, cabin crew training, best trends and practices, disruptive passengers and air rage, briefings, cabin crew health, cabin crew uniforms, human factors in cabin safety, flight-time/duty-time limitations, crew resource management, accident incident investigation, and witness interviewing.

Dunn said, "It was a tightly packed schedule, but there was plenty of time allotted for open discussion and all objectives of the workshops were met."

P.K Chattopadhyay, deputy director general, Civil Aviation Department, director general of Civil Aviation, India, opened the workshop in Delhi, and Capt. Fareed Ali Shah, regional flight operations expert and project coordinator, COSCAP–South Asia, welcomed the Karachi attendees.

During both workshops, ISASI membership applications were made available to the attendees, and the Society gained four new members from the region.

Each participant received a workbook containing a paper copy of a PowerPoint presentation produced by the facilitators, also a CD-ROM from Transport Canada on the seating of restricted passengers, and the latest issue of the Cabin Safety Compendium from GAIN. During the accident investigation module, all in attendance received a copy of the ISASI Cabin Investigation Guidelines authored by the Cabin Safety Working Group

In her report to the ISASI International Council, Dunn said, "We owe a large vote of thanks to our sponsors—ICAO, Boeing, Air India, Pakistan International Airlines, the Civil Aviation Authority in India, Civil Aviation Authority in Pakistan, and COSCAP—South Asia. Without their support and generous hospitality, Cabin Safety ReachOut would not have been possible." ◆

Who is Where?

• **John Goglia, ISASI,** and the first and only airframe and powerplant mechanic to receive a presidential appointment to the National Transportation Safety Board (NTSB) has joined the leadership of the Professional Aviation Maintenance Association (PAMA) as senior vice-president of government and technical programs. Goglia, who retired from the NTSB following 9 years of service, will spearhead PAMA's efforts to increase the public's recognition and respect for the individual aviation maintenance technician.

• **John O'Brien, ISASI,** and director of Engineering and Air Safety, Air Line Pilots Association, retired from ALPA on July 31, after 32 years of service. Many aviation notables spoke at O'Brien's farewell luncheon recounting significant aviation safety advances in which he played a major role. He will remain active with ALPA as a consult-

NASA Develops New Tool for Airline Accident Prevention

A "tool" created by NASA scientists to alert airline analysts to potential, unanticipated problems and to enhance safety and reliability in the industry is available for licensing, according to a NASA announcement.

Scientists at NASA's Ames Research Center (ARC), Moffett Field, Calif., developed a "Morning Report" of atypical flights. It automatically identifies statistically extreme flights to airline flight operations quality assurance (FOQA) analysts. The new software may help analysts identify the precursors of incidents or accidents.

"The Morning Report offers a promising method for identifying unanticipated problems and opportunities in flight data recorded by commercial aircraft," said Thomas Chidester, Aviation Performance Measuring System manager at ARC. "The Morning Report implements concepts from flight science and statistics into practical applications usable in industry," he added.

"Our goal is to focus the limited time of experts on analyzing the most operationally significant events, while broadening and deepening their analytical capabilities," Chidester said. "The challenge is finding and understanding key information from the mass of data generated by aircraft and collected by data recorders," he said.

Only a small portion of the data generated by flights is analyzed through the identification of situations where aircraft operate outside predefined ranges. The Morning Report tool may be able to interpret more aircraft data for improved analysis. Unlocking information contained in data sets has the potential to enhance safety, reliability, and the economics of flight operations.

The Morning Report tool has attracted the attention of industry-leading providers of flight data analysis software, looking to improve their analysis tools. SAGEM Avionics of Grand Prairie, Tex., is the first to license the technology.

"The licensing of this analysis tool from NASA to SAGEM Avionics is another shining example of how NASA-developed technologies are transferred to the private sector to help benefit the American people," said Lisa Lockyer, chief of the Technology Partnerships Division at ARC.

The tool provides airline quality-assurance personnel with a list of atypical flights in an easy tabular format, highlighting the most extreme 5 percent. These flights may include groups of flights experiencing an operational problem or unique situations encountered by single flights. Highlighted flights are examined by FOQA analysts to determine whether they represent operational problems.

The Morning Report tool was developed by NASA's Aviation System Monitoring and Modeling project under the Aviation Safety and Security program. NASA's Aeronautics Research Mission Directorate, Washington, manages it. ◆

DUES NOTICE

Invoices for the 2005 annual dues (January 1 through December 31) to ISASI have been mailed. All individual members are asked to check individual identification information and update where necessary. Members are reminded that the deadline for payment is January 31. A fee of $20 will assessed for late payments. Credit card payment may be made. See the mailed invoice for credit card use. Checks should be made payable to ISASI and forwarded to ISASI, 107 E. Holly Avenue, Suite 11, Sterling, VA 20164-5405. ◆

ant, and continue to serve as a member of the Flight Safety Foundation Board of Governors, on the Embry-Riddle Aeronautical University Board of Trustees, and will remain active in other related activities.

- **Keith Hagy, ISASI,** and ALPA, was promoted to succeed John O'Brien as the director of ALPA's air safety effort. Hagy joined ALPA in 1986 and has participated in more than 130 aircraft accident investigations, including more than 30 classified as "major." He also serves as the Secretary for ISASI.
- **Michael K. Hynes, ISASI,** and formerly with Haynes Aviation Services, is now director of Aviation Science, College of the Ozarks, Branson, Mo. The college owns its own airport and conducts aviation technology and pilot training. Its aviation science program is designed to provide the student with an airframe and powerplant mechanic's certificate. ◆

ISASI Corporate Member S. Matthews Gains Award

Stuart Matthews, CEO of Flight Safety Foundation and ISASI corporate member (CPO2100), has been selected by the National Business Aviation Association to receive its annual award for meritorious service to aviation during NBAA's annual conference held in Las Vegas in October.

The award is presented to an individual "who, by virtue of a lifetime of personal dedication, has made significant, identifiable contributions that have materially advanced aviation interests," said an NBAA news release. ◆

Welcome to Australia *(from page 6)*

systems knowledge. In our case, as the regulator, my hope is that we can identify such system deficiencies before they cause problems, not recognize them only once we have started to pick up the pieces; and I hope your outputs will play a part in that process.

We need to be proactive in targeting, for example, management systems. This becomes a real issue for an organization like ours since we are drafting regulations requiring implementation of safety management systems.

In your case, you tend to be involved after the event. You have a tradition or providing excellent technical skills, but I suggest you also need to ensure you have the skills required to assess safety systems, management approaches, and so on.

Again, I see you have a paper "Uncovering Organizational Deficiencies in Maintenance Operations," so it would seem systemic and management-related issues are on your radar, and that is a good thing. So, maybe I am preaching to the already converted.

It gives me great pleasure to formally declare the 2004 seminar of the International Society of Air Safety Investigators officially open. I wish your seminar the success it deserves and that you will all have an enjoyable and informative time. ◆

The Challenges for Air Safety Investigators *(from page 13)*

not see the fatigue cracks with the naked eye. Compounding the problem is the fact that non-destructive techniques for investigating composites have not caught up to the techniques for investigating metals.

After all the testing and data have been gathered, the investigators must determine a probable cause. The probable cause is never just one factor. This excess of factors can be direct and indirect. As an investigator, knowing that pilot error is the leading cause of aircraft accidents, it is important to list all of the secondary and tertiary factors that could have led to the accident so that people can come to understand that the pilots were influenced by other factors that sometimes cannot be controlled. While the greatest pressure faced by an investigator may be to determine what happened, the ultimate goal of the investigator is to determine why it happened and how to apply that information to prevent future accidents.

Finally, investigators must create a list of recommendations for the Federal Aviation Administration (FAA). This is a challenge because the FAA does not have to mandate the suggestions and must also balance the cost of implementing proposed recommendations. Investigators can only hope that the FAA will realize the merit of the proposals and mandate them for the good of the aviation community. Air safety investigators also have the duty to educate pilots on safety and how they can avoid becoming a statistic. Organizations such as ISASI, the Air Safety Foundation, the Aircraft Owners and Pilots Association, the International Civil Aviation Organization, and many more help to promote safety throughout the aviation community in hopes that past mistakes will not be repeated. ◆

Phoenix Performs Underwater Operations

(Who's Who is a brief profile of an ISASI corporate member to create a more thorough understanding of the organization's role and function.—Editor)

Phoenix International, Inc. (Phoenix) is an employee-owned marine services company that performs complex manned and unmanned underwater operations worldwide. One of the company's primary business segments is locating and recovering fixed-wing aircraft, helicopters, missiles, and other debris from the underwater environment to assist crash investigators in determining the cause of the loss. Expertise is provided in the operation of side-scan sonars, aircraft pinger locator systems, and remotely operated vehicles (ROVs). Manned diving expertise (surface supplied air, mixed gas, saturation, and one-atmosphere diving systems) is also available to support shallow-water recoveries.

Phoenix has the multidisciplinary technical staff and undersea equipment needed to conduct search-and-recovery projects in water depths to 6,000 meters of seawater (msw). The company maintains comprehensive capabilities in all critical aspects of deep-ocean search-and-recovery operations: Collection and analysis of "loss" information; at-sea operations planning and logistics; search equipment evaluation and selection; underwater search operations and navigation/positioning; side-scan sonar interpretation and analysis; data (target) management and presentation; object rigging and recovery by diver, one-atmosphere diving systems or ROVs.

Current staff members, either during their previous employment or as Phoenix employees, have planned, managed, or participated in nearly all major national and international aircraft search-and-recovery projects conducted offshore over the past 30 years. This represents more than 200 search operations in water depths ranging from 6 to 6,000 msw, with a success rate in excess of 95 percent.

Emergency operations are conducted on a global basis and with a project staff sufficient to conduct simultaneous missions. From April to June 2002, Phoenix conducted seven successful search-and-recovery projects with three simultaneous missions taking place in the Philippine Sea, the Mediterranean Sea, and the western Atlantic Ocean, and two more in the Mediterranean Sea and Gulf of Mexico. During this period, recoveries included a U.S. Army MH-47E and Navy CH-46 and SH-60B helicopters, a U.S. Navy F-14-B and Air Force F-15C fighter aircraft, and two U.S. Air Force T-39 training aircraft.

In addition to numerous U.S. military search and recoveries, Phoenix has completed several high-visibility projects for international clients. Representative efforts included the search and recovery of an Israeli Air Force F-16D and the recovery of a Japanese H-II missile from water depths of 3,000 msw. Phoenix also managed the multi-agency search for space shuttle *Columbia* debris, conducting operations from February to April 2003.

Phoenix maintains and operates four work class ROVs and a very small, expendable inspection vehicle capable of penetrating confined spaces at great depths (7,000 msw). The work ROVs include systems of 25, 200, and 400 horsepower (hp). Two 25-hp systems are Phoenix designed ROVs built for working around and recovering wreckage from 6,000 msw. They are small footprint, agile systems designed for deployment aboard vessels of opportunity. All Phoenix ROVs are capable of inspecting, documenting, and rigging for recovery wreckage that is needed to assist the crash investigation team in performing its analysis. The ROVs are often prepositioned at sites outside the U.S. in order to rapidly respond to varying geographic needs.

The company has a national and international customer base comprised of diverse commercial organizations, research agencies, the U.S. Navy, as well as the institutions, military, and governments of foreign nations.

For more information visit www.phnx-international.com. ◆

ISASI
107 E. Holly Ave., Suite 11
Sterling, VA 20164-5405
USA

NON-PROFIT ORG.
U.S. POSTAGE
PAID
Permit #273
ANNAPOLIS, MD