



# **Airport Safety Oversight and Advanced Technologies Workshop**

**September 21-23, 2010  
Bali, Indonesia**

## **Final Report**

**APEC Transportation Working Group, Aviation Experts Group**

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Produced by

AVENTI Associates, LLC  
300 South Pointe Drive, Suite 708  
Miami Beach, FL 33139  
Tel: (1) 786-282-8793  
Email: [guevara@aventiasociates.com](mailto:guevara@aventiasociates.com)  
Website: [www.aventiasociates.com](http://www.aventiasociates.com)

and

IOS Partners, Inc.  
311 Mendoza Ave.  
Coral Gables, FL 13323  
Tel: (1) 305 648 6877  
Fax: (1) 305 446 7122  
Email: [rhans@iospartners.com](mailto:rhans@iospartners.com)  
Website: [www.iospartners.com](http://www.iospartners.com)

For  
Asia Pacific Economic Cooperation Secretariat  
35 Heng Mui Keng Terrace  
Singapore 119616  
Tel: (65) 68919 600  
Fax: (65) 68919 690  
Email: [info@apec.org](mailto:info@apec.org)  
Website: [www.apec.org](http://www.apec.org)

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## Executive Summary:

On September 21-23, 2010, 185 delegates from 13 APEC economies and three non-APEC economies gathered in Bali, Indonesia, to share information, best practices, and advanced technologies with respect to airport safety oversight. Attendance included a broad audience comprised primarily of civil aviation authority airport civil servants, airport operators, and industry providers of airport safety solutions. APEC airport safety experts delivered presentations on meeting International Civil Aviation Organization (ICAO) Annex 14 – Aerodromes safety oversight standards, with specific focuses on aerodrome certification, SMS implementation, and runway safety. This project report details the workshop activities and primary outcomes based on post-workshop surveys that measured its value and success. It also illustrates the key recommendations for next steps to undertake by the APEC TPTWG Aviation Experts Group.

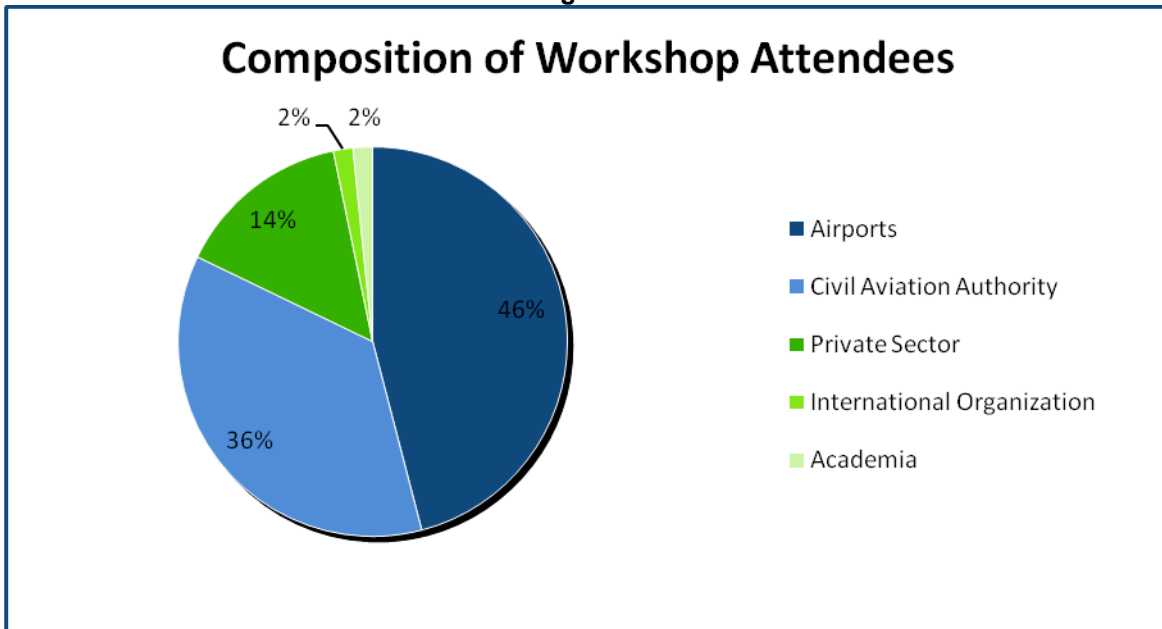
Overall, the workshop explored several examples of best practices for implementing successful programs for aerodrome certification, SMS implementation, and runway safety, primarily delivered by The United States and Singapore. The workshop raised the need for continued attention to detail and progress toward aerodrome safety enhancements among many developing economies. Delegates called for high-level APEC pressure for economies to heed advice for airport safety enhancements, especially in secondary airports among developing economies that typically receive less attention and focus from the international community but are still critical to developing APEC economies tourist and/or export industries. Common themes to that end included the call for funding to implement enhanced safety measures and technologies, the need for continued interaction among developed and developing economies to address aerodrome safety issues, and the desire for practical, hands-on exercises in demonstrating exactly how to implement best safety practices at airports.

Based on the results of this workshop, the APEC TPTWG Aviation Experts Group, Safety Sub-group, intends to seek APEC funding for and launch a follow-on project, “APEC Airport Safety Evaluation Visit Program (ASEVP) in 2011. The Airport Safety Evaluation Visit Program (ASEVP) seeks to assist APEC Economies to effectively implement all safety requirements in accordance with ICAO Annex 14 – Aerodromes. Through introduction of the Runway Safety Action Team (RSAT) concept, the program will also enhance overall safety at smaller regional airports in developing economies that need low cost safety solutions. Target airports are smaller regional airports in developing economies that see significant air traffic flows from tourism or export related commerce but lack sufficient funding sources for safety improvements. The program scope encompasses a direct transfer of knowledge, best practices, and lessons learned on airport safety through sharing information and expertise by subject matter experts from developed APEC Economies. It also includes delivering a final report on APEC letterhead with recommended safety enhancements provided to the participating APEC economy’s appropriate Ministry for active consideration. The AEG-SAF is currently seeking participation from all APEC economies, either by offering up an airport safety oversight expert to be a part of the site evaluation visits, or by hosting a visit at one or two domestic airports that will benefit from the overall program scope. If your economy is interested in partaking in this project, please contact AEG Chair Ms. Emily White ([Emily.A.White@faa.gov](mailto:Emily.A.White@faa.gov)), with cc to Ms. Vicki Harrison ([Vicki.Harrison@faa.gov](mailto:Vicki.Harrison@faa.gov)) as soon as practical.

## Section One: Overview

The APEC Airport Safety Oversight and Advanced Technologies Workshop was held September 21-23, 2010, in Bali, Indonesia, and drew 185 delegates from 16 economies. Of these delegates, 152 were from either civil aviation authorities or airports. 27 were from the private sector, 3 from international organizations and 3 from academia (See Figure 1).

Figure 1



The delegates were from 13 APEC economies: Indonesia; Australia; Canada; Hong Kong, China; Malaysia; Mexico; The Philippines; Papua New Guinea; Singapore; Chinese Taipei; Thailand; The United States and Viet Nam. Three non-APEC economies, Cambodia, Myanmar and Nepal also attended. The workshop had strong participation from the host economy, Indonesia, accounting for 122 delegates from the Ministry of Transport, DGCA Indonesia, airports and airport managers, the private sector and academia. The United States also had strong participation with 24 attendees from the Federal Aviation Administration, airports, technology companies, as well as consultants and service providers.

Of the 152 delegates from governments and airports, 36% came from their economy's Transport Ministry and civil aviation authority while 46% were from airports or airport managers. There were 38 airports and regional airport authorities, of which 86% were Indonesian. Six other APEC economies were represented by 12 delegates from 3 individual APEC airports and 5 regional airport authorities. (See Figure 2).

<b>38 Airports &amp; Airport Authorities Represented</b>	
30	– Indonesia
2	– Malaysia
1	– PNP
1	– Philippines
1	– Thailand
1	– USA
2	– Vietnam

Figure 2



During the initial registration process, 69 delegates responded to a pre-workshop survey. Forty-five were from civil aviation authorities or airport operators, 21 were from the private sector, and 3 were from international organizations. These registrants were asked to cite their reasons for attending the workshop, choosing between the following:

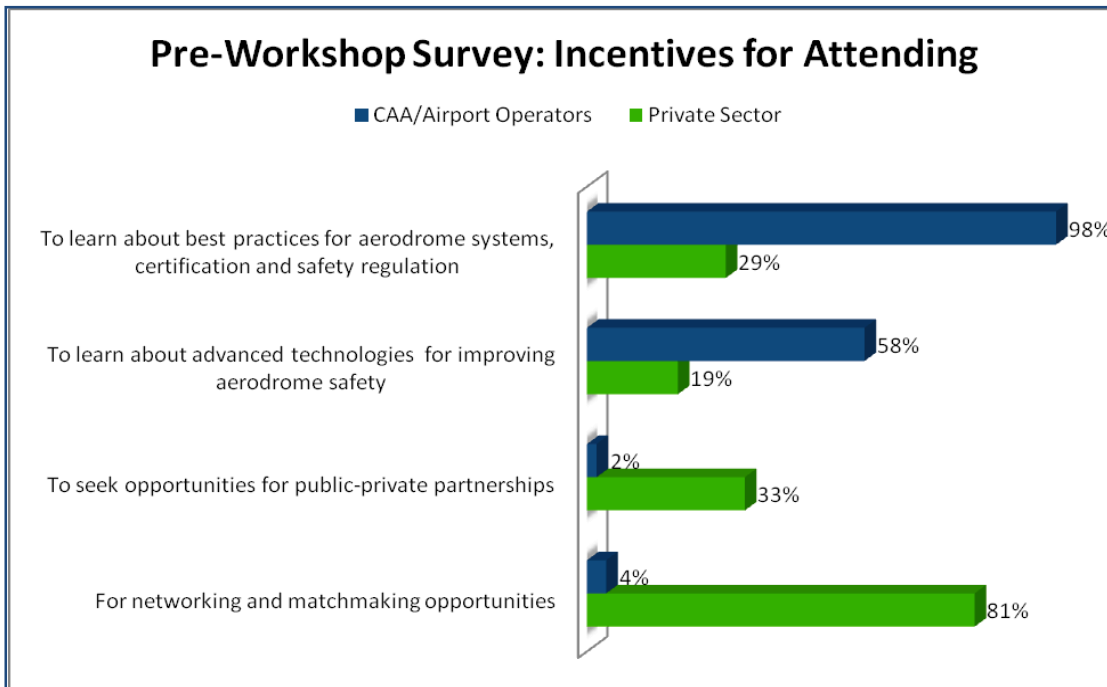
- To learn about best practices for aerodrome systems, certification and safety regulations;
- To learn about advanced technologies for improving aerodrome safety;
- To seek opportunities for public-private partnerships; and,
- For networking and match-making opportunities.

For the public sector delegates, 98% chose the answer “to learn about best practices for aerodrome systems, certification and safety regulation”, 58% chose “to learn about advanced technologies for improving aerodrome safety.” While only 2% chose the answer “to seek opportunities for public-private partnerships and 4% chose “for networking and matchmaking opportunities,” the outcome of matchmaking efforts far exceeded participants’ expectations. These results were similar for representatives from international organizations.

For the private sector, 29% chose the answer “to learn about best practices for aerodrome systems, certification and safety regulation,” 19% chose “to learn about advanced technologies for improving aerodrome safety,” 33% chose “to seek opportunities for public-private partnerships and 81% chose “for networking and matchmaking opportunities” (See *Figure 3*).

The differences observed in responses from the public sector and the private sector necessitated the preparation of two separate post-workshop surveys to determine how well the event met each groups’ expectations for the workshop.

Figure 3



Following the workshop, two different sets of surveys were distributed: one for the private sector and one for government and airport delegates and others. Organizers received 67 surveys that offered perceptions of the workshop in the areas of logistics, content, networking opportunities, strengths and weaknesses, and recommendations for future APEC events. Of these surveys, 55 were from civil aviation authorities, airport operators and international organizations, and 12 were from the private sector.

Overall, the survey results were highly positive, citing that the workshop had been well organized, provided useful knowledge and presented good networking opportunities. An overwhelming majority of respondents rated the workshop sessions at the highest or second highest levels of success (out of five levels), and survey respondents also offered recommendations to help improve APEC workshops in the future. Some respondents suggested the need to create a workshop that would attract more airport operators from across the region. Others encouraged expanding APEC activities to developing countries outside of APEC. There was strong interest to integrate practical exercises and small-group discussions into the workshop, and increasing communication between economies outside of workshops. All appreciated having the opportunity to interact with the advanced technology companies in the exhibit area and through one-on-one meetings, and to hear how the technology can be used to implement solutions for enhanced aerodrome safety at their airports. Some respondents suggested that future workshop should include sessions on financing opportunities for the technologies.



### Workshop Budget and Sponsorship

The Airport Safety Oversight and Advanced Technologies Workshop was co-organized by the U.S. Federal Aviation Administration (FAA), the Indonesia Directorate General for Civil Aviation (DGCA), and the Civil Aviation Authority of Singapore (CAAS). Major funding for the workshop was provided by the APEC Secretariat and the Indonesia DGCA. The United States, Singapore, and Indonesia provided the project overseer and technical assistance. The Indonesian DGCA hosted the workshop providing strategy, funding, physical space, all local logistics including food and transportation, keynote speakers, signage and all workshop-related printing, and staffing resources. APEC provided funding for travel and per diem for several participants from APEC travel eligible economies, including Viet Nam, Malaysia, Thailand, PNG, Mexico, and The Philippines, as well as for two expert speakers from the U.S. private sector. APEC also funded a consultant team, Aventi Associates / IOS Partners, to handle event website development and pre-registration and organize logistics of the workshop. The project was completed on time and within the original APEC budget outline with no overruns.

A key success to the event came from the strong additional support and sponsorship from various other private sector companies and organizations.

- Nine private sector sponsors from APEC Economies provided a combination of funding, technical presentations and exhibit booths and/or made themselves available for match-making meetings with APEC economy aviation and airport officials. These included: one “Platinum Sponsor”, Oshkosh Corporation; four “Technology Sponsors”, Teledyne Controls, MJG Aviation, Zodiac Aerospace ESCO, and MITRE Corporation; and three “Supporting Sponsors”, Boeing, Sensis, and The Louis Berger Group. Stratech Singapore participated by presenting its technology.
- Angkasa Pura I (API) and Angkasa Pura II (APII), State Enterprises of the Indonesian Department of Transport responsible for the management of airports and air traffic services in Indonesia sponsored an off-site dinner and cultural event for all attendees.
- Sekolah Tinggi Pariwisata Nusa Dua Bali (Bali Tourism Institute) sponsored in-kind by providing volunteers to facilitate workshop logistics and the matchmaking meetings. These volunteers were not registered attendees.
- Three Indonesian airlines provided t-shirts, caps, flash drives and other items for all attendees. These airlines were: Lion Air, Garuda Airlines and Batavia Airlines. These sponsors were not registered attendees.

The nine private sector sponsors provided a total of US\$38,500 in sponsorship funds. In-kind contributions from API and APII, The Bali Tourism Institute, and three Indonesian airlines are estimated at US\$20,000. These funding sources were secured over and above the original APEC project budget outlined in the APEC TPT02 2010A project proposal. In all, there is an excess of US\$26,748.87 in APEC travel funding that will remain unused at the end of this project due to several travel eligible economies being unable to send participants to the workshop despite available APEC funds. This should not be viewed as an over-estimate to the original budget. Rather, for future activities more time and effort should be placed on recruiting participants from travel eligible economies to maximize participation.



## Section Two: Civil Aviation Authorities, Airport Operators and International Organizations Survey Results

This group turned in 55 surveys of which 25 came from Indonesian delegates and 30 balanced across the other delegations. Overall, these respondents expressed their approval of the workshop citing that the speakers were informative and that they learned valuable information on enhancing airport safety capacity in their home economies. They also cited strong appreciation for the opportunities to network with the private sector on how to incorporate advanced technologies and best practices at their airports. Of those surveyed, over 90% of respondents indicated the intent to share their experiences with co-workers and management, as well as to take further action to implement best practices for airport safety enhancements and explore opportunities to incorporate new related technologies.

### Event Logistics

Over 95% of respondents “agreed” or “strongly agreed” that the event was well-organized and the venue was suitable, although a few delegates from APEC-sponsored economies expressed frustrations with the reimbursement system and cited preferences for all airline and hotel costs to be paid directly by APEC. One delegate felt that the hotel staff should have been more helpful directing delegates to the check-in desk. A number of respondents also suggested ice-breaking exercises to initiate the workshop as well as a city tour or sightseeing as part of the three days.

**98% of respondents  
“agreed” or “strongly  
agreed” the event was  
well organized**

### Panel Effectiveness

Analyzing the workshop content, 89% of respondents said the event’s content and outcome was “great” or “very great,” and of those who responded, 100% found the speakers knowledgeable. Several delegates from developing economies suggested increasing the number of speakers and case studies applicable to difficult issues facing these states. Others recommended increasing the time following each presentation to promote audience interaction or small-group discussions. Further suggestions included practical exercises including visits to airports to observe practices and procedures, more information on human skills and training, and facilitating greater interaction and coordination between economies.

### RECOMMENDATIONS:

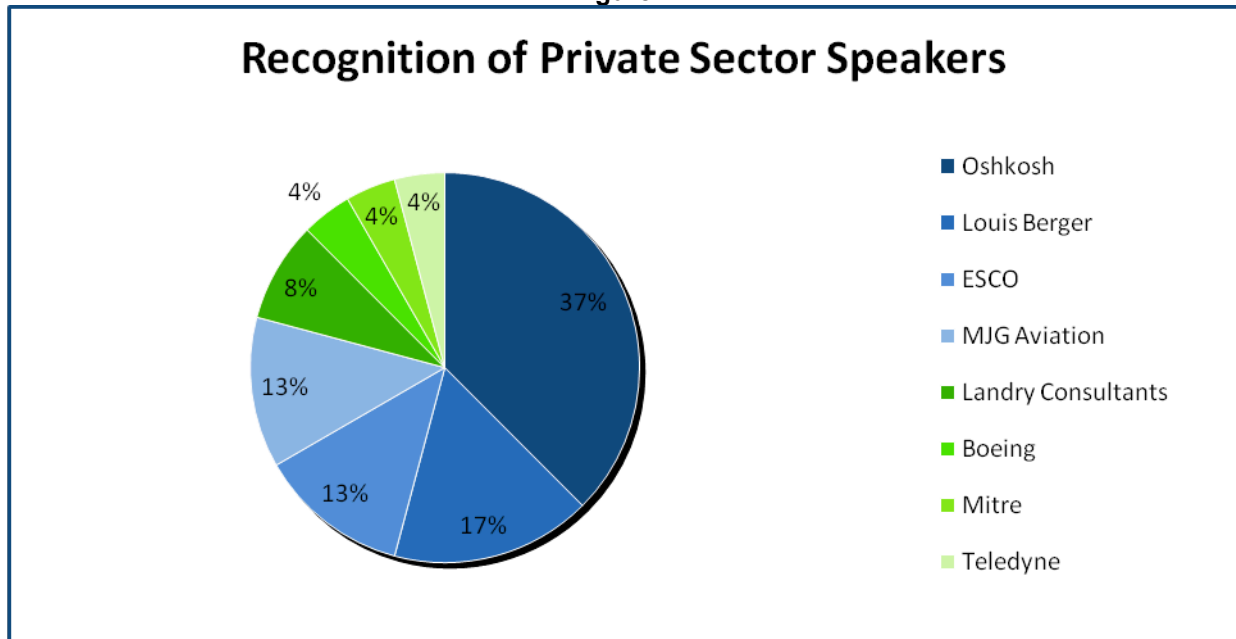
- **Small group discussions following panel presentations**
- **Practical exercises and airport visits**
- **Human skills and training information**
- **Continued interaction among economies**

### Interaction with Private Sector

Overall and throughout the surveys, delegates expressed a strong appreciation of the advanced technology presentations, exhibits and networking opportunities. In terms of interaction with the private sector, 55% said they took part in the one-on-one matchmaking appointments with advanced technology and/or service consulting firms or made headway with

firms during the networking coffee breaks. Many delegates said they intended to follow-up with the companies with whom they met. Delegates were also asked to list the speakers they found most useful. Of the private sector speakers, Oshkosh received the most recognition followed by the Louis Berger Group, ESCO Zodiac and MJG Aviation. Interest was also expressed for services provided by Teledyne, MITRE, Boeing and Landry Consulting (See Figure 4).

Figure 4



Survey respondents made several comments and suggestions concerning private sector participation in future workshops, including requests for:

- Establishing a process whereby the TPT-WG could continue to facilitate follow-up activities between the aerodrome safety experts in developed economies, aviation and airport delegates in developing economies, and the private sector companies;
- Providing financial resources for or applying high level APEC political pressure to obtain funding and assistance for developing countries to obtain advanced aerodrome safety technologies;
- Continuing regular inclusion of advanced technologies sessions in APEC workshops;
- Urging companies to be more specific on how their technologies help meet required ICAO standards for safety by tying their presentations more closely to the regulatory sessions;
- Establishing programs to train CAA and airport operator personnel on how to use the advanced aerodrome safety equipment.

**“High level APEC pressure is needed to secure funding to increase aerodrome safety measures at home.” – delegate**

### Workshop Usefulness

Those surveyed overwhelmingly acknowledged the benefits of the workshop, with 95% agreeing it was beneficial to their economy, 98% agreeing that it was beneficial to their civil aviation authorities and 87% agreeing that it was personally beneficial. Delegates expressed gratitude for the experience and found the knowledge obtained equally inspiring and relevant to their airports' needs. Delegates recognized the urgent need for developing APEC economies to enhance safety capacity at their airports through the use of best practices, measures and advanced technologies that were promoted at the workshop. They cited plans to follow-up on next steps necessary to promote action and enhance safety. A number of respondents recognized the need to obtain financing for safety enhancements and the acquisition of much-needed equipment and technology upgrades, particularly for the less affluent members of APEC, and recommended that funding considerations be addressed in future APEC activities.

#### WORKSHOP SEEN AS

- greatly beneficial
- useful for planning next steps for airport safety at their airports
- raising the need for high-level APEC pressure for financial support for safety upgrades in developing economies

### Comments on Panel Themes & Discussions

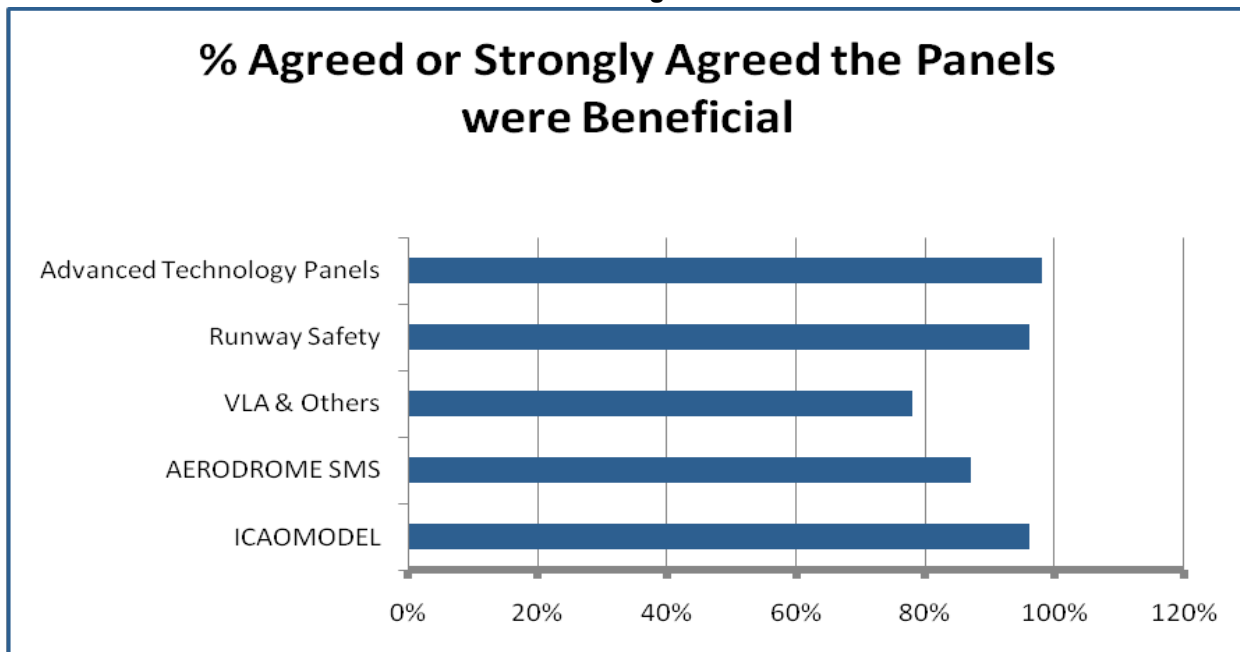
In response to Day 1, 96% of respondents said they “agreed” or “strongly agreed” that the presentations on the ICAO model for aerodrome certification, safety maintenance of aerodrome systems and training program requirements and availability were beneficial. (See *Figure 5*) Respondents also made suggestions for future presentation topics including: more best practices case studies relevant to a diverse range of economies, training of personnel and recognition from ICAO, the concept of auditing and reporting without leading to punishment, maintaining safety databases for hazard identification and safety assessments of aerodrome systems, producing a standard operation manual for aerodrome safety, and knowing equipment manufacturer specifications needed for certification.

For Day 2, 87% of respondents “agreed” or “strongly agreed” that the discussions on aerodrome safety management systems were beneficial. This figure dropped to 78% “agreeing” or “strongly agreeing” that the discussions on maintenance systems, very large aircraft and various other safety issues were beneficial (See *Figure 5*). Suggestions for future workshops included having more information on: the Acceptable Level of Safety (ALOS), the correlation between SSP and SMS, safety performance indicators for ATM/ATS, risks and hazard identification, reporting systems, and the process of applying international standards to national standards. Respondents also suggested addressing human factors and how to create a safety “culture” within their airport teams.

Respondents from Day 3 overwhelmingly approved of the runway safety presentations, with 96% finding them beneficial. Ninety-eight percent of respondents also “agreed” or “strongly agreed” that the Advanced Technologies panels demonstrated useful case studies on how advanced technologies can be used to improve airport safety (See *Figure 5*).

Recommendations for future runway safety presentations included providing an outline of the contents of the case study’s safety program (in this case, Boston-Logan), and another practical case study for analysis such as Bali’s Ngurah Rai International Airport. Respondents also requested more information on the ICAO perspective versus the FAA approach, and an alternative perspective from pilots or air traffic control. They also sought more knowledge specific to: marking, signage and lighting, standing water, taking off in wind and isolated areas, as well as on steps for making an action plan.

Figure 5



### Section Three: Private Sector Survey Results

Overall, private sector feedback was extremely positive. The workshop representation from the private sector was a total of 27 participants representing 18 companies from 7 economies. Of those companies in attendance, 44% were technology companies, 28% were from service or consulting companies, 22% from airlines and 1% from an industry association. (See Annex III).

**Private Sector  
Represented 7 Economies**

- Australia
- Canada
- Hong Kong, China
- Indonesia
- Singapore
- Thailand
- USA

Forty-seven percent of these companies actively participated in the program on a panel, and 58% were workshop sponsors including Oshkosh Corporation, Teledyne Controls, MJG Aviation, ESCO Zodiac, The MITRE Corporation, The Louis Berger Group, Boeing, Sensis Corporation, Garuda Airlines, and Lion Air. Batavia Airlines was also an in-kind sponsor to the workshop. Not all sponsoring companies participated on a panel and not all panel participants from the private sector came from sponsoring companies. (See Annex III for details).

The workshop also brought participants from Landry Consultants, Stratech Systems Ltd., Osana International, PT. MJA, Merpati Nusantara Airlines, Thai Airways, and Supply Chain Security Association. The delegates represented companies based in The United States, Canada, Indonesia, Australia, Singapore, Thailand and Hong Kong, China. Twelve surveys were submitted for analysis from the private sector and each represented a different firm. 50% of the surveys represented American firms, 25% of the surveys represented Indonesia firms, 17% represented Australian firms, 8% represented Hong Kong, China firms, and 8% represented Singaporean firms.

### Outreach

According to the companies surveyed, most of the private sector, including all sponsoring companies, was informed of the workshop through direct contact from APEC civil aviation authorities or the workshop organizers. Other attendees cited an email passed on from an associate, contact by the FAA in Singapore and the APEC website as their point of reference

**Personalized contact was most effective in reaching out to private sector participants**

for the workshop (See Figure 7). Mass advertising and email distribution was not a driving factor and was relatively ineffective. One of the email marketing sources with personalized letters resulted in only 11% of 273 individuals that received invitations actually opening the emails with 1% clicking on a link to the event's website. Another email marketing source that did not have personalized emails fared worse. The private sector was

more responsive to individualized emails detailing the benefits of participation to their specific company.

Two recommendations can be made from reviewing the survey results and the general characteristics of the private sector participants:

1. Private sector participation was largely driven by the company's ability to showcase its services or technologies to the workshop participants. Therefore it is essential to carve out opportunities for private sector marketing and outreach must be personalized to match their interests; and
2. The low response to mass advertising and emails demonstrate that in order to expand private sector participation from other APEC economies for future events, it will be important to get civil aviation authorities to provide organizers with direct contacts for outreach.

**To increase future private sector participation from other economies, APEC civil aviation authorities should provide organizers with relevant contacts for personal invitations.**

### Workshop Usefulness

The private sector was largely pleased with the workshop and 83% said the workshop content met their expectations and helped promote their company. Seventeen percent said it partially fulfilled this role. Nonetheless, 100% of the survey respondents said they "agreed" or "strongly agreed" that the workshop was beneficial to their company and 92% found it personally

beneficial. Of those surveyed who participated in the advanced technologies panels, 86% “agreed” or “strongly agreed” that the experience allowed them to promote their company in response to the overall workshop discussions. All survey responders said they would share their experiences and materials with co-workers and management as well as attend future APEC events.

Respondents largely praised the presentations and felt that there were an adequate number of opportunities to network with aviation officials and airport operators. There was a strong sense that they would have active follow-up with their new contacts, particularly with the following economies: Viet Nam, Thailand, Indonesia, Chinese Taipei, The Philippines, Nepal, Cambodia, Singapore, Malaysia, Myanmar, and Papua New Guinea.

Recommendations for future workshops were made in two basic categories: topics and participation.

#### Topics

- Continued focus on advanced technologies solutions
- Personnel training and licensing
- Airport and airspace surveillance
- Airside procedures
- Sustainability & innovative airport design
- Increased ICAO case studies from other economies

#### Participation

- Inviting and involving more airlines and airports from across APEC
- Increasing attendance from other APEC economies like Australia, New Zealand and Latin America
- Involving more operational representatives

#### Matchmaking and Networking

An integral component of the workshop’s success was the one-on-one matchmaking appointments arranged between the private sector and civil aviation authorities and airport operators. Fourteen companies requested 47 meetings with 28 government and airport representatives. Those who took advantage of the opportunity praised the process, calling it an “excellent arrangement,” a “great idea,” and “well thought out, planned and executed.” These meetings drew companies into detailed discussions with participating economies including Indonesia, Thailand, Viet Nam, The Philippines, Nepal, Chinese Taipei, Cambodia, Malaysia, Papua New Guinea and Singapore. Numerous respondents said further follow-up was certain including in-country meetings and airport visitations.

**100% of the survey respondents said they “agreed” or “strongly agreed” that the workshop was beneficial to their company**

Further to these comments, it would be advantageous in future workshops to enhance the matchmaking and networking efforts by establishing opportunities for private and public sector



participants to exchange contact information and make preliminary meeting plans prior to the event.

It is also worth noting that a significant number of the public sector delegates (55% of those responding) participated in the matchmaking activities and expressed a strong appreciation for this feature of the workshop. It is clear that the opportunity to establish contacts and help foster partnerships between the public sector civil aviation and airport authorities and the private sector technology providers was one of the most rewarding aspects of the workshop.

Building on these initial contacts, it is anticipated that there will be continued interaction between the participants that may lead to investments in advanced technologies in airport safety in the APEC economies.

## Section Four: 2 Month Post Workshop Survey Results

A two-month post workshop survey was distributed to approximately 80 workshop attendees in November 2010. Only 15 responses were received. Nevertheless, important insights were provided. Delegates were asked to provide feedback on five key questions with respect to how the workshop has impacted their workplace and any future plans with respect to airport safety.

Respondents noted that they used and shared their workshop materials with their colleagues through holding brown bag discussions, updating internal training materials on related subjects, adopting new ideas from workshop presentations, sharing materials with counterparts in other airport facilities, and using the materials in discussions with aerodrome inspectors to resolve some issues as they arise.

When asked what ideas for changes to an economy's airport certification program resulted from the workshop, responses included: fine tune existing program, increase certification standards of an airport to include physical characteristics of the airport and take into consideration the performance management of equipment operated by the airport, update operational performance management activities, and work toward modifying regulations and procedures to protect SMS safety data related to the certification process. Noted changes to an economy's SMS implementation at airports plans include: increase data collection to better gauge safety performance, use the idea of competency officers for specific tasks related to SMS implementation, expedite the process of information dissemination and training toward SMS formulation, set new timeline for SMS implementation at airports, use workshop materials as reference documents for internal training, and update training requirements and

### Attendee Post Workshop Suggestions

- Continuing information sharing among economies
- Encouraging a safety culture
- Promoting criteria for a successful safety office
- Arranging best practices site visits
- Training on management of safety databases and other safety procedures
- Urging APEC intervention with respect to the funding needs for upgrades and acquisition of advanced technologies



activities for top management. With respect to progress in the area of runway safety coming out of the workshop, survey respondents indicated plans for more stringent requirements and a thorough education plan for airside drivers and a joint enforcement audit program with ground handlers, upgrades to runway and taxiway marking, enhancements to center line lighting, plans to build fillets, add more animated signage, install bird repellent equipment, and implement a bird strike safety program.

Looking forward, survey respondents made several suggestions on how APEC can continue to assist in the area of airport safety. The largest themes center on continuing the process of information sharing among developed/developing economies to encourage a safety culture and promoting primary criteria for establishing a successful safety office. Ideas for exchanges include opportunities for site visits to and/or about well-equipped, modernized facilities, another workshop focused on management of aerodrome safety database and safety information related to SMS implementation, and further safety related training and seminars. Respondents also reiterated a theme that arose during the workshop, specifically a request for APEC intervention with respect to the funding needs to facilitate aerodrome safety upgrades and/or the acquisition of new and advanced technologies.

## Creating Partnerships And Using Technology To Improve Airport Safety

### Section Five: Workshop Conclusions

Survey respondents overwhelmingly concurred on the APEC Airport Safety Oversight and Advanced Technologies Workshop's success. This success was due in large part to the Indonesian hosts and their hospitality which laid the foundation for an abundance of knowledge-sharing and partnership-building among attendees. Delegates representing civil aviation authorities, airports, the private sector, international organizations and academic institutions from 16 economies created a diverse atmosphere conducive to fostering public-private partnerships to improve airport safety. The details of this report show that attendees responded well to knowledgeable speakers, relevant discussion topics, and networking opportunities which they foresaw prompting further action. At the same time, survey respondents suggested ways to improve future APEC airport safety workshops which deserve reiteration. Organizers should increase efforts to solicit participation from individual airports, airlines and from other developed economies such as Australia, Japan, and New Zealand. The overall agenda should include small-group discussions and more time for questions and answers following speakers. More ICAO-based and emerging economy case studies from developing economies would also be appropriate for the audience. Finally, note that survey respondents also requested more information on personnel training and licensing, airside procedures, sustainability and innovative design and technology-based airspace surveillance for future workshops.

The workshop's presentations and subsequent survey results illustrate the pressing need for developing APEC economies to adopt best practices, integrate advanced technologies and enhance safety procedures (including marking, lighting, signage, wildlife mitigation and emergency equipment) to improve safety at their airports. Additional APEC events and activities focusing on enhancing airport safety capacity among APEC's developing economies to promote knowledge sharing and business partnerships will be fundamental to on-going improvements and success in this area.

## Annex I - Delegates and Survey Respondents

A = attendees S = surveys collected

Economy	Civil Air Auth		Airports		Private Sector		Int'l Orgs		Academia		Total	
	A	S	A	S	A	S	A	S	A	S	A	S
Australia					2	1					2	1
Cambodia *	1	1									1	1
Canada							1				1	
Chinese T.	1										1	
H. K. China					1	1	1				2	1
Indonesia	41	12	73	13	6	3			2		122	28
Malaysia	1	1	2	2							3	3
Mexico	2	2									2	2
Myanmar *	1	1									1	1
Nepal *	2	2									2	2
PNG	1	1	2	1							3	2
The Philippines	4	4	2	2							6	6
Singapore	2	2			2				1	1	5	3
Thailand	2	2	3	2	1	1	1				7	5
USA	8	2	1	1	15	6					24	9
Viet Nam	1	1	2	2							3	3
TOTAL	67	31	85	23	27	12	3	--	3	1	185	67

### NOTES

\* Non-APEC economies

Public Sector – This group includes the transportation and civil aviation government, as well as airport and traffic control delegates. Although some airports and traffic control organizations may be private or public-private they were all grouped in this category. In various cases there was a challenge to distinguish a delegate as “civil aviation authority” or “airport”, the default was to classify them as “other”. Civil Aviation officials stationed at airports were counted as “civil aviation”. The “airport” group included delegates registered as airport officials, regional airport authorities, and API and APII delegates. API and APII delegates were split in two groups: those that worked directly at an airport, and those that had regional or department-wide management responsibilities. The split for “airports” delegates is as follows: six APEC regional airport authorities (non Indonesian); 65 airports (58 Indonesia, 1 Malaysia, 2 the Philippines, 3 Thailand); and 15 other Indonesian airport authorities.

Private Sector – This group includes technology companies, consulting firms, airlines, and industry associations. The delegates were counted in the economy from which their company is based. Some of the U.S. company representatives are stationed in other APEC economies: Oshkosh had one from Singapore and two from China; The Louis Berger Group had one from Indonesia; Sensis Corp. had one from Australia; and a Canadian company, Searidge, was represented by MJG Aviation.

International Organizations – The International Civil Aviation Organization (ICAO), and Airports Council International (ACI)

Academia – Academia was represented by the Indonesia Civil Aviation Institute and the Singapore Aviation Academy.

Media – Three reporters from Indonesia were registered. These are not counted in the final tally of delegates.

## Annex II – Airports and Airport Authorities Represented

Airports Represented: 33 Airports (30 from Indonesia), and 5 Regional Airport Authorities for other APEC Economies.

Airport Delegates: 85 total (73 from Indonesia), and 12 from other APEC Economy airports & airport authorities.

Indonesia (58 airport and 15 regional/department airport or air traffic control managers)

- Adi Soemarmo Airport – 1
- Adisutjipto Airport (API) - 2
- Balikpapan – Sepinggan Airport (API) - 1
- Banjarmasin Airport - 1
- El Tari Airport Kupang (API) - 2
- Fatmawati Soekarno Airport – 1
- Halim Perdana International Airport, Kusuma (APII) – 2
- Hasanuddin Airport Makassar - 1 & (API) – 2
- Husein Sastranegara Airport (APII) - 1
- Jawata Airport – 1
- Juanda International Airport Surabaya - 2 & (API) - 2
- Makassar Airport - 1
- Minangkabau International Airport (APII) – 2
- Mopah Airport – 2
- Mutiara Airport - 1
- Ngurah Rai Airport (API) – 4 & (APII) - 1
- Pattimura Airport (API) - 1
- Polonia, Medan Airport – 1 & (APII) – 1
- Raja Haji Fisabilillah Airport (APII) - 1
- Rhe Tanjung Pinang Airport (APII) – 1
- SAB II Palembang Airport (APII) - 2
- Selaparang Airport – 1 & (API) 1
- Sam Ratulangi Airport 1 & (API) – 1
- Soekarno Hatta Int'l Airport (APII) – 8
- Sultan Hasanuddin Airport (API) - 1
- Sultan Iskandar Muda International Airport (APII) - 2
- Sultan Thaha Airport (APII) – 1
- Sultan Syarif Kasim II Airport (AP) - 1
- Syamsudin Noor Airport Banjarmasin (API) - 1
- Tjilik Riwut Airport – 2
- OTHER – Airport operators (including API & APII) - 15

Malaysia

- KL International Airport - 1
- Malaysia Airports Sepang, KLIA Kuala Lumpur – 1

Papau New Guinea

- National Airport Corporation – 2

The Philippines

- Mactan-Cebu International Airport - 2

Thailand

- Suvarnabhumi Airport – 3

The United States of America

- Massachusetts Port Authority – 1

Viet Nam

- Southern Airport Authority – 1
- Northern Airports Authority – 1

## Annex III – Private Sector Participation

Companies represented: 18

Private sector delegates: 27

Economies represented: 6

### Technology Companies

Company	Economy	Delegates	Sponsor	Speaker
Boeing	USA	1 from USA	Supporting Sponsor	VLA presentation
ESCO, Zodiac	USA	1 from USA	Technology Sponsor	Moderator & Technologies Panel
Jeppesen	Singapore	1 from Singapore	No	No
Mitre	USA	1 from USA	Technology Sponsor	Moderator & Technologies Panel
Oshkosh	USA	1 from Singapore 2 from PR China 1 from USA	Platinum Sponsor	Moderator & Technologies Panel
Sensis	USA	1 from Australia	Supporting Sponsor	No
Stratech	Singapore	1 from Singapore	No	Technologies Panel
Teledyne	USA	4 from USA	Technology Sponsor	Moderator & Technologies Panel

### Service/Consulting Companies

Company	Economy	Delegates	Sponsor	Speaker
Landry Consulting	USA	1 from USA	No	SMS - Seatac
Louis Berger Group	USA	1 from USA 1 from Indonesia	Supporting Sponsor	Aerodrome Certification Training
MJG Aviation (also representing Searidge Tech (CDA) & Sensis (US))	Australia	2 from Australia	Technology Sponsor	Moderator & Technologies Panel
PT MJA	Indonesia	1 from Indonesia	No	No
Osana Int'l	Indonesia	1 from Indonesia	No	No

### Airline Companies

Company	Economy	Delegates	Sponsor	Speaker
Garuda Airline	Indonesia	1 from Indonesia	In-kind	No
Lion Air	Indonesia	1 from Indonesia	In-kind	No
Merpati Nusantara	Indonesia	2 from Indonesia	No	No
Thai Airways	Thailand	1 from Thailand	No	No

### Associations

Company	Economy	Delegates	Sponsor	Speaker
Supply Chain Security Association	Hong Kong China	1 from Hong Kong China	No	No

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Produced by

AVENTI Associates, LLC  
300 South Pointe Drive, Suite 708  
Miami Beach, FL 33139  
Tel: (1) 786-282-8793  
Email: [guevara@aventiasociates.com](mailto:guevara@aventiasociates.com)  
Website: [www.aventiassociates.com](http://www.aventiassociates.com)

and

IOS Partners, Inc.  
311 Mendoza Ave.  
Coral Gables, FL 13323  
Tel: (1) 305 648 6877  
Fax: (1) 305 446 7122  
Email: [rhans@iospartners.com](mailto:rhans@iospartners.com)  
Website: [www.iospartners.com](http://www.iospartners.com)

For

Asia Pacific Economic Cooperation Secretariat  
35 Heng Mui Keng Terrace  
Singapore 119616  
Tel: (65) 68919 600  
Fax: (65) 68919 690  
Email: [info@apec.org](mailto:info@apec.org)  
Website: [www.apec.org](http://www.apec.org)

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