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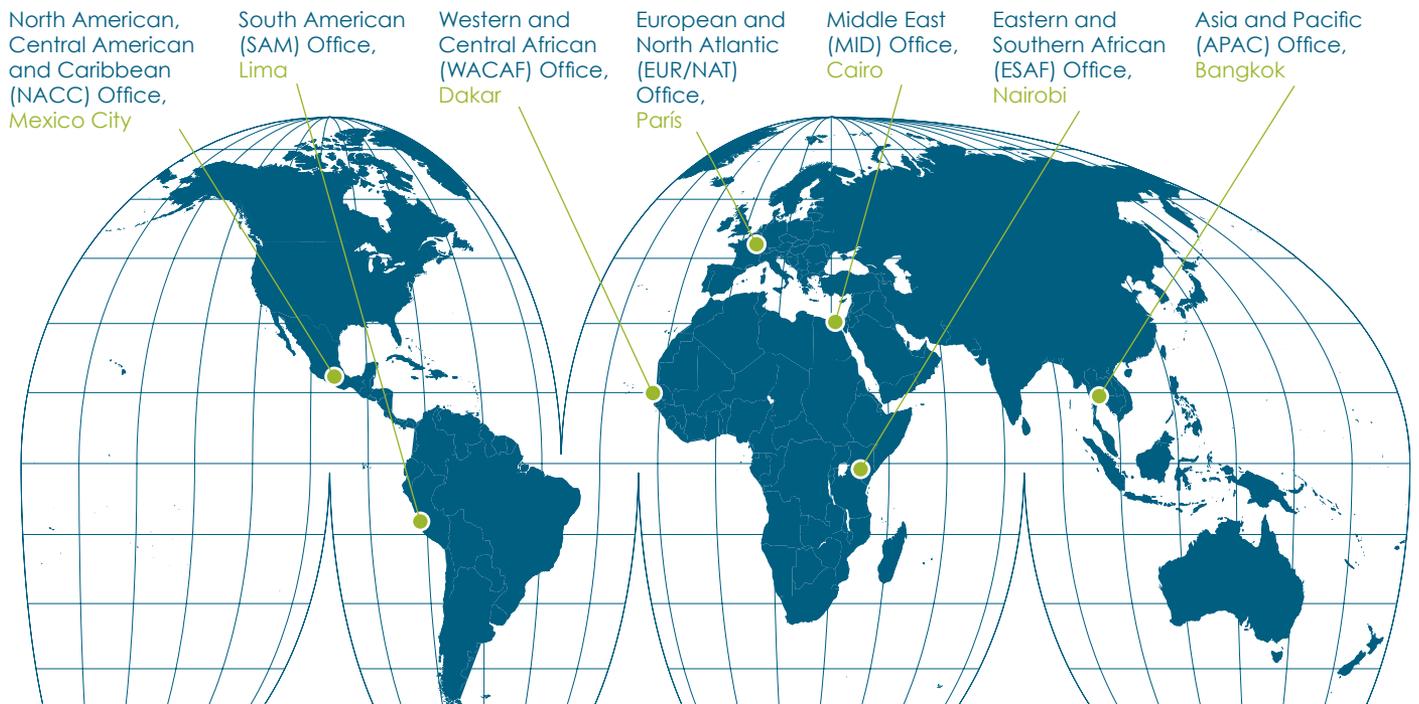
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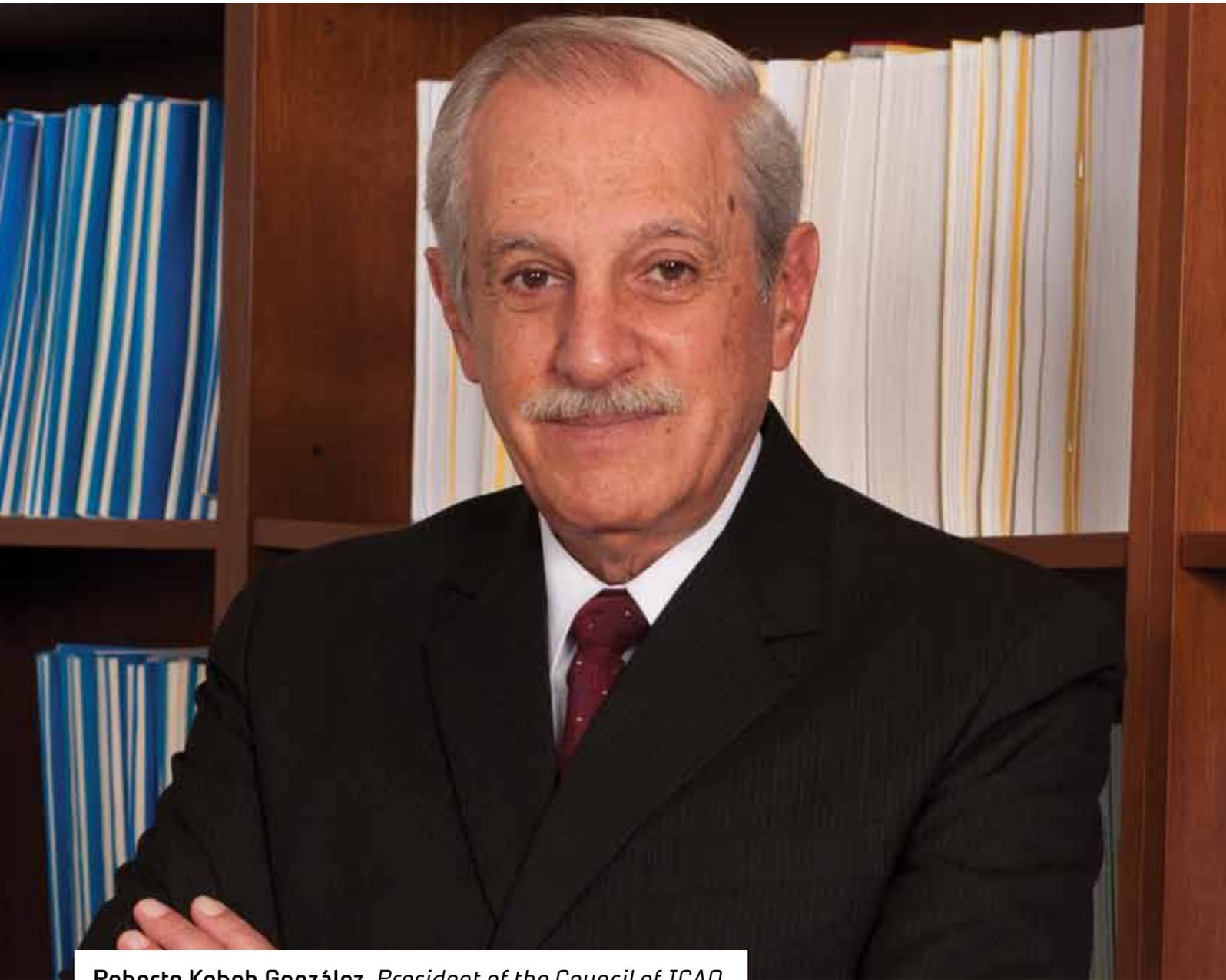
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Roberto Kobeh González, *President of the Council of ICAO*

STRESSING PROGRESS AND COMMITMENT ON VOLCANIC ASH

 We all vividly remember the aftermath of the eruption of Iceland's Eyjafjallajökull volcano in 2010. For days, air transport in Europe came to a standstill, impacting thousands of flights in and out of the Region. Airlines lost hundreds of millions of dollars, tens of thousands of people were stranded at airports and the billions in wider economic impact were quickly felt around the world. This turned out to be the single most disruptive event in the history of civil aviation from natural causes.

The fundamental issue was one of safety. Even as the crisis was unfolding, there was mounting pressure to resume flights, if only on a selective basis. The decision was taken to ensure safety prioritization and keep aircraft grounded.

As assurances grew, the Ministers of Transport of the European Union (EU) decided to gradually reopen the European airspace, in a safe and coordinated manner. At the same time, ICAO met with aviation stakeholders to plan short and medium term actions to advance the science of aviation safety and airspace contaminated by volcanic ash. We also wanted to better understand the Eyjafjallajökull context and to incorporate the lessons learned into updated and more flexible guidance material.

In the ensuing three years, we have made enormous progress. I believe we are now much better prepared to react quickly, effectively and, most important, safely to another major volcanic eruption anywhere in the world, however this progress must be continued.

It is noteworthy in this regard that ICAO and other stakeholders are maintaining comprehensive work programmes in order to achieve an even better understanding of such essential issues as engine and airframe susceptibility to volcanic ash, the concept of visible ash, and the use of ash concentration levels in the strategic planning phase.

Likewise, work has started at the regional level to develop and implement air traffic management volcanic ash contingency plans on the basis of globally applicable principles – but tailored to regional/sub-regional/national circumstances. This action acknowledges the complicated reality that volcanoes, eruptions and the ash they produce are ultimately unique in many respects.

This issue of the *ICAO Journal* provides an exceptional overview of the urgent work carried out over the past three years on one of the most spectacular and potentially overwhelming threats to the safety of air transport. It pays tribute to the hard work of individuals and organizations dedicated to coming to grips with a phenomenon that nothing in recorded history could have prepared us for.

Above all, this report is about the extraordinary power of cooperation among States and a host of other stakeholders – the scientific community, aviation safety professionals, manufacturers, airports and airlines industry – in establishing a new global safety risk framework for routinely determining safe levels of operations through volcanic ash. ■

ICAO and other stakeholders are maintaining comprehensive work programmes in order to achieve an even better understanding of such essential issues as engine and airframe susceptibility to volcanic ash, the concept of visible ash, and the use of ash concentration levels in the strategic planning phase.



HEEDING EYJAFJALLAJÖKULL'S LESSONS

✈ The eruption of Iceland's Eyjafjallajökull volcano in 2010 clearly demonstrated the vulnerability of aviation to volcanic eruptions that occur in or near to high density airspace. More than 100,000 commercial flights were cancelled during the volcano's eruptive phase and over \$5 billion¹ in global GDP was lost due to what eventually became the largest shut-down of European air traffic since World War II. IATA estimated that its airlines alone lost \$1.7 billion due to this single volcanic event.

In light of the scale of these impacts, ambitious programmes were undertaken in 2010 to draw lessons from Eyjafjallajökull. These efforts have helped ensure the smoother handling of similar eruptions such as the Puyehue-Cordón Caulle eruption in Chile in 2011, where the ash plume circumnavigated the southern hemisphere several times, affecting many flight information regions.

Karsten Theil, former ICAO Regional Director Europe and the North Atlantic (EUR/NAT), summarizes the work and achievements of ICAO's International Volcanic Ash Task Force in this special submission to the *ICAO Journal*, with support from ICAO's Meteorology Section and from Peter Lechner, Chief Meteorological Officer at the Civil Aviation Authority of New Zealand and Chairman of ICAO's International Volcanic Ash Task Force (IVATF) and International Airways Volcano Watch Operations Group (IAVWOPSG).

The eruption of the Eyjafjallajökull volcano, situated in the Southern part of Iceland, started with a flank eruption on 20 March 2010. The explosive phase of the eruption began on 14 April and lasted 39 days. A volcanic ash plume was first observed in the early morning of 14 April, and it gradually rose during the day, reaching around 10 km above sea level by evening. North westerly winds carried the ash towards the southeast with ash reaching Europe in the following days.

In accordance with ICAO provisions, upon receiving notification from the Icelandic Meteorological Office and armed with a necessary set of eruption source parameters, the London Volcanic Ash Advisory Centre (VAAC) activated its atmospheric transport and dispersion model and, supported by an observational analysis, began issuing volcanic ash advisories on the extent and movement of the volcanic ash cloud. Several other VAACs, within the framework of ICAO's International Airways Volcano Watch (IAVW), provided further advice, assistance and coordination where the volcanic ash cloud extended beyond the London VAAC's area of responsibility.

IMMEDIATE REACTIONS

Since 2004, and in support of the IAVW structure outlined above, Air Traffic Management (ATM) Volcanic Ash Contingency Plans had been established for the European (EUR) and the North Atlantic (NAT) Regions of ICAO. Similar procedures were in place for aircraft operators with recommendations stipulating that air traffic control should not allow flights through volcanic ash-contaminated airspace and that pilots should avoid volcanic ash.

Eyjafjallajökull's volcanic ash was relatively fine-grained and ejected high into the atmosphere. The ash could therefore potentially be carried over long distances. This was correctly forecast by VAAC London and aircraft operators responded by cancelling flights in contaminated and potentially contami-

THE INTERNATIONAL AIRWAYS VOLCANO WATCH

The International Airways Volcano Watch (IAVW) was established by ICAO in close coordination with the World Meteorological Organization (WMO) in November 1987. It helps civil aviation mitigate the significant hazards posed by volcanic eruptions and volcanic ash in the atmosphere on safe and efficient aircraft operations.

Since the late 1980s, through a global, collaborative approach led by ICAO, the IAVW has matured into a comprehensive worldwide monitoring and notification system consisting of volcanological observatories, meteorological offices (including volcanic ash advisory centres), air traffic service units and users.

ICAO provisions relating to the IAVW ensure the necessary monitoring of active or potentially-active volcanoes, the observation, reporting and predicted movement of volcanic ash in the atmosphere, the issuance of information to aircraft in flight and to aerodromes warning of the presence or expected presence of volcanic ash, information regarding the closure of air routes and aerodromes, the activation of alternative contingency routes, and the reporting by pilots to air traffic service units of any observed volcanic activity or encounters with a volcanic ash cloud.

nated airspace. Based on the procedures, guidelines and level of experience available at the time, this was the only option that would adequately ensure flight safety.

"The IVATF has been a very important catalyst in galvanising globally the volcanic ash event mitigation effort. The Task Force has produced a number of important guidance documents and clarified many areas of concern and confusion in the international aviation sector.

Most importantly, the Task Force brought together for the first time under the ICAO umbrella, a global representation of disciplines including pilots, airlines, scientists, aircraft engineers, ATM, and infrastructure and operations experts. This inter-disciplinary approach was a fundamental key in rapidly advancing the issues and achieving the outcomes sought. It serves as an excellent model for solving other international aviation issues.

The Task Force's recommendations will now be implemented and further developed by the ICAO IAVWOPSG in an accelerated and re-energised work programme. However, it needs to be

emphasised that work on the mitigation of volcanic ash safety and economic risk is no small thing. It is effectively about continuing to build a global system and perspective on geophysical and meteorological phenomena that is relatively new to aviation.

So while the Task Force achieved much, there is more to do. In particular, work in areas like defining engine and airframe tolerance and design criteria, as well as reducing uncertainties in ash reporting and plume modelling is expected to eventually provide critical warning system enhancements in the future.

Importantly, the objective remains to provide increasingly granular and robust information that will allow aircraft to operate safely and economically proximal to volcanic ash in the atmosphere."

- Civil Aviation Authority of New Zealand

In light of the resulting disruption to aviation across Europe, the North Atlantic and beyond, not to mention the significant new perspectives on volcanic ash that Eyjafjallajökull was generating, a change to the European aviation regulation on permissible volcanic ash concentration levels for operation of commercial aircraft was made on 19 April 2010.

This decision allowed for the reopening of limited commercial air traffic routes in Europe to better balance flight safety and economic regularity. A great deal of new data and experience was gained by aircraft operators, ATM officials and aviation regulators in Europe during these first weeks of limited operations and ICAO reacted swiftly in having it reflected in updated guidance material.

ICAO RESPONSE

The Eyjafjallajökull eruption was a strong reminder that most issues related to flight safety and volcanic ash have wide, global implications. This realization emphasized that measures to mitigate the effect of volcanic eruptions on international

“While the well-established ICAO IAVWOPSG, in which WMO has been a long-term partner and contributor, had helped to keep aviation safe in the presence of continued volcanic activity around the world, it was the recent protracted eruption scenario of Icelandic and Chilean Volcanoes that demonstrated that, for an optimized balance between safety and operational regularity and efficiency, further efforts by all stakeholders were needed.

The IVATF process rested on a number of pillars, one of which was the Science effort which was very much relying on the new IUGG-WMO effort of the Volcanic Ash Scientific Advisory Group. The Science group excelled by providing highly relevant guidance and clarification on all aspects of volcanology, the science of atmospheric transport and diffusion of volcanic ash, and vastly improved the common knowledge base on all these aspects of volcanic ash.

WMO and its partner organization, IUGG, are indeed proud to have played an active role in this process, assisting and/or facilitating a highly successful series of workshops and events that, by sharing best practices and scientific methodologies, established an improved basis for the decision support needed by the industry and regulators. The foundations were laid for a much improved capacity to provide a quantitative estimate of volcanic ash present in the atmosphere. This resulted in an improved readiness to design, produce and provide tailored information to decision makers if and when the successful conclusion of technical experiments provides reliable guidance on the ash tolerance of airframes and engines.”

- World Meteorological Organization (WMO)

aviation be globally applicable and well understood by aviation and related technical, scientific and operational communities.

ICAO's first response was to establish a common EUR/NAT Volcanic Ash Task Force (EUR/NAT VATF) to review and revise the EUR and the NAT ATM Volcanic Ash Contingency Plans taking into account the experience gained. Alongside these EUR/NAT-specific efforts, ICAO established an International Volcanic Ash Task Force (IVATF) at the global level to ensure the EUR/NAT experience and recommendations would benefit other regions as well. The work of the IVATF was complementary to ICAO's existing International Airways Volcano Watch Operations Group (IAVWOPSG) that oversees the operation and the development of the IAVW.

By the end of June 2010, the EUR/NAT VATF had completed its work and delivered a draft amendment of the revised contingency plans to the European Air Navigation Planning Group and to the North Atlantic Systems Planning Group for adoption. During and following its inaugural meeting in July 2010, the IVATF worked to address the issues highlighted by the Eyjafjallajökull eruption. Further meetings of the Task Force were held in 2011 and 2012. In late-2011, ICAO convened a meeting of senior-level decision makers to provide guidance to the Task Force on a number of fundamental issues. In June 2012, at its fourth meeting, the Task Force delivered the results of its work to the ICAO Secretariat and was dissolved thereafter. It had completed work on the majority of the issues before it, and provided advice for existing or future ICAO work programmes on any outstanding work that was required. Much of the remaining work and recommendations fall to the IAVWOPSG that meets to further this work, amongst its other responsibilities, in March 2013.

IVATF ACCOMPLISHMENTS

In order to develop a safety risk management framework that would achieve maximum regularity of flights during a volcanic eruption without compromising flight safety,



Passengers rest on cots at the airport in Frankfurt, Germany, as they wait for the resumption of air travel

you're cleared to land

the IVATF divided its work programme into four sub-groups:

- Atmospheric sciences.
- Airworthiness and aircraft operations.
- Air Traffic Management.
- IAVW coordination.

As most of the issues considered were of a highly multi-disciplinary nature, teleconferences were convened at regular intervals between meetings to ensure effective, comprehensive coordination. The Task Force work programme was updated and revised at each meeting.

Eruption situational awareness factors

Most volcanic eruptions can be predicted in advance to some degree. Advance knowledge of impending volcanic eruptions is essential with regards to alerting the aviation community, in particular the flight planners and the airspace managers, that 'normal' flight operations might be disrupted.

In the case of Eyjafjallajökull, the first indications of magma movements were detected as early as 1992-94, and deep earthquakes were detected in 1999-2000. An eruption on 20 March 2010 was preceded by intense seismic activity and the rapid inflation of one of the volcano's flanks. As a result of the volcano's monitoring, the explosive eruption on 14 April was by no means a surprise to volcanologists.

The IVATF therefore performed an evaluation of the volcano monitoring gaps worldwide and recommended a future work plan in this area for the IAVWOPSG, in close cooperation with the Smithsonian Institution and the United States Geological Survey. Also in this regard, the World Organization of Volcano Observatories, through the International Union of Geodesy and Geophysics, developed initial guidelines to promote aviation-specific terms and pre-eruption information.



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Advance knowledge of impending volcanic eruptions is essential with regards to alerting the aviation community, in particular the flight planners and the airspace managers, that 'normal' flight operations might be disrupted.

The International Airways Volcano Watch (IAVW) was established by ICAO in close coordination with the World Meteorological Organization (WMO) in November 1987. It helps civil aviation mitigate the significant hazards posed by volcanic eruptions and volcanic ash in the atmosphere on safe and efficient aircraft operations.

Volcanic ash detection and avoidance

Once an eruption has started, detailed knowledge of an ash cloud's three-dimensional size, density, composition, etc., is vital. This is true not only for flight planners and airspace managers but also for pilots and air traffic managers who need to avoid hazardous ash in real-time. This information is also helpful to Volcanic Ash Advisory Centres as they seek to more accurately forecast ash cloud movement.

For some time, the *avoid visible ash* concept has been employed by flight planners and pilots, while the concept of *avoid all ash* has been relied upon by airspace managers and air traffic managers. Each of these approaches only has limited practical applicability, in as much as:

- The concept of *avoid visible ash* only functions effectively under good daylight conditions. It therefore cannot guarantee that a flight occurring at night or in poor visibility conditions will not enter an ash cloud, posing a risk to flight safety.
- The concept of *avoid all ash* compromises flight economic regularity since it might prevent flights from operating through airspace for which the concentration of ash poses no significant flight safety risk.

In the early days after the eruption of Eyjafjallajökull, regulatory authorities in Europe, in coordination with engine manufacturers, established a threshold value of 2mg/m³ with respect to a volcanic ash concentration level that is likely to be visible and could therefore form the basis for a decision to operate a given flight or not.

A scientific analysis performed by the Task Force, however, demonstrated that there exists considerable range in concentration values – two or three orders of magnitude – that could be used to represent visible ash, even under good viewing conditions. In addition, the Task Force found that current technologies for ash cloud detection do not support determination of the actual or forecast concentration levels with an accuracy that would assist operators in mitigating flight safety uncertainties.

The Task Force therefore identified technologies and recommended system requirements pertinent to ground-based, airborne and satellite-based volcanic ash detection systems. It furthermore made recommendations on the types of volcanic materials that should be used to conduct airframe/engine testing.

“Volcanic contamination seriously affects the operation of aircraft and therefore pilots need accurate knowledge about its existence in airspace planned for their flight. IFALPA was an active participant to the IVATF, providing papers and presentations to the sub-groups and full task group.

IFALPA appreciates that the IVATF had achieved a great number of improvements to the existing knowledge about the safe operation of flights despite the occurrence of volcanic contamination. However, the inevitable silos of information need to be integrated into a comprehensive strategy involving the whole ATM Community (as defined in ICAO Doc9854) and further effort is required to ensure all aviation decision makers are aware of the outcome of IVATF.

ICAO needs to focus on developing globally harmonized Volcanic Ash Advisories (VAAs), also in graphical form, and to rationalize SARPs that currently create information overload during eruptive events. Development of technical provisions would ensure that the most accurate information concerning volcanic hazards are displayed on the flight deck in a way that can be easily used by pilots.

It is essential that pilots are given clear instructions as to what information is required for flight planning and execution of the flight and how to comply with the conditions of their operator's safety risk assessment.”

- International Federation of Air Line Pilots' Associations (IFALPA)

“The 2010 eruption in Iceland constituted a wakeup call on the disastrous economic downfall natural events can bring to aviation. Although safety was guaranteed, it turned out that the model, actions and procedures at the time, implied unnecessary closure of immense portions of airspace leading to unacceptable financial losses. At the call of the industry, ICAO acted swiftly. The convening of IVATF and the opening of the Volcanic ash end-to-end process to examination and assessment, was the right decision. The intense discussion between representatives of regulators, operators, specialized organizations and the scientific community made it clear this would constitute a complex task; handling a daunting number of variables. Within tight timelines, the IVATF produced core recommendations which were widely supported by the industry. It developed actions commensurate with the capability of the ICAO IAVW to detect and warn for visible volcanic ash.

The initial guidance developed will certainly improve the evaluation and decision-making process, not only for regulators, but also operators and ANSPs. However, this is a first step with further development and implementation still to occur. Much of this work lies within the realm of the revamped IAVWOPSG process as well as operators’ SMSs. The enhancement of these will steadily improve the efficiency achieved in dealing with eruptions while allowing operations with the required level of safety.”

- International Air Transport Association (IATA)

New guidance in these areas will be included in the *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds* (ICAO Doc 9691) and the *Handbook on the International Airways Volcano Watch – Operational Procedures and Contact List* (ICAO Doc 9766).

Health effects of volcanic sulphur dioxide

The Task Force completed an assessment which highlighted that, during a volcanic eruption, a number of toxic gases – including sulphur dioxide (SO₂) – may be emitted in addition to volcanic ash, and that it may exist quite separately from the volcanic ash cloud itself.

Sulphur dioxide was considered to be of particular importance since it may be emitted in large quantities and potentially has significant health effects. The Task Force determined that more research is necessary to better understand the potential risk of sulphur dioxide to aircraft occupants, airframe and engine components and any associated expeditious mitigation of the risk. This research is on-going through the International Airways Volcano Watch Operations Group (IAVWOPSG).

Risk management by aircraft operators

One of the most important mandates given to the Task Force was to develop a global safety risk management framework that makes it possible to determine safe levels of operation in airspace reported or forecast to be contaminated by volcanic ash.

It therefore developed comprehensive guidance material which resulted, in early 2012, in the publication of ICAO Doc 9974 — *FLIGHT SAFETY AND VOLCANIC ASH – Risk management of flight operations with known or forecast volcanic ash contamination*. The new manual was co-branded by ACI, CANSO, IATA, ICAO, ICCAIA, IFALPA and IFATCA and it will be updated through the ICAO Operations Panel as further experience and knowledge arises on related hazards.

ATM contingency planning

Realizing that ATM contingency planning needed to address regional or sub-regional nuances, the Task Force developed an ATM Volcanic Ash Contingency Plan template taking such factors into account. The template was developed on the basis of European experiences in the early days after the eruption, as well as further findings of the Task Force. It was distributed to the ICAO Regional Offices to assist the Planning and Implementation Regional Groups (PIRGs) in the development of region-specific volcanic ash contingency plans, in particular for those ICAO Regions where no such plan had existed before.

In this context, and considering that newer safety risk assessment guidance for aircraft operators and regulatory authorities was now available through Doc 9974, the Task Force recommended that *Danger Areas* should not be used to manage airspace, potentially or actually contaminated with





volcanic ash. With this recommendation and others in mind, ICAO is proposing an amendment to the *Procedures for Air Navigation Services – Air Traffic Management* (Doc 4444) regarding procedures to be utilized by air traffic services units when a volcanic ash cloud is reported or forecast. The proposed amendment reinforces existing ICAO provisions concerning special air reports of volcanic activity from the flight crew – thus improving the observation and tracking of a volcanic ash cloud – and highlights that the flight crew, based on safety management system principles, has the final authority as to the disposition of the aircraft (i.e. whether to avoid or to proceed through a reported or forecast volcanic ash cloud).

IAVW operational recommendations

The Task Force made significant progress in assisting to enhance the operating efficiency of the International Airways Volcano Watch. In parallel with additional Task Force activities in this area, two Best Practices Seminars were conducted in 2012 with participation from all nine Volcanic Ash Advisory Centres, and from the user and manufacturer communities. The main results achieved were:

- Identification of tools and procedures to help foster more collaborative decision-making and consistent responses to volcanic eruptions, wherever they occur.



“The IVATF divided responsibilities into four groups, one of which was Air Traffic Management Sub-Group (ATM-SG). The IVATF ATM-SG was initially lead by NAV CANADA's Larry Lachance and shortly thereafter to NAV CANADA's Ted Fudge.

The most notable accomplishment of the IVATF ATM-SG was the collaboration of its members who agreed on a global understanding on the provision of air traffic services during a volcanic ash event. Interestingly, the group naturally employed a Safety Risk Management approach which focused and enabled the group to achieve its success.

To facilitate its global implementation, the group agreed to put forward a proposal for amendment to the ICAO PANS-ATM section 15.8 (Procedures for an ATC Unit When a Volcanic Ash Cloud is Reported or Forecast). The group also agreed to create a Volcanic Ash Contingency Plan Template for global harmonization. In addition, the ATM experts recognized that there was a need to address the information overload of a volcanic ash event and provided suggestion for change to the appropriate ICAO group.

The ATM-SG did an excellent job; the group was engaged throughout the process and were anxious to see the results of our hard work progressed as quickly as possible.”

- Civil Air Navigation Services Organisation (CANSO)

- Supporting the requirements of a future system-wide information management (SWIM) environment, a recommendation that ICAO provisions be amended to enable the availability of volcanic ash advisories in a digital form.
- Proposals for amendments to ICAO provisions and guidance to ensure appropriate volcanic eruption monitoring and volcano observatory response and notification.
- Development of a draft Concept of Operations for the IAVW to be reviewed and further developed by the IAVWOPSG.



“The IVATF was able to work quickly and intensely in response to a new paradigm with regard to Volcanic Ash. This work pointed out that while existing ICAO standards are designed to maintain the maximum level of safety, we are finding more and more often that they have not kept pace with changes in the state of aviation technology. As much of the discussion in advanced ATM considers the implementation of new technologies, the work of the IVATF illustrated that the modernization of standards and procedures is equally important. As we face increasing demands on the global aviation system and an increased need to manage capacity in adverse meteorological conditions, including volcanic ash, it is important to ensure that the policy framework keeps pace with technological innovation. In doing so, ICAO and its expert groups need to ensure that any new proposal includes a comprehensive review of existing language to prevent any inadvertent negative consequences.”

- International Federation of Air Traffic Controllers' Associations (IFATCA)

ICAO DOCUMENTS RELATED TO VOLCANIC ASH

- Annex 3 *Meteorological Service for International Air Navigation*
- Annex 11 *Air Traffic Services*
- Annex 15 *Aeronautical Information Services*
- Doc 4444 *Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM)*
- Doc 8126 *Aeronautical Information Services Manual*
- Doc 8896 *Manual of Aeronautical Meteorological Practice*
- Doc 9377 *Manual on coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services*
- Doc 9691 *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds*
- Doc 9766 *Handbook on the International Airways Volcano Watch – Operational Procedures and Contact List*
- Doc 9854 *Global ATM Operational Concept*
- Doc 9882 *Manual on Air Traffic Management System Requirements*
- Doc 9965 *Flight and Flow Information for a Collaborative Environment – A Concept*
- Doc 9974 *Flight Safety and Volcanic Ash – Risk Management of Flight Operations with Known or Forecast Volcanic Ash Contamination*

- Development of a revised Volcanic Activity Report form with supporting provisions adapted from both existing ICAO and non-ICAO sources.
- Identification of the complexities and co-existing roles between the different aeronautical and meteorological message types that relate to volcanic ash, resulting in a recommendation that the IAVWOPSG, in coordination with other relevant groups, continue to work on strategies to reduce or eliminate information overload.

LOOKING AHEAD

Given the two-year life span of the Task Force, its very ambitious work programme and the resources available to it, the related accomplishments were commendable. It was not surprising that all of its tasks were not completed by June 2012, especially since more data will be needed before conclusions can be derived on aircraft occupant susceptibility to volcanic gases and airframe and engine susceptibility to volcanic ash.

The recommendations and guidance developed by the Task Force on future work to be undertaken provides significant assistance to those working structures within ICAO (the IAVWOPSG and other forums) as well as within other international organizations and entities now vigorously pursuing further progress. ■

FOOTNOTE

- ¹ Oxford Economics.



TOURISM AND AVIATION: SHARING THE BENEFITS OF GROWTH



ABOUT TALEB RIFAI

Taleb Rifai was elected as Secretary-General of the World Tourism Organization (UNWTO) in October 2009 and began his four-year term on 1 January 2010

✈ In 2012, one billion international tourists travelled the world, generating over US\$1.2 trillion in export earnings. Over half these tourists arrived at their destination by air, with much higher proportions in long-haul destinations, particularly landlocked and island developing countries.

Aviation is key for tourism. The extraordinary growth of international tourism over the last decades – from 25 million tourists in 1950 to one billion in 2012 – is as much due to advances in air transport as to the rise of the middle class, the growing wealth in industrialized and emerging countries and the forces of globalization. By the same token, the growth of air transport is intrinsically connected to the expansion of tourism, an expansion set to continue - by 2030, UNWTO forecasts international tourist numbers to reach 1.8 billion, 52% of which will arrive at their destinations by air¹.

Tourism and air transport are communicating vessels. UNWTO is much committed to the new dimension, promoted *inter alia* by ICAO, of fostering closer cooperation between tourism and air transport. As we work for a sustainable future – socially, environmentally and economically – we need to position air transport and tourism collectively as a strategic sector. Thinking beyond the silos provides synergy and positive results.

UNWTO AND ICAO – MAKING TRAVEL AND TOURISM AN EFFECTIVE TOOL FOR GROWTH AND DEVELOPMENT

UNWTO, like ICAO, is a Specialized Agency of the United Nations. With 161 Member States and Territories and over 400 Affiliate Members, UNWTO is mandated to “promote the development of responsible, sustainable and universally accessible tourism”. Within this mandate, UNWTO has worked closely with ICAO since a *Working Arrangement between both organizations* was established in 1978. More recently, in 2010, this collaboration was strengthened through a *Memorandum* identifying areas of mutual interest and action, including:

- security and facilitation of travellers
- investment in aviation infrastructure and safety
- crisis management
- health issues
- sustainable development
- statistics methodology and data collection
- data analysis and forecasting
- liberalization of international air transport and associated safeguards
- economic studies on tourism and air transport.

While efforts are continuing on all these issues, there are key areas which UNWTO considers a priority.

1. SECURITY AND VISA FACILITATION

Security and facilitation have been greatly assisted through ICAO's work on Advanced Passenger Information and specifications for Machine-Readable Travel Documents. But restrictive visa policies and complicated entry formalities

FOOTNOTES

- ¹ UNWTO, *Tourism Towards 2030, 2011*. See for more information: http://dtxqt4w60xqpw.cloudfront.net/sites/all/files/pdf/unwto_2030_ga_2011_korea_1.pdf
- ² UNWTO/WTTC, *The Impact of Visa Facilitation on Job Creation in the G20 Economies, (2012)*: http://dtxqt4w60xqpw.cloudfront.net/sites/all/files/pdf/120731_impact_visa_facilitation_g20_mexico_prot_0.pdf
- ³ Implementation of measures that affect positively the citizens from at least 20 or more countries.
- ⁴ Originally developed as a safeguard to apply to international routes to and from least developed countries which are socio-politically equivalent to essential air service schemes in developed countries, there is now a case for the concept to be applied more widely to reduce market fragmentation. See http://www.icao.int/sustainability/pages/Eap_ER_Databases_EssentialRouteScheme.aspx
- ⁵ UNWTO/UNEP, *Climate Change and Tourism: Responding to Global Challenges, 2008*.
- ⁶ <http://sdt.unwto.org/en/climatechangedocs>

are still stifling tourism growth, particularly from emerging economies which are also some of the fastest growing source markets for tourism.

Research by UNWTO and the World Travel and Tourism Council (WTTC) presented to the 4th T20 Ministers Meeting (G20 tourism ministers) in 2012 demonstrates that improving visa processes could generate an extra US\$ 206 billion in tourism receipts and create as many as 5.1 million additional jobs by 2015 in the G20 economies². As a result, the G20 Leaders recognized the role of tourism as “a vehicle for job creation, economic growth and development” and committed to “work towards developing travel facilitation initiatives in support of job creation, quality work, poverty reduction and global growth.” Aware of the link between visa facilitation and economic growth, many countries are advancing visa facilitation. UNWTO research shows that between 2010 and 2012, over 40 countries made significant changes to their visa policies changing from visa required to “visa on arrival”, “eVisa” or “no visa”³. This impressive movement translated into more than 5,000 bilateral facilitation measures during a two-year period.

UNWTO believes there are considerable benefits of closer collaboration with ICAO in areas of facilitation policy. We strongly support the work of ICAO on document specifications, recalling that in 2010 the ICAO Assembly agreed to UNWTO’s proposal that ICAO should explore with international partners the development of standards and specifications for eVisas, and that in October 2012 UNWTO’s Executive Council mandated the Secretariat to “engage in discussions with ICAO to support the advancement of international benchmarks to harness technology in visa processing and issuing”.

2. CONNECTIVITY AND ECONOMIC REGULATION

A key factor, for developed and developing countries alike, is the growing need for market liberalization. Air service reciprocity continues to take precedence in too many countries over an assessment of economic and social benefits, while separate sectoral policies on air transport and tourism result in a fundamental, and too often even conflicting, disconnect which constitutes a severe constraint on the development of travel and its economic impact. Very shortly, ICAO will hold its sixth Air Transport Conference. Over the past five Conferences, the approach has moved from “whether to liberalize” to “how to liberalize”. This has produced a wealth of guidance but less implementation than desired. UNWTO would favour seeing the focus moving to “let’s liberalize”, including broader application of the ICAO and UNWTO joint concept of *Essential Service and Tourism Development Routes (ESTDR)*⁴.

3. TAXES AND LEVIES

While properly constituted taxes and duties are a fundamental and legitimate fiscal tool, there is a growing concern regarding a proliferation of levies on both air transport and tourism. While the industry should naturally contribute its due, this increasing proliferation of taxes and charges can actually produce a net

damage to the economy, particularly in those destinations which are so dependent on air travel. In many cases, these taxes distort the market and create trade barriers hampering fair competition. This issue needs to be addressed, as with travel facilitation and connectivity, by collective positioning of the benefits of air transport and tourism, with cross-silo emphasis on analysis and guidance to States on the impact of taxes and charges.

4. CONSUMER PROTECTION

There is an insufficiency of binding rules at the global level governing the rights and obligations of tourist consumers and travel organizers. UNWTO has initiated a process, with the participation of ICAO, to draft an international convention dealing with the key scope elements identified, including non-binding provisions. UNWTO has naturally no intention to substitute or duplicate any related regulatory frameworks which have been already adopted by the European Union or other international organizations such as ICAO. This project should contribute to a better protection of both tourists and tourism service providers worldwide by making international and multilateral some of the standards already existing and functioning effectively.

5. ENVIRONMENTAL SUSTAINABILITY

While environmental sustainability has long been on the tourism agenda, a primary focus for UNWTO in recent years has been tourism and climate change. A joint UNEP/UNWTO/WMO study carried out for UNWTO’s Second International Conference on Climate Change and Tourism in Davos in 2007 showed that tourism represents about 5% of global CO₂ emissions⁵. Air transport accounts for an estimated 40% of the tourism contribution of CO₂ and is overwhelmingly dominant at medium- and long-haul.

UNWTO works closely with ICAO regarding air transport emissions. In 2010 UNWTO presented a *Statement Regarding Mitigation of Greenhouse Gases from Air Passenger Transport* to the ICAO Assembly⁶. UNWTO also coordinates with ICAO in the UNFCCC process – at COP 18, ICAO together with other partners, took part at the side event organized by UNWTO on tourism and climate change, delivering a common message on the commitment and mitigation efforts being carried out by the tourism and travel sector to respond to climate change. For its part, UNWTO is committed to providing a tourism perspective to ICAO’s ongoing policy analysis and debate, notably as regards market-based mitigation measures.

AN INTEGRATED, COLLECTIVE VISION FOR TRAVEL AND TOURISM

There is clearly a need for ever-closer cooperation and collective action beyond functional ‘silos’ of tourism and air transport. Coordination amongst airlines, tourism destinations and airport authorities is crucial, fostered at the national level by appropriate government direction and at the global level by the joint work of UNWTO and ICAO. Positioning travel and tourism collectively as a strategic sector, having a single voice on common issues, will pave the way to a sustainable future. ■



"We take great pride in hosting this ICAN event in our country," commented His Highness Prince Turki Bin Faisal AL SAUD, Chairman of the closing session. Pictured above left to right: Mr. Yuan-Zheng Wang, Air Transport Officer, EAP; Ms. Magda Boulos, Air Transport Officer, EAP; H.H. Prince Turki Faisal AL SAUD, Vice President, International Organization Affairs General Authority of Civil Aviation, Kingdom of Saudi Arabia; Mr. Frederic Malaud, Air Transport Development Manager, EAP; Ms. Lina El-Taweel, Technical and Administrative Assistant, EAP; Ms. Carmen Marcu, Operational Manager, EAP.

ICAO AIR SERVICES NEGOTIATION CONFERENCE EVENT LAYS FOUNDATION FOR EXPANDING MARKET ACCESS

 ICAO's 5th Air Services Negotiation Conference (ICAN) concluded with a record number of new air services agreements and arrangements signed.

Held in Jeddah, Kingdom of Saudi Arabia, in December 2012, ICAN was hosted by the General Authority of Civil Aviation and brought together over 350 air service negotiators from 62 States, representing every world region. Over 350 meetings were held during the five-day event and more than 130 new air services agreements and arrangements were signed.

"The ICAN process and its continuing success clearly demonstrate that ICAO is best positioned to provide this type of service to our Member States," said ICAO Council President, Roberto Kobeh González. "Traditionally, States would have to travel to each of their partner nations to conduct these types of negotiations. The ICAN setting provided for a far more efficient and cost-effective venue allowing for not only bilateral but also regional, plurilateral or multilateral negotiations."

"The objective of the conference is to facilitate ICAO Member States in their bilateral (or multilateral) air service negotiations and to improve the efficiency of the process by providing a central meeting place for States to gather and conduct such negotiations at one location," added Boubacar Djibo, Director, Air Transport Bureau, ICAO. "At previous ICANs, each delegation had an average of four meetings. This conference was similarly productive."

Agreements signed during ICAN meetings provide the basis for expanding market access and route connectivity between States, which in turn, bring benefits to consumers and contribute to the development of local communities and wider economic interests of the countries concerned.

The attending delegates highly commended ICAO for continuing to provide the ICAN forum and praised the event's excellent networking opportunities. They also expressed their gratitude for the special ICAN seminar session which allows participants to learn about latest trends and developments in air transport, discover related ICAO policies and guidance and exchange information.

"We take great pride in hosting this ICAN event in our country," commented His Highness Prince Turki Bin Faisal, Chairman of the closing session. "It benefits not only Saudi Arabia but also all participating States, as its results will help the development of air transport services and promote friendship and understanding between peoples of the world."

"ICAO's efforts have provided a convenient platform to facilitate aviation relations and improve air links and services between States such as Kuwait," said Mr. Fawaz Al-Farah, Director General of Civil Aviation, Kuwait. His country signed a total of 11 agreements at ICAN 2012, seven of which involved open skies arrangements.

REGULATORY COOPERATION AND CONVERGENCE GOES HAND IN HAND WITH OPEN AND FAIR COMPETITION

Open competition in a market only makes real sense when it is based on a set of common rules including robust instruments to safeguard open and fair competition with strict application of competition law and state aid rules, says Klaus Geil, Head of Sector – External Aviation Policy European Commission.

In a speech to delegates attending the 2012 ICAO Air Services Negotiation Conference (ICAN) in Jeddah, Kingdom of Saudi Arabia, Geil said he believes the process of market liberalization would be much more easily facilitated if it was accompanied by a parallel process of regulatory cooperation and convergence which would enhance confidence that market opening is based on open and fair competition and a level playing field.

Geil stressed that regulatory convergence is also needed at the global level.

"In this respect, we believe that ICAO can and should play a more prominent and stronger role also in promoting global guidance for the economic regulation of international air transport as ICAO does in other areas," he said. "Europe therefore sees the ICAO Air Transport Conference in March 2013 as excellent and important for developing guidelines and basic principles for how the future global regulatory environment for air transport should look like both in terms of liberalizing market access and airline ownership and control, while safeguarding fair competition and passengers' rights."

"The United States has participated in all five ICANs to date, and we found it provides tremendously valuable opportunities for meeting partners around the world," echoed Mr. Wendell Albright, Director of the U.S. State Department's Office of Aviation Negotiations. "I congratulate ICAO and the host for organizing this successful event." ■

Venue	DUBAI UAE	ISTANBUL Turkey	KINGSTON Jamaica	MUMBAI India	JEDDAH KSA
Year	2008	2009	2010	2011	2012
# of participating States	27	52	38	64	62
# of bilateral meetings held	100	200	200	340	350
# of bilateral agreements signed	20	60	60	120	130



ANNUAL PASSENGER TOTAL APPROACHES 3 BILLION ACCORDING TO ICAO 2012 AIR TRANSPORT RESULTS

Some 2.9 billion people used air transport to help realize business and tourism needs in 2012, according to ICAO preliminary figures on scheduled services.

The annualized passenger figure is up 5% since 2011 and is expected to reach over 6 billion by 2030, according to current projections.

Total scheduled passenger traffic grew at a rate of 5.5% in 2012 - in terms of revenue passenger-kilometres (RPKs) - a 1% point decrease compared to last year's growth rate. This is a reflection of positive economic results worldwide, despite slow economic growth in some regions and the implementation of fiscal austerity policies in key European economies.

The Asia/Pacific region was the world's largest air transport market in 2012, with a 30% share in terms of world RPKs. The Middle East region, accounting for 8% of the world RPKs, recorded the fastest growth rate at 16.8% in 2012 compared to 2011.

The overall air transport capacity offered by airlines, expressed in available seat-kilometres (ASKs), increased globally by 4.0% in 2012. The overall load factor increased slightly at just over one point compared to 2011.

ACI, IATA AND ICAO JOIN FORCES ON YOUNG AVIATION PROFESSIONALS PROGRAMME

ICAO has signed a Memorandum of Understanding (MOU) with the International Air Transport Association (IATA) and Airports Council International (ACI), establishing a global Young Aviation Professionals Programme.

The programme will identify young talented professionals, with due consideration to diversity, who have advanced university qualifications and knowledge of and practical experience in the aviation industry and regulatory activities. Selected candidates will be expected to contribute to work programmes relating to aviation safety, security, environment and/or air transport, focusing on the inter-relationships between regulatory activities and the airline and airport industries.

"Within the United Nations Common System Organizations, the Young Aviation Professionals Programme is unique as it enables young professionals to complete a work assignment with an international regulatory body which develops international standards, as well as with the industry partners in the airline and airport industries, through which the international standards are implemented," commented ICAO Bureau of Administration and Services Director, Fang Liu. "Through these assignments, which will cover a period of twelve months, the young professionals will be expected to further develop their knowledge and understanding of regulatory activities and the airline and airport industries. The young professionals we're looking for will be expected to have the potential to participate in, and/or lead future activities undertaken by ICAO, IATA and ACI."



MOU signatories from left to right: ACI Director General Angela Gittens, ICAO Secretary General Raymond Benjamin and IATA Director General Tony Tyler.

ICAO COMMENDS MAURITANIA AS EC REMOVES AFRICAN STATE FROM SAFETY WATCH LIST

Acknowledging Mauritania's exceptional progress on its aviation safety oversight challenges, as recently validated by ICAO, the European Commission (EC) has removed the African State's certified air carriers from its safety watch list, effective December 2012.

ICAO has highly commended Mauritania for its recent safety progress, which led to the EC's action. Two ICAO Coordinated Validation Missions (ICVMs), conducted in Mauritania during 2012, confirmed the State's latest safety progress and have directly led to the re-opening of European skies to its airlines.

AUTHORS DOCUMENT CHALLENGES OF POST 9/11 AIRPORT SECURITY IN *DISCOVERING AIRPORT SECURITY*

Ignacio López and Carmen Cordero, authors of *Discovering Airport Security*, (published in Spanish by Aena Airports SA), have been at the forefront of the post-9/11 era of airport security at Madrid-Barajas Airport, managing the dramatic change in all aspects related to the 'security revolution' and providing testimony of their own experience in the years since 2001.

López, a senior aeronautical engineer with extensive experience in security issues, was promoted to Security Manager of Madrid-Barajas Airport from 2006 to 2010, with the challenge of implementing new security measures imposed by the European Commission and dealing with all the changes that had to be undertaken to achieve it.

Cordero, humanist and writer with airport experience, was in charge of communicating a message of acceptance and cooperation for the new security measures to airport employees. An accomplished author of a manual and editor of the airport security newsletter, she developed a basic awareness course aimed at airport groups who were, at first, apprehensive about the challenges of undertaking new security measures.

Both López and Cordero worked on the book for more than two years and used their different skills, experience and knowledge to provide readers with comprehensive information about the origins, history, reasons and consequences of the development of these new airport initiatives, in which concepts such as security, facilitation and operation must fit seamlessly together.

"Spanish airport employees, as in the rest of the world, were shocked and dismayed while witnessing live coverage of those terrible events of 9/11," said López. "We had to adapt ourselves very quickly to a radical change in our daily routine."

The first challenge was to adapt the airport installations themselves to the new security requirements. Designed for facilitating thousands of aircraft operations and the movement of millions of passengers in the shortest possible time, the concept of functionality became the first challenge for the new security measures.

"We were forced to reorganize the terminals to safeguard passengers and aircraft," says López. "Millions of Euros were spent to equip airports with advanced technology and well trained personnel that could prevent access to any potential threat. In a very short time, we had to build 'virtual walls' to deny access to the 'bad guys' and to detect any dangerous objects. On the other hand, the airport manager's priority was restoring productivity and confidence in air travel so we were always dealing with two imperatives."

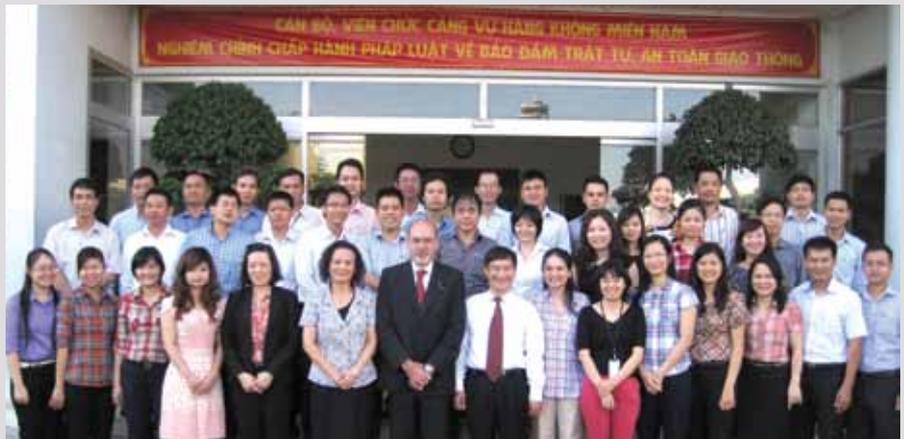
"This is a useful and informative book not only for air transport industry workers, but for all passengers and users who want to understand the reasons why air travel involves going through such rigorous security measures," added Cordero.



Co-authors Carmen Cordero and Ignacio López

INTERNATIONAL CIVIL AVIATION LAW TRAINING COURSE IN VIETNAM

A Training Course on International Civil Aviation Law took place in Ho Chi Minh City from 26 to 30 November 2012, organized by the Southern Airports Authority of Vietnam under the auspices of the Civil Aviation Authority of Vietnam with the assistance of ICAO. The objective of the course was to enhance the knowledge base of civil aviation professionals in Vietnam in the international legal framework of civil aviation. Forty-one professionals specializing in different fields of civil aviation, including air law, and coming from various State departments, corporations and institutions dealing with civil aviation in Vietnam participated in the course.



ICAO Secretary General Visits Indonesia



ICAO Secretary General, Raymond Benjamin, is received by the Director General of Civil Aviation, Herry Bakti, and his Senior Staff.



The ICAO Secretary General delivered a memento to the Minister of Transportation, HE. E.E. Mangindaan

At the ASEAN Aviation Training and Education Summit, Secretary General of ICAO, Raymond Benjamin, delivered the keynote speech.



Opening Session of the ASEAN Aviation Training and Education Summit, from left to right: Bobby Mamahit, Head of Human Resource Development in Transportation Agency; Raymond Benjamin, Secretary General of ICAO; Dr. Bambang Susantono, Vice Minister of Transportation; Catalin Radu, President of the European Civil Aviation Conference (ECAC); Herry Bakti, Director General of Civil Aviation.

ICAO Secretary General Raymond Benjamin visited the Republic of Indonesia from 20 to 25 January 2013. During his visit, he held high-level discussions with the civil aviation authorities of Indonesia, including the Minister of Transportation, H.E. Mr. E.E. Mangindaan, and met with representatives of the Indonesian airline industry and other civil aviation stakeholders.

During his visit, he was the keynote speaker at the Association of Southeast Asian Nations (ASEAN) Aviation Training and Education Summit which took place in Indonesia's capital, Jakarta, from 22-23 January 2013. The meeting was also addressed by the Vice-Minister of Transportation of Indonesia, Dr. Bambang Susantono; the Director General of Civil Aviation of Indonesia, Mr. Herry Bakti; the President of the European Civil Aviation Conference (ECAC), Mr. Catalin Radu and the Director Generals and other high-ranking officials of ASEAN Member States.

The ASEAN Summit took place in cooperation with ECAC and the Joint Aviation Authorities Training Organisation (JAA TO) and had as its main objective to develop a framework for closer cooperation between ASEAN countries to maximize the use of existing resources in the field of civil aviation training and education. The event should be seen against the background of the ASEAN "Roadmap for the Integration of the Air Travel Sector" and the vision of a single ASEAN air transport market from 2015.

As part of the ASEAN Aviation Training and Education Summit, Mr. Benjamin also had the opportunity to visit the Indonesia Civil Aviation Institute (ICAI), which is the main governmental training institution in the field of civil aviation in Indonesia, as well as the Maintenance Facility and the Training Center of Garuda Indonesia Airlines.

Singapore

BUILDING AVIATION CAPITAL





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A Confluence of Minds

TALENT IS A COUNTRY'S MOST PRECIOUS ASSET, MORE SO FOR
A SMALL RESOURCE-POOR COUNTRY LIKE SINGAPORE...

IT IS THE DEFINING FACTOR.

– *Memoirs of Lee Kuan Yew*

Singapore is a city State built on human capital. We subscribe to the adage: “Give a man a fish and you feed him for a day; teach a man to fish and you feed him for a lifetime”.

From our beginnings as an island trading post in Asia, Singapore is acutely cognisant of the importance of global connectivity to support and sustain our economy. Air and maritime transport have been key to linking us to the rest of the world, and we have done much to develop the aviation and maritime sectors. The connectivity that these sectors provide has not only facilitated trade, business and tourism but also the confluence of minds and ideas, making Singapore an intellectual capital and a global schoolhouse.

This is a journal on Singapore’s experience in engaging minds towards building human capital and aviation.

LAYING OUR FOUNDATION

Education has been and will continue to be a cornerstone of Singapore’s development. From the onset of our nationhood, Singapore has placed strong emphasis on education, benchmarking our standards with the best in the world, and a culture of continuous learning.

Singapore’s education system based on the English language and meritocracy ensures that all Singaporeans, regardless of their background, can benefit from the opportunities to learn, communicate and work; even as education in the mother-tongue helps them keep their cultural roots. Education is compulsory and free for all Singaporean children in the formative years. Significant subsidies are also given by the Government for education thereafter: that for a university education is about 75%, and a full range of financial assistance schemes from government bursaries to low or interest-free loans are also available.

Our commitment to education is steadfast, especially as Singapore grows as a knowledge economy. Increasingly, our education system is focusing on innovation, creativity and critical thinking. At the tertiary level, four universities in Singapore – the National University of Singapore (NUS), the Nanyang Technological University (NTU), the Singapore Management University and the Singapore University of Technology and Design – provide variegated choices in business, finance, medicine, informatics, science and technology. NUS and NTU are ranked among the top 50 universities globally by Quacquarelli Symonds (QS).

A Voyage of Discovery, Learning and Application

BUILDING ON OUR FOUNDATION

Singapore's success in aviation did not happen by chance or just on our own. We invested in our only asset, our people, and we began by learning from others more advanced in their aviation development. Some shared their experiences to show us the ropes; others made available to us training programmes and facilities to develop our human resource. Assistance was also provided under the United Nations Development Programme (UNDP). These avenues helped set our foundation in aviation. Over the years, we have adapted and innovated for our special needs and circumstances, even as aviation grew with increasing dynamism, complexity and sophistication.

AIR NAVIGATION ADVANCEMENT

As aviation in Singapore developed and the demand for trained personnel grew, sending our aviation professionals overseas for training became increasingly difficult – there were less training vacancies available and it was getting too costly. This provided the impetus for Singapore to establish its own civil aviation training school. This was set up in 1958, in an empty hangar, by a group of air traffic controllers led by the then Director of Civil Aviation of Singapore. The school improvised in building its first aerodrome “simulator”, using a large wooden table top and painting on it the runway and taxiways. The air traffic controllers playing the role of “pilots”, manually manoeuvred small aircraft models on sticks to simulate taxiing and flight, based on commands communicated over the telephone by trainee air traffic controllers situated in an adjacent glass-panelled room.

The civil aviation training school expanded and grew over the years to

1958

MARKED THE BIRTH OF THE FIRST CIVIL AVIATION TRAINING SCHOOL. THE SCHOOL IMPROVISED ITS FIRST AERODROME ‘SIMULATOR’ FROM A LARGE WOODEN TABLE TOP WITH A PAINTED REPLICA OF RUNWAY AND ASSOCIATED TAXIWAYS.

become what is the Singapore Aviation Academy today. The improvised aerodrome “simulator” of the early days has since been replaced with three state-of-the-art air traffic control simulators: a “virtual” Aerodrome Control Simulator with a 360° wrap-around screen showing photo-realistic images and fully interactive systems to simulate a variety of air traffic situations; a

Surveillance Simulator for training in en route and terminal operations; and a Procedural Simulator for training in the control of air traffic outside radar coverage. What has not changed is the development of these simulators by practitioner Singapore air traffic controllers according to the training needs and methods that they envision for each new generation of trainee air traffic controllers. As their predecessors did in 1958, the Singapore air traffic control professionals are constantly innovating to develop with the latest technologies and training capabilities to meet the growing complexities in air traffic management.

Besides training capabilities, the Civil Aviation Authority of Singapore (CAAS) is investing in a S\$300 million third generation air traffic management system, LORADS III. As with LORADS I and LORADS II, the new system uses state-of-the-art technologies and embeds procedural and operational improvements envisioned by CAAS air traffic controllers and engineers. The system, when commissioned in 2013, will effectively serve the projected future air traffic way beyond the more than 500,000 aircraft movements currently handled by CAAS Air Traffic Control in the Singapore Flight Information Region in a year, while maintaining a deficiency-free rating from the International Federation of Air Line Pilots' Associations (IFALPA).





AIRPORT DEVELOPMENT

The decision to move the airport from Paya Lebar to Changi in the 1970s is another important chapter in our journey into uncharted waters. The operations at Paya Lebar Airport were scrutinised and analysed, and detailed studies of traffic flow patterns at major international airports around the world were conducted. When flying over Boston's Logan Airport, the then Prime Minister of Singapore, Mr Lee Kuan Yew, saw the benefits of

having an airport by the waters, in that aircraft taking off and landing would not have a noise and pollution footprint over the city and there would be space for expansion. This swayed the decision made in 1975 to build a multi-billion dollar new airport (a scale unmatched at that time) on reclaimed land along the east coast of Singapore. This was instead of the cheaper and faster alternative of building a second runway at Paya Lebar Airport, but which had flight paths over the heart of the city and land constraints.

With that decision, the airport master plan was drawn up and work began to turn the swamp and sea into an international airport. Within 5

51

MILLION PASSENGERS PER ANNUM
PASS THROUGH SINGAPORE CHANGI
AIRPORT – THE 7TH BUSIEST AIRPORT
FOR INTERNATIONAL PASSENGER AND AIR
CARGO TRAFFIC WITH OVER 110 AIRLINES
OPERATING SOME 6,500 SCHEDULED
WEEKLY FLIGHTS TO MORE THAN 240
CITIES IN OVER 60 COUNTRIES.

years, the backwaters were transformed into a modern award-winning airport with over 420 world-best airport accolades to date. Today, Singapore Changi Airport is the 7th busiest airport for both international passenger and air cargo traffic, handling some 51 million passengers per annum with over 110 airlines operating some 6,500 scheduled weekly flights to more than 240 cities in over 60 countries. It is one of the world's most connected airports globally, serving the air

transport needs of the economically vibrant Asia-Pacific region.

Thirty years on, a new airport master plan is being developed to capitalise on the space abutting the existing Changi Airport that was reserved in the 1970s, to add a third parallel runway and new passenger terminals to handle the projected traffic demand of three times the current traffic volume within the next 20 years. This new master plan is being developed by an in-house team of experts based on the experiences gained from operating the existing Changi Airport and exchanges with other airport master planners.



WORLD CLASS AIRLINE MANAGEMENT

The story of the growth of Singapore Airlines (SIA) as an independent national airline is one based on challenging the traditional mindset in management. The then Prime Minister of Singapore, Mr Lee Kuan Yew, gave this mandate and challenge to the newly formed SIA in July 1972, “I spelt out the need for a Singapore airline to be competitive and self-supporting; it would close down if it incurred losses. We could not afford to run an airline just to show the flag like other countries did.” This set the tone for the management approach taken by the Singapore national carrier. The SIA management team and the union embarked on a journey of close cooperation, focusing on making its business model succeed and knowing that the government would not bail them out financially. Today, SIA is one of the most successful and awarded airlines worldwide, operating flights to every continent.

Having witnessed the success of SIA, other Singapore carriers followed suit with different business models but the same mindset – the need to be competitive and self-supporting. Singapore now has six other airlines: SilkAir, Tiger Airways, Jetstar Asia Airways, Valuair, Scoot and SIA Cargo – adding diversity to our air transport industry with many foreign carriers that

operate to Singapore. The government plays a part in their development, but only to provide a conducive business environment and a liberal air transport policy to reduce barriers. Singapore has concluded air services agreements with more than 110 countries, of which over 50 are open skies agreements.

AEROSPACE INDUSTRY DEVELOPMENT

The growth of the aerospace industry in Singapore stems from a similar approach of the government providing an ease-of-doing business environment and a skilled workforce for aerospace companies to grow to support the aviation demand in the Asia Pacific. Host to Asia Pacific’s largest air-show, Singapore provides business opportunities for aviation stakeholders around the world. There are now over 100 international Maintenance, Repair and Overhaul (MRO) companies providing a comprehensive array of services and facilities in Singapore. ST Aerospace – the world’s largest independent aircraft MRO provider – is leading the industry with a margin of nearly three million airframe maintenance man-hours between itself and the next biggest aircraft MRO provider, while SIA Engineering Company is the first and largest A380 MRO company in the world.



Building for the Future

INTERNATIONAL AVIATION HOLDS UNBOUND POSSIBILITIES AND OPPORTUNITIES, BUT AT THE SAME TIME MANY CHALLENGES. THE SHORTAGE OF TRAINED AND SKILLED AVIATION PROFESSIONALS IS LIKELY TO BE THE SINGLE MOST SIGNIFICANT LIMITING FACTOR TO THE SUSTAINABLE GROWTH OF AVIATION. SHIFTING DEMOGRAPHICS, SKILL GAPS AND WANING INTERESTS AND PASSION IN THE AVIATION PROFESSION IS MAKING IT DIFFICULT FOR THE AVIATION SECTOR TO KEEP PACE WITH THE GROWING DEMAND.



SAA WAS CONFERRED THE 34TH ICAO EDWARD WARNER AWARD BY THE COUNCIL OF ICAO IN RECOGNITION OF ITS EMINENT CONTRIBUTION AS A CENTRE OF EXCELLENCE IN INTERNATIONAL CIVIL AVIATION TRAINING.

ICAO's Next Generation of Aviation Professionals (NGAP) initiative is timely in addressing the challenges in aviation manpower development.

As a member of the NGAP, CAAS is working with stakeholders to make training and certification for aviation professions more seamless, and has intensified efforts in promoting aviation as a career to youth in Singapore. Singapore also

hosted the inaugural ICAO TRAINAIR PLUS Global Symposium in 2012 to generate greater awareness and exchanges on the latest trends, tools and best practices in aviation training. The Singapore Aviation Academy is further developing its training pedagogy, beyond the classroom, to suit the Y-Generation. This includes more interactive teaching facilities and techniques, and web-based training.

Singapore appreciates the training provided to our aviation personnel by those more advanced in aviation when we needed them and has too adopted an open door policy in offering basic, advanced and customised training. The aviation training centre in Singapore was first designated the ASEAN Centre of Excellence for training in air traffic control and aircraft fire-fighting and rescue in 1977, and jointly designated by ICAO and UNDP as the Asia Pacific Regional Training Centre to provide specialised training to government civil aviation personnel in 1978. The aviation training school has developed to what is now the Singapore Aviation Academy. Comprising the School of Air Traffic Services, School of Aviation Management, School of Airport Emergency Services, and the School of Aviation Safety and Security, the Academy has joint programmes and collaboration with other established academic institutions from the US, Europe, and China in addition to local institutions, IATA and CANSO. The Academy has over 70,000 academy alumni from over 200 countries and territories, with some

5,000 receiving training fellowships from the Singapore Government. The global participation in the Academy's programmes adds to the richness of the programmes for the benefit of all.

For its role in aviation human capital development, SAA was conferred the 34th ICAO Edward Warner Award by the Council of ICAO in recognition of its eminent contribution as

a centre of excellence in international civil aviation training. The Award recognises SAA for its dedicated and tireless efforts in facilitating the exchange of information and expertise among all components of the civil aviation sector, thus fostering regional and inter-regional cooperation and coordination, and the development of international civil aviation, an important contributor to the wealth and welfare of people in all regions of the world.

To transform Air Traffic Management (ATM) to meet the complexities of the future, CAAS is spearheading the building of Singapore as a Centre of Excellence (CoE) for ATM. This is being done based on the successful template of the CoEs for biomedical sciences and information, communication and technology in Singapore. It is anchored on four fundamentals - research and development, intellectual capital, industry partnership and international collaboration. A CoE for ATM Programme Fund of S\$200 million has been set up to provide seed funding to establish research institutes and think-tanks and for research and development programmes. The CoE for ATM will be a vibrant and self-sustaining ecosystem for the research and development of ATM concepts, technologies and solutions, and the grooming of the next generation of ATM professionals and researchers. The benefits of these will extend beyond Singapore to ASEAN, the Asia Pacific and globally.

Inspiration for Tomorrow

THE DREAMS AND GOALS OF TOMORROW
ARE ATTAINED BY THE ACTIONS OF TODAY.
INSPIRED BY OUR PAST, SINGAPORE WILL
CONTINUE TO INVEST IN HUMAN CAPITAL
DEVELOPMENT AND NURTURE THE NEXT
GENERATION OF AVIATION PROFESSIONALS
TO TRANSFORM INTERNATIONAL AVIATION
IN SINGAPORE AND GLOBALLY.



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Aviation Safety & Security



Air Traffic Services



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34th ICAO Edward Warner Award

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**SIA ENGINEERING
COMPANY**

POWERING AHEAD
THROUGH INNOVATION

Global Connections

With more than 110 airlines operating some 6,500 weekly flights to over 240 destinations in 60 countries and beyond, Singapore Changi Airport is a leading air hub in the Asia Pacific region. Singapore itself is a key financial and business centre, as well as a growing tourist hub with two integrated resorts. It also hosts international events such as the world's first Formula One night street race. Besides being a bustling hub for full service carriers, Singapore is experiencing one of Asia's strongest growth in low cost travel.

Strong Partnerships with Airlines

The growth of Changi Airport as an air hub can be attributed in part to the strong partnerships that Changi Airport Group (CAG) has established with its airline partners. CAG works closely with airlines to identify growth opportunities, and also offers a comprehensive range of incentive schemes to support the airlines' growth while keeping costs competitive.

Setting Benchmarks in Civil Aviation Standards

CAG is committed to working with ICAO to develop and implement the highest possible standards in operations, safety and security in civil aviation. For example, CAG collaborated with a homegrown technology company in 2011 to implement a Perimeter Intrusion Detection System for better detection of perimeter intrusions, more accurate determination of the incident location, and a faster response time by the security team.

Commitment for Future Growth

CAG adopts a proactive policy of building in anticipation of future traffic demand, and providing ample capacity to accommodate the growing numbers of passengers and flight movements. CAG recently completed the upgrading of Terminal 1 (T1) and will be redeveloping the open-air carpark in front of T1 into a multi-use complex. Terminal 4 (T4), expected to be ready by 2017, will provide a wider choice of retail and food & beverage offerings, as well as passenger amenities. These new developments help ensure that Changi Airport is well-positioned to serve the region's aviation needs in the future.

Supporting the Environment

CAG recognises the need for sustainable growth and its impact on the environment. Changi Airport attained Green Mark Gold status, conferred by the Singapore government, for Terminal 3 (T3) in 2009 and Terminal 2 (T2) in 2011. Other environmental efforts include support for the World Wildlife Fund's Earth Hour initiative, the use of CNG vehicles in airside operations, and the use of treated waste water for fire-fighting, sanitation and cooling purposes. CAG has achieved ISO 14001 status since 2011 and was awarded the Distinguished Achievement (Platinum) in the ACI Asia Pacific's inaugural Green Airports Recognition Awards in May 2012.

Committed to Service Excellence

Service excellence continues to be a hallmark of Changi Airport. In 2011, CAG was conferred the inaugural Singapore Service Excellence Medallion, in recognition of its steadfast commitment to service excellence and attaining high levels of customer satisfaction.

CAG is proud to support ICAO's work in improving civil aviation standards and recommended practices for airport operations.

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Korea

State Profile

The Republic of Korea

The country with splendid natural scenery,
a rich cultural heritage,
and the best air transport system
that everyone can enjoy and share with each other.

This is **KOREAN STYLE!**



Korean singer and rapper "PSY"
who created an international
sensation with "Gangnam Style"



Korea

The best air transport system that everyone can enjoy and share with each other, this is “Korean Style!”



INTRODUCTION

Located in Northeast Asia, the Republic of Korea (ROK) covers a total area of 100,210 square kilometers ranking 109th in the world in terms of land area and has a population of 50 million ranking 25th in the world. Above all, the country is the sixth biggest in terms of air transport volume. When it comes to the aeronautical policies of the ROK, aviation safety, security and environment always come first. Under such solid principles, the Korean government provides institutional support by easing regulations on the aviation industry and ensuring thorough quality control on air services so that air travelers can have confidence in their safety. To that end, the ROK has organized the aeronautical authorities with qualified and competent professionals. With these devoted experts, the ROK will never cease its research efforts to create best practices for each aviation field.

The ROK has always envisioned the highest level of national aviation safety and that is achieved by safety inspections tailored to each airline and the Safety Management System (SMS). Aviation security, another important pillar, is also thoroughly managed by state-of-the-art security equipment and well-trained security professionals.

In the ROK, ICAO international standards and corresponding national regulations are monitored in real time through an IT system. Aircraft operations are efficiently regulated based on the ROK aviation laws and regulations that transparently reflect international standards, and periodic inspections are also conducted by safety inspectors who have the necessary knowledge and experience.

The ROK aviation sector is also actively going green. The country participates in ICAO efforts to reduce aviation emissions. National carriers and airport corporations have established voluntary carbon emission reduction targets and are making genuine efforts to achieve their targets based on agreement with the government.

As an ICAO Council Member, the ROK strives to contribute to the international community. The ROK has been providing its self-developed safety management software to Member States free of charge. In addition, the ROK is in the middle of developing a programme in cooperation with the ICAO Air Navigation Bureau so that Member States can more easily exchange safety-related data.



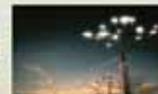
FLY GREEN!

Green Wings to the Earth.
Asiana Airlines pledges to help protect Mother Nature with eco-friendly flights.

A greener Earth is our most important destination. In 1995, under the slogan "The one and only earth, as precious as our customers," Asiana became the world's first airline to obtain the ISO 14001 (Environmental Management System) certification. Ever since then, every Asiana employee has actively participated in our industry-leading green management program.



Eco-Flight operation system



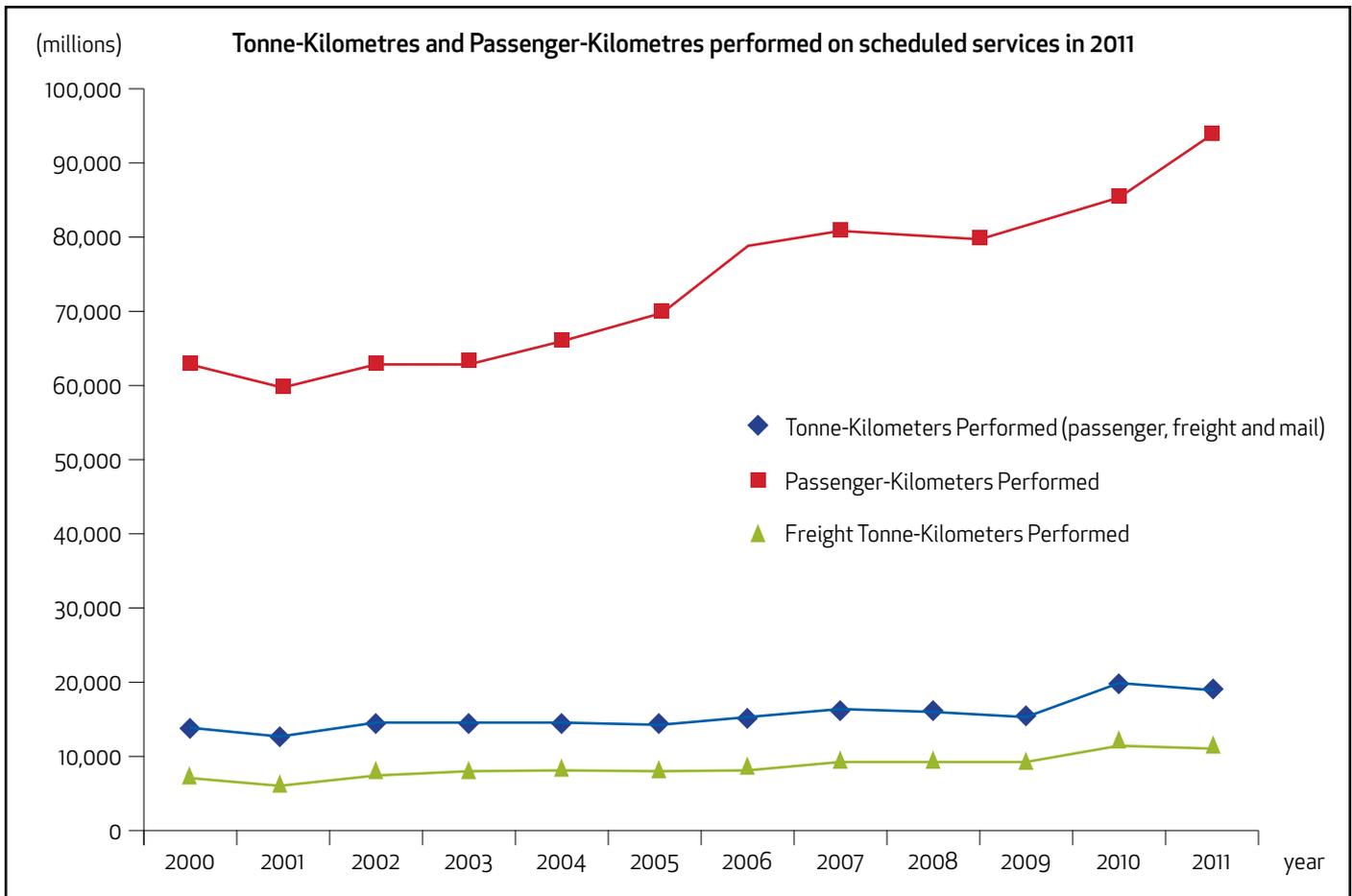
Installation of solar energy streetlights in Angkor Wat



Tree planting campaigns in Thailand, China and Japan



UNESCO Cultural Heritage Protection sponsorship



Source: ICAO Air Transport Statistics

Living up to its reputation as a premier country in ICAO's Universal Safety Oversight Audit Programme (USOAP), the ROK takes the lead in sharing its experience and know-how with its neighboring countries. Its outreach efforts also include fellowship training programmes for aviation professionals of developing countries.

GROWING AIR TRANSPORT

Geopolitically, the ROK has a strategic advantage to be the hub of air transport networks as it is located in Northeast Asia linking Southeast Asia, the Middle East and the Americas. Major air transport markets such as China and Japan are located right next to the country and a population of 1.4 billion, and 43 cities with a population of over 1 million, are within a 2,000 km radius. Based on such favorable conditions, the ROK could become the sixth biggest country in aviation thanks to the constant efforts of the Korean government in promoting air service liberalization as well as that of national flag carriers in establishing robust global air networks.

The ROK has two world-renowned full service carriers, Korean Air and Asiana Airlines, which serve 201 routes to 128 cities around

the globe. More recently, five Low Cost Carriers, namely Jeju Air, Jin Air, Air Busan, Eastar Jet and T'Way, inaugurated services and have been making substantial developments on the short- and medium-haul routes. These Korean airlines, which are all privately-owned companies, have generated continued growth based on their strong competitiveness even during challenging times marred by global economic crisis and soaring oil prices.

The key to their strong competitiveness is quality in-flight service represented by caring crew members and exquisite in-flight dining. Such service excellence is well recognized and has been acclaimed several times by various aviation magazines and travel quality rating agencies.

Korean Air, the prime national flag carrier, is the two time winner of the Mercury Award from the International Travel Catering Association (ITCA), the most prestigious award for in-flight catering service. Korean Air's enviable records also include a double accolade from World Travel Awards which is aviation's equivalent of the Oscars: the airline won the World's Most Innovative Airline Award for two consecutive years as well as the World's Excellence in Service Award, which was granted for the first time ever to an airline. Not only that, but



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Excellence in Flight
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Incheon International Airport

Korean Air has been ranked among the top three Favorite Airlines in China by Global Times for four years in a row.

Asiana Airlines was founded in 1988 as the second Korean national flag carrier. Asiana is the world's first airline to win the 'Airline of the Year' award for 4 consecutive years: 2009 ATW (Air Transport World), 2010 Skytrax, 2011 Global Traveler, and 2012 Premiere Traveler. In 2012 Asiana was also named the 'Best Overall Airline in the World' by Business Traveler. These awards have resulted in Asiana becoming the first and only airline in the history of the aviation industry to achieve the Golden Grand Slam. Abiding by the management philosophy of customer satisfaction, Asiana Airlines continues to provide the best service and safety in order to uphold its esteemed reputation as the only Golden Grand Slam airline.

Far from being complacent, Korean air carriers are making relentless efforts to provide more comfortable travel environments and better travel experiences to passengers by expanding their fleets of cutting-edge aircraft and searching for ways to further improve their service excellence.

WORLD'S BEST AIRPORTS

The ROK has Incheon International Airport as its major gateway along with 14 other local airports including Gimpo, Gimhae and Jeju Airport.

Incheon International Airport, since its grand opening in 2001, has been making constant efforts to improve services and expand facilities. Thanks to such efforts, it has now become a de facto global hub that connects 176 cities in 55 countries. Incheon International Airport garnered universal praise from various airport rating organizations. To begin with, it was crowned the Best Airport Worldwide for an unprecedented seven consecutive years including 2012, by Airports Council International (ACI) in its Airport Service Quality (ASQ) Survey. In addition, it was named the World's Best Airport by Skytrax in 2012 not to mention winning similar recognition from Global Travelers for seven years in a row.

So far, over 6,400 airport operators from around the world have visited Incheon International Airport to learn from its success.



Phase 3 expansion plan of Incheon International Airport

Also, the airport exported airport operation know-how to countries including Russia, Indonesia, Iraq and the Philippines. Once the third phase expansion project of the airport is completed by 2017, Incheon International Airport is expected to emerge as a stronger hub airport of Northeast Asia handling over 62 million passengers and 5.8 million tonnes of cargo a year.

Gimpo Airport, the longtime Seoul gateway, before the opening of Incheon International Airport, is now a business oriented airport. Its transformation was clearly successful. For instance, Gimpo Airport ranked highest in efficiency among those same-sized airports in Asia for two years running. Most recently, the airport was named the best medium-sized airport by ACI in its ASQ Awards.

Gimpo Airport achieved significant growth by developing a successful business model that generates profits through non-aeronautical revenue streams by offering customers a multitude of services and attractions. To that end, the airport has transformed idle space into the production of valuable income. Gimpo Airport's extra revenue earners include

department stores, hospitals and shopping malls.

Being strategically located close to downtown Seoul, Gimpo Airport is living up to its reputation as a 'Biz-port' by attracting business travelers and developing short-haul international routes such as links to Japan and China.

AVIATION SAFETY

The ROK puts aviation safety at the top of its priorities. Korean airlines are maintaining their safety record of no fatal accident in passenger services every year. All these achievements have made the country recognized as one of the countries with the world's best aviation safety record. The ROK ranked number one in ICAO USOAP-Comprehensive Systems Approach (CSA) in May 2008 by setting the highest ever compliance rating of 98.89% which was far above the world average of 57.93%. The country has also been selected to run the pilot programme of ICAO's new initiative, USOAP-Continuous Monitoring Approach (CMA). As such, the ROK has built trust and confidence internationally with its top-notch approach to safety.

Regulatory Framework of the State Safety Programme in the ROK



Taking advantage of its world class IT, the ROK developed and operates a software programme called SARP's Management and Implementation System (SMIS) in order to conduct real-time monitoring of the implementation of over 10,000 ICAO Standards and Recommended Practices.

Keeping up with ICAO's safety management policies, which are moving from post accident to preventive management, the ROK introduced the State Safety Programme to form an integral part of its Aviation Act in June 2008. In accordance with the Programme, the national safety goal is clearly set up and comprehensive management is conducted on nation-wide aviation safety activities including safety reporting, accident investigation and safety oversight.

The ROK earned ISO 9001 certification in 2012 for quality control systems on overall aviation safety that have significantly contributed to maintaining its world class aviation safety.

NEXT GENERATION AVIATION PROFESSIONALS

The ROK launched the Next Aviation Leader Development Aid Project in order to prepare for future aviation demand and create jobs. As it takes considerable time to nurture aviation specialists, the Korean government provides support in

training and education of aviation professionals starting from high school to college. To meet future pilot demand, next generation pilots are trained at Uljin Flight Training Center. In going forward, the ROK plans to develop a comprehensive database system of aviation professionals which will cover the entire human resource cycle including demand forecast, HR development and management.

ADVANCED AIR TRAFFIC MANAGEMENT

Efficient airspace management is gaining more and more importance as the air traffic volume of Asia Pacific is growing rapidly. The ROK is making consistent efforts to maximize traffic volume by adapting cutting-edge technologies in airspace management.

In order to ensure safe and efficient airspace and effectively manage air traffic, the ROK implemented various initiatives such as: developing parallel routes and Standard Instrument Departure/Arrival (SID/STAR) procedures using Performance Based Navigation (PBN) technologies; providing radar surveillance and communication service for entire Flight Information Region (FIR); implementing Reduced Vertical Separation Minima (RVSM); introducing Air Traffic Flow Management (ATFM) systems and setting up the second Area Control Center (ACC).

Korea Airports Corporation

State-of-the-art aviation & information technology(IT)
Opening the skies around the world

32 years of experience and accumulated know-how have enabled Korea Airports Corporation(KAC) to develop navigational aid systems which are marketed both domestically and internationally.

KAC's navigational aid systems have successfully complied with many flight inspections test around the world and proved their reliability.



As an organization on airport operations, KAC operates 14 airports from Gimpo to Jeju in Korea. KAC has developed core navigational aid systems such as ILS, DVOR, DME, A/G, AMOS, and FTS and is continuously developing more equipments that are essential for aircraft operation safety.



That's not all. The ROK has made constant investments in Research and Development (R&D) of air navigation facilities for safer air navigation and more efficient airport operations. As a result, the ROK successfully developed the Instrument Landing System (ILS) and Doppler VHF Omni-directional Radio Range (DVOR) all with its own technology and with state-of-the-art IT. What is fascinating is that they are in compliance with international standards, easy to repair and maintain and able to operate at peak performance even in the ROK's mountainous terrain as well as other challenging topography.

In addition, the ROK developed the Pavement Management System (PMS) to better manage runway safety as well as LED Airfield Light and the Individual Lighting Control & Monitoring System (ILCMS) to realize low-carbon green airports. All these are exported to 14 countries already.

ENVIRONMENT PROTECTION

Even though the ROK is a country with no binding target to reduce greenhouse gas emissions, it actively participates in ICAO's efforts in reducing aviation emissions. The Korean government has concluded agreements with airlines since 2010 to promote the establishment of voluntary reduction targets in the field of international air services and encourage actual implementation.

AIRCRAFT MANUFACTURING INDUSTRY

The ROK successfully completed the development of two-seater and four-seater aircraft; and a 12-seat business jet and commercial unmanned aerial vehicle are also in development. In this regard, the ROK concluded a bilateral agreement with the U.S. Federal Aviation Administration and accelerated its efforts to establish a certification system to support future mass production.

Korea Aerospace Industry



TRAINING PROGRAMMES FOR DEVELOPING COUNTRIES

Since 2001, the ROK has been providing various aviation fellowship training programmes together with ICAO to enhance the capacity building of developing countries including States in Asia Pacific, the Middle East and Africa. So far, 837 aviation professionals from 97 countries have enjoyed the full benefits of these training programmes.

The excellent aviation training programmes of the ROK have earned a worldwide reputation and the country takes pride in hosting promising and distinguished



trainees. These fellowship training activities will be continued in the future with the country's ambitious plan to increase the number of courses and trainees.

IT SUPPORTS JOINING HANDS WITH ICAO

Based on its outstanding aviation IT, the ROK promotes various technical cooperation programmes, joining hands with ICAO. Upon ICAO's request, the ROK is jointly developing the CMA Online Framework needed for the implementation of USOAP-CMA. In addition, the country supports the Foreign Air Operator Surveillance Database (FAOSD) upgrade scheduled in 2013 called for by the ICAO Asia/Pacific Regional Office.

CLOSING REMARKS

Within its borders, the ROK seeks quality growth by establishing the world's best systems in each aeronautical field. Outside its borders, the ROK endeavors to lead Northeast Asian aviation and contribute to the further advancement of international civil aviation by sharing its advanced systems with ICAO Member States. Reaching beyond its borders, with profound understanding of the importance of air transport in linking cultures and economies, the ROK pursues the sustainable development of air transport that will benefit all people around the world. The ROK will stay humble and vigilant, making the utmost effort with every step forward. ■



The 7th golden bell rings

Incheon International Airport was awarded
“Best Airport Worldwide”
by Airport Council International(ACI)
for 7 consecutive years in 2012

The airport that is fast and convenient.
The airport with spirit of culture and art.
The airport that everyone wants to visit.

The sensational service rings your heart.



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More than 33 ICAO videos and counting... including **ICAO TRAINAIR PLUS Programme Presentation**, "ICAO is introducing a new era in cooperative aviation: TRAINAIR PLUS. The programme helps to ensure that countries and industry continue to have access to the skilled professionals they need to support our ever-expanding global air transport network."

Watch for more ICAO videos on issues and topics of interest to the global aviation community.

FORUM

UAE GCAA: STRATEGIC PLANNING TO ACHIEVE MEANINGFUL CHANGE

Throughout my years of experience as a corporate strategist at major transportation organizations in the public sector, it never crossed my mind to be part of such a success journey that has marked the world of aviation. I was privileged to witness the General Civil Aviation Authority (GCAA) of UAE becoming one of the leading examples in international aviation. Today, UAE enjoys a renowned reputation for safety and security despite the challenges of being one of the fastest growing aviation markets in the world.

Three years ago, we embarked on an ambitious project: the Overall Transformation Plan (OTP). We were determined to accomplish meaningful change and align the GCAA's OTP

with the best models that exist out there. The OTP succeeded in optimizing performance with a total success rate of our operational plan of 97.5% for the first year and 98.25% for the following year. Our hard work was rewarding. I was thrilled and humbled to see the GCAA scoring new goals every day. Despite the fact that it is a young organization, I was confident that GCAA would be able to develop and implement a plan that would make the organization among the best of the regulatory authorities in the aviation sector. We are very grateful that our efforts are recognized by the Sheikh Khalifa Government Excellence Program (SKGEP) which has strengthened our resolve and commitment to continually enhance our processes.

The SKGEP criterion is rigorous and sets the bar extremely high for organizations to receive this prestigious award. The award submissions are assessed on the level of excellence in the strategy formulation process, engagement of stakeholders, understanding of industry and business environment, use of customer analysis, execution of strategy and performance management in determining the success of the plan.

Our inspiration to develop the GCAA strategic plan comes from the leaders of our nation who are committed to the progress and prosperity of the UAE through economic growth, modernization of infrastructure and development of its human capital. We thank the Director General of GCAA, His Excellency Saif Al Suwaidi, for his commitment and trust in the planning process. We also take this opportunity to express our recognition and appreciation of the Executive Directors of GCAA and their teams of dedicated staff, without whose contribution and support the development and execution of this plan would not have been possible.

The GCAA strategic planning process consists of an outstanding blend of attributes of these criteria. Our use of national and international sources of information on the best practices of



ABOUT THE AUTHOR

Laila Hareb is the Executive Director of Strategy and International Affairs in UAE GCAA. She joined the General Civil Aviation Authority (GCAA) in September 2009 to lead its Strategic Planning and Corporate Excellence Department. In little over

two years since she began her work at the GCAA, it has been awarded the prestigious Sheikh Khalifa Government Excellence Program (SKGEP) award in recognition of its best practices in the areas of Strategic Planning and Performance Management systems. In addition to this, it was also recognized as the government entity for the most improved performance.

leading civil aviation authorities and a thorough understanding of the industry requirements, led us to an effective planning process. GCAA is a relatively small organization however we were able to demonstrate that even small organizations can engage in effective strategic planning, without becoming overly bureaucratic.

AVIATION SECTOR IN THE UAE

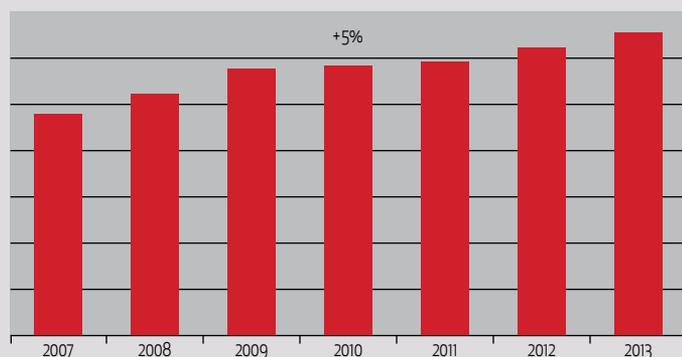
According to a recent study conducted by Oxford Economics, Air transport to and from the United Arab Emirates (UAE) creates three distinct types of economic benefit. Typically, studies such as this focus on the 'economic footprint' of the industry, measured by its contribution to GDP, jobs and tax revenues generated by the sector and its supply chain. The study, carried out in 2011, showed that the aviation sector contributes 61.3 billion United Arab Emirates Dirhams (AED), (or 6.2%) to UAE GDP. This total comprises:

- AED 35.2 billion directly contributed through the output of the aviation sector (airlines, airports and ground services);
- AED 14.5 billion indirectly contributed through the aviation sector's supply chain;
- AED 11.6 billion contributed through the spending by the employees of the aviation sector and its supply chain;
- In addition there are AED 84.5 billion in 'catalytic' benefits through tourism, which raises the overall contribution to AED 145.8 billion or 14.7% of GDP.

The sector has a noticeable impact on the creation of employment in the country as well:

- The aviation sector supports 224,000 jobs in the UAE. This total comprises:
 - 141,000 jobs directly supported by the aviation sector;
 - 46,000 jobs indirectly supported through the aviation sector's supply chain; and
 - 37,000 jobs supported through the spending by the employees of the aviation sector and its supply chain.
- In addition there are a further 209,000 people employed through the catalytic (tourism) effects of aviation.

UAE Annual Aircraft Movements (thousands)



UAE has experienced a consistent increase in year-over-year traffic showing a positive increase on two of its major airports i.e. Dubai and Abu Dhabi, home to its national carriers Emirates and Etihad. The LCC sector is well served with Air Arabia and Fly

Dubai. The new entrant in the market, RAK Airways, is also making its presence felt. This consistent improvement in traffic is attributable to the liberal policies of the UAE which are well supported by the world class aviation infrastructure. The positive outlook for the aviation industry challenges GCAA to ensure that it has the necessary capacity and capabilities needed to match the growing industry.

GCAA – THE ORGANIZATION

The role of the Regulator

On behalf of their respective states, Civil Aviation Authorities provide the mechanism by which nations ensure the safety of their skies through safety and security regulation. In order to fulfill its regulatory obligations, the Authority has to keep pace with the technological advances of the industry it oversees. Thus, civil aviation authorities need to ensure that they have the necessary human, financial and technological resources required to ensure effective oversight for a rapidly evolving industry.

UAE GCAA has a unique position among international civil aviation authorities. In addition to the regulatory role of a typical CAA, it is also an air navigation services provider, runs the aircraft accident investigation functions and supports the UAE government's ambitions to enhance its global connectivity. Often, the exponential growth in the national aviation sector is followed by a lapse in the safety and security standards; many of the emerging global economies have fallen prey to this unfortunate phenomenon. However, the directions for the UAE aviation sectors have been very clear: no compromise on the safety and security standards at any cost.

GCAA Strategic Plan Development

GCAA follows a three-year Strategic Planning cycle. The first Plan was developed in 2007 for the 2008-10 period. GCAA is currently following its second Strategic Plan of 2011-13. Although, as an organization, GCAA lacked maturity in the strategic planning processes, it was well supported by a strong commitment and clarity of vision from the top leadership. From the outset, the directions to the Strategic Planning team were very clear i.e. to develop a functional strategy which takes into account industry dynamics, particularly: the consistent growth, the role that the federal government wants the sector to play in its economy, the international geopolitical challenges and last, but not least, the organization's internal capabilities and capacities. The process yielded a new strategic focus for the GCAA that provides for a step change in performance.

The Mission and Vision statements were reviewed in 2010 and modified to reflect the business environment in a practical and achievable manner. GCAA exists to regulate and oversee aviation safety, security and environment; deliver air navigation services; and facilitate air connectivity through international collaboration in order to serve the general public and the civil aviation industry in a responsive and cost-effective manner. The new Vision of the GCAA places emphasis on developing a national aviation system



GCAA is making steady progress towards its targets

that excels in safety, security and environmentally-sustainable standards. This strategic direction is fully aligned with our legal mandate and our stakeholder's expectations.

Safety and security issues are at the forefront of the aviation sector, a concern that this strategic plan precisely aims to address. In order to deliver this mandate, particular attention is given to building a capable organization that gives particular attention to the needs of the industry, global advances in aviation and the role our country must play in promoting aviation.

Strategy Development

To understand internal and external influences on the Organization, a number of perspectives were considered, namely, global and Middle East industry dynamics, UAE industry trends and internal organizational challenges. The strategic planning process for the three-year period commencing in 2011, was aimed at addressing the impact of these forces to provide the foundation for building a sustainable organization and a springboard for success into the future. GCAA considered the external environment and planned for mitigating any risks it posed to its functions. During the planning process, factors affecting the organization from an external perspective were reviewed and the impact on the organization explored. Studies and gap analysis were carried out using tools such as PESTL and SWOT.

Over the 2011-13 period, delivery on the following Strategic Objectives will ensure that GCAA successfully meets the desired results as mandated and sought by its stakeholders:

1. To ensure safe and secure operations of the aviation industry in compliance with ICAO standards and best practices;
2. To facilitate global connectivity;
3. To develop UAE aviation environment regulations and influence global policies to balance the needs of all stakeholders and international commitments to environmental sustainability;
4. To provide support services in the civil aviation sector;
5. To position the UAE to be globally recognized as a major shaping force in aviation;
6. To strengthen the internal processes, develop capabilities and instill excellence culture in line with the best practices and the growth in the aviation industry;
7. To be communicative and responsive with national and international stakeholders through partnership and alliances;
8. To be financially self-sustainable.

Strategy Delivery

When we commenced our journey to implement the strategy, we ensured that all the key organizational enablers were in place to promote a high-performance culture. The immediate challenge was to cascade the Strategic Objectives into Corporate and Business level yearly plans and agree on meaningful key performance indicators and realistic targets. Series of meetings and workshops with business units resulted in the development of Operational Plans. In order to ensure that the Operational Plans were adequately funded, the annual budgeting exercise was aligned with the operational planning process.

Corporate Performance Management System

As often said, "if you can't measure it, you cannot manage it". The corporate performance management system in GCAA promotes a systematic and integrated approach that assists Business Units in translating the organizational strategy into core processes and activities. It provides a framework for organizing and analyzing Business Unit activities, developing performance metrics and producing analytical reports on Business Unit progress against Key Performance Indicators to empower and facilitate management decisions.

The overall goal of the performance management system is to ensure that the organization and all of its subsystems (processes, departments, teams, employees, etc.) are working together in an optimum fashion to achieve the results desired by the GCAA.

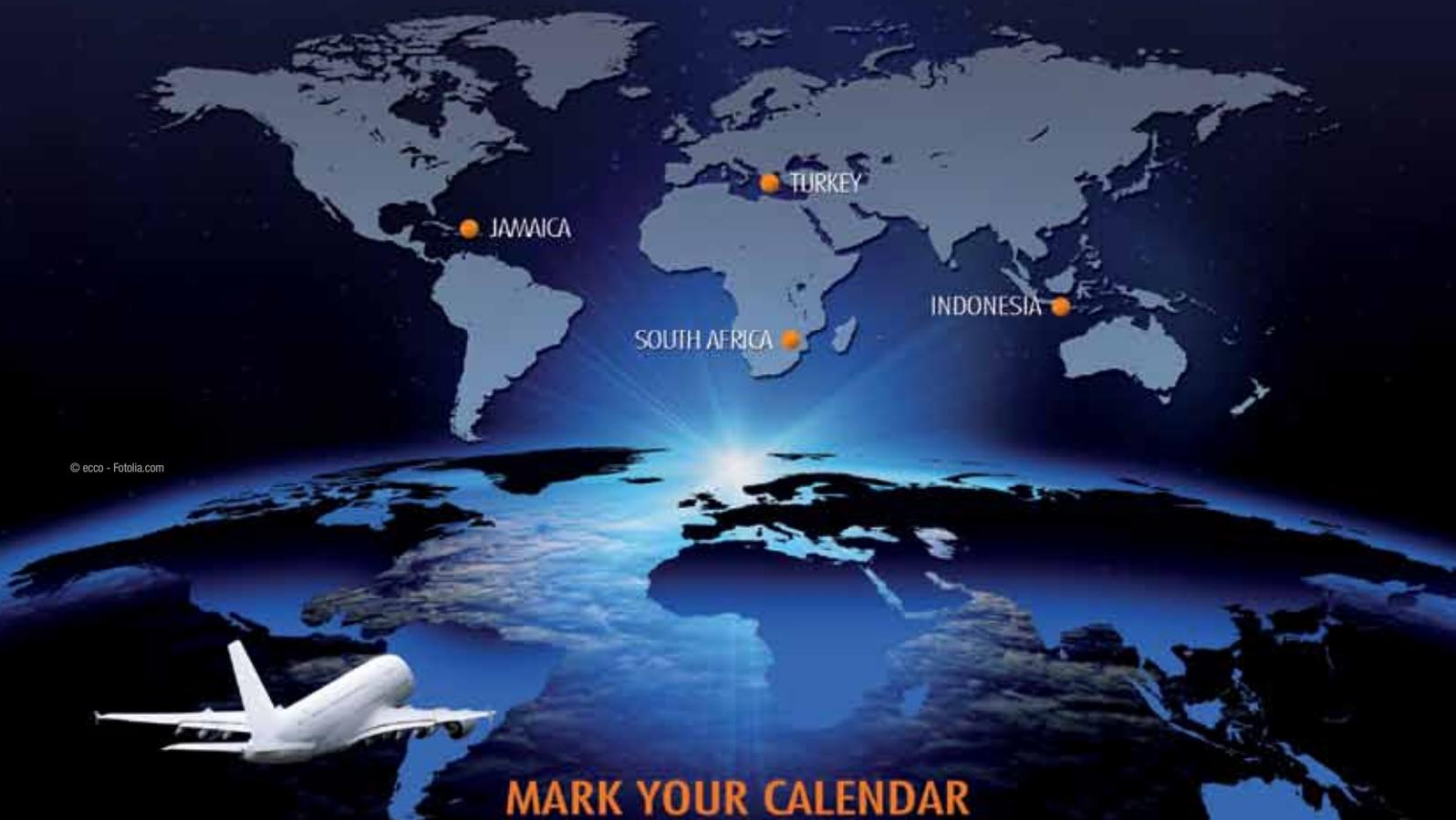
The GCAA performance management system enables a closed-loop process that starts with understanding where the organization is today, where it wants to go, what targets should be set, and how resources should be allocated to achieve those targets. Once plans have been set, the Strategy & Performance Department coordinates with Business Units to develop their Action Plans and Monthly Progress Checkpoints to monitor the performance of those plans, highlight exceptions, and provide insight as to why they occurred. The system supports the evaluation of risks associated with exceptions and the remedial actions thus closing the loop by ensuring that the targets are met.

We see the Strategic planning process similar to a journey where we determine a destination and the route to get there. This journey is best completed when the leaders and the team commit to the plan. The current GCAA Strategic Plan will conclude with the completion of the 2013 Operational Plan. As of now, GCAA is making steady progress towards its targets and we are confident that we will meet our goals. ■



ICAO NEXT GENERATION OF AVIATION PROFESSIONALS (NGAP) AND TRAINAIR **PLUS** REGIONAL SYMPOSIA

THESE EVENTS PROVIDE UNIQUE OPPORTUNITIES TO EXCHANGE VIEWS, BEST PRACTICES AND EXPERIENCES ON HOW TO ENSURE THAT ENOUGH QUALIFIED AND COMPETENT AVIATION PROFESSIONALS ARE AVAILABLE TO OPERATE, MANAGE AND MAINTAIN THE FUTURE OF THE INTERNATIONAL AIR TRANSPORT SYSTEM. THEY ALSO REPRESENT AN IDEAL FORUM TO DISCUSS HUMAN RESOURCES, PARTNERSHIPS AND TRAINING ISSUES WITH ICAO, REGIONAL ORGANIZATIONS, STATES, TRAINING ORGANIZATIONS, OPERATORS AND THE INDUSTRY.



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