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INTERNATIONAL CIVIL AVIATION ORGANIZATION

Nature's Wrath

European civil aviation stakeholders keep safety paramount as Iceland's Eyjafjallajök volcano blasts unprecedented volumes of ash into the skies over northern Europe

37th Assembly Preview

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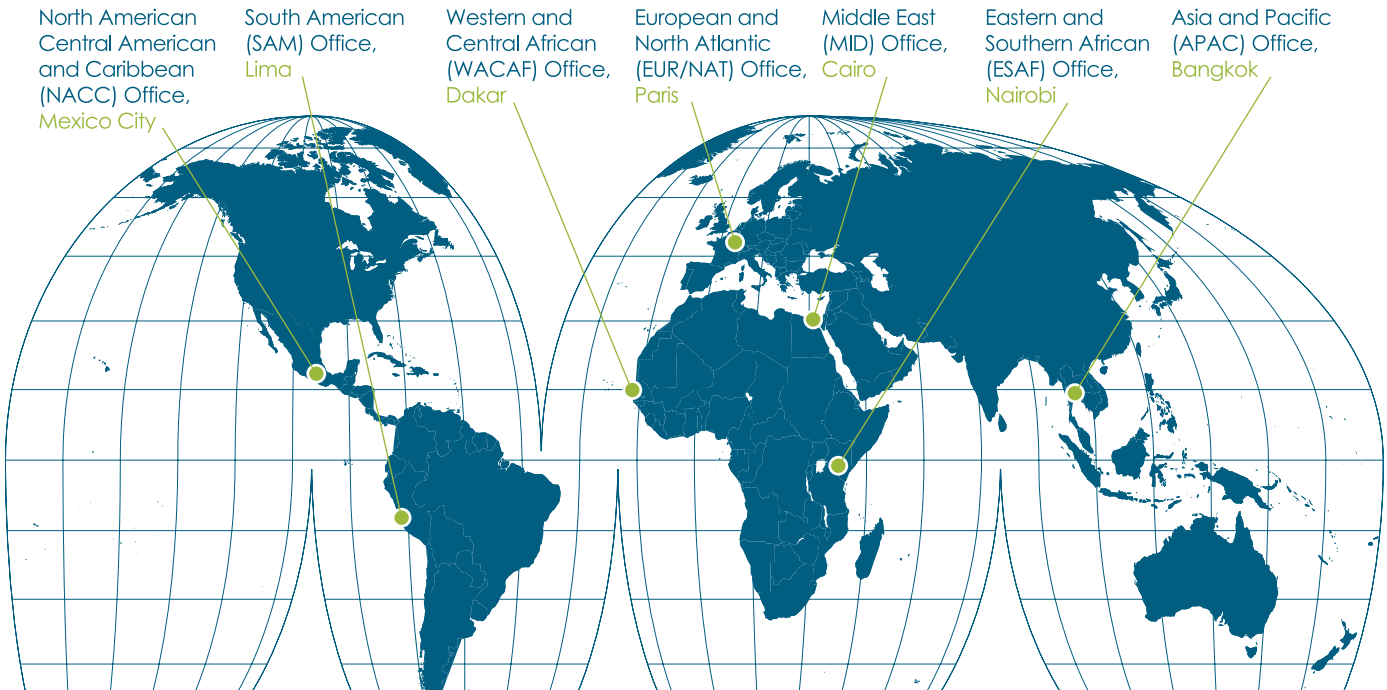
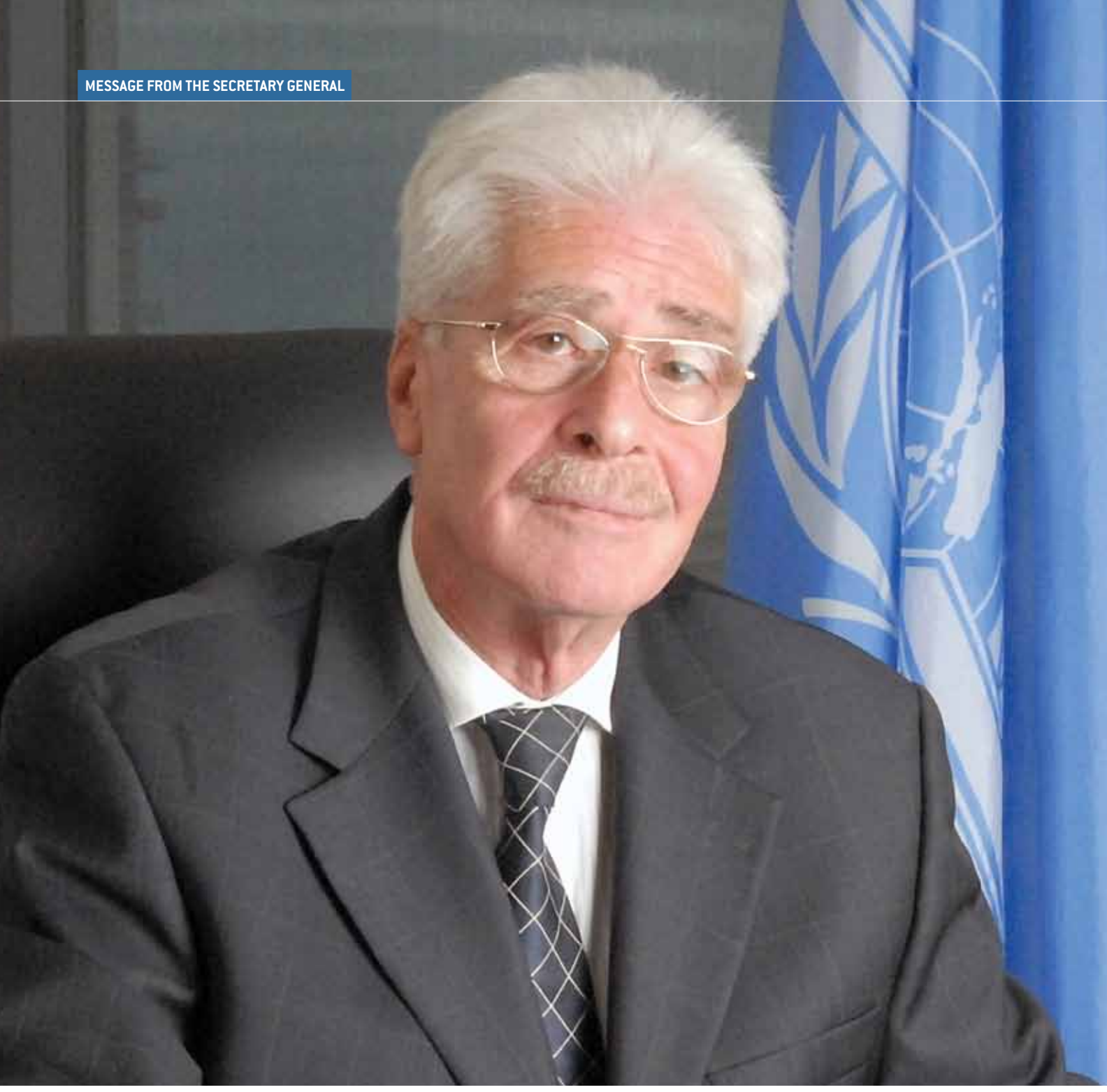




Safety as a Guiding Priority

The eruption of Iceland's Eyjafjallajökull volcano in April of this year was an unprecedented event for civil aviation. It represented the first time that a volcanic disruption of this magnitude has impacted such a densely utilized airspace, and the ensuing ash cloud was so significantly widespread that it prevented airspace managers the possibility of suggesting alternate routings—the response which has characterized past ash events in other parts of the world.

"We have created a transportation system which, in its less than 100 years of existence, has learned how to avoid or accommodate many of nature's more extreme conditions. As Eyjafjallajökull has clearly demonstrated, however, our planet remains quite capable of humbling us every so often with the especially violent, dramatic and unpredictable forces at her disposal."

The initial response by European States was therefore the most responsible option available to them: putting safety first. This entailed closing the impacted flight regions until such time as more detailed data could be made available to the many experts who were being assembled to assess and comprehend Eyjafjallajökull's actual danger.

These experts included meteorological and volcanological experts, airlines, airspace managers and, perhaps most importantly, the engine and airframe manufacturers who remain our best sources of actionable data regarding the impact of volcanic debris on critical aircraft systems.

That the decision to shut down northern European airspace was an unpopular response with airlines and passengers, not to mention the countless supply chains and economic sectors that benefit from aviation's normally smooth operations, is absolutely an understatement. The billions in lost revenue and the significant inconvenience to the millions of passengers affected was a regrettable but, ultimately I believe, unavoidable consequence of properly ensuring the safety of persons and property.

The decision to put safety first in this manner, besides respecting one of aviation's most fundamental tenets, has ensured that the legacy of Eyjafjallajökull will not be a catastrophic loss of aircraft and passengers in the skies and potentially property and civilians on the ground.

Rather, it will be recognized as a catalyst to bring all aviation stakeholders together to focus on a global, long-term solution to one of the most potentially disruptive natural phenomena to impact international air transport.

To play its part in moving aviation understanding and guidance forward, ICAO's high-level bodies and its Secretariat, both at the Regional EUR/NAT and the international level, have responded with a speed and effectiveness that are commensurate to the importance of the issue.

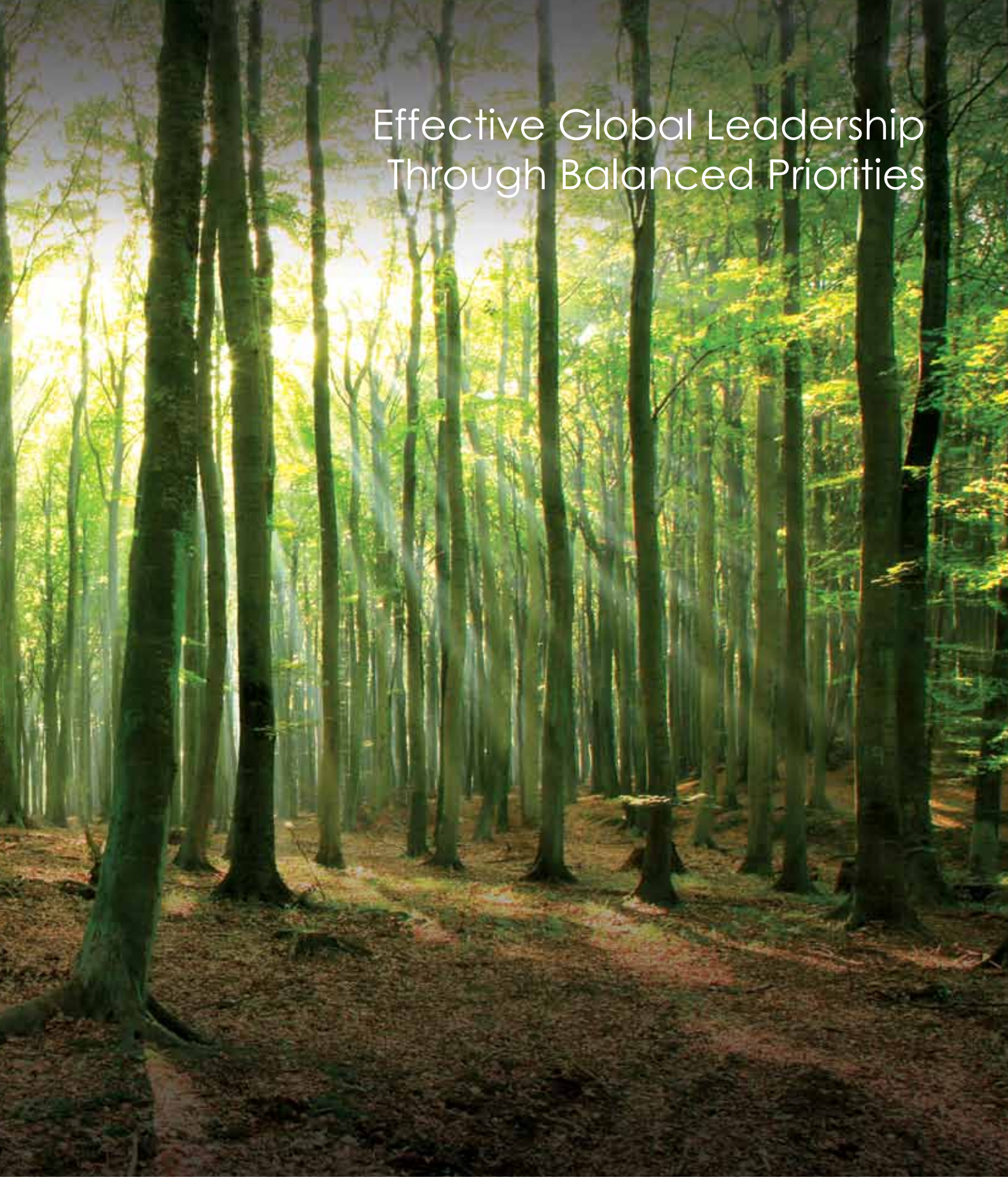
Members of the ICAO Council quickly met together with IATA only two days after the eruption to review the situation, while the following day ICAO's Air Navigation Commission (ANC) considered some near-term initiatives to advance the science of aviation safety in airspace contaminated by volcanic ash. Council delegates and ANC members both stressed the need for the Organization to begin looking into existing volcanic ash guidance, contingency planning and operational responses to help alleviate the European situation.

The ICAO European and North Atlantic Volcanic Ash Task Force (EUR/NAT VATF) was meanwhile convened only days after the event to assess available outcomes and propose amendments to the appropriate EUR/NAT Air Traffic Management (ATM) Contingency Plans. ICAO also established a new International Volcanic Ash Task Force (IVATF) that has begun the work of refining a more nuanced global safety risk management framework associated with volcanic ash events.

As we look back now with the benefit of some hindsight, it's important to stress that Eyjafjallajökull, in certain respects, has revealed as many of the global aviation system's virtues as it has any shortcomings. The millions of passengers inconvenienced by the European ash cloud represent but a small fraction of those who daily take for granted the ease by which aircraft routinely fly them around the world.

We have created a transportation system which, in its less than 100 years of existence, has learned how to avoid or accommodate many of nature's more extreme conditions. As Eyjafjallajökull has clearly demonstrated, however, our planet remains quite capable of humbling us every so often with the especially violent, dramatic and unpredictable forces at her disposal. Aviation certainly cannot be expected to have comprehensive contingency planning always at the ready for this scale of catastrophic event.

There is, and likely always shall be, a constant tension in global aviation between the underlying goals of safety and efficiency. Although we strive at all times to find solutions that present the most effective balance of these guiding priorities, and generally achieve this goal with constant regularity, it is my view and the position of ICAO that safety must always be paramount when a choice must be made between the two. ■


Effective Global Leadership
Through Balanced Priorities

Eyjafjallajökull's Aftermath

Far from just another eruption, the April 2010 volcanic event at Eyjafjallajökull propelled some 750 tonnes of ash per second high into the earth's atmosphere in its first few days, creating Danger Areas that essentially shut down air traffic over all of northern Europe —one of the world's busiest flight regions.

The Iceland eruption was an unprecedented meteorological (MET), airworthiness and Air Traffic Management (ATM) occurrence in that no significant ash event had ever before impacted such a densely-routed airspace. Pertinent stakeholders responded quickly to the crisis, first by ensuring the safety of passengers and aircraft as Eyjafjallajökull became better understood, and then by adapting responses based on input from the regulators, operators, airspace managers, airframe and engine manufacturers and other volcano and MET experts who have been re-assessing ash responses in a series of teleconferences since the first days of the eruption.

As civil aviation continues to assess the important lessons that Eyjafjallajökull has presented to it, ICAO's European and North Atlantic (EUR/NAT) and new International Volcanic Ash Task Forces are already formalizing this newly-emerging data into practical recommendations that will help permit operators and airspace managers to respond more flexibly to similar events in the future.

When the Eyjafjallajökull volcano awoke this past spring from almost 200 years of peaceful slumber, the resulting and massive plume of ash that was sent shooting skyward created an unprecedented disruption in the airspace over northern Europe.

As civil and commercial aviation stakeholders came together in those first few days after the 14 April eruption, an extremely rapid and collaborative response was initiated. What began as a series of emergency teleconferences, featuring input from regulators, operators, airspace managers, airframe and engine manufacturers, as well as volcanological, atmospheric and meteorological specialists, culminated this June in several important and practical new proposals being brought forward by ICAO.

This intensely active short-term process and its resulting recommendations have come to stand out as a testament to how the aviation community and European and North Atlantic stakeholders in particular were able to quickly respond in the face of what has been a truly extraordinary airspace occurrence.

A Nordic Giant Awakens

Eyjafjallajökull's stirrings started innocently enough in December 2009, when scientists registered the first of several thousand micro-earthquakes (magnitude 1-2 on the Richter scale) in the mountain's vicinity. In late February, more acute seismic activity

Existing volcanic ash contingency plans, which were put into place as soon as the eruption's impact became apparent, did prove effective in fulfilling civil aviation's first and guiding priority: ensuring the safety of all passengers, crews and aircraft.

ERUPTION FIRST RESPONDERS: THE INTERNATIONAL AIRWAYS VOLCANO WATCH (IAVW)

The International Airways Volcano Watch system was established in 1987 by ICAO in coordination with the World Meteorological Organization (WMO). It provides critical information allowing States to take more immediate and effective action in their responses to eruptions. Considering that a commercial aircraft will travel about 150 km (80 NM) in 10 minutes, and that volcanic tephra (ash and other fragmental material) can be jettisoned to flight levels commonly used by turbine-engine aircraft in half that time, from a safety standpoint urgency in responding to all ash-related volcanic events is essential.

The backbone of the IAVW system is made up of nine Volcanic Ash Advisory Centres (VAACs) around the world which are responsible for detecting and tracking the movement of clouds of volcanic ash to advise international aviation. The VAACs disseminate information regarding the location of areas of volcanic ash and their predicted movement (volcanic ash advisory messages) directly to State Meteorological Watch Offices (MWOs). These are responsible for the issuance of warnings to aircraft in flight (SIGMET messages) and to properly advise ATS Units and NOTAM Offices. The advisory information is also used directly by airlines.

The IAVW collates observations of volcanic ash mainly from State volcano observatories, meteorological offices and satellites, as well as aircraft in flight.

The Fifth Meeting of the International Airways Volcano Watch Operations Group (IAVWOPSG/5) took place at the ICAO South American Office (SAM) from 15 to19 March 2010. The meeting was attended by eighteen experts from eight States that are host to volcanic ash advisory centres, as well as by relevant international organizations. The meeting reviewed IAVW-related provisions in ICAO Annex 3 and in air navigation plans. In addition to addressing a number of issues related to the operation, roll-out and further development of the IAVW, the meeting agreed to extend the area of responsibility of VAAC Wellington and to pursue further work on issues related to the "safe" concentration of volcanic ash. The Group's near-term objectives will now be significantly impacted by the related ICAO Volcanic Ash Task Force initiatives in the aftermath of Eyjafjallajökull.

allowed Icelandic geophysicists to conclude that magma was pouring from underneath the earth's crust and collecting in the volcano's magma chamber.

By 20 March a small eruption of lava finally began bursting from Eyjafjallajökull through vents above the glacial ice that covers much of the volcano beneath. The persisting small-scale lava displays created minor amounts of steam and smoke, ironically serving as a tourist draw for the next few weeks and presumably a positive force on Iceland's passenger air travel during that period.

But on 14 April the Eyjafjallajökull volcano let loose with a much more dramatic and intense release of lava from its central, glacier-covered crater. These larger lava flows melted the surrounding ice causing serious local flooding and evacuations. The meltwaters also poured down into the volcanic vent triggering a significant and explosive eruption. In an instant, 750 tonnes of ash per second began shooting into the skies high above eastern North Atlantic and northern Europe—10 to 20 times the discharge rate of the preceding 20 March flank eruption at Fimmvörðuháls.

Eyjafjallajökull has been a significant geological event by any standard. It represents Iceland's largest since the notorious eruption at the neighbouring and much larger Katla volcano in 1918, and it follows closely in some respects on the Grímsvötn eruption in 2004. Grímsvötn was the last ash event to impact northern European aviation, though to a far lesser degree than Eyjafjallajökull's 2010 eruption.

Existing volcanic ash contingency plans, which were put into place as soon as the eruption's impact became apparent, did prove effective in fulfilling civil aviation's first and guiding priority: ensuring the safety of all passengers, crews and aircraft.

The safety precautions taken were also criticized publically, however, primarily because the blanket restrictions that were imposed—due to the lack of an agreed definition for a safe volcanic ash concentration—resulted in unprecedented disruptions of service and severe economic impact on the airlines that make heavy daily use of northern European air routes. Passengers impacted had to adjust to flights being postponed for a week or more as experts developed a more detailed understanding of the Eyjafjallajökull impact.

It should not be overlooked, however, that although initial ATM responses may have frustrated and seemed overly-protective to some air transport stakeholders, the precautions put in place and subsequent regulatory initiatives have also ensured that the true legacy of Eyjafjallajökull will now be

a safer and more efficient civil aviation system—not a tragedy of lost lives or severely damaged aircraft.

ICAO Responds

ICAO reacted quickly to Eyjafjallajökull from both a Regional and an international perspective in the early weeks after the eruption. The ICAO European and North Atlantic Volcanic Ash Task Force (EUR/NAT VATF) was quickly convened to assess and address Eyjafjallajökull's more Regional impacts and outcomes and propose amendments to the appropriate Air Traffic Management (ATM) Contingency Plans, while a new ICAO International Volcanic Ash Task Force (IVATF) was also established in order to drive the development of a more global safety risk management framework.

This latter international initiative is expected to leverage the ash dispersion and route data emerging from the Eyjafjallajökull aftermath as well as other up-to-date scientific and engineering knowledge, in order to allow States and airspace managers around the world to more routinely and flexibly determine safe levels of future operations in airspace contaminated by volcanic ash.

The ICAO Council was also quickly convened on 19 April to review the Eyjafjallajökull situation. It noted the decision by the Ministers of Transport of the European Union (EU) at that time to gradually reopen the European airspace in a safe and coordinated manner. The next day, ICAO's Air Navigation Commission (ANC) additionally considered some near-term initiatives to advance the science of aviation safety in airspace contaminated by volcanic ash.

Both of these high-level meetings, in the absence of agreed values regarding what constitutes a hazard to jet engines, highlighted the need to look into existing volcanic ash guidance material, contingency planning and operational responses as a

ICAO VOLCANIC ASH GUIDANCE MATERIAL

The following ICAO Guidance materials were already published prior to the Eyjafjallajökull eruption.

- Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691)
- Handbook on the International Airways Volcano Watch (IAVW)—Operational Procedures and Contact List (Doc 9766)
- Volcanic Ash Contingency Plan—EUR Region (EUR Doc 019)
- North Atlantic Volcanic Ash Contingency Plan (NAT Doc 006, Part 2)

Additional reference material can also be found in ICAO Annexes 3, 11, and 15. Recommendations for new guidance are now expected by 1 May 2011 as a result of the ongoing efforts of ICAO's EUR/NAT and International Volcanic Ash Task Forces.

way to help alleviate the European situation. These meetings also paved the way for the establishment of the International Volcanic Ash Task Force (IVATF).

Early in June 2010, the ICAO Council also approved a request from Iceland's civil aviation authority for the procurement of a new mobile weather radar device for ash plume monitoring. This new device will be able to be placed closer to the Eyjafjallajökull volcano, providing for better resolution and the ability to detect the plume height from the crater top and upwards. This enhancement in monitoring of the ash plume will result in more precise data and, as a result, could lead to more precise calculations of ash dispersion—resulting in smaller danger areas.

The procurement process for Iceland's new weather radar system has been approved by ICAO under the current Icelandic Joint Financing Agreement and has also been supported by IATA. The device's installation and operation will be advanced in cooperation with an international team of experts in the field of radar ash monitoring, as well as with the newly formed ICAO Volcanic Ash Task Force.

EUR/NAT Actions

The EUR/NAT VATF was last convened in 2005, shortly after the eruption of Iceland's Grímsvötn volcano in 2004. Its work in the Grímsvötn aftermath helped to establish the relevant European and North Atlantic ATM contingency plans which proved so successful in ensuring the safety of eastern North Atlantic and northern European skies after the Eyjafjallajökull eruption.

During its new mandate following Eyjafjallajökull, the EUR/NAT VATF's proposed amendments to the Volcanic Ash Contingency

Photo by Ulrich Latzenhofer.

"The fact that all concerned parties were involved in these discussions demonstrated the high level of resolve to propose options that would significantly improve responses to future volcanic ash emergencies, with due emphasis on both safety and efficiency."

– Karsten Theil
ICAO EUR/NAT Regional Director

Plan—EUR Region (EUR Doc 019) and the North Atlantic Volcanic Ash Contingency Plan (NAT Doc 006, Part 2) have been informed by delegates from provider States in the European and North Atlantic Regions, as well as stakeholders such as CANSO, EUROCONTROL, the European Commission, IATA, IBAC, ICCAIA, IFALPA, IFACTA and the World Meteorological Organization.

"The fact that all concerned parties were involved in these discussions demonstrated the high level of resolve to propose options that would significantly improve responses to future volcanic ash emergencies, with due emphasis on both safety and efficiency," commented Karsten Theil, ICAO EUR/NAT Regional Director. "The updated Air Traffic Management Contingency Plan accommodated the need for additional flexibility, standardization and coordination and has now led to a single Volcanic Ash Contingency Plan for EUR/NAT."

All amendments under discussion required subsequent endorsement by the European Air Navigation Planning Group and the North Atlantic Systems Planning Group. The Task Force also compiled a list of 15 issues that were to be later brought to the attention of the International Volcanic Ash Task Force when it met at ICAO Headquarters in Montreal on 27 July.

Amongst other provisions, this process identified three standardized definitions of ash contamination *(Low/Medium/High, see sidebar bottom left))* that will now enable provider EUR/NAT States to rely on a common, agreed reference to be used when defining ash contamination densities. EUR/NAT ATM Providers, Met Offices, Volcanic Ash Advisory Centres and Air Traffic Flow Management Units will all be required to align their Regional operational and communication procedures to reflect the new Low/Medium/High categorizations.

EUR/NAT Provider States would still retain the right under this framework to ascertain which level (High, Medium, etc.) of ash concentration would require classification as a Danger Area, a situation which the EUR/NAT VATF agreed could lead to discontinuities between adjacent Flight Information Regions (FIRs). This issue will require further consideration within the EANPG and NAT SPG or more likely by the International Volcanic Ash Task Force, in the hope of establishing greater global interoperability and harmonization between FIRs.

In the event that some carriers may be willing to operate aircraft within ash concentration zones *not* classified as Danger Areas, States of the operator will also now need to impose additional regulatory safety risk assessment and mitigation measures. These measures would be akin to those now applied to aircraft operations over mountainous

REGIONALLY AGREED DESCRIPTORS FOR ASH CONTAMINATION LEVELS

The following are the three standardized definitions of ash contamination first proposed by the EUR/NAT VATF as an amendment to its Volcanic Ash Contingency Plan. They have been put forward in order to enable an agreed reference that would permit States to define more harmonized airspace Danger Areas in the event of a significant ash event:

LOW Contamination
An airspace of defined dimensions* where volcanic ash may be encountered at concentrations equal to or less than 2 x 10-3 g/m3.

MEDIUM Contamination
An airspace of defined dimensions where volcanic ash may be encountered at concentrations greater than 2 x 10-3 g/m3, but less than 4 x 10-3 g/m3.

HIGH Contamination
An airspace of defined dimensions where volcanic ash may be encountered at concentrations equal to or greater than 4 x 10-3 g/m3, or areas of contaminated airspace where no ash concentration guidance is available.

* "defined dimensions" refers to both horizontal and vertical airspace aspects.

terrain, ensuring that necessary contingencies are in place in the event of any emergency.

ATM procedures in the EUR and NAT Regions are also being amended to streamline operations throughout three identified phases: Alerting, Reactive and Proactive *(see Sidebar on page 14).)*. The 'Alerting Phase' primarily details actions conducted prior to the availability of information from the VAAC and other sources; the 'Reactive Phase' addresses tactical rerouting of aircraft as more data emerges; and lastly the 'Proactive Phase' would look to future planning options taking into account VAAC and other available ash dispersion forecast data.

The International Volcanic Ash Task Force

The lessons learned as ICAO further harmonized its EUR and NAT ash responses were doubtless of significant relevance to the substance and results of the discussions held by its International Volcanic Ash Task Force in late July. This multidisciplinary team of experts from States, international organizations, users and industry will prepare a report by 1 August 2010 on the lessons learned from the crisis and identify guidance material and contingency plans which need to be updated.

Building on the report, a plan for establishing globally-harmonized ash concentration thresholds, options for improved detection systems of volcanic ash, as well as recommendations to improve notification and warning systems is now targeted to be completed by May 2011.

States invited to join the IAVTF include, amongst others, the host countries

Overview of the 2nd fissure on Fimmvörðuháls, close to Eyjafjallajökull, as the lava flows down towards the north, turning snow into steam.

Leadership and Vision in Global Civil Aviation

where the nine Volcanic Ash Advisory Centres of the International Airways Volcano Watch are located, namely Argentina, Australia, Canada, France, Japan, New Zealand, United Kingdom and the United States. Brazil was added as another of the States where commercial aircraft are manufactured, and also Spain as it currently holds the Presidency of the European Union. Fourteen international organizations will also be invited to participate *(for more on the IAVTF, please see the sidebar on page 15).*

Aviation Community Reactions

The broader industry first-responses to Eyjafjallajökull were primarily coordinated by the London VAAC, which organized and led the emergency teleconferences after the 14 April eruption. The first two of these teleconferences were held on the Saturday and Sunday (17–18 April) immediately following the event.

These early discussions primarily involved receiving and then applying updated information from engine and airframe manufacturers that provided for a more detailed but still provisional understanding of various ash density effects on airframes and engines, something aviation volcano specialists had been looking to receive and adjust to for some time.

"The question of airframe and engine ash tolerance definitely goes back quite a long way," commented International Airways Volcano Watch Operations Group (IAVWOPSG) Chairman, Peter Lechner. "New Zealand, for instance, had significant eruptions in the mid 1990s at Mt. Ruapehu in the centre of its North Island. Those events spurred the New Zealand CAA to begin investigating the implications of volcanic ash events much more closely than had previously been the case."

New Zealand realized in the aftermath of Ruapehu that the way aviation had coped with the its eruption was not sustainable. Rather than a situation whereby officials were opening and closing airspace in a real-time manner, the CAA perceived the need to shift more operations and airworthiness responsibility onto operators and manufacturers.

The investigations undertaken by the New Zealand CAA after Ruapehu took officials and airline representatives to a number of locations around the world in order to assess best practices. The group realized that a critical element in being able to manage ash events would be a more detailed understanding of the capabilities of specific airframes and engines. Queries were made with manufacturers accordingly, all before the end of the 1990s.

"Understanding ash impacts involves a number of factors relating to the volume of ash that has been ejected, its specific chemical and mineralogical composition, the amount of time that an aircraft is exposed, and even the performance aspects of the aircraft at the time of exposure," added Lechner. For instance a 95 percent power climb may result in more significant ash damage to an engine than a 70 percent cruise profile."

In some ways it has taken the profound and unprecedented impact of Eyjafjallajökull to focus manufacturers on this issue in more detail and identify the varying degrees of ash concentration and exposure times that can allow for some degree of flexibility for operators. By 20 April the subsequent London VAAC teleconferences had achieved a provisional consensus amongst airframe and engine manufacturers, leading to the development and release of amended ash charts and more flexible northern European flight operations shortly afterward.

REGIONALLY AGREED DESCRIPTORS FOR ASH CONTAMINATION LEVELS

Volcanic Event Alert Response Phases in EUR/NAT Region

Alerting Phase
The initial emergency response: "raising the alert". Alerting information will be provided by SIGMET, NOTAM or ASHTAM as appropriate and disseminated to affected aircraft in flight by the most expeditious means. In addition to the normal distribution list, the NOTAM/ASHTAM will be addressed to meteorological/volcanological agencies.

If it is considered that the event could pose a hazard to aviation, a Danger Area will be declared by NOTAM around the volcanic source. Normally, clearances will not be issued through the Danger Area.

Reactive Phase
The Reactive Phase commences at the outbreak of volcanic eruption and entrance of volcanic ash into the atmosphere and mainly pertains to aircraft in flight. A "Start of eruption SIGMET" will be issued and a Danger Area will be declared by NOTAM. Normally, clearances will not be issued through the Danger Area.

Proactive Phase
The Proactive phase commences with the issuance of the first VAA after completion of reactive responses. The +6 hrs forecast of the contaminated area are to be issued as SIGMET. The +12 and +18 hrs forecasts of contaminated areas are to be issued as NOTAM/ASHTAM. Significant changes may result in a reversion to a temporary Reactive Phase situation and unscheduled issuance of VAA, SIGMET and NOTAM/ASHTAM. As appropriate, Danger Areas will be notified via NOTAM.

"Understanding ash impacts involves a number of factors relating to the volume of ash that has been ejected, its specific chemical and mineralogical composition, the amount of time that an aircraft is exposed, and even the performance aspects of the aircraft at the time of exposure. For instance a 95 percent power climb may result in more significant ash damage to an engine than a 70 percent cruise profile."

– Peter Lechner, Chairman
International Airways Volcano Watch Operations Group

Boeing, for example, supported the 20 April consensus that a predicted ash concentration of $2x10^{-3}$ g/m^3 was acceptable for European operations. This position and recommendation was conditional upon operators adhering to Boeing's guidance to avoid operations in visible ash, and additionally that the predicted ash concentration was known to be conservative.

Boeing was also suggesting these new limits based on the fact that flight tests conducted in the European airspace had shown no damaging ash findings. It specified that operator sampling programmes were required to monitor the long-term economic impacts to the airplane and engines and that all recommendations were contingent on continued engine manufacturer acceptance following analysis of sampling programme data.

Boeing also noted that the position it derived after the 20 April teleconferences applied to the specific situation in Europe at that time and did not apply elsewhere. It noted that different volcanoes generate varying considerations (e.g., chemistry of ash, ash concentrations, predictive methodologies, etc.).

Engine manufacturers were also on board with the new guidance limits. Many have now issued advisories

ICAO'S INTERNATIONAL VOLCANIC ASH TASK FORCE: TERMS OF REFERENCE

The International Volcanic Ash Task Force (IVATF) is a multi-disciplinary global group and a focal point and coordinating body of all work related to volcanic ash being carried out by ICAO at the global and Regional levels. It will address issues related to air traffic management (ATM), airworthiness, aeronautical meteorology (MET) and atmospheric sciences.

The Task Force's work will be progressed by sub-groups with the following areas of expertise:
a. ATM (ATM sub-group).
b. Airworthiness (AIR sub-group).
c. Science (S sub-group).
d. International Airways Volcano Watch (IAVW coordination group).

Quarterly teleconferences will be held in October 2010, January 2011 and April 2011 to monitor progress. With respect to its Terms of Reference, the IVATF is tasked to undertake, in close coordination with the IAVWOPSG and the EUR/NAT Volcanic Ash Task Force, the following tasks:
a. Evaluation of the Icelandic eruption.
b. Revision of guidance on volcanic ash contingency plans.
c. Review of operational response to volcanic ash encounter.
d. Development of ash concentration thresholds.
e. Improvement of ash detection systems.
f. Review of notification and warning for volcanic ash.
g. Improvement and harmonization of dispersion models.
h. Improvement of visual volcanic ash advisory centre (VAAC) products.

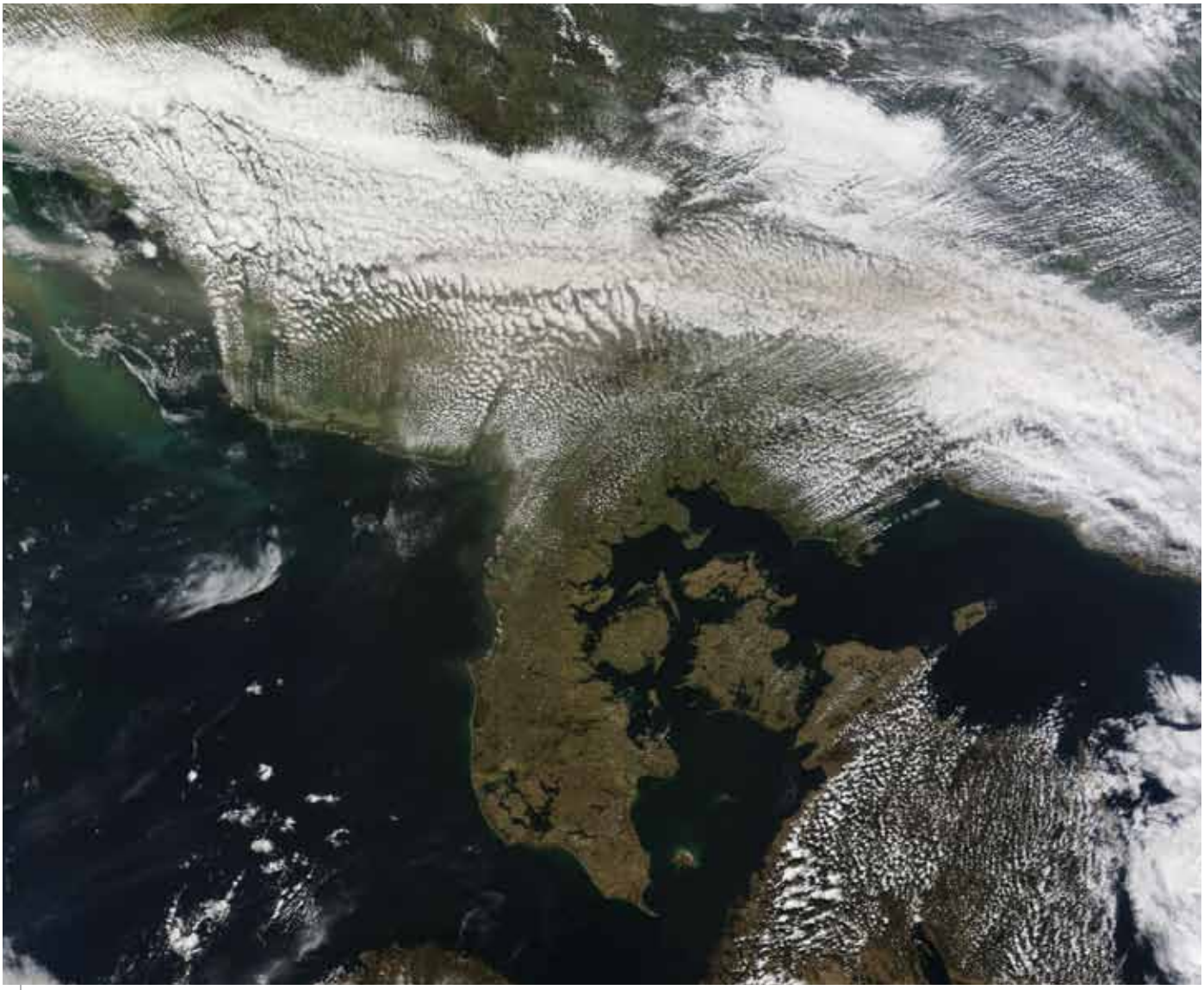
IVATF Participating Organizations:
- Airports Council International (ACI)
- Chairman of the International Airways Volcano Watch Operations Group (IAVWOPSG)
- Civil Air Navigation Services Organisation (CANSO)
- European Aviation Safety Agency (EASA)
- European Commission (EC)
- European Organisation for the Safety of Air Navigation (EUROCONTROL)
- European Space Agency (ESA)
- International Air Transport Association (IATA)
- International Council of Aircraft Owner and Pilot Associations (IAOPA)
- International Coordinating Council of Aerospace Industries Associations (ICCAIA)
- International Federation of Air Line Pilots' Associations (IFALPA)
- International Federation of Air Traffic Controllers' Associations (IFATCA)
- International Federation of Airline Dispatchers Associations (IFALDA)
- International Union of Geodesy and Geophysics (IUGG)
- National Aeronautics and Space Administration (NASA)
- World Meteorological Organization (WMO)
- World Organization of Volcano Observatories (WOVO)

to operators indicating that engine operations within non-visible ash cloud areas (less than $2x10^{-3}$ g/m^3) is acceptable, while flying in areas where ash densities are higher than $2x10^{-3}$ g/m^3 may also be undertaken, but only at operators' discretion and providing that all flight into visible ash remains prohibited. Any flights through areas with ash densities higher than $2x10^{-3}$ g/m^3 would require checks after each flight in order to identify aircraft that may have been detrimentally affected by ash exposure.

On the political front, an extraordinary meeting of transport ministers was quickly established for 19 April to coordinate European reaction. The European Commission (EC) also set up a group to assess impacts on the air travel industry and the economy in general. EC Vice-President Kallas emphasized in a statement *(see sidebar on page 17)* that there can be no compromise on safety, that all decisions must be based on scientific evidence and expert analysis, and that more European co-operation was needed to find solutions for this crisis.

CANSO meanwhile praised Air Traffic Control organizations for their "swift, sensible and safe" approach to opening up European airspace once the requisite approvals had been received from State officials. It also stressed that the level of cooperation between the affected European aviation sectors was "unprecedented".

"European airspace is the busiest and most complex in the world," noted CANSO Director General Graham Lake as the crisis unfolded. "We are seeing an unprecedented degree of



Ash drifts over northern Europe two days after the Eyjafjallajökull eruption. The brown ash is mixed with clouds in this photo-like image taken by the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Terrasatellite. The visible ash can be seen sweeping across the Netherlands, Germany, Poland, and Russia. It is likely that the cloud cover in evidence masks additional ash.

One of the other problems with the geophysical community is that there is no equivalent to ICAO's system of volcano observatories and there's no worldwide convention-based body to oversee these activities. This makes it very hard to coordinate standardized and reliable information, monitoring and responses on a global scale.

cooperation between the various aviation companies to get airplanes moving."

CANSO later brought together CEOs of ANSPs from across the globe to discuss the Eyjafjallajökull issue. The Session, at CANSO's Global ATM Summit in Oslo, was moderated by David Learmount of Flight International. The Eyjafjallajökull panel consisted of David McMillan, DG of EUROCONTROL, Jeff Poole of IATA, CEO of NATS Richard Deakin, Dan Smiley of the FAA (and CANSO Operations Manager), as well as Doug Johnson of the London VAAC.

"CANSO recognizes the importance of ICAO's role to set the global standards and guidance for States so that they take responsibility and act in a coordinated manner during crises," Lake later remarked. "While issues relating to volcanic ash are primarily of an airworthiness and aircraft operations nature—not Air Traffic Management—we are happy ICAO has been as responsive as it has been at the Regional and global level to review and revise guidance on contingency plans and develop new ash concentration thresholds."

Lake went on to note that in CANSO's view the major failings during the volcanic ash crisis were at the level of European leadership and coordination. He stressed that ICAO could assist in facilitating the discussions and debates on institutional changes that are now needed at the European level.

Next Steps

Future responses by aviation to volcanic ash fallout incidents will doubtless be enhanced by the research and improved coordination that will eventually become the true legacy of Eyjafjallajökull. But even as the developed world hones its measurements and responses to ash clouds in order to provide more flexible solutions for air transport operators, procedures and advisories relating to volcanoes in the developed world still pose some serious concerns.

"You have to remember that many of the earth's volcanoes are not in the developed world, and even those that are in the developed world are not always well monitored" concluded IAVWOPSG Chairman Peter Lechner. "In one State, for example, they have 142 active volcanoes but can only afford under present conditions to monitor approximately 40 of them. One of the other problems with the geophysical community is that there is no equivalent to ICAO's system of volcano observatories and there's no worldwide convention-based body to oversee these activities. This makes it very hard to coordinate standardized and reliable information, monitoring and responses on a global scale."

It may well be the case then that civil aviation as a whole and ICAO specifically may eventually need to step into and fill this gap in global volcano monitoring as part of a future and more advanced Regional mandate for the IAVWOG. This will of course require the commitment and collaboration of many of the Organization's Member States within Regions known for their more regular and violent volcanic activity, but aviation's history of achievement with precisely these types of international consensus-building challenges also makes it an excellent sector to fill the leadership gap now evident in this area. ■

EYJAFJALLAJÖKULL: THE EC RESPONSE

The following is an abridged version of the statement made by EC Vice-President, Siim Kallas, following the extraordinary meeting of EUR transport ministers on 19 April 2010. For the complete version of the Kallas statement, please visit: europa.eu/rapid

I will repeat now, as I have repeated throughout the past days, the three key principles that guide all the work that we are doing:

- There can be no compromise on safety.
- All decisions must be based on scientific evidence and expert analysis.
- We need more European co-operation to find solutions for this crisis.

On the basis of a recommendation agreed unanimously by the national authorities and experts of the 38 Members of EUROCONTROL, transport ministers have agreed to intensify European co-ordination and risk assessment of airspace management.

Today with the ministers, the main discussions focused on the safety issues and better co-ordination of airspace. That was the right thing. It is the central issue which holds the key to relief for both stranded passengers and the air industry. There is still a lot of work to be done. The European Commission is working on many fronts to respond to this crisis: on safety; on the economic consequences; on passenger rights.

Third ICAO Pre-Assembly Conference

Air Transport: What Route to Sustainability?

26–27 September, 2010, Hilton Bonaventure, Montreal

McGill

Presented in cooperation with the Institute of Air and Space Law, McGill University

ICAO and the Institute of Air and Space Law, McGill University, are co-hosting a Worldwide Conference and Exhibition on ***Air Transport: What Route to Sustainability?*** This event will provide a detached and preparatory forum for State delegates and stakeholders attending and/or interested in the issues proposed for the 37th Session of the ICAO Assembly on September 28th. The special pre-Assembly Conference will bring together hundreds of international experts from the air transport industry, government, specialized organisations, academia, law, and finance.

Four fundamental themes of concern to the Assembly and global aviation will be addressed:

- **The State of the Industry.**
- **Security and Facilitation.**
- **Aviation and the Environment.**
- **Strategies and the Way Forward.**

Luncheon keynote speakers will be **Giovanni Bisignani,** Director General and Chief Executive Officer of the International Air Transport Association (IATA), and **Gary Scott**, President, Bombardier Commercial Aircraft.

The Conference is a 'must attend' for professionals from civil aviation authorities and transport ministries (including members of State delegations to the ICAO Assembly), airlines, airports, air navigation service providers, aviation security providers as well as personnel of organizations directly involved in supporting the aviation business such as manufacturers, law and consulting firms, and international and regional organizations.

This event is supported and promoted by a number of Associates including: the International Air Transport Association (IATA), Airports Council International (ACI), the Civil Air Navigation Services Organisation (CANSO), the International Coordinating Council of Aerospace Industries Associations (ICCAIA), the International Federation of Airline Pilots Associations (IFALPA) and the World Bank.

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www.icao.int/ICAO-McGill2010

Issues and Objectives at the 37th ICAO Assembly

Expectations are high that the upcoming 37th Session of the ICAO Assembly, from 28 September to 8 October 2010, will have a substantial impact on the future direction of global air transport. This expectation is due in part to the wide range of events and initiatives which have taken place since the previous Assembly in 2007.

A special preview of what the delegates will be assessing at this October's pre-eminent civil aviation gathering of States and stakeholders.

As the sovereign body of ICAO, the Assembly meets every three years to review in detail the work programme of the Organization in the technical, economic, legal and technical cooperation fields. It provides guidance and directives to the Council and the Air Navigation Commission for their future work in all of these areas.

The Assembly also approves the triennial budget of the Organization based on the business plan and work programme submitted by the previous Council, and then it elects the next Council that will oversee the implementation of the business plan in the coming triennium.

Over the past decade, the Assembly has attracted record numbers of participants from Member States, observer delegations and interested stakeholders. This year should be no different when one considers the issues and proposals contained in the preliminary agenda.

Safety

Safety remains ICAO's top priority. Many Assembly discussions will consider actions to advance the level and efficacy of air transport safety around the world. Major items include:

- Wide-ranging proposals arising from the High-level Safety Conference held earlier this March, including a recommendation for the creation of a strategy to further reduce the global accident rate through the sharing of safety-related information among Member States and the air transport industry.
- An initiative to establish Regional bodies for the purpose of following-up on the implementation of the Global Aviation Safety Plan (GASP) at the Regional level.
- A follow-up on a request to establish Regional safety oversight systems and assistance to States.
- A plan to transition the Universal Safety Oversight Audit Programme to a Continuous Monitoring Approach (CMA) for implementation later in 2010

- An update on past and future activities concerning the Comprehensive Regional Implementation Plan for Aviation Safety in Africa, including a strategy to bridge the gap between training needs and facilities for aviation personnel.
- Recommendations flowing from a global air traffic management forum on civil/military cooperation in 2009, including suggestions on making optimum use of the airspace by all users to effectively meet operational requirements of air transportation, national defence and environmental conservation.
- Significant developments in other safely-related issues, including runaway safety, proficiency in the English language, the availability of qualified and professional aviation personnel, and the implementation of NextGen/SESAR air navigation systems.

Security

The Council will present the Assembly with a report on recent security developments, in particular a proposal for the adoption of a new comprehensive security strategy encompassing future regular programme activities in the areas of security policy, audits and assistance to States. The intention is to focus intently on developing measures and deploying technology that address existing and potential threats.

In the pursuit of the dual objective of ensuring both the optimal security of passengers and their speedy transit through airport facilities and procedures, progress in furthering the Machine Readable Travel Document (MRTD) programme will be fully reviewed, with special emphasis on further improving the security and integrity of passports and other travel documents, the implementation of e-Passports and the ongoing establishment of ICAO's Public Key Directory (PKD).

Environment

Global cooperation under the leadership of ICAO produced solid results during the last triennium, as aviation became the first sector to put forward a definite plan of action for dealing with greenhouse gas emissions on a global basis, as well as a strategy for integrating alternative fuels in a comprehensive programme to considerably minimize the impact of air transport on the environment.

As part of its report to the Assembly, the Council will also review activities relating to:

- Aircraft noise (including technology goals and consideration of night curfews).
- Aircraft engine emissions affecting local air quality.
- The Programme of Action on International Aviation and Climate Change.
- Trend assessments regarding the impact of aircraft noise and emissions.

Efficiency

Within the context of ongoing efforts to support the healthy growth of the global air transport industry, the Assembly will be sensitized to developments in the economic regulation and liberalization of international air transport services, specifically ICAO's work and strategies in exerting its leadership role in the liberalization process.

These deliberations will include an overview of the economic and organizational aspects of air transport infrastructure, and the outcome of the Conference on the Economics of Airports and Air Navigation Services (CEANS).

Continuity

In addition to updating the Assembly on the ICAO policy on radio frequency spectrum matters in preparation for the upcoming International Telecommunication Union (ITU) World Radio Conference in 2012, the Council will update participants on the Cooperative Arrangement for the Prevention of Spread of Communicable Disease (CAPSCA) project.

First implemented in the Asia/Pacific Region in 2006, CAPSCA is now established in Africa and the Americas. States will be encouraged to support ICAO in this work.

Legal

Of particular interest will be a progress report on the item in the Work Programme of the Legal Committee entitled: *Compensation for Damage Caused by Aircraft to Third Parties Arising from Acts of Unlawful Interference or from General Risks*. The Council will also present a report on the legal work relating to existing aviation security conventions, with a view to covering the new and emerging threats to civil aviation.

Increasing the Efficiency and Effectiveness of ICAO

The Council will present reports on the ongoing process to improve the efficiency and effectiveness of the Organization, which will include a status report on the formulation of the Strategic Objectives and Business Plan, including working methods of the Organization, and a report on the Regional Offices study.

The Council will also present a comprehensive communications plan that ensures global awareness and recognition among local, national and international audiences of ICAO's intentions, actions and achievements in the pursuit of its Strategic Objectives. The plan also includes activities to broaden ICAO's outreach within the economic, social and political milieu of Montréal. ■

Get your Dangerous Goods Information and Training Straight from the Source

ICAO Dangerous Goods Training Programme

ICAO has launched an exclusive new Dangerous Goods (DG) Training Programme based on the recently revised *Dangerous Goods Training Manual* (Doc 9375). The Programme consists of this new manual and several courses which will assist States in complying with the broad principles governing the international transport of dangerous goods by air as outlined in Annex 18—*The Safe Transport of Dangerous Goods by Air* and detailed in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284).

Main benefits of the ICAO DG Training Programme include:

- **Courses and materials are delivered by ICAO directly—no third parties.**
- **Programme is developed specifically for State Inspectors, but will benefit all personnel dealing with DGs.**
- **Participants receive an official ICAO certificate upon successful completion of a test.**
- **Courses are based on the ICAO *Technical Instructions*—the only legal source of regulations for the safe transport of dangerous goods by air.**
- **Courses are delivered by senior level DG personnel with extensive experience.**
- **On-site training is offered to maximize availability and minimize costs.**

The first course—*Using the Technical Instructions*—is a prerequisite/refresher course that reviews the *Technical Instructions* section by section employing real-life examples and scenarios. Potential students should be well-versed in aviation terminology. Familiarization with the transportation of dangerous goods by air is useful, but not mandatory. Montréal course dates for Using the Technical Instructions are now established but spaces are limited.

Applicable dates are:

- **23-27 August 2010 - SOLD OUT** *(call for possible last minute availability)*
- **25-29 October 2010**
- **22-26 November 2010**

A series of additional specialized courses will be offered by ICAO in 2011.

Register today!

For more information contact:
Rick Lee
rlee@icao.int
+1-514-954-8219 ext. 7001

For additional details visit:
www.icao.int/anb/fls/dangerousgoods/training/

ICAO RASG-PA/ALTA Safety Event Advances Regional Efforts

More than 200 attendees participated in the First Pan American Aviation Safety Summit this April in Sao Paulo, Brazil, including representatives from Civil Aviation Authorities (CAAs) from 10 States, as well as executives from more than 30 airlines representing more than 90 percent of Latin American and Caribbean passenger traffic and representatives of 50 companies from the air transport industry.

Under the auspices of the ICAO Regional Aviation Safety Group – Pan America (RASG-PA), in partnership with ALTA (Latin America and Caribbean Air Transport Association), the successful Summit was the most complete safety event yet focusing specifically on the Pan American Region. The Summit featured both a safety conference and associated training seminars.

"Safety, as always, remains our top priority," commented ALTA's Executive Director Alex de Gunten. "Although 2009 was a good year for safety record improvements, there remains much to be done. We commend the efforts of everyone who participated in the First Aviation Safety Summit and are looking forward to continuing to bring our industry's leaders and authorities together as we continue to work collectively towards the ongoing improvement of air transportation safety."

One of the primary objectives of the ICAO RASG-PA is to coordinate, develop and implement mitigation strategies targeted at the top aviation safety risks in the NAM/CAR/SAM ICAO Regions. During the second annual RASG-PA meeting held in Bogota, Colombia, in November of 2009, a workshop was conducted using the Global Aviation Safety Roadmap (GASR) process to develop and prioritize recommended safety risk mitigation actions. The workshop participants then took the resulting recommended actions and evaluated them relative to their safety impact and implementation feasibility.

The results of this process indicated that training was a top mitigation action for RASG-PA in the Pan American Region. The outlines of a first training conference in the area began to take shape, with 2010 set as a target timeframe, and the initiative was given a boost by the support from ALTA when it agreed to host the conference in Sao Paulo, Brazil, in partnership with RASG-PA and with additional support from ANAC, the Brazilian Civil Aviation Agency (CAA).

The event was then renamed "The First Pan-American Aviation Safety Summit," and its agenda was developed into a forum that would not only provide training focused on RASG-PA safety enhancement initiatives, but also address more comprehensive harmonization of Pan American aviation safety programs.

"As the level of participation for the summit grew, it was a clear indication that training was a key priority for aviation safety leaders when it came to mitigating safety risks in these Regions," commented Loretta Martin, ICAO North American, Central American and Caribbean Regional Director and RASG-PA Secretary. "Safety strategies, to achieve their full potential, must be shared among all relevant stakeholders."

During the Summit, the RASG-PA Executive Steering Committee reconfirmed its resolve to work together to continue improving aviation safety in the Region through a coordinated, focused and data-driven approach.

This commitment was established to help drive initiatives that will further mitigate risk from the top three identified areas of safety concern in the Pan American Region, namely: Runway Excursions (REs); Loss of Control in Flight (LOC-I); and Controlled Flight Into Terrain (CFIT). It was unanimously endorsed by the following key aviation industry organizations:

- ICAO RASG-PA
- ACI (Airports Council International)
- ANAC (Agência Nacional de Aviação Civil Brasil)
- Airbus
- ALTA (Latin America & Caribbean Air Transport Association)
- Boeing

- CASSOS (Caribbean Aviation Safety and Security Oversight System)
- CAST/FAA (Commercial Aviation Safety Team/Federal Aviation Administration)
- COCESNA/ACSA (Corporación Centroamericana de Servicios de Navegación Aérea/Agencia Centroamericana de Seguridad Aeronáutica)
- IATA (International Air Transport Association)
- IFALPA (International Federation of Airline Pilots' Associations)
- IFATCA (International Federation of Air Traffic Controllers' Associations)

The Summit included a Safety Conference featuring top level safety experts from the Region's key aviation organizations and companies. The Summit not only provided specific strategies to address the top aviation safety risk areas, but also provided an overview of the Region's safety statistics and other current RASG-PA initiatives to enhance flight safety. In addition, training exercises, panel discussions and seminars focused on mitigation strategies directly aimed at the top three data-driven risk areas in the Region.

As a result of the success of the Sao Paulo Summit, the RASG-PA Executive Steering Committee, along with key aviation organizations in attendance, adopted a new Declaration confirming their determination to continue enhancing aviation safety in the Pan America region.

For more information:
ICAO RASG-PA: http://www.mexico.icao.int/RASGPA.html
ALTA: www.alta.aero ■

About ALTA

The ALTA (Latin American and Caribbean Air Transport Association) is a private, non-profit organization whose member airlines represent more than 90 percent of the region's commercial air traffic. The ALTA coordinates the collaborative efforts of its member airlines in order to facilitate the development of safer, more efficient and more environmentally friendly air transport in the Latin America and Caribbean Region for the mutual benefit of the association's members, their customers and the industry. Founded in 1980, the ALTA is currently celebrating its 30th anniversary.

About the ICAO RASG-PA

The Regional Aviation Safety Group - Pan America (RASG-PA) was established in November 2008 to be the focal point to ensure harmonization and coordination of safety efforts aimed at reducing aviation risks in the North American, Central American, Caribbean, and South American Regions, and to promote the implementation of resulting safety initiatives by all stakeholders. These objectives will be achieved through the involvement of all stakeholders including ICAO, States, international organizations and industry.

Evolving ICAO's Universal Safety Oversight Audit Programme: The Continuous Monitoring Approach

The ICAO Universal Safety Oversight Audit Programme (USOAP) was launched on 1 January 1999, pursuant to a resolution by the ICAO Assembly. The objective of the USOAP is to promote global aviation safety by regularly auditing ICAO Member States to determine their capability for effective safety oversight. The USOAP is managed by the Continuous Monitoring and Oversight Section of the Air Navigation Bureau.

The current cycle of USOAP Comprehensive Systems Approach (CSA) audits, which assess the level of effective implementation by States of the critical elements of a safety oversight system, began in 2005 and will be completed at the end of 2010. ICAO is now looking ahead to the implementation of a USOAP Continuous Monitoring Approach (CMA) which was adopted by the Council of ICAO as a more proactive approach which will incorporate the analysis of safety risk factors.

> **"The CMA is designed to be long-term, cost-effective, flexible and sustainable, generating valuable data and contributing to the improvement of global aviation safety. This will be accomplished by using a harmonized and consistent approach to monitoring the safety oversight capabilities of Member States on an ongoing basis."**

The USOAP will embark on two-year transition period to the CMA beginning in 2011, with the launch of this new approach now planned for 2013.

CMA Highlights

The CMA is designed to be long-term, cost-effective, flexible and sustainable, generating valuable data and contributing to the improvement of global aviation safety. This will be accomplished by using a harmonized and consistent approach to monitoring the safety oversight capabilities of Member States on an ongoing basis. The CMA will identify safety deficiencies, assess associated safety risks, develop assistance strategies, and enable the prioritization of assistance.

CSA audits will continue to be carried out by ICAO and will be tailored to the level and complexity of aviation activities in the State and could be either full scale or of limited scope additional activities are envisaged; which will include, but not limited to, safety audits (CSA audits carried out at the request of States and on a cost recovery basis) and ICAO Coordinated Validation Missions (ICVMs).

Note: ICVM's are missions carried out with a view to validate the status of

CMA ORIGINS: ASSEMBLY RESOLUTION A36-4

At the 36th ICAO Assembly, Assembly Resolution A36-4 called on the Secretariat to develop a new methodology to be considered following the end of the CSA cycle of audits in 2010. A36-4 provided the Secretariat with its marching orders and set it on a course to develop the new CMA methodology that USOAP will begin transitioning to on 1 Jan 2011. The Resolution's objectives for the ICAO Secretariat included that it should:

- Consider options for the evolution of USOAP beyond 2010 based on the concept of continuous monitoring.
- Incorporate the analysis of safety risk factors and apply them on a universal basis in order to assess, in an ongoing manner, States' oversight capability.

This new methodology was required in order to consider the concept of continuous monitoring while also covering the core elements of Annexes 1, 6, 8, 11, 13 and 14. In addition, it was specified that the new methodology should incorporate a safety risk-based approach while maintaining the core USOAP principles, such as universality.

compliance and effective implementation of the latest corrective action plan submitted by States on findings/ recommendations emanating from an ICAO USAOP CSA audits.

States will also be required provide ICAO with certain information in order to evaluate their capacity for safety oversight. This information will include updates to corrective action plans prepared following CSA cycle audits and a completed State Aviation Activity Questionnaire (SAAQ).

Prior to the launch of the CMA, States will also be responsible for developing a plan for the completion of CMA protocol questions (PQs) within a specific time frame. Once their plan is developed, States will need to adhere to their established timelines for completing the PQs using an interactive on-line framework. This framework, combined with a centralized database, will allow ICAO to manage information received on an ongoing basis.

ICAO has begun the process of developing the SAAQ and PQs that will be used under the CMA. These will be based on the questionnaires developed for the CSA audit cycle and will incorporate lessons learned. During this development process, collaboration with States, international organizations and other stakeholders in international civil aviation will be very valuable.

The CMA will provide benefits to both States and to other stakeholders in international civil aviation. These include a continuous monitoring process rather than one-time "snap-shot" assessments of safety oversight systems, as well as collective sharing of safety data and the ability to identify safety risks. ICAO is confident that the CMA will go a long way towards ensuring the safe and orderly development of international civil aviation, while also providing adaptability to meet future challenges. ■

Training the Digital Generation for the Aviation Industry:

A Call for 21st Century Technology

The word technology usually conjures up images today of computers and other electronic gadgets, but new analysis tools and design processes should also be considered part of the definition. A look at the current state of the aviation industry and the characteristics of the new generations that will join it suggests that a second look at both aspects of technological training are due when it comes to hiring, training, and maintaining a skilled workforce.

As Carlos Sanchez-Lozano reports, innovations in aircraft technology, globalization, and the requirements of the new Digital Generation are imposing new conditions on training programmes and methodologies.

After working as a consultant in competency-based systems for leading pharmaceutical and health companies in Latin America in the nineties, Carlos Sanchez-Lozano applied his background in aerospace simulations to training initiatives, harnessing technology and media to develop more engaging and effective instructional experiences. His doctoral research helped him establish an evidenced-based design framework that maps instructional information resources, access cost, and forms of interactivity in digital spaces to specific learning objectives. He now designs and develops interactive environments that can be used to acquire advanced skills.

It is anticipated that there will be a shortage in air transport's qualified workforce once the economic recession is over, mainly as a result of new additions to commercial fleets and many aviation professionals reaching retirement age.

With these challenges in mind, ICAO organized the Next Generation of Aviation Professionals Symposium in Montreal in March 2010. It was clear throughout all presentations that the problems are highly complex and that the foremost concern of airlines is and will continue to be the safety of their passengers and the crew.

In view of this objective, attracting very capable individuals and implementing highly effective training programmes become critical. Aircraft technology has advanced significantly, yet associated training programmes remain largely unchanged from those employed for previous generations of equipment. Furthermore, training institutions have failed to adapt quickly enough to accommodate the learning styles of the new Digital Generation, also referred to as the 'Millennial' or 'Internet' Generation.

After reviewing the current state and requirements of the aviation industry workforce, there remains a clear demand for more technologically-oriented instructional tools that allow for more effective learning. In particular, air transport needs to more closely examine human resources and the methodologies used to evaluate required skills needed, not to mention more advanced instructional design techniques and training strategies.

The aviation industry might be going through tough times at present, but its growth is still forecast at 5 percent annually through 2020. IATA predicts that around 200,000 new pilots and 400,000 new maintenance personnel could be required worldwide by 2018, and in the next 20 years 25,000 new aircraft will be added to the current 17,000 commercial fleet.

By 2026, 480,000 new technicians will be needed to maintain these aircraft, and 350,000 pilots to fly them. In addition, the current workforce is aging and many will retire soon. It is estimated that 73 percent of the controller workforce will be eligible to retire from 2005 to 2015.

Despite the fact that the current market is oversaturated with qualified people due to the recession, these figures show that once the downturn is over there will be a daunting demand for skilled personnel.

This brings us to the first issue: namely how we can be assured that potential candidates will have the skills companies need. And if they need to be trained, how can we be more certain that our training interventions are adequate? These concerns are not exclusive to the aviation industry.

Competency-based Approaches

For quite some time, the Intellectual Quotient (IQ) measure was used as an indication of how capable a person was. Yet, there was no correlation between this measure and job performance.

In the 1970s there was a shift, with organizations starting to pay more attention to behavioral evidence linked to performance. This effort led to what we know today as 'competencies' or, as noted by Spencer and Spencer in *Competence at Work*: "an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation".

Competency-based systems not only detail the skills necessary for successful performance, but also define them and their different levels of proficiency in terms of observable behaviors. Developing these systems is expensive but they are an invaluable tool to select and train employees. A competency-based approach also helps at the time of designing appropriate training initiatives with fully harmonized, agreed-upon and observable objectives. Career paths are an additional benefit, allowing the employee to visualize the different training opportunities and required skills to achieve a certain position.

A perfect example is the multi-crew pilot license (MPL) which applies a competency-based approach to training and licensing. Captain Dieter Harms, in the May/June 2007 issue of the *ICAO Journal*, noted that this effort has been perceived as a time- and money-saving strategy. This is hardly the case in any custom competency system design and development process.

Since competencies are context-bound, generic models are not very effective. The initial investment in determining the observable behaviours that will compose the final model for a particular organi zation is important. Furthermore, the design phase can only go so far and data collection and interpretation are necessary for validation.

This proof-of-concept, as ICAO has called it, consumes significant time and resources as data has to be carefully collected in order to avoid false results. There are also challenges such as harmonizing these guidelines so that they can be effectively used worldwide (this is also an issue regarding training initiatives that can be distributed around the world). The benefits, however, will indeed include important economic advantages, such as clear guidelines for training initiatives, examples of training objectives and the characteristics of suitable training equipment.

Many complained during the NGAP Symposium that training has not evolved at the same pace as technology in the aviation industry. Once a competency-based system is in place, training initiatives have to be designed and implemented to achieve the specified objectives. Many presenters talked about their successful application of blended and e-learning strategies, but despite many of the successes training leaders are still faced with challenges of their own.

In 2008, TrainingIndustry.com and Expertus carried out several surveys with training executives to better understand insights and practices that impact learning efficiency. These included the optimization of learning technologies and the effect of budgets on measures of learning.

The surveys revealed that over 90 percent of executives felt pressure to reduce costs. Contrary to generalized expectations about content delivery as a source of costs saving (20 percent), the majority (46 percent) reported that savings came from improvements in administration. Technology was cited as the last area where trainers would cut costs due to gains in the long run.

The most common investment in technology was to move instructor-based content to blended or e-learning delivery forms. Learning portals (blogs, polls, online coaching, etc.) were reported to be very popular, with over 93 percent of participants employing them in their organizations. The most important measures collected were those referring to the instructional quality of the training programmes. Less than 25 percent used business outcomes or ROI measures.

These results show that budget limitations are a widespread concern. Although training leaders are not oblivious to the importance of the financial impact of training interventions, these figures suggest that they put special emphasis on measuring instructional effectiveness.

We also see that companies are well aware of the value and potential of technology to better their training initiatives; but are these new tools really effective to warrant the high develop-ment times and costs? Taking a look at one of the most widely used, the jury is still out. It is undeniable that e-learning has provided significant reductions in travel costs and delivery. Nevertheless, adoption has not been as widespread as it was initially expected to be (Carliner and Shank, 2009).

There are very positive studies comparing the efficacy of e-learning against classroom-based instruction. Efficiency is another story, with some instructors complaining that e-learning is more time-consuming. In some cases, the content quality has not met expectations and lack of understanding of the underlying pedagogic, instructional design, and development principles has led companies to make expensive mistakes.

Blended and Evidence-based Learning

It has been suggested that e-learning is more suitable for declarative and procedural knowledge. Practical application of this knowledge is limited however. This is partially true as it depends also on the kind of educational principles used—many of which have recently appeared in response to the unique characteristics of digital media.

An answer to the limitations of using only one methodology has been blended learning: a combination of different pedagogical approaches and delivery

strategies. The difficulty in this case is to adequately integrate the content and assess learners. A more recent approach is evidence-based learning, which incorporates research findings into the design and development of instructional interventions. It is certainly important to examine the full body of research that exists in the fields of education, educational technology, learning theories, psychology, and many other fields to inform the different strategies employed.

And what of the people that are going to be trained? During the NGAP Symposium, many presenters noted that newer generations are likely to require different approaches that will harness the power of new technologies, such as mobile devices and social networks.

For the Digital Generation, the Internet, massively multiplayer online games, social networks and mobile devices make up a large part of their lifestyle. Although it is true that members of this generation use technology more than other generations, a 2009 Nielsen report also showed that they still like traditional media and have some interests similar to their parents. A Pew Research Report also found that the Digital Generation is probably the most educated in American history. Its members have high levels of confidence and use communication technologies extensively to stay connected to others. Older generations also use these new technologies of course, but not nearly as intensively.

Additionally, the digital divide is not only generational but also geographical. As of 30 September 2009, only 25 percent of the world population had access to the Internet, with penetration ranging from 6.8 percent in Africa to 74.2 percent in North America, according to Internet World Stats.

New generations will perhaps force us to look at new ways to integrate technology to make training initiatives more interesting. Surprisingly, enough serious games were not mentioned in any of the sessions I attended. Digital games and simulations are frequently cited as the classic antidote for instructional boredom. America's Armed Forces is probably one of the best current examples of using massively multiplayer online role-playing games (MMORPGs) for recruitment and training purposes.

The airline industry already uses advanced simulators to train pilots and traffic controllers. Virtual Leader, created by Clark Aldrich, is a highly successful leadership simulation. In their book Total Engagement, Byron Reeves and J. Leighton Read go even further and suggest that work can be embedded in a game-like environment to create a strong sense of engagement, purpose and community as seen in MMORPGs.

Games are not the only solutions we can create with current technologies. Many presenters at the Symposium mentioned the challenges created by a geographically dispersed workforce that requires standard training. It is likely that we will soon be able to conduct training in virtual spaces such as Second Life, where people from all over the world can attend the same courses with the content based on a well-designed competency-based system. A three-dimensional virtual university where the new generation of workers in the aviation industry can get the skills they need is no longer a far-fetched fantasy.

The success of these kinds of initiatives will depend on three factors: pedagogy, measurable outcomes and assessment. The pedagogy used to design these environments should be based on sound research, clearly address training requirements and adequately harness technology. It is because of poor design processes and scarce knowledge of adult education principles and media characteristics that many expensive, technology-based initiatives remain relegated to obscurity despite significant amounts of money having been invested to implement them.

The second factor is the need for measurable outcomes, particularly in the aviation industry. We need to show that these initiatives have a positive impact on security measures and ROI, and we need specific variables that can be linked to competency-based systems and the business architecture in general.

Assessment methodologies in technology-based environments have been largely borrowed from formal education, as the ubiquitous multiple-choice test attests to. These tools are helpful, no doubt, but new uses of media in training require innovative evaluation methods. Since computers are more powerful now, it is possible to collect real-time data and then use data mining techniques to analyze patterns of use. Such strategies can yield important results that would otherwise go unnoticed using traditional methods. Information visualization can be used to uncover hidden communication and learning channels, thus allowing managers to identify informal learning opportunities.

The challenges posed by a new economic scenario and the characteristics of the new generation of professionals in the aviation industry are not simple. Nevertheless, we have seen that many initiatives are already well on their way to address them. Competency-based systems have been designed and validated. New technology has been gradually incorporated in training strategies with promising results.

And yet it remains that we can certainly choose to push the envelope further. Digital games, virtual spaces, and augmented reality are no longer the subject of fiction. They are a powerful, growing industry and, based on the degree to which young people have embraced them, they are here to stay.

A more innovative use of new technologies and media can augment the elusive 'cool' factor that will help attract the best and brightest of our younger generations to an already fascinating industry. ■

HIGHLIGHTS

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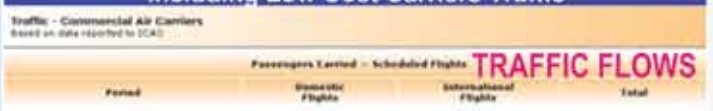

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ICAO to Endorse Testing for Language Proficiency

Since the first ICAO symposium on the subject in 2004, disparities in the quality and appropriateness of language proficiency testing have been identified as obstacles to the effective implementation of ICAO's related safety objectives. Many States still lack the expertise and resources to implement ICAO Guidance regarding the selection or development of appropriate testing tools.

The Organization has therefore initiated a new collaborative endorsement process for aviation language proficiency tests, one that will leverage input from language testing experts and other stakeholders in order to provide States, operators, pilots and controllers with much higher confidence levels as they seek out programmes that will effectively meet their language proficiency objectives.

Aviation language testing for licensing purposes is currently not regulated. ICAO, as the only global aviation Standards body, has been deemed by language proficiency stakeholders as the sole Organization capable of fostering effective self-regulation in the industry.

ICAO has been working closely with a number of partnering bodies in this field since the issue of language proficiency shortcomings and their detrimental effects on safety came to the fore earlier this decade. These collaborating organizations include: the International Civil Aviation English Association (ICAEA); the International Federation of Air Line Pilots' Associations (IFALPA); the International Federation of Air Traffic Controllers' Associations (IFATCA); and the International Language Testing Association (ILTA).

Since the first ICAO symposium on the subject in 2004, disparities in the quality and appropriateness of language proficiency tests have been identified as obstacles to the effective implementation of ICAO's safety objectives in this field. The decision to establish a process to endorse language tests used for licensing purposes is the latest in a series of steps taken by ICAO since the issuance of its new Language Proficiency Requirements (LPRs) in March 2003. All of these measures have supported good practice in this field and serve to underpin the ongoing validity of the ICAO LPRs.

"It was essential in moving this initiative forward that a wide range of stakeholders come together to support the language test endorsement process," began Carolyn Turner, President of ILTA. Her association played an integral role in developing the endorsement concept. Charles Alderson, a member of ILTA, had been doing research in the aviation language area within the Lancaster Language Testing Research Group (LLTRG). His results and discussions with other stakeholders led to the formation of an *ILTA Task Force* which culminated in a set of *Guiding Principles* to be used as baseline information for an eventual *ICAO/ILTA Joint Task Force*. This latter body had its first meeting in January 2010.

"Alderson's work in this area motivated our efforts," Turner continued. "We all became aware that the full range of stakeholders would need to work together - language testing experts, subject matter experts—in this case the operational stakeholders from IFALPA and IFATCA—and of course ICAO and ICAEA."

Difficulties still persist in the language proficiency area, primarily because many States lack the expertise and resources to implement the ICAO guidance established to assist them to oversee, select or develop appropriate tests. It was agreed by all concerned that States absolutely needed an independent entity to endorse English language testing programmes for them—in compliance with ICAO guidance.

The primary goal of the new testing endorsement initiative will be to provide a pool of testing systems of appropriate design and content, and which additionally meet well-defined standards of good practice from which States can then choose. More indirectly, ICAO's language test endorsements should help to promote the wider application of best practices throughout the proficiency testing profession.

The language test endorsement initiative has also been structured to be self-funding and self-sustaining. All efforts

will be made to reduce the costs for requesting test providers from developing States.

"The endorsement of tests in this field is a significant step which can only be warmly welcomed by both the operational and aviation language testing and training communities," commented ICAEA President, Philip Shawcross. "Although the responsibility for selecting, approving and overseeing language testing is ultimately the responsibility of each national regulator, the authorities can often benefit from guidance and support as this activity is outside their core areas of expertise…

Moreover, the many cases of sub-standard testing practice which have been reported to the ICAEA over the last year, in the lead-up to March 2011, are a cause of great concern and a phenomenon which definitely required remedial action."

The new endorsement process will be both voluntary and confidential, but it will also be formative—providing test providers with constructive feedback and recommendations about how to enhance their exams. It is expected to gradually, but durably, enhance and extend standards of good practice across the board.

"The independent stakeholders in this endorsement process, under the auspices of ICAO, the professional federations IFALPA and IFATCA on one hand, and the international language testing experts of ILTA on the other, confer great strength and validity to the process," confirmed Shawcross. "ICAEA, as an inter-professional association which has striven for the past twenty years to create links and develop synergies between the operational and linguistic communities, serves as a facilitator in this process. It is a source of great satisfaction for us to see that the integration of these different but complementary perspectives is becoming a reality within the framework of ICAO LPR implementation."

Endorsement will be provided on behalf of ICAO for a maximum three year period. Subsequent endorsements will be subject to a much more streamlined review process. ICAO will be involved at all levels of the process and in every case will retain approval authority over final endorsements.

Testing providers will generally be subject to a two-phase process consisting of an initial review and, if needed, a final review. Endorsement will be granted only if recommendations made during the initial review have been implemented by the test provider. It could also be granted simply after the initial review provided that all requirements and criteria have been met at that stage.

IFALPA's members were both pleased and relieved to some extent by the endorsement announcement. Both the airline operators and the pilots who fly for them have been significantly committed to the education and re-education requirements necessary to improve English proficiency levels and industry safety.

Captain Rick Valdes, IFALPA Representative, and a founding member of ICAO's Proficiency Requirements In Common English Group (PRICE SG), noted however that although the airlines have spent considerable resources on retraining for their pilot employees, they and their pilots have not always gotten the results from the process that some States and language education providers had assured them would be the case.

"One of the most serious concerns for IFALPA before this new ICAO endorsement mechanism was confirmed was that, in too many occasions, either States or companies who had provided the educational products were also conducting the testing," noted Valdes. "Obviously these providers have a conflict of interest in this respect, in the sense that it is very much in their interest NOT to fail anyone. By having all tests endorsed by ICAO as we move forward, it adds a new level of independent oversight to this process that can only make it more effective."

Valdes also remarked that the endorsement process will help to alleviate the 'patchwork' effect that the former regimen was engendering, leading to Level 4 English proficiency in one country being something very different from Level 4 in another country.

"No matter what country a pilot is operating in now, Level 4 English is going to mean Level 4 English," he concluded. "This brings a degree of confidence to all crew members and will only serve to enhance the safety of operations globally." ■

ICAO Visit by Airport Executive Leadership Programme Students

Students from the Concordia University Airport Executive Leadership Programme (AELP) are shown here during a recent visit to ICAO.

The visit by the AELP students, hosted by ICAO representatives Garleen Tomney and Jose Falcon, helped to put a 'friendly face' on ICAO and reinforce the synergy which exists between the Organization and other aviation stakeholders. The visit also helped demonstrate the strong and joint commitment of all aviation organizations to continuously work toward making the global air transport system safer, more secure and more operationally efficient. ■

Deposit by Lesotho

Lesotho deposited its instrument of accession to the 1988 Protocol for the Suppression of Unlawful Acts of Violence at Airports during a brief ceremony at ICAO headquarters on 8 June 2010. This brought the total number of States parties to the Protocol to 170.

Shown on the occasion (from left to right) are: John Augustin, Deputy Director, Legal Affairs and External Relations Bureau, ICAO; and Moshe Kao, Acting High Commissioner of the Kingdom of Lesotho in Ottawa. ■

Boeing and PetroChina Launch Alternative Fuels Initiative

Boeing and PetroChina, together with representatives of the Chinese energy sector and the global aviation industry, recently announced the signing of an agreement to evaluate establishing a sustainable aviation biofuels industry in China. The strategic assessment is the first such effort in China and will take a comprehensive look at the environmental and socio-economic benefits of developing sustainable alternatives to fossil-based jet fuels.

The new project will look at all phases of sustainable aviation biofuel development, including agronomy, energy inputs and outputs, lifecycle emissions analysis, infrastructure and government policy support. The assessment, slated to begin in June, supports a broader sustainable aviation biofuel agreement between China's National Energy Administration and the U.S. Trade and Development Agency to promote the commercialization and use of aviation biofuels in China through the U.S.-China Energy Cooperation Program (ECP), a public-private partnership.

Other U.S. companies participating include AECOM, Honeywell's UOP and United Technologies. Air China and PetroChina will lead the Chinese team. ■

Low Fare Airlines and SESAR

Following an open call for tenders, the SESAR Joint Undertaking (SJU) signed a framework contract recently with the European Low Fares Airlines Association (ELFAA) to include its expertise in the execution of the SESAR work programme.

For the purposes of the contract, ELFAA has secured the confirmed participation of three of its airline members: Ryanair, Jet 2.com and Flybe. This marks the latest addition of external partners to SESAR, the European ATM Modernization Programme. The mission of the SESAR Programme is to enhance the capacity, safety and efficiency of the European ATM network while reducing the environmental impact per flight by 10 percent. To do so, the SESAR Joint Undertaking built an effective partnership between airlines, airports, manufacturing industry and Air Navigation Service Providers (ANSPs).

Apart from its 15 members and EUROCONTROL, the SJU has so far concluded contracts with staff associations, major airlines, business and general aviation, as well as air transport associations. The academic world is integrated through a dedicated work package and the SESAR Scientific Committee.

ELFAA members currently account for 35 percent of intra-European air traffic. Under the present contract, the associations and its selected partners will contribute to the execution of the SESAR work programme by providing technical expertise and by preparing, performing and analysing live or simulated flight trials.

"ELFAA is already been closely engaged with the SESAR Joint Undertaking and we share the same objectives," commented John Hanlon, Secretary General of ELFAA. "ELFAA and SESAR are about increasing safety, efficiency and capacity with reduced impact on the environment. SESAR is what we need, and we will contribute to make SESAR an affordable reality." ■

ICAO MID Strategies Find Support in New CANSO Middle East Declaration

The Civil Air Navigation Services Organisation (CANSO) announced its 'Middle East Declaration' in January at the CANSO Middle East ANSP Conference. The statement commits the members of its Middle East Office and other aviation stakeholders in the MID Region to work together to improve Air Traffic Management (ATM) across the Middle East.

The Declaration was endorsed on January 25th by all the organizations attending the CANSO Middle East High-level Meeting. Representatives included the Members of the CANSO Middle East Region, key civil aviation organisations and ANSPs, airlines, IATA, ICAO, and several important industry suppliers.

"ICAO MID strategy falls clearly in-line with the new CANSO Declaration. During the last four ICAO MIDANPIRG meetings, conclusions have been adopted in support of this evolution from a systems-based approach to a performance-based approach for air navigation planning and implementation."

– Mohamed Khonji
ICAO MID Regional Director

Mohamed Khonji, ICAO's MID Regional Director, delivered a presentation to the assembled stakeholders of the ANSP Conference on *Seamless ATM in the MID Region*. It provided attendees with an overview of related Global ATM Operational Concept (Doc 9854) objectives and strategies in general, as well as the MID Regional Office ATM activities, MID Air Navigation Planning and Implementation Regional Group (MIDANPIRG) efforts and Safety Oversight results in the MID Region more specifically.

Middle East Stakeholders United in Regional Efforts

The new CANSO Declaration acknowledges the importance of aviation in the Middle East and recognizes the importance of a collective response by all stakeholders—aviation business sectors, States and international organizations—to cooperate to meet the unprecedented challenges facing air navigation services in the Region. It endorses the CANSO Middle East 'REDSEA' vision to 'Realise, Enhance and Develop Seamless Efficient Airspace' through a seven-pillar, high-level strategy and four work programmes. The CANSO vision aims to encourage the successful transformation of ATM in the Region.

"ICAO MID strategy falls clearly in-line with the CANSO Declaration," noted Khonji. "During the last four ICAO MIDANPIRG meetings, conclusions have been adopted in support of the evolution from a systems-based approach to a performance-based approach for air navigation planning and implementation. These conclusions are based on the ICAO Global Air Navigation Plan (Doc 9750, also referred

CANSO and Regional dignitaries announcing the organization's new Middle East Declaration. Pictured from left to right: CANSO Director General Graham Lake; Saudi Arabia GACA President His Excellency Abdullah M. N. Al-Rehaimi; CANSO Chairman Ashley Smout; and Senior Vice-President Flight Operations, Emirates Airline, Alan Stealey.

ICAO GLOBAL AIR NAVIGATION PLAN (DOC 9750): GLOBAL PLAN INITIATIVES (GPIS)			
GPI-1	Flexible use of airspace	GPI-12	Flight Management System (FMS-based) arrival procedures
GPI-2	Reduced vertical separation minima		
GPI-3	Harmonize level systems	GPI-14	Runway operations
GPI-4	Alignment of upper airspace classifications	GPI-15	Match IMC and VMC operating capacity
GPI-5	Performance based navigation	GPI-16	Decision support and alerting systems
GPI-6	Air Traffic Flow Management	GPI-17	Implementation of data link applications
GPI-7	Dynamic and flexible ATS route management	GPI-18	Aeronautical information
GPI-8	Collaborative airspace design and management	GPI-20	WGS-84
GPI-9	Situational awareness	GPI-21	Navigation systems
GPI-10	Terminal area design and management	GPI-22	Communication network infrastructure
GPI-11	RNP and RNAV Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARs)	GPI-23	Aeronautical radio spectrum

to as the Global Plan or GANP) and reflect relevant ICAO Global Plan Initiatives (GPIs)."

GANP GPIs serve as options for air navigation system improvements that, when implemented, result in direct performance enhancements. Each State or Region identifies their own GPIs through an analytical process specific to the particular needs of a homogeneous ATM area or major traffic flow, taking into account initiatives being pursued by other Regions in order to facilitate the objective of a seamless Global ATM system. A set of interactive performance-based planning tools assists with the Regional analysis process.

The challenges for the MID Region stem from the rapid air traffic growth that it will be experiencing for the foreseeable future, as projected by ICAO's Economic Analysis and Policy (EAP) Section. In 2009, while aggregate international and domestic traffic fell by 3.9 and 1.8 percent respectively (based on declines in every other ICAO Region), MID traffic grew by close to 10 percent. Projections to 2025 currently indicate that this growth will continue virtually unabated—at an average annual rate of 7.6 percent.

Accordingly, the CANSO Declaration supports and strengthens recent MIDANPIRG conclusions such as the improvement of the MID ATS route structure (flexible use of airspace (FUA); dynamic and flexible ATS route management; improved Civil/Military coordination; enhancement of MID States' Terminal area (TMA) management; improvement of communication infrastructure; and implementation of ATN in the MID Region.

His Excellency Saif Mohammed Al-Suwaidi, Director General of the UAE General Civil Aviation Authority (GCAA), sent an announcement to be read in his absence to the assembled participants of the CANSO High-level Meeting. The GCAA only recently joined the CANSO family but Al-Suwaidi noted that his country is already seeing the benefits that derive from being part of a worldwide network of ANSPs.

"I am very pleased to see CANSO develop to the benefit of the Region," Al-Suwaidi commented. As a progressive and leading ANSP, the UAE GCAA is working with our partners to take advantage of the best practices and new technologies now available to ATM planners. I am sure that, in the spirit of this Declaration, all Middle East ANSPs will endeavour in the near- and long-term to lift their ATM capabilities to a new level."

Ashley Smout, CEO of Airways New Zealand and CANSO Chairman, noted that the new Declaration marks a major step forward in the transformation of ATM in the Middle East. He congratulated the leaders of Saudi Arabia's General Authority of Civil Aviation (GACA), the GCAA, Egypt's National Air Navigation Services Company (NANSC) and the SERCO international service company, along with all CANSO's partners in the High Level Group, for their far-sighted commitment to the work programme.

"CANSO is the global voice of ATM and today that voice has spoken in the Middle East," concluded Graham Lake, CANSO's Director General. "Together with the vital support of our partners and customers in the Region, notably ICAO, CANSO looks forward to proactively continuing to work together to improve the capacity, performance, safety and efficiency of Middle East ATM." ■

MIDANPIRG PARTICIPATING STATES

ICAO's Middle East Air navigation Planning and Implementation Regional Group was established by the ICAO Council in 1993. It has held 11 Meetings since its first in November 1994, with MIDANPIRG/11 (February 2009 in Cairo) resulting in an outcome of 87 Conclusions and Decisions. MIDANPIRG/12 is scheduled for October 17-21 2010.

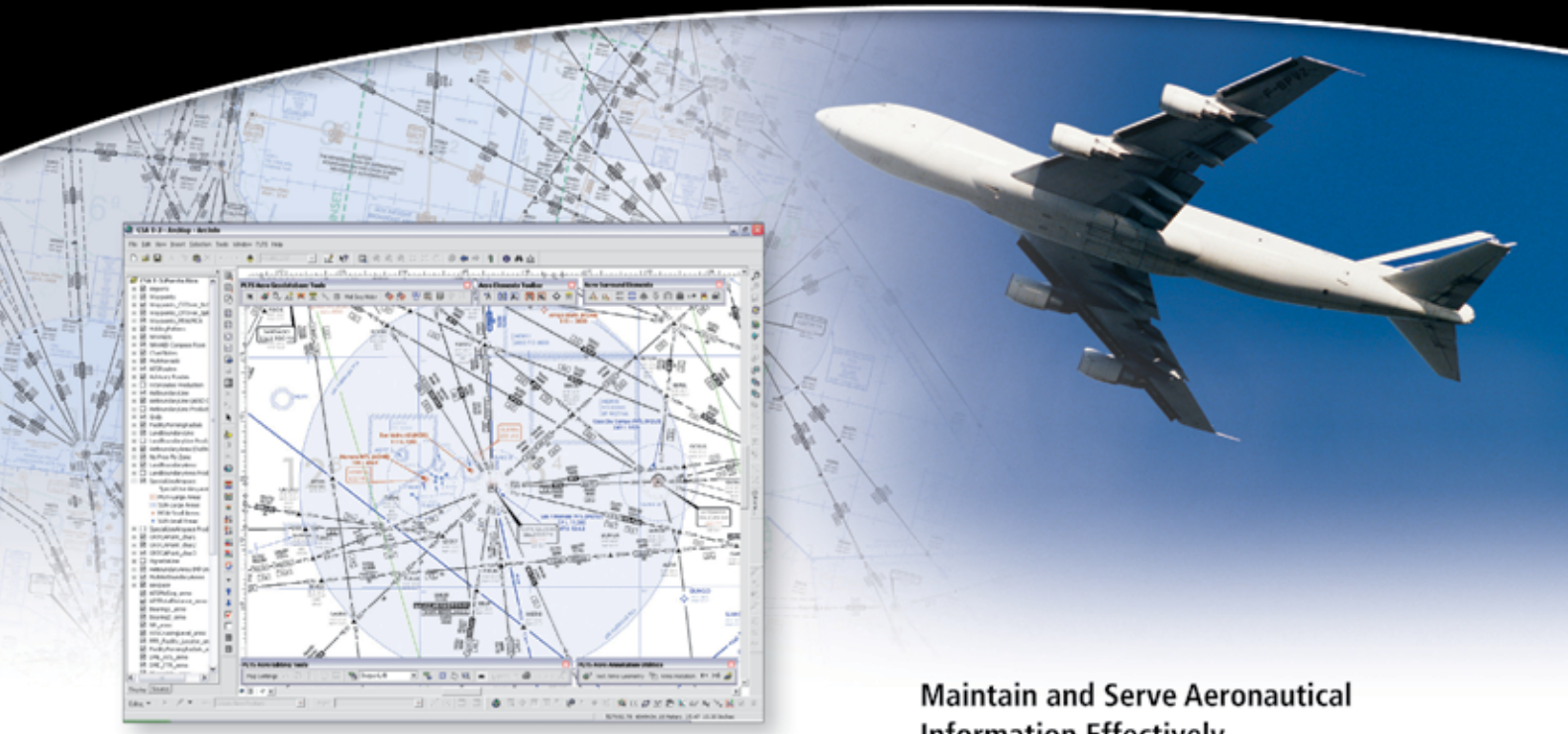
States participating as members in MIDANPIRG presently include:

- Bahrain
- Egypt
- Iran
- Iraq
- Israel
- Jordan
- Kuwait
- Lebanon
- Oman
- Qatar
- Saudi Arabia
- Syria
- United Arab Emirates
- Yemen

2010 ICAO CALENDAR OF EVENTS

Meetings	Site	Duration
International Conference on Air Law Diplomatic Conference on Aviation Security (DCAS 2010)	Beijing, China	30 August–10 September 2010
Global Aviation Strategy Summit	Vancouver, Canada	20–21 September 2010
ICAO/McGill University Assembly Pre-Conference	Montreal, Canada	26–27 September 2010
ICAO Assembly – 37th Session	ICAO Headquarters, Montreal	28 September—8 October 2010
Sixth Symposium and Exhibition on ICAO MRTDs, Biometrics and Security Standards	ICAO Headquarters, Montreal	1–4 November 2010
ICAO Regional Seminar on MRTDs, Biometrics and Security Standards	Maputo, Mozambique	24–26 November 2010

GIS—Modernizing Aeronautical Information Workflow



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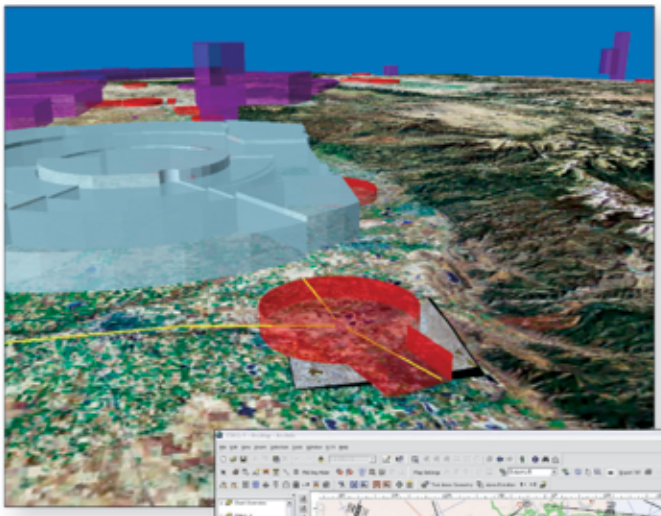

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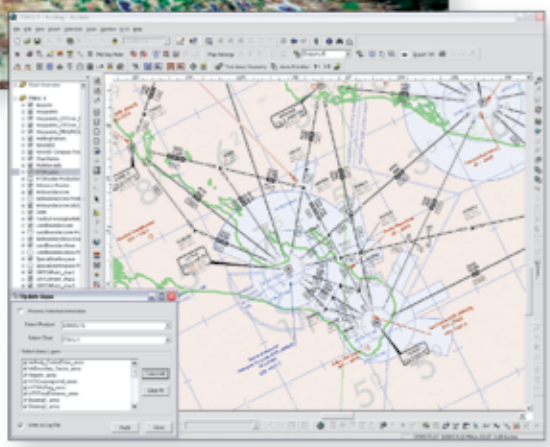

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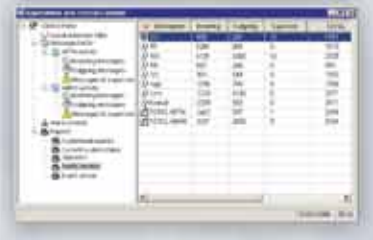

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