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SAFETY SPOTLIGHT

Flight tracking and conflict zones take center stage at ICAO's 2015 High-Level Safety Conference

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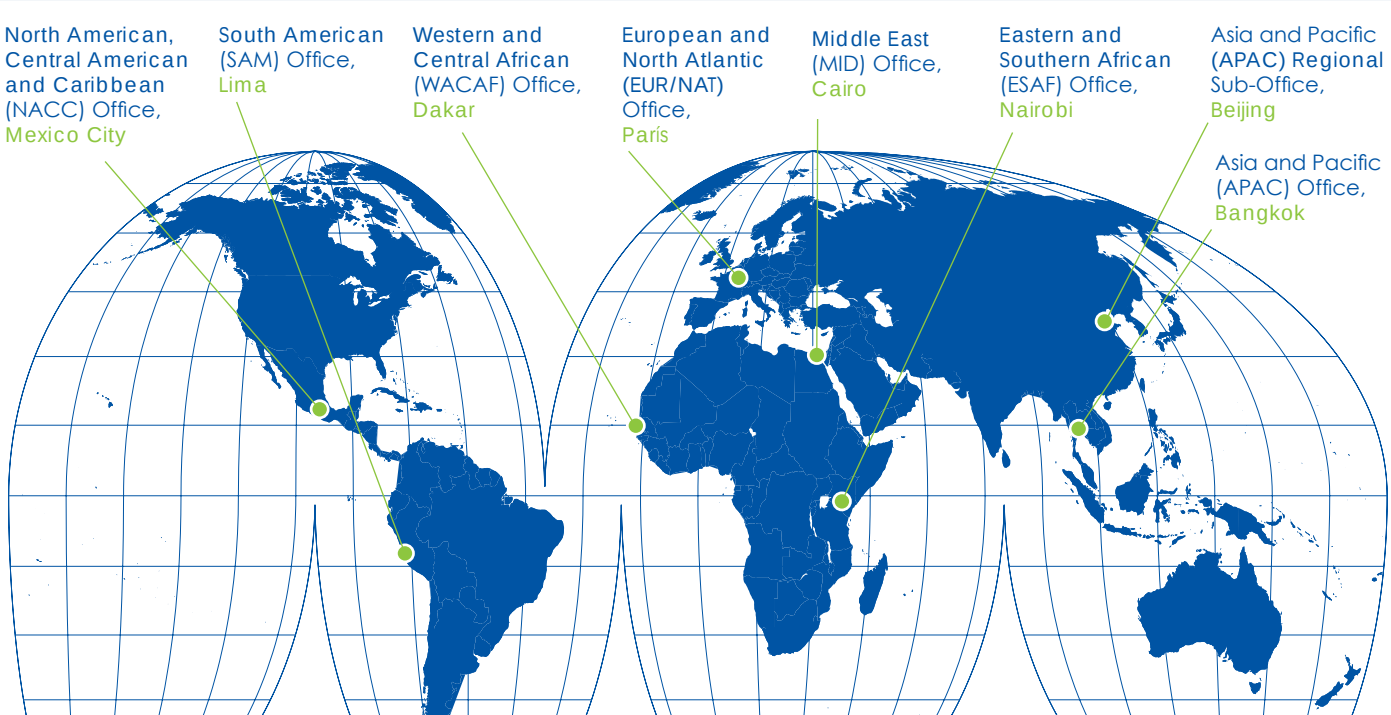

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when it comes to global aviation standards

Because all ICAO Member States should have access to the benefits of safe and reliable air transport services

ICAO

Olumuyiwa Benard Aliu

The disappearance in 2014 of Malaysian Airlines flight MH370, and the later downing of flight MH17 over an active conflict zone (CZ), raised a number of concerns with respect to the public's trust in international civil aviation and led to a series of rapid actions on behalf of the many States and international organizations which comprise aviation's global community.

The culmination of these cooperative responses was achieved at the High-Level Safety Conference (HLSC) which ICAO convened this past February, and in the following pages of our first *ICAO Journal* for 2015 you will find detailed reviews of the outcomes from that event.

As readers may recall, following the loss of MH17, a senior-level task force set up by ICAO concluded that States and airlines would benefit from greater information sharing on CZs. It was also agreed that a centralized online resource could potentially enhance existing processes. These findings were part of a comprehensive CZ risk mitigation work programme which was subsequently presented at the HLSC.

The Conference subsequently recommended, among a number of related priorities, that a web-based repository should be hosted urgently by ICAO to permit States to publicly share their CZ risk information with other States and for the benefit of airlines.

When considering the HLSC recommendations for final adoption, the ICAO Council was guided by two fundamental principles of the Chicago Convention: firstly that States are responsible for the safety of civil aviation operations in their respective airspace; and secondly that airspace users are ultimately responsible for deciding where they can operate safely.

Recognizing the urgency of this matter, Council approved that an interim version of the CZ risk information repository should be made available by ICAO as soon as possible for a one-year evaluation period. I am pleased to report that this repository went live shortly afterward, on 2 April 2015, and that it is presently available to States, operators and the travelling public from the homepage of the ICAO public website.

Another major outcome of the Safety Conference was the support achieved for a new 15-minute flight-tracking Standard. This was a direct response to the loss of MH370 over high seas airspace in 2014, and I presently expect that the new Standard will be adopted by Council as early as this fall.

Importantly, the 15-minute standard will be performance-based and not prescriptive, meaning that global airlines can meet it using available aircraft equipage and the procedures they deem most cost-effective. It represents an important foundation for global flight tracking, and a critical first step in the implementation of ICAO's more comprehensive Global Aeronautical Distress and Safety System (GADSS), the concept of operations for which was developed by ICAO over 2014.

The GADSS calls for a three-tiered approach for tracking aircraft under normal, abnormal and distress flight conditions over the long-term. It also outlines procedures and responsibilities for operators, air navigation service providers and rescue coordination centres.

ICAO has organized a global aircraft tracking implementation initiative, in a multinational context, in order to demonstrate the best use of existing equipment and capabilities in the service of 15-minute flight tracking. The exercise includes the testing of procedures for operator flight monitoring, air traffic services, search and rescue, and civil/military cooperation, and the first steps were undertaken at meetings hosted by Qantas Airlines, in Sydney, Australia, from 16-18 June 2015.

> "If aviation is to succeed in making a remarkably safe system even safer… every member of our community must do their share."

These exercises will be critical to the establishment of effective and practical ICAO standards and guidance for flight tracking. They also help to bring added focus on how ICAO is placing greater priority today on providing the tools and resources that States require to effectively implement our Standards and policies – initiatives which we are presently highlighting under our *No Country Left Behind* campaign.

Besides these developments on MH370 and MH17, readers should also take note that the HLSC delivered important recommendations in additional areas, notably: the safe integration of remotely piloted aircraft systems into civilian airspace; the continued adoption of proactive safety management approaches in States; the sharing and protection of safety information; implementation of performance-based navigation regulatory oversight; and assistance for States seeking to attain minimum levels of effective safety oversight.

If aviation is to succeed in making a remarkably safe system even safer, not to mention reinforcing the element of public trust which is so critical to every aspect of profitable and reliable air transport operations, every member of our community must do their share. Effective cooperation has certainly been a hallmark of our sector since the dawn of civil aviation, and it remains the best guarantee we have of successfully confronting any and all future challenges. ■

HIGH-LEVEL SAFETY EVENT TAKES URGENT ACTION WHILE RESPECTING STRATEGIC GOALS

The 2015 ICAO High-Level Safety Conference (HLSC), which followed the inaugural ICAO HLSC in 2010 as per its five-year cycle, was originally expected to focus on ongoing issues of information sharing and protection. But two dramatic events in 2014 altered the dynamic and the HLSC re-vectored its attention to the high-profile topics of aircraft tracking and conflict zone overflight.

"Civil aviation as a sector has a long history of meeting and resolving even the most difficult of challenges. The extraordinary qualities and benefits of modern air services, including our global network's overall safety performance, are the direct result of the commitment of our Member States, industry, and international organizations to work together and through ICAO," said ICAO Council President Dr. Olumuyiwa Benard Aliu in his opening remarks to the more than 850 conference participants from 120 States and 35 international organizations.

"Our work at this event must seek to respect and maintain a strategic approach to aviation safety. We must deliver recommendations which will progressively achieve agreed-upon safety targets, but we must also continue to avoid any unintended consequences which could introduce new risks into what remains the safest mode of global transportation."

The HLSC forged global consensus on the two particularly challenging emerging safety issues – flight tracking and conflict zone risk mitigation, prompted respectively by flights MH370 and MH17. "The series of unusual and tragic accidents which took place last year brought renewed awareness and commitment to our

"We must seek to respect and maintain a strategic approach to aviation safety."

– Dr. Olumuyiwa Benard Aliu, ICAO Council President

> "It became imperative for us to take immediate action to address these unfortunate events. And we have done just that."
>
> – Raymond Benjamin, ICAO Secretary General

community which has developed such an enviable safety record. It became imperative for us to take immediate action to address these unfortunate events. And we have done just that," stated Raymond Benjamin, ICAO Secretary General (SG).

However, though those two topics understandably garnered most of the post-conference headlines, the HSLC accomplished much more. The event also delivered clear affirmations for the objectives now being pursued in every world region under the ICAO Global Aviation Safety Plan (GASP).

For example, the conference recognized the instrumental coordinating role now being performed by ICAO's Regional Aviation Safety Groups (RASGs). Sector-wide safety performance is a critical prerequisite for the sustainable development of air transport and the social and economic development benefits it fosters in States and regions.

Coordinating and supporting the regional implementation of the GASP has been entrusted to the RASGs, which have been established by ICAO in all regions. The RASGs collaborate with ICAO as well as other international and regional organizations and industry.

"This coordination helps to illustrate that aviation, like the world it serves, is much more interdependent and interconnected today than it has ever been," Dr. Aliu noted. "Every State and Region knows that the global network can work to the benefit of all, but only when every player in our network cooperates on the basis of globally harmonized and globally enforced provisions."

Michael Huerta, head of the U.S. Federal Aviation Administration (FAA), said, "The challenges of enhancing safety even further are much bigger than one country or region. It is essential that we work through ICAO, and its regional offices and partners, to effectively and efficiently improve aviation safety."

SG Benjamin noted, "In every region, States have formed collaborative relationships with their industry partners, and are working ever closer together to address safety improvements at the regional level and local level. And we've made good progress toward achieving the targets. But as always, there is more to do."

Dr. Aliu emphasized that any near-term responses must be fully consistent with long-term and consensus-driven safety objectives. The GASP helps to assure the needed consistency and continuity of safety-related work by stressing the importance of:

- The information needed to identify emerging safety trends and risks
- The international requirements that effectively address such risks, as well as the necessary human and technical resources to ensure their implementation
- The principles which formalize a collaborative approach, inclusive of Member States, industry, and partner organizations.

João Aguiar Machado, head of the European delegation, remarked that the GASP "will play a strategic part in ensuring the ability to plan, prioritize, monitor, measure, and report on progress and improvements as regards aviation safety. This is not just about looking to the future. The future is only achievable if based on the past and present, and in this context we must ensure that enough attention is given to ensuring that the basis from which we want to progress is solid enough to allow for that, based on an effective implementation of existing safety provisions by all."

In addition, the HLSC also stressed its recognition of the role played by aviation in responding to public health emergencies such as the Ebola outbreak in western Africa and the importance of collaboration between the aviation and public health sectors in preparedness planning and response to public health events.

2014-2016 GLOBAL AVIATION SAFETY PLAN (GASP) OBJECTIVES AND PRIORITIES

NEAR-TERM	MID-TERM	LONG-TERM
2017	2022	2027
■ All States establish effective safety systems ■ States with effective safety oversight (over 60% EI) fully implement State Safety Programme (SSP) ■ States/Stakeholders support RASGs with the sharing of safety information	■ All Member States fully implement the ICAO SSP Framework ■ RASGs incorporate regional monitoring and safety management programmes	■ Member States implement predictive risk capabilities as necessary to support future Air Navigation Systems

PRIORITIES	
	RUNWAY SAFETY
	CONTROLLED FLIGHT INTO TERRAIN (CFIT)
	LOSS OF CONTROL IN-FLIGHT (LOC-I)

The Global Aviation Safety Plan (GASP) was "completely overhauled" in 2014, according to Nancy Graham, former ICAO Air Navigation Bureau Director.

Of the 140 working papers and information papers submitted for the conference, topics included:

- Runway safety (U.S.)
- Fatigue risk management implementation (Turkey)
- Performance-based navigation (PBN) procedures (ICAO Secretariat)
- Remotely piloted aircraft systems (Canada)

"With the outcomes of this Conference and those of the earlier Twelfth Air Navigation Conference, ICAO and the global air transport sector it serves have established a solid foundation and clear direction for aviation safety and for air navigation capacity and efficiency for some years to come," concluded SG Benjamin.

Nancy Graham, then Director of the Air Navigation Bureau (ANB), told participants that, since the 1st High-Level Safety Conference in 2010, ICAO has developed a number of new or improved tools for Member States to address safety, including:

- iSTARS – Integrated Safety Information
- Integrated Safety Briefings
- Integrated Geographic Info Systems (improved)
- Continuous Monitoring Approach (CMA) Online Framework
- SSP Gap Analysis
- Mobile Annexes (beta)
- Implementation Kits (I-Kits)
- PBN Tools and Training
- Regional Dashboards

Dr. Aliu also emphasized ICAO's *No Country Left Behind* theme: "There is no doubt that ICAO has done well with respect to our safety rule-making activities, oversight auditing, targeted cooperative programmes, and strategic safety management planning. The greater challenge which now lies ahead is to resolve the concerning level of variance in State-by-State implementation of ICAO standards and recommended practices (SARPs)."

"We must do more to level the playing field with respect to the local capabilities and capacities each State and Region has at its disposal to ensure truly effective SARP implementation."

The Council President called *No Country Left Behind* a fundamental and organization-wide priority for ICAO. He said the organization will also be "increasingly more transparent in publicizing related priorities, targets and achievements relating to SARP implementation." To be successful, the programme will "require the buy-in and support of each and every one of you … especially if we hope to ensure that all ICAO Member States can eventually realize the full and significant benefits that safe and reliable air services deliver." ■

For more information on the 2nd High-Level Safety Conference (HLSC), including working papers, information papers, presentations, and discussion summaries, visit: http://www.icao.int/Meetings/HLSC2015/Pages/default.aspx

MONTRÉAL DECLARATION 2015

States Agree on Wide Range of Strategic Planning for Aviation Safety Improvement

The High-Level Safety Conference was not limited to the issues of aircraft tracking and conflict zones. Directors General for Civil Aviation and heads of other relevant authorities, meeting in Montréal, Canada, from 2-5 February 2015, agreed to act on plans for these and other safety issues.

GASP	Facilitate effective implementation of the near-term, mid-term, and long-term objectives of the ICAO Global Aviation Safety Plan (GASP).
RASGs	Participate in Regional Aviation Safety Groups (RASGs), Regional Safety Oversight Organizations (RSOOs), and other regional frameworks to establish the GASP objectives.
PBN	Expedite full implementation of performance-based navigation (PBN) regulatory oversight.
TRACKING	Implement the Global Aeronautical Distress and Safety System (GADSS) concepts of operations, including 15-minute normal tracking and every-minute distress tracking.
CVR	Proposed amendment to extend cockpit voice recorder (CVR) recording duration to 25 hours for newly manufactured large aeroplanes.
CONFLICT	Initiate sharing of information concerning risks to civil aviation arising from operations over or near conflict zones.
CIVIL / MIL	Ensure the safety of civil aircraft through civil / military coordination.
SMS	Apply risk-based safety management system (SMS) principles and performance-based regulations across the aviation system through State Safety Programmes (SSPs).
SUSTAINABLE	Secure funding for sustainable development of air transport.
HEALTH	Facilitate improved management of public health events that impact the aviation sector.
METEO	Determine whether enhancements to ICAO provisions are required to further mitigate risks associated with extreme meteorological conditions.
RPAS	Expedite development of ICAO guidance to regulate remotely piloted aircraft system (RPAS) operations.

PERFORMANCE-BASED GADSS TO ADDRESS TRACKING ISSUE

The dominant topic of the 2nd ICAO High-Level Safety Conference (HLSC) in February was global flight tracking. The conference adopted both near-term and long-range approaches to the issue: a new 15-minute tracking standard and development of a comprehensive, performance-based Global Aeronautical Distress and Safety System (GADSS).

Following the disappearance of Malaysia Airlines flight MH370 on 8 March 2014, a special multidisciplinary meeting regarding global flight tracking was held at ICAO Headquarters in May 2014. The meeting participants concluded that global tracking of airline flights should be pursued as a matter of priority to provide early notice of, and response to, abnormal flight behaviour. It also concluded that a draft concept of operations (CONOPS) on flight tracking be developed with a clear definition of the objectives of flight tracking, ensuring that information is provided in a timely fashion to the right people to support search and rescue, recovery and accident investigation activities, and it should also include the roles and responsibilities of all stakeholders.

> "ICAO, with the support of the United States and the international community, has responded quickly to the challenge of global flight tracking. Standards that would normally take years of deliberation have instead been developed in months."
>
> – Michael Lawson, U.S. Representative to ICAO on the Council

To develop the CONOPS as the guiding document for the efforts, the President of the ICAO Air Navigation Commission (ANC) and Director of the Air Navigation Bureau (ANB) established an ad hoc working group (AHWG). Separately, to identify potential solutions for routine flight tracking using existing technologies, the Aircraft Tracking Task Force (ATTF) was established, led by the International Air Transport Association (IATA).

The unprecedented loss of MH370 focused "intense scrutiny on the ability of our network to better track our aircraft on a truly real-time, global basis," said ICAO Council President Dr. Olumuyiwa Benard Aliu. He added that, while this capability may not prevent accidents from occurring, technologies do currently exist, and are in operational use, to track aircraft positions when operating outside of radar coverage. "Given that global flight tracking can provide valuable information that can be used to manage safety contingencies and, when necessary, support search and rescue efforts, it must be a priority for us."

The conference's recommendations included:

- Urging industry to start implementing global tracking on a voluntary basis through the use of available technologies
- Continue developing performance-based provisions for normal aircraft tracking, providing industry with viable options
- A global aircraft tracking implementation initiative in a multinational context designed to demonstrate best use of equipment in use today and integrate the outcome into guidance material
- Regional search-and-rescue (SAR) training exercises related to abnormal flight behaviour
- Finalize and use the GADSS for the implementation of normal, abnormal, and distress flight tracking, SAR activities and retrieval of cockpit voice recorder (CVR) and flight data recorder (FDR) data.

ICAO will incorporate comments received from the States and offer a Standard for a 15-minute aircraft tracking over oceanic airspace for adoption by the ICAO Council this fall. ■

INFORMATION SHARING KEY TO CONFLICT ZONE RISK ASSESSMENT

ICAO Secretary General Raymond Benjamin, Council President Dr. Olumuyiwa Benard Aliu, and then Air Navigation Bureau Director Nancy Graham leading the 2nd High-Level Safety Conference.

"There is an urgent need to utilize and enhance existing mechanisms for the purpose of sharing critical information related to airspace use restrictions that are associated with conflict zones and to ensure robust risk assessments," participants in the 2nd ICAO High-Level Safety Conference (HLSC) concluded.

The discussion on conflict zone information, of course, was prompted by the tragic loss of the passenger aircraft MH17 on 17 July 2014, apparently by a surface-to-air missile (SAM), as it operated over the Dnipropetrovsk flight information region near Donetsk in eastern Ukraine. ICAO responded quickly with a special high-level meeting on 29 July and formation of the Task Force on Risks to Civil Aviation arising from Conflict Zones (TF RCZ).

The Task Force "identified that both States and airlines could benefit from greater information sharing on conflict zones, including risk assessments for a given conflict area, and that a centralized online resource could help facilitate the exchange of information needed to achieve that objective," said Dr. Olumuyiwa Benard Aliu, ICAO Council President.

Based on the Task Force recommendations, ICAO is developing a comprehensive conflict zone risk mitigation work programme. In the near-term, the conference recommended: "ICAO should establish, as matter of urgency, a simple centralized web-based repository to make information available which supports the assessment of risks over or near conflict zones[1]. The source of this information should be clearly identified in the repository." This information repository would support the availability of notices to airmen (NOTAMs), aeronautical information circulars (AICs), aeronautical information publication supplements (AIPs), and other types of operational information intended to support the conduct of comprehensive risk assessments related to operations in conflict zones.

ICAO Secretary General Raymond Benjamin noted: "The intention is for this central repository to be hosted by ICAO and to serve as a single source for up-to-date risk assessments from States and relevant international organizations. Importantly, it would also link all risk assessment data presented with the State or organization which provided it, and a suitable legal framework would be established to ensure that ICAO would not face liability implications arising from the information which States and agencies submit."

The Task Force estimated such a web-hosted information database could cost about US$25 million per year. Concerns were also expressed about managing information which might be unreliable, inaccurate, or contradictory.

Other priorities of the conflict zone work programme supported by the HLSC include the harmonization of terminology used for risk assessments, a comprehensive review of existing requirements and message formats, and industry led-initiatives to share operational information and be more transparent with passengers on conflict zone risk methodologies being applied.

"I think it would reflect on us very badly if we did not see these ideas through to delivery," stated Patricia Hayes, Director of Aviation in the U.K. Department of Transport.

ICAO will provide an update on the progress of the programme at the 39th session of the ICAO Assembly in 2016.

Dr. Aliu reminded that, under the Chicago Convention, "each State is responsible for assessing civil aviation conflict zone risks in their territories, and for making that information promptly available to other States and airlines."

Irrespective of the impact of the MH17 disaster, ICAO's Aviation Security Panel Working Group considers the potential for intentional or unintentional long-range SAM attacks to be rare and of very low risk to civil aviation. ■

[1] ICAO launched its prototype conflict zone risk information repository at the beginning of April 2015.

FUTURE APPROACHES TO MANAGE AVIATION SAFETY

Of the 2nd High-Level Safety Conference's 10 sessions, six were devoted to future approaches to managing aviation safety, building on the 1st conclusions of the HLSC in 2010 and subsequent developments since. Here is a quick overview of several of the key topics discussed, conclusions, and recommendations of the participants.

"As our network continues to expand, so too will our exposure to safety risks, unless we take measures now to proactively address emerging issues," advised Dr. Olumuyiwa Benard Aliu, ICAO Council President.

REGIONAL COLLABORATION

The conference reviewed ICAO's efforts to strengthen regional cooperation through various initiatives and encouraged that they should be continued, and include the development of a resources mobilization strategy that would help intensify the regional cooperation to attain the priority safety targets.

The conference agreed on these recommendations:

- **Regional Collaboration to Improve Safety in States** - aviation safety partners, including donor States, international organizations, industry, and financial institutions, assist States to improve aviation safety by enhancing regional coordination, cooperation, and collaboration under ICAO's safety policies, strategy, framework, and mechanisms; States, international organizations, and industry continue their support to the activities of the RASGs by increasing their level of participation and contribution of resources, including technical experts, and promoting further implementation of RASG's safety initiatives.
- **Regional Safety Oversight Organizations (RSOOs)** - ICAO consider ways to integrate functions and increase the powers of RSOOs in relation to the ICAO regional safety framework, possible sustainable funding mechanisms, mergers, and agreements between RSOOs, and evolve Cooperative Development of Operational Safety and Continuing Airworthiness Programmes (COSCAPs) into RSOOs.
- **Certification and surveillance activities of Approved Maintenance Organizations (AMOs)** - ICAO consider the development of a global framework and regional initiatives to reduce duplication of certification and surveillance activities of AMOs.

STATE SAFETY PROGRAMME

The conference agreed that a risk-based approach is an effective means for States to manage new and existing aviation activities, and that new or enhanced ICAO provisions, as well as collaboration between States, are required to ensure the safe integration of remotely piloted aircraft systems (RPAS).

The conference agreed on these recommendations:

- **Strategies for managing aviation safety** - ICAO should assess the feasibility and benefits of expanding safety management system (SMS) applicability to additional aviation activities; establish a coordination mechanism to assist States in resolving safety concerns related to foreign aircraft operators; develop guidance material to facilitate the establishment of performance-based regulations; and expedite the development of provisions to be used by States to regulate RPAS operations within their airspace and to educate users regarding the risks associated with their operations.
- **Implementing SSP** - States should use the ICAO SSP gap analysis tool to support the monitoring of SSP implementation; ICAO should develop guidance and mechanisms for sharing best practices to support SSP implementation; and ICAO should improve and harmonize the defined safety performance indicators (SPIs), taking into account those currently in use.
- **Enhancing SSP provisions** - ICAO should ensure that the eight critical elements remain visible and intact and that their role as the foundation of the SSP is emphasized and harmonize the ICAO safety data collection provisions.

SAFETY INFORMATION SHARING

The exchange of information is a fundamental tenet of a safe air transportation system and is acknowledged as an enabler to achieve the objectives of the Global Aviation Safety Plan (GASP).

The conference agreed that ICAO facilitate a phased approach towards the development of the global framework for the exchange of information pertaining to the identification of systemic safety issues and other types of information in the interest of safety; that ICAO develop a Standard for the collection and sharing of operational safety data, as well as a standardized safety risk management methodology in order to promote harmonization of continuing airworthiness processes; and that ICAO establish a database for safety recommendations of global concern and expedite appropriate actions to make it available on an appropriate ICAO website.

The conference recognized that there is a need to adhere to the Code of Conduct on the Sharing and Use of Safety Information. This would enhance confidence in the sharing of safety information.

SAFETY INFORMATION PROTECTION

Proactive mechanisms designed to manage aviation safety rely on the collection, analysis, and exchange of safety information for

the timely identification and subsequent mitigation of risks and hazards that may result in an accident or an incident. The success of this proactive approach to manage aviation safety depends on the appropriate protection of safety information and related sources to encourage meaningful reporting.

The Conference agreed on the recommendations that ICAO ensure meaningful progress towards the adoption of new and enhanced provisions on the protection of safety management information as well as accident and incident records; that States undertake the necessary legal adjustments to efficiently implement new and enhanced protective frameworks to facilitate safety management and accident investigation activities; and that ICAO support States in implementing new and enhanced provisions through a strategy comprised of supporting guidance material, tools, and seminars tailored to the needs of each region aiming at building trust, cooperation, and a common understanding among aviation safety professionals, accident investigation authorities, regulators, law enforcement officers, and the judiciary in the context of an open reporting culture. The conference also considered it essential to establish a dialogue between aviation and judicial authorities to achieve the desired level of protection.

EVOLUTION OF THE GASP

In addition to the recommendations on global flight tracking and conflict zones, the conference addressed these topics as part of the evolution of the Global Aviation Safety Plan (GASP):

- **Public Health** - the conference noted the importance of the aviation sector in helping to prevent the spread of communicable disease and recognized the value of a multi-sector approach in effectively managing public health events, which can develop rapidly. The Ebola Virus Disease outbreak has demonstrated the ongoing value of the Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA) programme. The conference encouraged States to utilize expertise in the medical department of their regulatory authority, in addition to public health experts in other authorities, to facilitate improved management of public health events that impact the aviation sector and to gather and share relevant information.

Capt. V.E.O. Spaine, Chairman of the Civil Aviation Authority of Sierra Leone, told participants, "We have been encouraged in the fight for survival knowing that we were not alone but had the entire world aviation community behind our efforts to defeat an unseen but deadly enemy invading our subregion with a ferocity never experienced before on our planet."

A few of the speakers and participants in ICAO's 2nd High-Level Safety Conference. Top photo, left to right: Oscar Derby, RASG-PA Chair; Gerardo Hueto, RASG-PA Co-Chair; Gerold Reichle, RASG-EUR Chair; H.M.C. Nimalsiri, RASG-APAC Chair, DG and CEO of the Civil Aviation Authority of Sri Lanka, Vice-Chair of the HLSC; Ismaeil Mohammed Al Blooshi, RASG-MID Chair; Zakhele G. Thwala, RASG-AFI Chair; Bottom photos, left to right: Gilberto López Meyer, Chair of the HLSC Conference and Director General of Aeropuertos y Servicios Auxiliares SCT México; Catalin Radu, Deputy Director, Aviation Safety, ICAO; Mark Allen, Representative of Canada on the ICAO Council with Jim Marriott, Deputy Director, Aviation Security & Facilitation, ICAO; Gerold Reichle.

- **Extreme meteorological conditions** - ICAO should pursue its work in studying data and information from accident and incident investigations as well as data and information provided by aircraft manufacturers, linked to unusual / extreme weather events; based on the study results, ICAO should evaluate the need for improved ICAO airworthiness, operations and detection equipment carriage related provisions in order to further mitigate changing meteorological risks and take appropriate action.
- **Duration of CVR recording** - States should support the proposed amendments from the flight recorder panel (FLIRECP) concerning extended CVR recording duration for newly manufactured large aeroplanes to 25 hours.

FATIGUE RISK MANAGEMENT

States should encourage air operators to effectively use SMS processes before implementing a Fatigue Risk Management System (FRMS) in order to gain optimum safety and efficiency of its benefits.

PBN IMPLEMENTATION

States should expedite full implementation of performance-based navigation (PBN) regulatory oversight by making full use of all available resources to improve the effectiveness of their PBN oversight function; ICAO should develop a clear overview of the different regulatory oversight requirements, functionalities, and activities necessary for an effective PBN implementation. ■

"One of the most important products of our investigations is safety recommendations developed to prevent future accidents. ISASI supports the development of an ICAO global database of safety recommendations."

– Ron Schleede, VP International Society of Air Safety Investigators (ISASI)

2014 AVIATION SAFETY BY THE NUMBERS

3.3 BILLION

Scheduled commercial international and domestic operations passengers (up from 3.1B in 2013)

38 MILLION

Scheduled passenger traffic sectors flown (up from 32M in 2013)

20

Number of accidents, as defined in ICAO Annex 13 involving aircraft with a maximum certificated take-off weight of over 5700kg and reviewed by the ICAO Safety Indicators Study Group, excluding shoot-downs (down from 29 in 2013)

3.0

Accident rate per million departures (second lowest year ever)

7

Fatal accidents (down from 9 in 2013)

904

Number of fatalities (up from 173 in 2013; average 489.2 for previous five-year period)

59%

States above GASP target of 60% effective implementation (up from 52% in 2010)

“PUBLIC TRUST, RAPID RESPONSE”

An Interview with Raymond Benjamin, Secretary General of the International Civil Aviation Organization (ICAO)

The Secretary General of ICAO is head of the Secretariat and chief executive officer of the Organization, providing leadership to a specialized international staff working in the field of international civil aviation.

Raymond Benjamin became Secretary General in 2009 and has served two consecutive three-year terms. Beginning in August this year, he will be succeeded by the first woman to be elected ICAO Secretary General, Dr. Fang Liu of China.

This is the first of a new series of interviews with ICAO leaders.

EDITOR: ICAO and the global aviation community have been confronted with some serious and seemingly unprecedented issues in the past year and a half. What is your view of the responses to date and the framework being developed for further development?

RAYMOND BENJAMIN: International civil aviation came face-to-face with two very high-profile emerging safety and security issues in 2014, issues characterized by distinct challenges which ICAO and the global air transport community have been very focused on in recent months.

And while we have benefitted from a number of important lessons learned in the aftermath of the tragic losses of MH370 and MH17 last year, it is nonetheless equally critical to keep these incidents and the actions we are taking to address them in proper perspective with respect to our wider strategic planning.

The disappearance of Malaysian Airlines flight MH370 and the downing of Malaysian Airlines flight MH17 raised important concerns with respect to the public's trust in air transport. Perhaps first among the lessons learned from these two incidents, and especially MH370, is the recognition that our sector must respond rapidly, even to extremely rare accident events in our network, when there is a question of public trust involved. This is why ICAO rapidly convened a sectoral response and brought related proposals to the attention of the High-Level Safety Conference (HLSC) less than a year after these incidents took place.

"Our sector must respond rapidly when there is a question of public trust involved."

EDITOR: The tracking issue has attracted the most publicity. The media and the flying public seemed astonished that a civil aircraft could simply disappear.

RAYMOND BENJAMIN: You will recall the media frenzy MH370 generated terms such as "unprecedented" and "mysterious" in relation to its disappearance. In fact, the probability of a flight vanishing in this manner is upwards of a one-in-100-million chance when you consider the vast number of flights we safely manage year after year.

And yet as soon as it became apparent that MH370 was no ordinary accident, and that the public's trust in the safety and effectiveness of our network had been called into question, ICAO, ACI [Airports Council International], CANSO [Civil Air Navigation Services Organisation], and IATA [International Air Transport Association] rapidly convened a high-level meeting to discuss an appropriate sectoral response.

The fruit of ICAO's labours was the concept of operations for what we have now termed our Global Aeronautical Distress and Safety System, or GADSS. Over time, GADSS will lead to greater tracking frequency and precision under distress conditions.

All of this work was begun in May of 2014, and less than one year later, at ICAO's High-Level Safety Conference this past February, over 120 ICAO Member States and 30 international organizations recommended the adoption of the GADSS.

EDITOR: The GADSS concept proposes a 15-minute global flight tracking standard for normal operations. What is the rationale for this timeframe?

RAYMOND BENJAMIN: The initial 15-minute tracking requirement, applicable to commercial fleets as of November 2016, responds directly to the public expectation that we improve aircraft location finding over remote and oceanic airspace. We also see this as an important first step in terms of laying the foundation for future tracking enhancement.

We have also recommended the implementation of a one-minute aircraft tracking requirement under distress or abnormal flight conditions. This more precise capability, because it will require new aircraft equipage in many cases, has been agreed to become applicable to new aircraft entering service as of 2021.

Importantly, both the 15-minute and one-minute tracking proposals are performance-based, meaning that airlines are free to use the technologies and services they deem most cost-effective when meeting the new requirements. Performance-based standards also carry the benefit of not restricting future innovation, so that airlines can continue to seek the latest and best technologies as they upgrade or renew their fleets.

EDITOR: What happens next with the tracking initiative?
RAYMOND BENJAMIN: ICAO is presently coordinating an implementation assistance exercise in the Asia-Pacific region. The region was selected for these exercises mainly due to the size of its airspace, and we presently expect a dozen or more world airlines and a wide range of aircraft types and configurations to participate.

ARINC [Aeronautical Radio Inc.], SITA [Société Internationale de Télécommunication Aéronautique], INMARSAT, and other communications providers are already coming forward with tracking solution packages, and it is our hope that some or all of these companies will participate in our trials. The exercise will be completed by late summer with its results going on to our Air Navigation Commission, then ultimately the ICAO Council, so as to inform what it ultimately adopts by end-November.

EDITOR: How does ICAO reconcile these emergency responses with its longer-term planning? Don't the GASP and the GANP already guide the Organization's actions on a more strategic basis?
RAYMOND BENJAMIN: Yes, they do. And ICAO had already formulated performance planning and technology roadmaps that would have realized a global flight tracking capability for aviation. This came after comprehensive consultations with States and industry between 2011 and 2013, a process perhaps best exemplified by our successful Global Air Navigation Industry Symposium in 2011.

We undertook all of this work in connection with the 2013 revision of our *Global Air Navigation Plan*, or GANP. The GANP, together with its companion document the *Global Aviation Safety Plan* (GASP), are ICAO's chief response to the need for long-term strategic planning for global aviation safety and efficiency.

The loss of public trust over the disappearance of MH370 simply accelerated the implementation of one aspect of the strategic performance improvements aviation had already set out.

Separate work carried out under ICAO's *Flight Data Recovery* and *Triggered Transmission of Flight Data* working groups, convened subsequent to the recommendations contained in the BEA accident report on AF447, had already advanced related planning on items such as accident site locating, underwater locator beacons , and deployable flight recorders .

This, then, is why we are describing the 15-minute tracking requirement for 2016 as a 'foundation' or 'first-step' with respect to a more comprehensive tracking capability and framework which will eventually be realized.

EDITOR: The second major emerging issue pertained to the loss of MH17 and the risks to civil aviation arising from conflict zones. What strategy is ICAO pursuing in this regard?
RAYMOND BENJAMIN: The Conference's main recommendation was for ICAO to develop and host a centralized online repository where States, operators, and applicable organizations could share up-to-date conflict zone risk information. The ICAO Council subsequently endorsed this recommendation and, as of early April, access to the repository has been readily available on the homepage of the ICAO website (http://www.icao.int/czir/Pages/default.aspx). The goal of this portal is to facilitate and enhance conflict zone risk assessments by States and operators.

While considering these recommendations, the Council was guided by two fundamental principles of the Chicago Convention:
- First, that States are responsible for the safety of civil aviation operations in their respective airspace;
- And second, that airspace users are ultimately responsible for deciding where they can operate safely.

This decision and process once again point to the air transport sector's commitment to respond rapidly when needed, but always within the limits and respectful of the principles which have long made aviation a force for positive, consensus-driven progress in the world.

EDITOR: More recently, the Germanwings 9525 tragedy raised yet another rare issue.
RAYMOND BENJAMIN: ICAO has been seeking to draw greater attention to the importance of mental health assessments for licensed aviation personnel since 2009, and we will continue to do so. But I also wish to stress in this regard that determining mental health to any practical extent is a very complex medical challenge, and that airlines, pilots, and others can only react to what the best medical approaches make available to us.

EDITOR: Since the 1st HLSC in 2010, what success has been achieved in addressing the "big three" safety targets?
RAYMOND BENJAMIN: Having analyzed safety data for many years now, and working collaboratively with industry operators to share accident information and results, our sector identified three high-fatality accident categories which we are now working on collaboratively. These are:
- Runway incursions and excursions
- Controlled Flight into Terrain, or CFIT
- and Loss of Control Inflight, or LOC-I

These efforts have seen some clear results. ICAO has been working since 2010 with ACI, IATA, and 10 other national, regional and international organizations to reduce runway incursions and excursions. Runway-related fatalities have decreased from 179 in 2010 to just one in 2014. Similarly, we have seen the CFIT fatality rate drop by almost 85 per cent. The number of LOC-I accidents, meanwhile, has been cut in half over the same period.

"Strategic planning and collaboration is precisely how we will continue to make aviation even safer in the years ahead."

These are not the results or objectives of a sector in crisis. They are the product of determined and strategic planning and collaboration, and that is precisely how we will continue to make aviation even safer in the years ahead.

EDITOR: Looking now to the Security and Facilitation domain, cybersecurity is an issue which is showing up more often in the news with hacks on government and other high-profile computing systems. How is ICAO addressing this threat?
RAYMOND BENJAMIN: ICAO is coordinating in this area with ACI, CANSO, IATA, and the ICCAIA [International Coordinating Council of Aerospace Industries Associations], based on an agreement we signed in late 2014. Our organizations will now be more proactive in sharing critical information such as threat identification, risk assessments, and cybersecurity best practices.

We will also be encouraging more substantial coordination at the State level, notably between our respective government and industry stakeholders on all cybersecurity strategies, policies, and plans.

But we should also acknowledge, once again, that established policies and principles [in Annex 17 on Security] will provide us with a solid foundation to start from, especially so as to ensure the global harmonization aspects which are ICAO's chief responsibility.

EDITOR: Air passenger traffic is expected to reach more than six billion by 2030. What are some of the implications of this doubling of traffic?
RAYMOND BENJAMIN: The global challenges we have in common will require a unified approach supported by practical implementation assistance. The implications of such traffic growth are multiple and interrelated, as we well know. They point to: increased airspace and airport congestion, with risks to the safety, security and efficiency of air operations; growing environmental pressures; and the need for massive investments in ground infrastructure and air navigation systems.

ICAO, its Member States, and industry have made substantial progress over the years in coming to grips with the myriad issues underlying the long-term viability of airports, airlines, and other operators. These issues include market access, air carrier ownership and control, fair and equitable competition, rationalized consumer protection regimes, and minimized taxes and levies.

EDITOR: What are some things happening with regard to the ground side of aviation?
RAYMOND BENJAMIN: From a user's perspective, airports are in one sense our 'first responders' with respect to what we all strive for in aviation – a seamless system of services for passengers and shippers. In this context, the quality and availability of services at an airport often dictates whether there will be repeat business. Ease of use, friendliness, commercial activities, efficient customs and immigration, cargo handling, parking … any one of these elements can make or break a passenger's air travel experience.

Over the years, in close cooperation with respective Member States and our close colleagues at ACI, ICAO has developed a number of strategies and policies to further enhance an airport's ability to meet the demands of a growing and competitive marketplace.

The first of these deals with the ownership and control structure of facilities. Because of the growing requirement for significant investments to support new airport development and infrastructure, private interests are increasingly involved in financing such projects. Commercialization, privatization, and public-private partnerships furthermore make it easier to integrate proven business and management models to ensure that airports remain competitive with one another.

EDITOR: And where does liberalization fit into the equation?
RAYMOND BENJAMIN: The concept of 'connectivity' that has become so relevant to air transport economics in recent years implies that we are all partners – States, airlines, airports, air navigation service providers, and users – and that we share the responsibility for maintaining the healthy development of our industry.

ICAO continues to strongly support agreements and measures aimed at accelerating the process of liberalization and optimized connectivity. ICAO also recognizes, however, that some emerging issues which can negatively impact liberalization, mainly relating to protectionism and slot access, are concerns not only in a region, but also where airlines fly to.

Currently, the vast majority of arrangements concerning routes are locked into bilateral Air Services Agreements. The key is to remove those bilateral restrictions that limit the availability of services for the end-user. Greater flexibility in these agreements increases demand and ensures that the services, which result in greater connectivity, are sustainable over the long-term for all stakeholders, including airports.

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In every instance we must strive for global harmonization of approaches and greater liberalization to best assure end-user satisfaction.

EDITOR: Despite the recent high-profile accidents, overall safety continues to improve.
RAYMOND BENJAMIN: Safety remains our top priority in civil aviation. As 2014 and its intense media spotlights have made very clear to us, the public trust which is so critical to air transport viability and profitability depends first and foremost on how safely we operate our global network.

Fortunately, we are very good at being safe. One could even say we have gotten too good given the sometimes nonsensical level of scrutiny our sector is now being held to.

Last year, despite all its publicized challenges, civil aviation achieved a global accident rate of just 3.0 accidents per million departures, the second-lowest ever recorded. And while fatalities were up in 2014, mainly due to the very uncharacteristic losses of MH370 and MH17, the total number of fatal accidents also decreased to just seven – the fewest we've seen since 2008.

EDITOR: Next year, the Assembly will resume discussions on market-based measures and other environmental issues.
RAYMOND BENJAMIN: In the environmental domain, ICAO continues to drive forward on the basket of measures relating to biofuels development, improved operations, and other initiatives which have been supported by recent ICAO Assemblies. We have realized a number of important achievements in setting Standards on aircraft noise and emissions, and we are currently finalizing a first-ever CO_2 certification standard for aircraft.

We are also progressing our work on an aviation Market-Based Measure (MBM), and conducting a series of MBM Global Aviation Dialogues (GLADs) this spring to raise awareness on it in every ICAO Region.

We are reviewing best practices and lessons learned in order to assist States and operators as they engage local communities regarding aircraft operations, noise, emissions and local air quality, in close coordination with ACI.

EDITOR: ICAO has also devoted considerable attention to upgrading the airspace infrastructure.
RAYMOND BENJAMIN: Air traffic management (ATM) coordination advances must move forward hand-in-hand with airport development to achieve optimum network expansion results, and ICAO's guidance on the flexible use of civil-military airspace can also play an important role here.

I would add that ICAO is also continuing to progress its work on Air Traffic Flow Management (ATFM) and other capacity/efficiency priorities, and that these and other elements of our recently revised *Global Air Navigation Plan* (GANP) should be considered with respect to all related long-term planning – both at the State and regional levels.

EDITOR: There's a lot on ICAO's plate. How does the industry make this all happen?
RAYMOND BENJAMIN: Progress on all of the priorities will require not only that we determine practical standards and guidance, but also that our Member States have the tools and proficiencies they need to effectively put those provisions into practice.

The Council President has made it his clear priority that ICAO stay closely focused on providing and coordinating the implementation assistance and capacity-building resources many of our States require. ICAO recognizes that only by succeeding on this goal will we be able to ensure that *No Country is Left Behind* where the significant social and economic benefits of air transport are concerned.

A comprehensive list of ICAO implementation resources is now available under the recently developed *No Country Left Behind* section of our public website – http://www.icao.int/about-icao/NCLB/Pages/default.aspx.

EDITOR: Any final thoughts?
RAYMOND BENJAMIN: This will likely be my last opportunity to address readers as Secretary General. I wish to underline that it has been my great honour to serve ICAO, and the global air transport sector it supports, for so many years now.

The commitment and achievements supporting the growth of civil aviation over the last few decades are truly to be commended, and further collaboration and consensus, through ICAO, will continue to be your best path forward.

I wish you only the greatest success in the years ahead. ■

Secretary General Raymond Benjamin was born in Alexandria, Egypt, and holds French citizenship. Trained in public law and international relations, he became involved with the Civil Aviation Administration of France and subsequently the European Civil Aviation Conference (ECAC).

From 1989-94, he was Chief of ICAO's Aviation Security Branch, and from 1994-2007 Executive Secretary of the ECAC, developing policy advice and strategic options on safety, security, and environmental issues.

Prior to becoming ICAO Secretary General in 2009, Benjamin was Special Adviser to the Joint Aviation Authorities Training Organization and the European Aviation Security Training Institute.

“COMMON VISION, COMMON GOALS”

An Interview with Tony Tyler, Director General & CEO, International Air Transport Assocation (IATA)

Oxford University-educated British national Antony (Tony) Tyler has broad international working experience in Australia, Canada, Hong Kong, Italy, Japan, the Philippines, and the U.K.. Before taking on the role of Director General and Chief Executive Officer of the International Air Transport Association (IATA) in July 2011, he was Chairman of the organization’s Board of Governors.

Tall and affable, Tyler built his career at John Swire & Sons in Hong Kong, a diversified group whose holdings include Cathay Pacific Airways and Hong Kong Aircraft Engineering. Joining Swire in 1977, Tyler eventually rose to become Chief Executive of Cathay Pacific in 2007.

At IATA, he works from both its headquarters in Montréal, Canada and executive office in Geneva, Switzerland. Tyler is a Fellow of the Royal Aeronautical Society (FRAeS).

On a typical gray day in Geneva, Switzerland, ICAO Journal editor Rick Adams met with Tony Tyler in his office overlooking the runway at Genève Aéroport to discuss IATA's view of industry challenges such as safety, security, and the environment. This is the first of a new series of interviews with world aviation leaders.

EDITOR: What do you regard as the most challenging issues facing airlines and the aviation industry today, and what actions is IATA taking to resolve them?

TONY TYLER: I think the most important priority for everyone in the industry is always, of course, safety. It's a key area where ICAO and IATA work very closely together.

IATA's flagship safety product or service is IOSA [IATA Operational Safety Audit], which is undergoing something of a change at the moment into what we call Enhanced IOSA. You could criticize it as a concept in that originally it was a two-year audit and therefore was a snapshot in time, with no mechanism to monitor adherence to the IOSA standards between audits. The new Enhanced IOSA has an element of continuous assessment and quality assurance to make sure that standards are kept up through the whole audit period.

"... space-based ADS-B ... really could be the silver bullet."

It's not only all the 250 IATA members who are on the IOSA Registry; we have another 150 or so non-member airlines who are on the Registry because they recognize the value or that value is recognized by regulatory authorities who use it to enhance their own safety regimes. I think it's a good example of how IATA is filling a wider role, not simply a group that's looking after its own members. We do see our role particularly in the area of improving safety in a much broader perspective.

Another thing we're doing is taking a big data approach to safety management with our Global Aviation Data Management (GADM) project, which now has input from some 470 different organizations. We're pulling together databases of the operational experience of airlines, air navigation service providers (ANSPs), airports, really any partner in the operational chain that can present data in an organized way that we can feed into the database.

Aviation has become very safe because whenever there is an incident it gets investigated very carefully, objectively, and thoroughly, and then the lessons learned get applied into a newer and better way of operating. And that's served us very well, and that system needs to remain in place. But now with the sort of IT power that exists we have the ability to get the right data organized in the right way to make predictions rather than rear-view mirror assessments. We must continue to learn from any accidents or incidents but if we can learn from the data about what could happen in the future, then prevention is much better than cure.

The financial health of the industry is also a hugely important aspect of business. Without financial sustainability, the industry certainly wouldn't grow. We had a good year last year, relatively, but even in a good year airlines made just under 20 billion dollars profit, which is just a little more than what Apple made in Q1 FY15, so one company is making more in a quarter than a whole industry is making in a year. IATA is doing its bit to help. We work hard to improve the efficiency of processes through programmes like our Fast Travel, which is all about self-service, a double win because passengers want to serve themselves – a bit like internet banking and ATMs, the way people want to interact with their banks. Self-service is very much the way forward in this industry too.

Another thing is working with partners in the value chain. I'm thinking particularly of airports and ANSPs to drive more efficiencies and in some cases a slightly fairer share of the pie to make sure that airlines aren't having to pour money down the drain unnecessarily, which I'm afraid all too often they have to when it comes to buying these kinds of services.

EDITOR: At the ICAO High-Level Safety Conference earlier this year, an approach to airline flight tracking was adopted. With the tracking system as envisioned, how might that change scenarios such as MH370?

TONY TYLER: I think on tracking what's been agreed is a sensible approach. MH370 was an extraordinary event. It was a shock to just about everybody that a plane could go missing like that, while the average man on the street can track his iPhone. Why don't we have a more robust system to track a large aircraft? What we're talking about here is tracking of aircraft in very remote parts of the world and over oceans where there isn't coverage and indeed where your iPhone would be out of reach as well.

Nonetheless, there emerges a strong expectation that we take action. Sometimes such "political" pressure can lead to hasty decisions which are later regretted, In this case, I think that the ICAO safety conference brought us to a reasonable balance. The big step is implementation measures, and I was pleased that this implementation initiative that ICAO's leading in the Asia-Pacific region will be an opportunity to make sure that what's being proposed will actually work in practice. We'll play a very active role in that, I hope. Everybody's got their eyes on space-based, ADS-B [automatic dependent surveillance – broadcast] in particular, which could come on line in the fairly near future, and really could be the silver bullet for this problem.

EDITOR: Another topic of extensive discussion at the HLSC was overflights of conflict zones. In a world where new conflicts pop up overnight, how do we move forward for airline safety?

TONY TYLER: It's good to see that ICAO is taking the lead on this because ultimately it's about sharing of information between governments, which is very much ICAO's area, and of course IATA will do all we can to support it. I think we all know there isn't a perfect system. There are plenty of conflicts around the world today, sadly, and again we are asking ICAO to pursue through the United Nations system the development of a legal mechanism which would help to control the design, manufacture, and the deployment of weapons capable of bringing down aircraft in the same way that there are international laws covering other weapons like landmines, nuclear weapons, other forms of warfare. It's perhaps time that this particular risk is recognized and managed at an international legal level.

Airlines need to make informed risk assessments. And they're doing that every day in every aspect of their operations. Airline managers can do a good job provided they've got the right information, and I think that's where ICAO has a very important role to help provide that information to those who are best placed to use it.

EDITOR: Recently there have been some high-profile accidents. What needs to be done to continue to improve aviation safety and reassure the public?

TONY TYLER: It's important to remember there are also 100,000 flights a day for 365 days that were taking off and landing safely. I think the public does have confidence in the safety of the industry – we expect some 3.5 billion passengers to board aircraft this year, and we must continue to earn that confidence by making safety the top priority.

Asia certainly grabbed the headlines, and not in the way they would have wanted to. It's a rapidly growing region, a huge promise to the future of the industry. But you can look at China as a good example of how growth can be managed while improving safety. Thirty years ago, maybe even twenty years ago, Chinese aviation had a reputation for being well behind global safety standards; now it's almost leading the world. Clearly oversight is critical.

> "Air connectivity enriches the world: materially, socially, culturally."

EDITOR: Another issue for the traveling public is what is perceived to be not only increasing layers of security but more intrusive measures at airports. What initiatives is IATA driving to streamline passenger processing while enhancing safety against emerging threats?

TONY TYLER: IATA is all about global standards and that applies to our approach to security as well. What I think passengers find disconcerting is that standards differ so much from one place to another. There should be more standardization and there should also be more mutual recognition of each other's security standards so passengers making connecting flights don't have to go through the rigmarole several times on one itinerary. In the long run, the answer to the security problem and the problem of facilitation is risk-based security. The system can just about cope with volumes at the moment and certainly we're not going to be able to cope with the volumes of the future unless we take a new approach. So the idea of combining a more risk-based approach with new technology that enables screening without all this disrobing and unpacking is the way forward. Just a recognition

"... what we in the industry want to see coming out of it is a global agreement to a well-designed market-based measure ..."

that not all passengers pose the same risk and that if we're looking for a needle in a haystack – and that's what we're doing – it's a lot easier to find the needle if the haystack's a lot smaller.

Security is essentially a State problem. When there is an attack on an airline they're not attacking because it's that airline; they're attacking that airline because they want to get at the State; they want to get at the people, they want to get at the country involved. I think this brings home the important point that it's a government responsibility to ensure the safety of its citizens and its facilities, and governments need to recognize that of course the airlines will do all they possibly can to assist and cooperate. When it comes to paying for all this, governments need to step up to the mark.

EDITOR: Last year the industry celebrated the 70th anniversary of the Chicago Convention. Certainly ICAO's role in civil aviation and collaboration with regulatory authorities and independent organizations such as IATA have evolved. How do you see ICAO's role in the coming years?

TONY TYLER: We've been partners since the beginning, or almost the beginning. We're celebrating our 70th anniversary this year. I think our work is very complementary – for example we have IOSA, ICAO has USOAP [Universal Safety Oversight Audit Programme]. We're tackling the environment issue very much together. And ICAO represents the governments that have regulatory authority over our industry, and our role is to support them in their efforts. I think we share a very common vision, common goals. Both ICAO and IATA focus on safe, efficient, sustainable development of air connectivity because it is such a critical component of the global economy and because connectivity enriches the world – it enriches it materially and it enriches it socially and culturally. And I think all the people in ICAO and people in IATA and the whole industry understand and do share a common vision, I think, of a globally interconnected world. I think it's partnership that's taken us this far. We have to continue that.

IATA has access to enormous expertise on the operational side, and that can help ICAO fulfill its role, which is to guide governments in the regulation of this activity. Of course, we're committed to making that expertise available whenever it's helpful or required, and do so through direct participation in ICAO technical and governance bodies. I must say we do have an excellent relationship with ICAO. The fact that we're across the street from one another in Montréal is hugely beneficial to both organizations and to the industry as a whole. The IATA people who need to work with their ICAO counterparts have excellent relationships and an open-door access to them, which works all the way from the getting-things-done level working experts right up to the top.

Their hearts are in the right place and they seem to be pragmatic. When I arrived in this job, I'd seen ICAO from quite a distance. I was told ICAO can't work as fast as some would like. It's an inter-governmental organization, and that's only to be expected, but it's not a problem. One has to have a sense of expectations in how quickly ICAO can deliver things, and certainly the Secretariat and the Council members, I think, are always motivated to doing things well and doing things fast, but you recognize it's a big organization. We've got 250 or so members in IATA and sometimes getting everybody to sing from the same hymnbook is a challenge. I've only got commercial companies to deal with; they've got governments, and whenever governments are concerned, politics comes into it. I think the Secretariat and the Council together do a pretty good job of handling these issues.

EDITOR: The Chicago Convention established a fine balance between the sovereignty of States over their skies and the access airlines needed to realize a global industry. Is that balance still appropriate seven decades later or is it becoming an impediment to a more profitable and sustainable airline sector?

TONY TYLER: If you look at how the industry's structured, the Chicago Convention has served the industry well for some 70 years. The Chicago Convention is here to stay and nobody's suggesting it should be changed. But the industry is changing all the time. We've got very different structures in 2015. In 1944 most airlines outside North America, although not all, were extensions of government in one way or another. It's now a very commercial business. There's a lot of private capital in it. And then we've got things like alliances and joint ventures and franchises and operating leases – all these things are very different from the world that the Convention and ICAO were set up to manage.
But despite that, they're both still relevant in that changing environment, and ICAO has adapted to it.

When it comes down to economic arrangements, traffic rights in particular, those are decided bilaterally as a consequence of the

way the system is set up and the governments have the capability to find solutions to most problems within those bilateral negotiations.

If we look at Europe, the creation of the Single Market for air transport was visionary and has been hugely successful. And it's encouraging a focus on opening markets in various parts of the world. The ASEAN nations are taking a staged approach to liberalizing their skies. We're also seeing it within Africa, but we've heard that before. We hope very much this time there will be some follow-through on the Yamoussoukro intentions. And within Latin America we're seeing strong regional cross-border brands and networks already developing. These are helping airlines to adjust to modern commercial realities and exploit modern commercial opportunities. Things are always evolving but within the framework of Chicago. The most important element of the Chicago Convention is the whole idea of sovereignty, and I don't see that changing.

What industry needs is clear rules and have those rules applied fairly. Look at where we've come from; you can see enormous progress and the way forward is inevitably in the direction of more competition, more open markets, because that's what drives benefits to consumers in the end and it's consumers who vote with their wallets as well as at the ballot box.

"It's a lot easier to find the needle if the haystack's a lot smaller."

EDITOR: Airport expansion and development faces complex issues of air traffic congestion, noise, CO_2 emissions, funding, and market competition. The process sometimes seems haphazard around the world.

TONY TYLER: I think impediments to growth are more infrastructure based. Sitting here in the middle of Europe, one is particularly aware of the political difficulty of building runways, and the unnecessary airspace congestion and high costs. The Single European Sky moves forward at a snail's pace due to vested political interests and expanding or building an airport could take decades. There are similar issues in other parts of the world, but there's more political will to do things about it.

One example is Bogota airport in Colombia. The airport is one of the fastest growing in Latin America in recent years. The authorities recognize if they want to keep that growth going – and it's hugely important for development of the local economy – then they need to improve airspace management. And IATA is leading a project to improve significantly the airspace management. It would be nice to see that frame of mind have more practical application in Europe too.

EDITOR: Next year is critical for aviation and the environment with the anticipated ICAO market-based measures (MBM) proposal. How do you see prospects for global general agreement and implementation of a common framework?

TONY TYLER: We're playing a very active role in supporting the work of the Environment Advisory Group (EAG) and are pleased with its progress. We're working hard within that group to do all we can to support a positive outcome and try to develop a global market-based measure that's appropriate, effective, and workable, and one that will help us meet our commitment to carbon neutral growth from 2020.

Ultimately it's up to governments to decide through the ICAO process. I think we've been successful up to now in clearly demonstrating that our industry is committed to improving its environmental performance, based on an impressive track record of fuel efficiency improvements. No other global industry has committed to the ambitious goals and targets that we've laid out as a sector. I'm confident that with the efforts of ICAO and of course the Member States of ICAO we can maintain a leadership position for aviation in the environment debate.

There are going to be challenges along the way. As far as the Assembly in 2016, what we in the industry want to see coming out of it is a global agreement to a well-designed market-based measure, based on carbon offsetting, simple to administer and minimizing the risk of competitive distortion. ■

More information on IATA can be found at:
http://www.iata.org

DATA AS THE KEY ENABLER OF PERFORMANCE-BASED REGULATION

By CAA International, a wholly-owned subsidiary of the U.K. CAA

Performance-Based Regulation as a concept is gaining interest and momentum in the international aviation arena. Its principles are central to the new ICAO Annex 19 and are often the subject of safety conferences and collaboration group publications. Regulatory bodies and industry groups welcome the concept, recognizing the need to move towards risk-based approaches and data-driven decisions. We are however in an exploratory phase where many States are devising strategies to move from prescriptive regulation to outcome-driven rules, whilst others are trialling performance-based principles in their surveillance programmes.

Effective safety management as described in Annex 19 requires that information is systematically collected, analyzed and monitored to identify risks and measure progress against outcomes. Data is pivotal in this process. As a result the desire to identify useful and relevant data sources is becoming increasingly important. To be positioned to make decisions based on intelligence, we need to expand the existing knowledge spectrum and enrich the current evidence base. Inevitably, to assemble an integrated total system picture we will need to look beyond the conventional compliance and occurrence reporting data, and include a broad type of information alongside expert judgment.

To enable development of a total risk picture, the breadth of data needs to encompass both hard data, such as accident reports and compliance data, and softer cultural and organizational indicators. Such elements may include: organization health checks, resource and staffing levels, compliance and complexity of the aviation system and SMS maturity. This turn towards data acquisition and information gathering is facilitated and expedited by current technology. The increase in computing power and the widespread use of the internet promotes sharing, exchange, and visualization of information and data in a rapid, straightforward manner.

Whilst advances in information technology can have catalytic effects in enhancing data, there is a danger of cultivating a data farming culture, utilizing data that is convenient as opposed to being important or relevant. Regulators should carefully govern the use of data to match the scope and the nature of their role. They should tailor their data feeds according to the size, maturity, and complexity of the aviation industry they regulate. It is unlikely that a small Aviation Authority would have the same requirements in terms of data volume, granularity, resource, capacity, or IT system sophistication as a large Aviation Authority.

Irrespective of the regulatory scope, the challenges in handling the volume and diversity of data still remain. We need to be best

Irrespective of the regulatory scope, the challenges in handling the volume and diversity of data still remain.

prepared and equipped – both in terms of technical expertise and technological means – to store, filter, clean, and generally manage and process the gathered information. Failure to recognize and address the limitations and the idiosyncrasies of the collected data will result in flawed analysis outputs and consequently to misleading conclusions.

As considerable quantities of data are becoming accessible, the risk of inadequate data management compromising the delivery of the required outcomes is also growing. The key to success is to identify and account for the different data attributes when designing flexible processes and tools to administer the data streams.

A consistent systematic data management approach is required involving categorization, harmonization and consolidation of multiple data sources onto a common platform. This enables reliable processing, analysis, and monitoring. Analysts then have access to a wide range of data where they can aggregate, compare, and calculate metrics to measure and track safety performance. Safety and key performance (leading and lagging) indicators are good examples of analyzed data. They can be used as monitoring metrics to measure effectiveness of actions and, when considered in combination with other indicators, can provide a broader and more comprehensive picture.

It is important that performance indicators and other outputs of data analysis are combined with expert judgment to generate compelling evidence. The subject matter experts, using their expertise and field experience, are in a position to verify and complement the outputs derived from data analysis. Such a process results in developing thorough, balanced views on issues that matter, ultimately creating pictures of intelligence which become the basis of useful conclusions and informed decisions. When these elements are combined they set the foundations for a proactive approach in managing risk and a performance-based, data-driven regulatory system.

Data is a key enabler of Performance-Based Regulation. Aviation Authorities aspiring to embark on PBR should establish data management approaches suitable to their needs and regulatory ambitions.

For more information on Performance-Based Regulation and U.K. CAA assistance, please contact:
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NGAP PROGRAMME TRANSITIONING TO REGIONAL IMPLEMENTATION FOCUS

ICAO's Next Generation of Aviation Professionals (NGAP) programme is progressing into Phase 2 to help States implement best practices for attracting and developing the large numbers of pilots, air traffic controllers, aircraft technicians, and other skilled individuals who will be needed to operate, manage, and maintain the growing air transport system. More than 300 participants from 58 States and 10 organizations, including hundreds of students, gathered in Montréal, Canada in December for the 2nd NGAP Symposium.

ICAO Council President Dr. Olumuyiwa Benard Aliu has stated: "International civil aviation's greatest priorities over the coming decades virtually all derive from the projected doubling of our network's capacity. The shortage of pilots, air traffic controllers, engineers, and mechanics we are facing around the world, as well as the need to accelerate training and certification for these aviation professionals and the new managers who will need to lead them, are key areas where ICAO's leadership and action will be instrumental to the future viability and sustainability of our global network."

Among the factors facing the aviation industry:

- Despite raising of the mandatory airline pilot retirement age to 65 (2007 in the U.S., 2011 in Europe) or even 67, as Japan has recently done, the industry is experiencing wholesale retirements of pilots of the post-World War II "baby boomer" generation.
- Aviation professions are increasingly not perceived as attractive enough to potential candidates. There is little awareness by the next generation of the types of aviation professions available to them. And there is significant competition with other industry sectors for skilled employees.
- Training capacity is insufficient to meet demand. There is a lack of accessibility to affordable training. And learning methodologies are not responsive to evolving learning styles.
- Some aviation disciplines lack harmonization of competencies.

The issues the ICAO NGAP programme is addressing are key factors to the long-term successful implementation of ICAO's *Global Aviation Safety Plan* (GASP) and *Global Air Navigation Plan* (GANP) as the industry responds to air transport passenger and total flight growth. In the next 20 years, airlines worldwide are forecast to add 25,000 new aircraft to the current commercial fleet of 17,000. In the next decade alone, 480,000 new technicians will be needed to maintain aircraft and over 350,000 pilots to fly them.

Dr. Thomas Carney, Professor of Aviation Technology at Purdue University in Indiana, U.S., and Chair of the ICAO NGAP Task Force, described the NGAP vision as "a global aviation community that has sufficient competent human resources to support a safe, secure, and sustainable air transportation system." To achieve that vision, the NGAP mission is "to develop strategies, best practices, tools, standards, and guidelines as applicable and to facilitate information sharing activities that assist the global aviation community in attracting, training, educating, and retaining the next generation of aviation professionals."

STRATEGY, TOOLS & DATA

ICAO established the Next Generation of Aviation Professionals Task Force in 2009, consisting of representatives from industry, academia, training providers, regulatory bodies, and international organizations. "During Phase 1 of the NGAP programme," stated Nancy Graham, Director of ICAO's Air Navigation Bureau (who retired recently), "we raised awareness and developed competency-based training (CBT) provisions for air traffic controllers (ATCOs) and air traffic safety electronics personnel (ATSEPs)."

"In Phase 2, the NGAP programme will roll-out new provisions to support implementation with guidance manuals and regional workshops, and create tools to support States to implement human capital best practices."

Graham announced that ATCO and ATSEP CBT regional workshops are planned from the second half of 2015 to 2017, and will include material designed for regulators, service provider senior management, course designers, and instructors (classroom and on the job). The publication of new ATCO and ATSEP training manuals is expected this year.

Planned NGAP outreach efforts and tools include:

- NGAP best practices database on the web
- Continued NGAP communication
- A web-based NGAP implementation kit (I-Kit)
- An aviation tertiary education institutions database (ATED) on the web - available at http://www.icao.int/Training/atedti/Pages/Default.aspx
- An amended *Procedures for Air Navigation Services – Training* (PANS-TRNG) Document 9868

On the final day of the Symposium, a proposal from the NGAP Task Force Research Working Group to develop an "NGAP Index" was presented. William Agius, Deputy Head, Centre for Aviation, Zurich University of Applied Sciences, Switzerland explained, "The availability of trained personnel is not evenly distributed across the globe, nor is demand, which is difficult to predict."

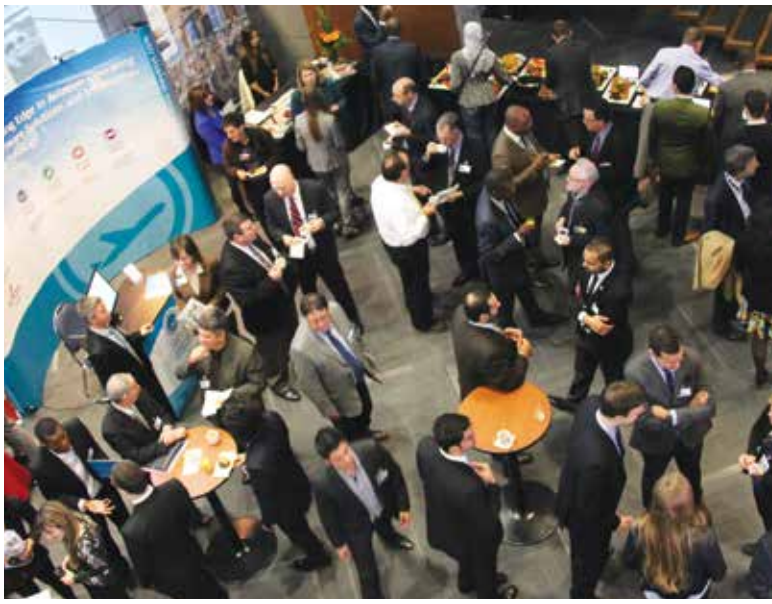
The NGAP Index incorporates a compilation of relevant data for aviation industry human resources planning, including economics, attractiveness to candidates, and people resources. The index is a component of the transition of the NGAP programme from a global initiative to a regional and national level. The plan is to evolve the concept into an NGAP dashboard on the ICAO iSTARS applications platform later in 2015, and provide the first reports to participating States in 2016.

ICAO Council Representative for the United Arab Emirates (UAE), Captain Aysha Alhameli, announced a new collaborative Aviation Discovery Programme (ADP) at the event, coordinated between the U.S. FAA Academy, Western Michigan University (WMU), the École nationale de l'aviation civile (ENAC) in France, and the Association of African Aviation Training Organizations (AATO). Through an information campaign, the ADP's objective is to excite and motivate youth throughout African regions, facilitated by AATO. The ADP team has agreed on a roadmap and will submit a progress report to the NGAP Task Force at its next meeting.

Capt. Alhameli said, "The NGAP initiative is of strategic importance for global aviation in order to insure that there are global mechanisms in place to attract young qualified and competent aviation professionals. The issues presented at the symposium are key to the long-term sustainable success of the aviation industry."

NEW APPROACHES TO LEARNING

Ruichun Lin, Assistant Professor at the Civil Aviation Flight University of China, noted that between now and 2040, degree-oriented learning will transition to lifelong learning, incorporating competency-based learning, on-the-job training, computer-aided learning, and virtual reality-based training. He predicted that the globalization trend will include student and professor exchanges and mutual recognition of academic degrees and certifications.



Lin cautioned, however, that with the technology and information explosion, "too much choice leads to riskier decisions" and unreliable information sources. "The current working experiences are not applicable for the new working environment."

Dr. Suzanne Kearns, Associate Professor at the University of Western Ontario, Canada, called social media websites such as Facebook, Twitter, YouTube, and others "weapons of mass distraction." She said future aviation training must customize content through adaptive curricula. Instead of the traditional classroom "sage on the stage," the new training dynamic is a "guide on the side." Learning will be more interactive and scenario-based, and "learners will search out answers rather than passively listen."

PASSION FOR AVIATION

The hundreds of students who attended from around the world were inspired by remarks from Julie Payette, who in 1999 was the first Canadian astronaut staying aboard the International Space Station (ISS) and is now Director of the Science Centre of Montréal. She shared her experiences and vision on attracting and retaining NGAPs of all ages, nationalities, gender, race, and socio-economic backgrounds into the Science, Technology,

"The NGAP programme vision: a global aviation community that has sufficient competent human resources to support a safe, secure, and sustainable air transportation system."

Canadian astronaut Julie Payette (centre) led off the 2nd NGAP Symposium with remarks that inspired both young and experienced professionals. Left to right: Nancy Graham, Director ICAO ANB (now retired); Kirill Lobakin, Moscow Aviation Institute graduate; Payette; Dr. Thomas Carney, Purdue University and Chair of the ICAO NGAP Task Force; Isavella Vasilogeorgi, ICAO/IAWA Scholar.

Panelists addressed the competencies needed for aviation careers. Left to right: Marc Lacroix, Manager, Technical Operations, NAVCANADA; Farid Zizi, President of the ICAO Air Navigation Commission; Mary-Ann Sievers, Manager Training Strategy, Airways New Zealand; Ashley Lauryssen, Senior Training Expert, Eurocontrol; Viktor Robeck, Assistant Director, SO&I Training and Qualifications, International Air Transport Association (IATA); Kellie White, SEP Training Manager, Emirates Airlines.

Engineering and Mathematics (STEM) education programmes in the U.S., U.K., Germany, France, and other countries.

"Since I've been a kid I wanted to fly. I wanted to fly in space. I wanted to fly airplanes," Payette said. "When I did have the opportunity, I realized this was exactly where I wanted to be, and it made sense. It's so much fun."

"Careers in aviation are plentiful. There's something for everybody," she added. "It's a very important industry for everybody on our planet. It connects us and we need to be part of it. I'm pleased to be part of both the 'aero' and the 'space' part."

Payette said, "No person should be left behind" in their interest and pursuit of a career in aviation.

Western Michigan University aviation flight science student Preston Mayes commented that the astronaut's presentation was "something I will never forget for the rest of my life. One distinct quote of hers that I think will stick with me … she said, 'Looking down at the little blue marble in all of the blackness, and realizing that's the only place I have hope to return to …' This quote was also relating to how far the aviation industry has come, and the potential the future has and the impact the NGAPs have on the industry."

> "The need for and availability of trained personnel is not evenly distributed across the globe."
>
> – William Agius, Zurich University of Applied Sciences, Switzerland

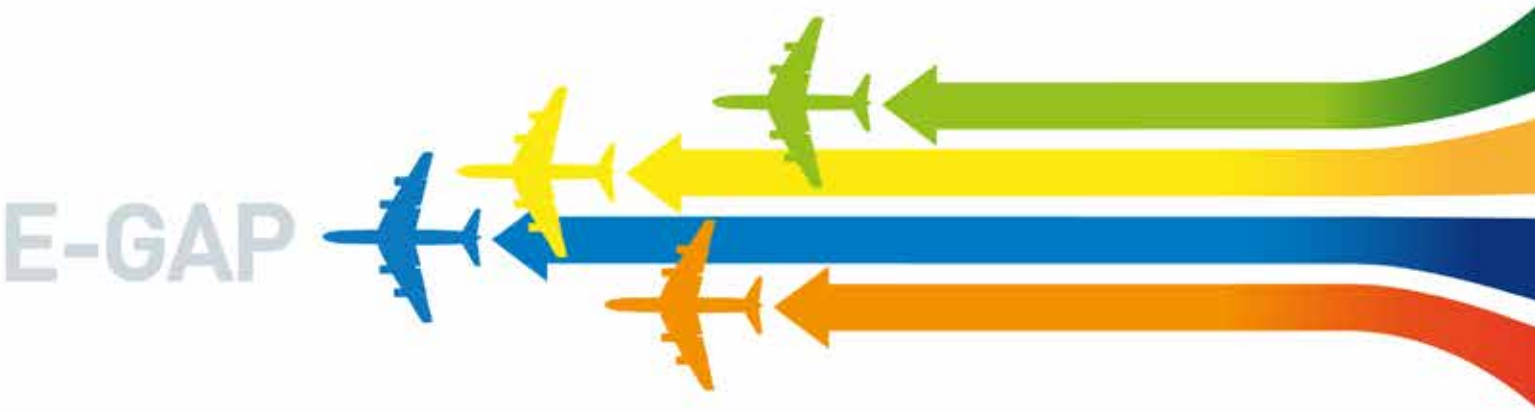
A 'speed networking' session during the Symposium, consisting of short interviews with individual experts, enabled young professionals to establish closer contact with industry experts, as well as to dispel any doubts about their career paths.

Immediately after the NGAP Symposium and just a couple of days prior to the 70th Anniversary of the Chicago Convention, ICAO also held the first Model Council Session for 36 university-level students. The aspiring young professionals had the unprecedented opportunity to sit in the seats of delegates of their countries and discuss ways to achieve sustainable development of aviation and to attract young professionals. The Model Council meeting for the future aviation experts is based on similar projects organized by the United Nations.

The selected participants discussed actions to be taken to more effectively promote the field of aviation – at national, regional, and global levels. All 36 students prepared working papers and three were selected under voting procedure for presentation by their authors, followed by comment and suggestions. Proposals included creating better online tools for communication about opportunities in the aviation industry, the promotion of women in aviation, directing attention to the celebrations of events connected to aviation to increase the interest of a broader group of people toward careers in the airline industry, and the development of aviation education centers.

"Interest in aviation must be carefully cultivated and nurtured," commented Brett Levanto, Director of Operations at the U.S. firm that manages the Aviation Technician Education Council (ATEC). "Their passion can grow once they come through the door, but to get these workers inside will take effort. Go to schools. Bring students to your facilities. Teach kids about lift and drag. You can't start too early. Show them the runway and let them learn to take off." ■

More information on NGAP can be found at http://www.icao.int/safety/ngap/Pages/default.aspx. Contact e-mail: ngap@icao.int



ICAO Global Aviation Partnerships on Emissions Reductions (E-GAP):

Multiplying Environmental Action

ICAO's Global Aviation Partnerships on Emissions Reductions (E-GAP): Multiplying Environmental Action Seminar. This seminar will provide a forum to showcase the synergetic effects of ICAO's ongoing partnerships with governments and other organizations for actions to reduce emissions from international aviation. Such synergetic effects include the results achieved through high-level engagement of Member States, in cooperation with other stakeholders, under the ICAO State Action Plans capacity building and assistance strategy.

Such partnerships are multiplying environmental action by stakeholders, encouraging resource mobilization, and facilitating cooperation in new areas.

The Seminar will address current and foreseen action in the areas of:

- Aircraft technology and research programmes
- Recycling of aircraft
- Next generation air navigation and green operations
- Sustainable alternative fuels and renewable energy
- Financing for aviation environmental activities
- Carbon markets.

The E-GAP Seminar is also to benefit from the opportunity offered by the attendance of a wide variety of stakeholders to foster new initiatives and partnerships for action. All the initiatives will be presented to the UNFCCC COP21 later in 2015.

ICAO

ENVIRONMENT

For more information, please visit www.icao.int/Meetings/EGAP

"…precise and clear information should be given to passengers regarding the types of PEDs that can or cannot be used during various phases of the flight …"

EXPANDING USE OF PORTABLE ELECTRONIC DEVICES (PEDs) IN THE CABIN

MARTIN MAURINO
M.Eng, is a Safety, Efficiency and Operations Officer for ICAO's Air Navigation Bureau.

Regulations regarding the use of portable electronic devices (PEDs) during commercial aircraft flight were essentially unchanged since the 1960s. As technology continues to evolve and passenger expectations for almost-constant connectivity increase, many regulatory agencies have begun relaxing the restrictions. In December, the ICAO Cabin Safety Group (ICSG) published Circular 340 – *Guidelines for the Expanded Use of Portable Electronic Devices* – to help States effectively deal with the change.

A year and a half ago, the U.S. Federal Aviation Administration (FAA) announced that commercial airlines could safely expand passenger use of PEDs during all phases of flight and provided operators with implementation guidance. In the wake of this highly visible shift in policy, ICAO received many queries from States wishing to follow the FAA's example of relaxing restrictions on passenger PED use. Shortly after, the European Aviation Safety Agency (EASA) advised ICAO that it would also begin working on the expanded use of PEDs for passengers.

To discuss the topic at an international level, ICAO representatives met with FAA and EASA colleagues and the International Coordinating Council of Aerospace Industries Associations (ICCAIA) in November 2013. The participants agreed that the situation required global harmonization, as many States wished to follow the United States' changes. In January 2014, the parties met again, this time with participation from the International Air Transport Association (IATA), to discuss a strategy to promote seamless international implementation. The stakeholders agreed that, prior to allowing the expanded use of PEDs, States should develop a clear process for the approval/acceptance of changes in operator policy and procedures, and determine actions that should be taken to maintain or enhance safety while implementing this change.

THE MAIN ISSUES OF PEDS

The initial discussions revolved around two main issues:

1. Technical considerations to determine the tolerability of an aircraft's onboard electronic systems and equipment to PED interference
2. Cabin safety issues related to the expanded use of PEDs

EASA and FAA conducted gap analyses for each of these issues to assess if any differences between their approaches could potentially hinder international implementation.

The results showed that technical considerations were not an issue of concern. Both regulatory agencies addressed PED tolerability testing through the use of internationally recognized standards.

However, cabin safety issues raised concerns, particularly due to differences between approaches from the United States and Europe which could lead to passenger confusion on international flights. The stakeholders agreed that these issues should be addressed by ICAO through development of guidance material which would tackle these points:

- Cabin safety aspects related to expanded use of PEDs by passengers
- Technical aspects of aircraft PED tolerability testing
- The process for States to approve the use of PEDs across the phases of flight for existing aircraft types

ICAO CABIN SAFETY GROUP TASKED

Since the main focus of the ICAO guidance would be cabin safety, the task of developing the material was assigned to the ICAO Cabin Safety Group (ICSG), comprised of cabin safety experts from States, operators, aircraft manufacturers, and international organizations. However, since the guidance material would also cover technical aspects such as airworthiness considerations, ICAO sought the expertise of other groups: members from the FAA PED Aviation Rulemaking Committee (ARC), subject matter experts from EASA, the European Organization for Civil Aviation Equipment (EUROCAE) working group on PEDs (WG-99), and the IATA Engineering and Maintenance Group (EMG).

The ICSG's work on the guidance material is reflected in ICAO Circular 340 - *Guidelines for the Expanded Use of Portable Electronic Devices*, published in December 2014. The content of this document was developed through a consensus process.

The purpose of Circular 340 is to present a harmonized, internationally agreed approach to the implementation of the expanded use of PEDs. In order to promote international harmonization, ICAO encourages States to incorporate the guidance presented in this circular into their regulations and/or guidance material.

> "The purpose of Circular 340 is to present a harmonized, internationally agreed approach to the implementation of the expanded use of PEDs."

"The distinction between devices which must be stowed or secured is based on size."

"Concerns were raised that PEDs used by passengers during taxi, take-off, or landing roll could become projectiles ..."

The circular provides guidance for States who wish to allow operators to transition to an expanded use of PEDs. It presents a series of considerations that the State should integrate into the approval / acceptance process, including modifications to regulations and changes in policy and procedures, which should be required of any operator considering or planning to allow the expanded use of PEDs onboard its aircraft. Guidance is also provided to assist operators in implementing the expanded use of PEDs. Additionally, the circular addresses post-implementation activities, such as ongoing surveillance by the State and safety assurance processes by the operator in relation to the expanded use of PEDs (e.g. reporting suspected PED interference).

The circular includes these chapters:

- Glossary
- Introduction
- Regulatory considerations
- Technical considerations
- Operator safety risk assessment
- Operator policy and procedures
- Training for crew members and State inspectors
- Passenger awareness
- Post-implementation activities, including reporting and investigation
- Additional resources (from States and international organizations)

AIRCRAFT-PED TOLERABILITY TESTING

The decision to allow use of PEDs is based on determining the potential for PED interference with onboard electronic systems and equipment, especially those required for continued safe flight and landing. States' regulations governing the use of PEDs on aircraft typically place the responsibility on aircraft operators for determining if PED use is acceptable. The circular explains how an operator may make the determination based on aircraft type certification data, specific PED tolerance tests, or aircraft operational tests. The use of available industry standards from standard-making organizations such as the RTCA (Radio Technical Commission for Aeronautics), and EUROCAE is recommended for determining if PED use is acceptable on an operator's aircraft.

The circular cites these documents as references:

- RTCA/DO-294 – *Guidance on Allowing Transmitting Portable Electronic Devices (T-PEDs) on Aircraft*
- EUROCAE ED-130 – *Guidance for the Use of Portable Electronic Devices (PEDs) On Board Aircraft*
- RTCA/DO-307 – *Aircraft Design and Certification for Portable Electronic Device Tolerance*

PED CHALLENGES FOR CABIN SAFETY

Cabin safety issues were at the forefront of the discussions during the development of Circular 340. The three main challenges tackled by the ICSG were:

- Stowing versus Securing of PEDs
- Passenger attention during the safety demonstration
- Implications for international operations

The issue of "stowed vs. secured PEDs" created considerable debate within the ICSG; members initially could not agree on how PEDs should be handled once an aircraft is in movement. Concerns were raised that PEDs used by passengers during taxi, takeoff, or landing roll could become projectiles in a sudden deceleration and cause injury to other cabin occupants. After lengthy discussions, the group decided that a clear differentiation should be made between devices considered to be stowed versus secured.

If a PED is "stowed," it must be placed into an approved stowage location on board the aircraft. These locations have been designed and certified to comply with the requirements for retention of articles of mass. Approved stowage locations have specific weight and size limitations. When a PED is "secured," it is restrained by a method which may not have been certified for retention of articles of mass.

The distinction between devices which must be stowed or secured is based on size. Larger PEDs such as laptop computers should be stowed in a location that is certified for retention (e.g. an overhead bin). Smaller hand-held PEDs such as mobile phones or tablets should be secured during surface movement, take-off, descent, approach, and landing. Passengers should secure smaller PEDs on their person by means acceptable to the State. PEDs should not be left unsecured in an adjacent empty seat or lying on the lap of a passenger.

Passengers may also secure small PEDs by placing them in the seat pocket. The use of seat pockets also generated a lot of discussion. As a result, the circular recommends that the operator's policy should address the use of seat pockets for securing PEDs (i.e. is it allowed?). As part of the approval process, the operator should conduct a safety risk assessment to determine an acceptable weight limit for items placed in a seat pocket.

Passenger attention during the safety demonstration was another challenge associated with the expanded use of PEDs. The pre-flight passenger safety demonstration is important for providing information to passengers on the safety aspects of the flight and demonstrating the use of safety and emergency equipment and aircraft systems. Unfortunately, accident investigations and studies have shown that passengers generally pay little attention to the safety demonstration. With the expanded use of PEDs, some experts expressed concern that even fewer passengers will be paying attention to the safety demonstration.

Although prohibiting the use of PEDs during the safety demonstration may address this concern, this was not considered a realistic solution, particularly on large aircraft, since cabin crew members would not be able to verify every passenger's compliance with this requirement. The ICSG agreed that distractions caused by use of PEDs during the safety demonstration should be avoided so that passengers can focus their attention on the safety briefing and crew instructions. Operators are encouraged to emphasize the importance of passengers paying attention to the safety demonstration and encourage them to focus on the briefing and cabin crew instructions. The operator may consider restricting the use of PEDs during the safety demonstration (e.g. by means of a passenger announcement), if it is deemed feasible for its particular operation (e.g. on smaller aircraft, or for passengers seated at emergency exits).

The implications of the expanded use of PEDs on operators conducting international flights also generated a great deal of debate during the development of the circular. Two scenarios were discussed:

- The State of destination has regulations allowing the expanded use of PEDs which differ from those of the State of the Operator
- The State of destination does not allow the expanded use of PEDs

The FAA's guidance material recommends that U.S. operators comply with any restrictions established by the State of destination (i.e. refrain from allowing the expanded use of PEDs when in States which do not allow it for their operators). This in turn means that operators should verify PED regulations in each State they operate to and from, and apply restrictions as needed. A consensus could not be reached on adopting this approach into ICAO guidance. The issue was left more open-ended, but States and operators are asked to give it consideration. The circular notes that, if the State of the Operator allows the expanded use of PEDs but the State of destination does not, the operator should include this aspect in its policy (and decide how to address it). The operator should have procedures to comply with any restrictions when applicable.

RAISING PASSENGER AWARENESS

As part of the transition process, the State should pay special attention to raising passenger awareness regarding the expanded use of PEDs. A key step in the process is conveying information to passengers on the operator's new PED use policy, any safety implications of expanded PED use, and any passenger responsibilities associated with the provision of this service.

Therefore, precise and clear information should be given to passengers regarding the types of PEDs that can or cannot be used during various phases of the flight, the requirement to secure and stow devices during certain phases of flights, and PED size and weight limitations.

The circular provides guidance to States and operators to assist them in defining key messages for passengers – to raise awareness on the importance of the safety-related aspects of expanded PED use during various phases of flight. Multiple methods for dissemination of information are recommended, such as the use of the operator's website. Well-coordinated dissemination of information is an integral part of the process and will facilitate the appropriate use of devices by the travelling public. ■

The ICAO Guidelines for the expanded use of portable electronic devices (Circular 340) are now available to States in English on the ICAO-NET at http://portal.icao.int/ and can be obtained via the ICAO online store at http://store1.icao.int.

More information on ICAO's Cabin Safety Programme can be found at www.icao.int/cabinsafety.

NEWS IN BRIEF

SINGAPORE INVESTING IN LIFELONG LEARNING

"Raising productivity is also about investing in our workforce …" – Josephine Teo, Senior Minister of State for Finance and Transport, Singapore

The government of Singapore plans to spend 1 billion Singapore dollars (about 735 million USD) annually until 2020 to support lifelong learning, according to Josephine Teo, Senior Minister of State for Finance and Transport. Speaking at the inaugural Aviation Productivity Conference 2015 in February, she said, "We will invest even more in training and education to raise the industry's skill level in their chosen professions."

Later this year, details are expected for the Aviation Development Fund, through which the Civil Aviation Authority of Singapore (CAAS) supports productivity efforts ranging from airport equipment adoption to self-service check-in and bag-drop solutions. "I encourage the aviation sector to take advantage of these incentives support," Mrs. Teo said.

Like many States, Singapore is facing financial challenges in aviation. "We expect growth this year to be modest. However, the labour market remains tight and cost pressures are unlikely to go away. It is therefore important for us to continue to raise the productivity level of the aviation sector, and to help businesses make the transition to innovation-driven growth," the Minister stated. "Many companies have shared that technology adoption is an important aspect in raising their productivity, but have cited the high investment costs as a key barrier."

Mrs. Teo noted that technology adoption does not necessarily always involve expensive equipment or costly research and development. "Impactful results can also be achieved through the adoption of mature technology, or through the implementation of simple yet clever ideas."

At the conference, awards were presented to 16 winners of Process Innovation Challenge 2. The selected concepts ranged from airline meal tray assembly and automated welding to improved tracking of cargo and a "flying carpet" for moving jet engines on a pallet of air.

The hovercraft-type floating pallet innovation, for example, developed by Rolls-Royce SATU and CEVA Logistics, saves 63% of the time required to transport 12-tonne Trent engines within its facility at about 40% of the cost of a customized electric forklift.

A team at SATS, which provides ground handling services, reconfigured its cargo import and export warehouse and streamlined the handover process, improving accountability and management of airlines' pallets and reducing the man-minutes required for sorting and transferring by 19%. SATS also manages in-flight catering services and started using robotic arms for tray assembly. "Now we can use the robots to put the parts like the salt and pepper, the cutlery, the glasses, the food on the trays without using human intervention at all," explained Alex Hungate, President and CEO of SATS.

MAJ Aviation, an engineering services firm, is using mobile devices for daily aircraft checks, replacing paper-based checklists and manual recording of aircraft parameters. Ian Tam Wvi Huat, Director of MAJ Aviation, said eight aircraft can now be turned around with four personnel instead of the previous six. "With two additional headcounts saved, we can re-deploy them to other work. We are planning to focus on developing them, sending them for training, so that they can perform other work inside the hangar."

NEW UPDATES FOR ICAO PBN IMPLEMENTATION KITS

In line with its ongoing cooperative efforts to assist States and operators with the establishment of Performance-based Navigation (PBN), the International Civil Aviation Organization (ICAO) has announced new updates to its PBN Implementation Kit, or 'iKit'.

First released in 2012, the updated 2014 PBN iKit contains documentation revisions relating to operational approvals, instrument procedure design and charting, as well as navigation specifications. It also includes references to new ICAO products and services that help to expedite PBN implementation.

"ICAO is committed to helping States achieve current targets for PBN implementation," remarked Dr. Olumuyiwa Benard Aliu, President of the ICAO Council. "We're working hard across our entire Organization at present to ensure that sufficient resources and assistance are available through ICAO to build State capacity and support the more harmonized global implementation of ICAO Standards and Recommended Practices (SARPs). The PBN iKit is one such resource and ICAO will continue to update and distribute it as needed so that no country is left behind where PBN benefits are concerned."

PBN implementation is the world aviation network's highest air navigation priority at present. It is a key enabler for many of the Aviation System Block Upgrades (ASBUs) contained in ICAO's Global Air Navigation Plan and provides significant safety, environmental, and operational efficiency benefits.

The ICAO PBN iKit provides the global air transport sector with a convenient single-source for tailored PBN support materials and other documentation. It is an essential resource for the many regulators, pilots, air traffic controllers, airspace managers, procedure designers, and other air navigation specialists responsible for implementing and following PBN specifications and procedures globally.

PRESIDENT ALIU LEADS RPAS & SPACE FACT-FINDING MISSION

Dr. Olumuyiwa Benard Aliu, President of the ICAO Council, led a special fact-finding mission to the United States at the invitation of the U.S. Federal Aviation Administration (FAA), seeking to ensure that ICAO remains proactive on regulatory developments relating to remotely piloted aircraft systems (RPAS) and the emerging realm of sub-orbital space flight. Joining President Aliu were the U.S. Representative to ICAO on the Council, Ambassador Michael Lawson, then Director of ICAO's Air Navigation Bureau, Nancy Graham, as well as Leslie Cary and Yuri Fattah, ICAO's technical experts in RPAS and sub-orbital space flight respectively.

The ICAO officials visited the NASA Armstrong Flight Research Center at Edwards Air Force Base, California, where they were provided with updates from NASA, FAA, and Department of Defense experts on how the U.S. is proposing to integrate civilian and military remotely piloted missions with commercial and general aviation operations.

On the sub-orbital space leg of their visit, the ICAO officials were given a tour of the Mojave Spaceport, including briefings on how sub-orbital test flights are managed, a brief from Spaceport CEO Stuart Witt, regulatory discussions, and hangar tours from the ground-breaking teams from XCOR and Virgin Galactic.

"These emerging areas of aerospace operations will be evolving and likely expanding dramatically over the coming century," stressed President Aliu. "ICAO will be seeking to anticipate rather than react to the regulatory developments which will be needed, while effectively supporting the exciting innovations now occurring in these areas."

ICAO is already well advanced on its RPAS guidance material thanks to the ongoing work of its RPAS Panel, a technical body comprised of nearly 100 international State and industry experts.

CYBER THREAT AGREEMENT SIGNED

Five major international aviation organizations have agreed to a "common roadmap" to combat attacks from hackers and other cyber criminals. The group includes the International Civil Aviation Organization (ICAO), Airports Council International (ACI), the Civil Air Navigation Services Organisation (CANSO), the International Air Transport Association (IATA), and the International Coordinating Council of Aerospace Industry Associations (ICCAIA).

ICAO Secretary General Raymond Benjamin commented: "Our common goal in developing this agreement is to work more effectively together to establish and promote a robust cybersecurity culture and strategy for the benefit of all actors in our industry."

The new cybersecurity agreement formalizes a common front against the "hackers, hacktivists, cyber criminals, and terrorists now focused on malicious intent ranging from the theft of information and general disruption to potential loss of life." The signatories will be more proactive in sharing critical information such as threat identification, risk assessments, and cybersecurity best practices.

"As technologies rapidly evolve and become more readily accessible to all, cyber threats cannot be ignored," Benjamin stressed. "This is an important new area of aviation security concern and our global community will ensure that it is met with a strong level of commitment and response."

ICAO-CERTIFIED TRAINING FOR LAGOS SECURITY

Bi-Courtney Aviation Services Ltd. (BASL), the operator of Murtala Muhammed Airport Terminal Two (MMA2) in Lagos, Nigeria, has trained its security personnel to bring the terminal up to international standards, according to Christophe Penninck, BASL Chief Executive Officer. The two-week training was conducted by ICAO-certified Aviation Security (AVSEC) with the support of the Nigerian Civil Aviation Authority (NCAA).

Penninck said MMA2 will inaugurate facilities that would enable self check-in by passengers and urged other airports to install a similar system in their terminals. MMA2 is implementing the Common User Passenger Processing System, which will make it easier and more efficient to process passengers and increase the dwelling time in the terminal. BASL has also installed new automatic gates, which will ensure that only passengers with a valid boarding pass can enter the secure zones.

DOMINICAN REPUBLIC SCORES HIGH

ICAO has ranked the Dominican Republic's air safety operations compliance with international standards with a high score, confirming the sector's development in recent years, reported Dominican Civil Aviation Institute (IDAC) director Alejandro Herrera at a meeting of civil aviation directors in Montréal, Canada. "The report confirmed the country's high degree of safety, averaging 86.19% compliance in all standards."

ICAO REPORTS TO UN CLIMATE CHANGE SECRETARIAT ON EMISSIONS

The International Civil Aviation Organization (ICAO) has submitted a report to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat containing information on emissions from fuel used for international air transport.

The ICAO report highlights recent ICAO developments, including: support to Member States' action plans on aviation carbon dioxide (CO_2) emissions reduction activities; technical work on the future use of alternative jet fuels and the associated range of potential emissions reduction; and a seminar on 'Fuelling Aviation with Green Technology.' ICAO also highlights the establishment of the Environment Advisory Group (EAG) and the group's work on a global market-based measure (MBM) scheme for international aviation.

On proposals to use international aviation as a potential source for mobilizing revenue towards the US$100 billion long-term finance target under the UNFCCC, the ICAO report highlights that the achievement of the Organization's global aspirational goal for the international aviation sector requires adequate financial resources. It also notes that ICAO's 38th Assembly urged ICAO and its Member States to express a clear concern on the use of international aviation as a potential source of climate finance for other sectors in a disproportionate manner.

The ICAO report contains an appendix of the ICAO Assembly Resolution A38-18 on continuing ICAO policies and practices on climate change.

INDIA ADDING EXPERTISE AHEAD OF AUDIT

India's Directorate General of Civil Aviation (DGCA) is restructuring its safety board and seeking to add professional technical expertise ahead of an ICAO audit. Previous ICAO audits in 2006 and 2012 had highlighted a lack of safety inspectors in its DGCA. The U.S. Federal Aviation Administration followed ICAO's 2012 audit with its own and downgraded India, effectively barring new flights to the U.S. by Indian airlines.

The result of the ICAO and FAA re-audits will have a bearing on the ability of existing Indian airlines to operate more flights to the U.S. and some international destinations and on new airlines' ability to start flights to these destinations.

ICAO operates its safety oversight auditing programme under a Continuous Monitoring Approach. India's upcoming 2015 audit is simply our next scheduled visit," an ICAO spokesperson said.

EC COMMITS CENTRALIZED ATM FUNDING

The European Commission (EC) will support centralized services initiatives in the field of air traffic management (ATM). By implementing the proposed improvements, which include projects to enhance ATM performance, interoperability and reduce costs, the EC aims to increase the efficiency and competitiveness of the European ATM system.

Frank Brenner, director general of Eurocontrol, said, "Advanced technology coming out of the Single European Sky ATM Research (SESAR) programme will now be supported both in content and financially by the European Commission. These are technologies that will be implemented centrally beyond the borders of the EU and for all of the 41 Eurocontrol member states." Brenner believes the new support for centralized services will help to develop a fully managed air and ground datalink infrastructure.

Brenner added: "Following the outcome of the recent ICAO Montréal High-Level Safety Conference, it is timely to work intensively on the tracking of aircraft, which we do with the European Tracking Service (EKTR) – CS3."

KUWAIT SIGNS COOPERATIVE AGREEMENTS

Kuwait's Directorate General of Civil Aviation (DGCA) has developed seven agreements and memoranda of understanding with various civil aviation authorities to upgrade services and bilateral cooperation. Agreements were signed with Botswana, Guinea Pisao, Jordan, Mali, and Somalia to organize civil aviation services. MoUs were signed with Armenia and Cameron on bilateral cooperation.

GLAD DIALOGUES FOCUS ON MBM FOR CO_2 EMISSIONS

ICAO has completed a series of regional Global Aviation Dialogues (GLADs) on Market-Based Measures (MBMs) – attracting 350 participants from 79 countries – in Peru, Kenya, Egypt, Singapore, and Spain to share information and provide a progress update on development of ICAO's global MBM scheme and its potential role in mitigating international aviation CO_2 emissions.

ICAO Council President Dr. Olumuyiwa Benard Aliu said, "The structure and format of the GLADs was designed specifically to inform and engage non-Council states on the basics of MBMs, as well as the potential role of an international aviation MBM to complement the basket of emissions mitigation measures ICAO is already pursuing." In October 2013, ICAO committed to developing by 2016 a global MBM scheme for implementation in 2020.

GLAD sessions focused on environmental integrity, the simplicity and cost-effectiveness of a global scheme, the need for differentiation without discrimination, and the goal of avoiding excessive cost or administrative burdens.

For further information, see the ICAO GLADs webpage: http://www.icao.int/Meetings/GLADs-2015/Pages/default.aspx

The GLADs process and results will be reviewed in more detail in a coming 2015 issue of the ICAO Journal.

HONG KONG TO OPERATE NEW ADS-B STATIONS

A new network of eight Automatic Dependent Surveillance-Broadcast (ADS-B) ground stations is expected to be operational soon in the Hong Kong flight region, supporting the International Civil Aviation Organization's (ICAO) regional plan to implement ADS-B throughout the Asia-Pacific region.

The Hong Kong ground stations will fuse data from the local ADS-B ground station network as well as foreign stations such as Taiwan and Indonesia.

The Hong Kong Civil Aviation Department (CAD) now requires, as of 31 December 2014, that aircraft flying within its airspace be equipped with mandatory ADS-B avionics in all Hong Kong airspace at and above Flight Level 290.

READY FOR BIG-SCREEN TV AIRPLANES?

What if airplane passengers could enjoy a "panoramic" view of the world outside their aircraft, instead of the current small windows? Developers in the U.K., U.S., and France are working on replacing the current aircraft fuselage structure with "smart screen" panels which will enable views of the outside or, optionally, display of computer information – like having a large-screen monitor next to your seat – so you could check your email or surf the internet.

In effect, the fuselage would become one large display screen. But part of the objective is also to reduce weight, which would cut fuel consumption.

Among the companies working on so-called "windowless" designs are Ixion, a private jet concept, supported by Technicon Design, Elancourt, France (*pictured*); supersonic business jet developer Spike Aerospace in Boston, Massachusetts, U.S.; and the Centre for Process Innovation (CPI), a U.K. organization in northeast England.

In a windowless aircraft, the plane's interior would be lined with ultra-thin, flexible screens that display streamed images from a variety of sources. The screens could show real-time views of sky and landscape shot by high-resolution cameras mounted on the plane's exterior. Movies and videoconferences could be shown as well. Displays might be changed with a simple hand gesture. "You can entirely tailor the experience to your preferences," says Gareth Davies, who led the Ixion/Technicon design team. If you prefer the traditional view, you could even programme the screens to display a classic cabin interior with little windows.

"We understood the need to take weight out of aircraft," said Dr. Jon Helliwell of the Sedgefield, U.K.-based CPI. By omitting windows in favour of walls of screens on panels, the fuselage would be lighter. "Follow the logical thought through. Let's take all the windows out – that's what they do in cargo aircraft."

The screens would be made using organic light-emitting diodes (OLEDs) – a combination of materials that give out their own light when activated by electricity.

The CPI is part of an umbrella group which receives U.K. government funding to drive growth in manufacturing. CPI says it's working on technologies to advance flexible OLEDs and tackle problems of cost and durability.

The idea of having the displays lining the inside of the plane could become reality in 10 years, Dr. Helliwell estimated.

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