ASSEMBLY ACHIEVEMENTS

LANDMARK CORSIA ENDORSEMENT TOPS WIDE-RANGING PROGRESS AT HISTORIC 39TH ICAO ASSEMBLY

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CYBERSECURITY INFORMATION SHARING AND AVIATION RESILIENCY

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Contents

A TREMENDOUS YEAR OF ACCOMPLISHMENT FOR INTERNATIONAL CIVIL AVIATION

This past triennium has presented our sector with some extraordinary challenges, a point clearly evidenced by the fact that our 39th Assembly benefitted from the participation of 30 percent more Delegates than any previous event of its kind.

The more than 2,200 senior government officials who joined us this year considered and endorsed over 500 working papers, providing ICAO and the air transport sector we serve with clear and comprehensive mandates for the coming ICAO triennium.

HISTORIC CORSIA AND OTHER ENVIRONMENTAL ACHIEVEMENTS

Clearly the most significant Assembly development this year was the landmark adoption by States of the Resolution for the new Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). This is one of the most important environmental achievements in the history of civil aviation. It was was recorded by many as our sector's "Paris Moment," referencing of course to last year's historic Paris Agreement on climate change.

The CORSIA consensus represents not only a new benchmark for international emissions governance, but also the very first market-based measure to address global CO_2 emissions from any major industry sector. International aviation presently contributes 1.3 per cent of global anthropogenic CO_2 emissions, but we also recognize that our sector continues to grow given its much appreciated contributions to global trade and the socio-economic objectives of many States and Regions.

Another world environmental first which was welcomed by our 39th Assembly was ICAO's development of a new CO_2 standard for aircraft. This will apply to various new aircraft types entering service in the global fleet as of 2021. While it may be just one of the over 12,000 international civil aviation standards which ICAO has forged consensus on during its more than 70 years of existence, like the CORSIA it comes at a critical juncture in humanity's struggle to address climate change.

IMPORTANT GLOBAL PLANNING ENDORSEMENTS

ICAO's Global Plans provide unique strategic targets and timelines for States and industry to align their efforts, and the 39th Assembly demonstrated enthusiastic support that they be improved and expanded in the years ahead.

The revised Fifth Edition of the *Global Air Navigation Plan (GANP)* was fully endorsed by Assembly Delegates, as was our continuing work on Performance-based Navigation globally. Some of the highlights of what can be found in the new *GANP* Fifth Edition include a new Logical Architecture for Air Traffic Management, the ASBU Block 1 minimum path to global interoperability, and information on the financial aspects linked to ASBU Implementation.

Many additional Air Navigation objectives we'll be considering — for instance in support of improved flight tracking and greater capacity and efficiency, more generally going forward — will be reviewed in much greater detail at ICAO's 13th Air Navigation Conference in 2018.

As with the *GANP,* the Second Edition of the ICAO *Global Aviation Safety Plan (GASP)* was also endorsed by the 39th Assembly. The revised Second Edition's amendments will mainly result in greater prioritization on safety management system (SMS) implementation for operators, and it also includes safety performance indicators for State Safety Programmes (SSPs), as well as a more defined course for us to follow toward predictive risk management, once SMS implementation is more advanced.

The tremendous success of the *GASP* and the *GANP,* as well as recent security incidents which highlighted the need for greater integration between local, national and international regulatory and enforcement agencies, led the Assembly to endorse calls for the development of a newly envisaged *Global Aviation Security Plan* (GASeP), and an extensive Resolution on cybersecurity preparedness.

These activities will accordingly be fast-tracked, and in the cyber realm more specifically, ICAO will be conducting a uniquely combined safety and security Cyber Summit and Exhibition next April in Dubai.

Landside security concerns were addressed at the Assembly through a number of points in the *Consolidated statement of continuing ICAO policies related to aviation security,* perhaps one of the most salient of which stressed the need to avoid the creation of any areas of mass gathering either inside or proximate to the terminal. This acknowledges the fact that simply moving the location of a landside risk area does not meaningfully mitigate it.

The 39th Assembly also called on ICAO to begin exploring the need for a new *Global Air Transport Plan*. Additionally endorsed in the Economic Development area was the need for near-term finalization of ICAO's international liberalization agreements; customization of global and regional forecasts for aviation personnel; and for ICAO to strengthen and expand its partnerships, with all applicable stakeholders, in aid of greater data sharing and analysis supporting increased investment for air transport development.

CONTINUED PRIORITIZATION ON IMPLEMENTATION SUPPORT
This Winter issue of the *ICAO Journal* also provides a helpful opportunity to draw our readers' attention to the fact that 7 December was International Civil Aviation Day, the theme for which is "*Working Together to Ensure No Country is Left Behind.*" This statement references the work ICAO began in 2014, under the *No Country Left Behind* initiative, to help our Member States more effectively implement ICAO's global standards.

We embarked on this major reprioritization of our work in recognition of the fact that air transport connectivity is critical to the sustainable peace and socio-economic prosperity of our Member States, as well as the fact that there is a great deal of variance in their respective capabilities to ensure effective ICAO compliance.

More and more, the world's governments and regions are becoming better aware of air transport's unique ability to connect their local businesses and producers to global trade flows, expand tourism, and ultimately broaden local tax bases to ensure sustainable planning and development in future decades. ICAO greatly appreciates how important it is that our global network continues to be effectively managed to ensure these benefits, and that the benefits in turn are accessible to all States, cities and regions.

Challenges persist, however, especially with respect to the investments needed to fund critical infrastructure and modernization to accommodate future air transport growth. Despite the fact that flight and passenger volumes are poised to double by 2030, currently only 4.2 per cent of Official Development Assistance is earmarked for aviation development priorities, which is significantly insufficient.

It is in light of these challenges that the next iteration in our *No Country Left Behind* strategy will be a much stronger focus on aviation infrastructure development. With a very noteworthy year now behind us, ICAO will continue to move forward on all of these issues in the same spirit of consensus-based cooperation that has been the hallmark of international aviation governance since our Convention was first established in 1944.

Keeping the world safely and securely connected through air transport's unparalleled capabilities is our most fundamental mission in ICAO, and we will continue to ensure that aviation's many benefits are accessible to and maximized by all on an economically viable and environmentally responsible basis. ■

"More and more, the world's governments and regions are becoming better aware of air transport's unique ability to connect their local businesses and producers to global trade flows, expand tourism,and ultimately broaden local tax bases to ensure sustainable planning and development in future decades."

– Dr. Olumuyiwa Benard Aliu
President of the ICAO Council

ICAO Council Information accurate at time of printing

President: Dr. Olumuyiwa Benard Aliu

Algeria	Mr. Amine Debaghine Mesroua	**Kenya**	Ms. Mercy Beatrice Awori
Argentina	Mr. Gustavo Eduardo Ainchil	**Malaysia**	Mr. Lim Yong Heng
Australia	Mr. Samuel Campbell Lucas	**Mexico**	Mr. Dionisio Méndez Mayora
Brazil	Mrs. Mitzi Gurgel Valente da Costa	**Nigeria**	Mr. Musa Shuaibu Nuhu
Cabo Verde	Mr. Carlos Alberto B.C.L. Monteiro	**Panama**	Mr. Germinal Sarasqueta Oller
Canada	Mr. Jean-Benoit Leblanc	**Repubic of Korea**	Mr. Jin Hur
China	Mr. Tao Ma	**Russian Federation**	Mr. Alexey Anatolievich Novgorodov
Colombia	Mr. Alberto Muñoz Gómez	**Saudi Arabia**	Mr. Saud A.R. Hashem
Congo	Mr. Raoul Maixent Ondzotto	**Singapore**	Mr. Tee Chiou Ng
Cuba	Mrs. Mirta Marina Crespo Frasquieri	**South Africa**	Mr. Mankopane Daniel Tshepo Peege
Ecuador	Mr. Iván Fernando Arellano Lascano	**Spain**	Mr. Víctor M. Aguado
Egypt	Mr. Ahmed Hossein Mostafa Khedr	**United Arab Emirates**	Miss Aysha Alhameli
France	Mr. Philippe Bertoux	**United Kingdom**	Mr. Mark Rodmell
Germany	Mr. Ulrich Schwierczinski	**United Republic**	
India	Mr. Alok Shekhar	**of Tanzania**	Mr. Raphael W. Bokango
Ireland	Mrs. Annemarie Smith Floch	**United States**	Mr. Michael Anderson Lawson
Italy	Mr. Marco Riccardo Rusconi	**Uruguay**	Mr. Martín Vidal
Japan	Mr. Shinji Matsui		

ICAO Air Navigation Commission (ANC) as of 1 January 2017

President*: Mr. Hajime Yoshimura
Secretary: Mr. Stephen Creamer

Elections for First and Second Vice-Presidents will be on 10 January 2017

Mr. J. Bollard	Mr. M. Halidou	Mr. A.A. Korsakov	Mr. N. Naoumi	Mr. W. Voss
Mr. R.H. Carboni	Mr. E. Héðinsson	Mrs. E. Koryfidou	Mrs. K.L. Riensema	Mr. H. Yoshimura
Mr. M.G. Fernando	Mr. C. Hurley	Mr. J. Metwalli	Mr. I.P. Serrano	Mr. K. Yu
Mr. R. H. Godinho	Mr. J.W. Kabbs Twijuke	Mrs. I. Monnier	Mr. F. Tai	

*The ANC President is appointed by the ICAO Council for a 1-year term; the First and Second Vice-Presidents are appointed by the Commission for a 1-year term; Commissioners are appointed by the ICAO Council for a three-year period.

ICAO's Global Presence

North American, Central American and Caribbean (NACC) Office, Mexico City

South American (SAM) Office, Lima

Western and Central African (WACAF) Office, Dakar

European and North Atlantic (EUR/NAT) Office, París

Middle East (MID) Office, Cairo

Eastern and Southern African (ESAF) Office, Nairobi

Asia and Pacific (APAC) Regional Sub-Office, Beijing

Asia and Pacific (APAC) Office, Bangkok

39TH ICAO ASSEMBLY

- Record Participation – more than 2,200 Delegates from 185 Member States and 56 Observer Delegations

- Endorsement of Historic Global Market-Based Measure for International Flight Emissions

- Endorsement to Develop a Global Aviation Security Plan

AFFIRMING AVIATION'S SUSTAINABLE FUTURE

The 39th Session of the ICAO Assembly delivered an historic agreement on a new global market-based measure (GMBM) to offset CO$_2$ emissions from international flights, as well as combined Resolutions supporting a more strategic, dynamic and innovative future for international civil aviation.

ICAO's 191 Member States faced a number of contentious issues on the eve of the 39th Session of the Organization's Assembly this year, which officially got underway at ICAO Headquarters on 27 September.

But by the time the final gavel was struck on 6 October, they had concluded not only the largest volume of work ever undertaken by an Assembly Session, but also had forged consensus around a new and landmark Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

"Aviation can now claim its 'Paris moment'," declared ICAO Council President Dr. Olumuyiwa Benard Aliu subsequent to the endorsement of the CORSIA Resolution. "Air transport is the world's first major industry sector to adopt a global approach to international emissions reduction."

President Aliu underscored that it had taken a great deal of effort and understanding for ICAO's diverse Member States to reach this agreement, while applauding the spirit of consensus and compromise they had demonstrated.

"We now have practical agreement and consensus on this issue, backed by a large number of States who will voluntarily participate in the GMBM – and from its outset," he highlighted.

The President's conclusions were reiterated by ICAO Secretary General, Dr. Fang Liu, who in closing the 39th Assembly stressed that "the GMBM will serve as an important new tool to complement the wide-ranging emissions reduction progress already being achieved under aviation's basket of measures through technological innovation, modernised procedures, and the ever-expanding use of sustainable alternative fuels."

The implementation mechanism for CORSIA supports aviation's aspirational goal for carbon-neutral growth from 2020. The scheme will begin with a pilot phase from 2021 through 2023, followed by a first phase, from 2024 through 2026.

Participation in both stages will be voluntary, and the second phase from 2027 to 2035 would see all States on board.

Some exemptions were included in its provisions, primarily in recognition of the particular needs of Least Developed Countries (LDCs), Small Island Developing States (SIDS), Landlocked Developing Countries (LLDCs), and States with very low levels of international aviation activity.

It is important to acknowledge that CORSIA is not a tax, but rather an offset mechanism in which airlines will pay for excessive emissions by purchasing carbon credits in other industries, such as forestry for instance.

The 66 States which have thus far signaled their intention to volunteer for CORSIA represent more than 83% of international air traffic. And importantly they include major aviation players such as the United States, China, and the European Union's 44-nation aviation conference.

The agreement is expected to reduce emitted carbon by about 2.5 billion tonnes, according to an Environmental Defence Fund calculation.

CORSIA also engaged the strong backing of the airline industry. Alexandre de Juniac, new Director General and CEO of the International Air Transport Association (IATA), emphasised this when noting afterward that "this agreement ensures that the aviation industry's economic and social contributions are matched with cutting-edge efforts on sustainability."

Delegates at the 39th ICAO Assembly.

ICAO Secretary General Dr. Fang Liu (left), ICAO Council President Dr. Olumuyiwa Benard Aliu (right), and President of the 39th General Assembly, Datuk Seri Azharuddin Abdul Rahman, Director-General of the Malaysia Department of Civil Aviation, celebrate the triennial Assembly's agreements.

Michael Gill, Executive Director of the Air Transport Action Group (ATAG), said that CORSIA "will successfully balance the growth in air transport, and all of the economic and social connectivity benefits that it brings, with the need to address CO_2 emissions from the sector."

Beyond the historic agreement on CORSIA, additionally significant and far-reaching 39th Assembly progress was achieved across all of ICAO's five Strategic Objectives for Aviation Safety, Air Navigation Capacity and Efficiency, Aviation Security and Facilitation, the Economic Development of Air Transport, and Environmental Protection.

ICAO Member States delivered very clear endorsements for the targets and approaches being pursued globally under ICAO's comprehensive strategic plans for aviation safety and air navigation capacity and efficiency, and supported the need for it to provide similar high-level leadership at the global level in the form of two new Global Plans to be developed for aviation security and air transport economic development.

The new *Global Aviation Security Plan* in particular was requested to be prepared on a fast-track basis.

States also showed their clear appreciation and support for ICAO's recent reprioritization on assistance and capacity-building, as coordinated under its *No Country Left Behind* strategy, and as aided by more intensive global partnership development and resource mobilization.

Other decisions of note included agreement to amend the Chicago Convention to increase the number of States on the

ICAO Council and its supporting body of technical experts, the ICAO Air Navigation Commission.

SIGNIFICANT LOGISTICAL AND POLITICAL CHALLENGES
During Assembly Sessions, ICAO's complete work programme in the technical, economic, legal and technical cooperation fields is reviewed in detail. Assembly outcomes are then provided to the other bodies of ICAO and to its Member States to guide their continuing and future work.

The 39th Assembly benefitted from the participation of more than 2,200 delegates from 185 Member States, non-Member States and 56 observer delegations – the highest number ever hosted – and achieved 30% more work than at any previous event of this kind. More on the monumental effort undertaken by the ICAO Secretariat to make the event efficient for member States can be found in the article on page 25.

With the 39th Assembly Resolutions now in hand, and its budget and priorities confirmed for its next triennium, ICAO's attention will shortly begin focusing on the agency's 40th Session of the Assembly, which will coincidentally take place during its 75th Anniversary year in 2019.

Details of Assembly discussions and decisions for each Strategic Objective for global aviation are described in the following pages. ■

Delegates at the 39th ICAO Assembly

ICAO Council President Dr. Olumuyiwa Benard Aliu (centre) and ICAO Secretary General Dr. Fang Liu (right) with Ban Ki-moon, Secretary General of the United Nations.

"Aviation can now claim its 'Paris moment'. Air transport is now the world's first major industry sector to adopt a global approach to international emissions reduction."

– Dr. Olumuyiwa Benard Aliu, ICAO Council President

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NORTH AMERICA CENTRAL AMERICA THE CARIBBEAN (10)

BARBADOS
The Barbados Civil Aviation Training Centre

CANADA
The ASI Institute, A Division of Aviation Strategies International

CUBA
Centro de Adiestramiento de la Aviación (CAA)

DOMINICAN REPUBLIC
Academia Superior de Ciencias Aeronáuticas (ASCA)

EL SALVADOR
Instituto Centroamericano de Capacitación Aeronáutica (ICCAE) de COCESNA

JAMAICA
Civil Aviation Authority Training Institute (CAATI)

MEXICO
Centro Internacional de Instrucción de Aeropuertos y Servicios Auxiliares. Ingeniero Roberto Kobeh González

TRINIDAD AND TOBAGO
Trinidad and Tobago Civil Aviation Authority Civil Aviation Training Centre

UNITED STATES
Federal Aviation Administration (FAA) Academy

The Washington Consulting Group (WCG), Inc.
The Technical Training Group

SOUTH AMERICA (11)

ARGENTINA
Centro de Instrucción, Perfeccionamiento y Experimentación (CIPE)

BOLIVIA
Instituto Nacional de Aviación Civil (INAC)

BRAZIL
Centro de Treinamento da Agência Nacional de Aviação Civil (ANAC)

Instituto de Controle do Espaço Aéreo (ICEA)

COLOMBIA
Centro de Estudios de Ciencias Aeronáuticas - CEA

Corporación Educativa Indoamericana (CEI)

ECUADOR
Escuela Técnica de Aviación Civil (ETAC)

PARAGUAY
Instituto Nacional de Aeronáutica Civil (INAC)

PERU
Centro de Instrucción de Aviación Civil (CIAC) de CORPAC

URUGUAY ★
Instituto de Adiestramiento Aeronáutico - DINACIA

VENEZUELA
Instituto Universitario de Aeronáutica Civil (IUAC)

EUROPE (20)

BELGIUM
Wallonie Aerotraining Network (WAN)

FRANCE
CAMAS International

Centre Français de Formation des Pompiers d'Aéroport (C2FPA)

École Nationale de l'Aviation Civile (ENAC)

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Entry Point North AB Nordic ATS Academy

TURKEY
TAV Academy Training Center

Turkish Aviation Academy

UNITED KINGDOM
International Fire Training Centre (IFTC) Serco

NATS Training

AFRICA (14)

BOTSWANA
IAS Aviation Academy

CAMEROON
École Régionale de Sécurité Incendie (ERSI)

ETHIOPIA
Ethiopian Aviation Academy (EAA)

Ethiopian Civil Aviation Training Centre (ECATC)

KENYA
East African School of Aviation (EASA)

MOROCCO
Académie Internationale Mohamed VI de l'Aviation Civile (AIAC)

Loumed Cabin Crew Training Center (LCCTC)

NIGER
École Africaine de la Météorologie et de l'Aviation Civile (EAMAC)

NIGERIA
Nigerian College of Aviation Technology (NCAT)

SENEGAL
École Régionale de la Navigation Aérienne et Management (ERNAM)

SOUTH AFRICA
Air Traffic and Navigation Services (ATNS) – Aviation Training Academy

SUDAN
Sudan Academy for Aviation Sciences and Technology (SUDAFAST)

TANZANIA
Civil Aviation Training Centre (CATC)

TUNISIA
Académie Tuniso-Française de Formation en Sûreté de l'Aviation Civile (AFSAC)

MIDDLE EAST (11)

EGYPT
Egyptair Training Center

Egyptian Aviation Academy (EAA)

IRAN (ISLAMIC REPUBLIC OF)
Civil Aviation Technology College (CATC)

JORDAN
Queen Noor Civil Aviation Technical College (QNCATC)

KUWAIT
Australian College of Kuwait (ACK)

LEBANON
Middle East Airlines Training Center

QATAR
Qatar Aeronautical College (QAC)

SAUDI ARABIA
Saudi Academy of Civil Aviation (SACA)

UNITED ARAB EMIRATES
GAL ANS Training Centre

Gulf Center for Aviation Studies (GCAS)

YEMEN
Civil Aviation and Meteorology Institute (CAMI)

ASIA/PACIFIC (23)

AUSTRALIA
ASSET Aviation International

BANGLADESH
Civil Aviation Training Centre (CATC)

CHINA
Capital Airports Holding Management Co., Ltd. (CAHM)

INDIA
Airports Authority Rescue and Fire Fighting Services Training Centre

Civil Aviation Training College Allahabad

Fire Service Training Center (FSTC)

GMR Aviation Academy

Indian Aviation Academy (IAA)

INDONESIA
Air Transportation Human Resources Development Centre (ATHRDC)

Indonesia Civil Aviation Institute Sekolah Tinggi Penerbangan Indonesia

JAPAN
Aeronautical Safety College (ASC)

MALAYSIA
Malaysia Aviation Academy (MAvA)

MONGOLIA
Training Centre of the Mongolia Civil Aviation Authority (TCMCAA)

NEPAL
Civil Aviation Academy of Nepal (CAAN)

NEW ZEALAND
Airways New Zealand Training Centre

PAKISTAN
Civil Aviation Training Institute (CATI)

PHILIPPINES
Civil Aviation Training Center Civil Aviation Authority

REPUBLIC OF KOREA
Civil Aviation Training Centre of Korea Airports Corporation (KAC)

Incheon Airport Aviation Academy (IAAA)

SINGAPORE
Singapore Aviation Academy (SAA)

SRI LANKA
Civil Aviation Training Centre (CATC)

Sri Lankan Aviation College

THAILAND
Civil Aviation Training Centre (CATC)

*As of 30 August 2016

ICAO 39TH ASSEMBLY HIGHLIGHTS

ICAO STRATEGIC PRIORITY
SAFETY

Endorsement of the ICAO *Global Aviation Safety Plan (GASP)*

Urged greater prioritization on safety management system (SMS) implementation

ICAO STRATEGIC PRIORITY
ENVIRONMENTAL PROTECTION

Endorsement of the Carbon Offsetting Reduction Scheme for International Aviation (CORSIA)

Recognition of development of a new global CO_2 emissions certification Standard for aeroplanes

Recognition of development of a new non-volatile Particulate Matter (nvPM) emissions Standard.

ICAO STRATEGIC PRIORITY
SECURITY & FACILITATION

Endorsement to commence development of the ICAO *Global Aviation Security Plan (GASeP)*

Encouraged a robust, risk-based approach to aviation cybersecurity programmes

ICAO STRATEGIC PRIORITY
CAPACITY & EFFICIENCY

Endorsement of the 5th Edition of the ICAO *Global Air Navigation Plan (GANP)*

Urged continuing priority for performance-based navigation (PBN) solutions

ICAO STRATEGIC PRIORITY
ECONOMIC DEVELOPMENT

Acknowledgement of the need to consider a new *Global Air Transport Plan (GATP)*

Endorsed the need for finalization of international liberalization agreements

ASSISTANCE AND CAPACITY-BUILDING

Endorsement of continuation of the *No Country Left Behind* initiative

Endorsement of the establishment of the ICAO Programme for Aviation Volunteers (IPAV)

UN SUSTAINABLE DEVELOPMENT GOALS (SDGs)

Encourage States to achieve SDGs through implementation of ICAO Strategic Objectives and work programmes

Urged Member States to elevate the priority of the aviation sector into their national strategic development plans

NEXT GENERATION OF AVIATION PROFESSIONALS (NGAP)

Endorsed the NGAP programme

Encouraged Member States to provide technical expertise, guidance, and resources to achieve NGAP's objectives

ACCIDENT VICTIMS

Recognised Council's 2015 adoption of Amendment 25 to Annex 9. Urged Member States to establish legislation, regulations and/or policies to support victims of civil aviation accidents and their families.

36 STATES ELECTED FOR ICAO 2017-2019 COUNCIL

The 39th Assembly of ICAO completed the election of its new 36-member Council for the 2017-2019 triennium. The election process was divided into three parts, with these States elected:

PART I	PART II	PART III
States of Chief Importance in Air Transport	States which Make the Largest Contribution to the Provision of Facilities for International Civil Air Navigation	States Ensuring Geographic Representation
■ Australia* ■ Brazil* ■ Canada* ■ China* ■ France* ■ Germany* ■ Italy* ■ Japan* ■ Russian Federation* ■ United Kingdom ■ United States*	■ Argentina* ■ Colombia ■ Egypt ■ India ■ Ireland ■ Mexico* ■ Nigeria* ■ Saudi Arabia* ■ Singapore* ■ South Africa* ■ Spain* ■ Sweden	■ Algeria ■ Cabo Verde ■ Congo ■ Cuba ■ Ecuador ■ Kenya* ■ Malaysia* ■ Panama ■ Republic of Korea* ■ Turkey ■ United Arab Emirates* ■ United Republic of Tanzania* ■ Uruguay

*Re-election

NOTE: The 39th Assembly also agreed to amend Article 50 (a) of the Chicago Convention to increase the membership of the ICAO Council from 36 to 40 States and to amend Article 56 of the Chicago Convention to increase the membership of the Air Navigation Commission from 19 to 21 States. These changes will be processed through the ICAO Council consultative process for ratification by Member States. ■

41ST EDWARD WARNER AWARD TO BLACK BOX INVENTOR DR. DAVID WARREN

✈ The highest honour in international civil aviation, The Edward Warner Award, was conferred posthumously on Australia's Dr. David Ronald de Mey Warren, recognised by the ICAO Council and the international civil aviation community for outstanding contributions to aviation safety made possible by his invention and refinement of the first-ever aircraft flight recorder, or "black box." The award was presented to three of Dr. Warren's children on the opening day of ICAO's 39th triennial Assembly by ICAO Council President, Dr. Olumuyiwa Benard Aliu.

"Flight recorders are one of our most relied-upon resources for the improvement of aviation safety," President Aliu highlighted, "and I wish to acknowledge here the tremendous debt of gratitude owed to Dr. Warren's vision, commitment and tenacity, and for his far-reaching contributions to international civil aviation."

In 1953, Warren was a jet fuel expert with what are now the Defence Science and Technology Organization's Aeronautical Research Laboratories in Melbourne. He was recruited to a special team assembled to analyse the mysterious mid-air explosions being experienced by the world's first commercial jet aircraft, the de Havilland Comet. (Warren's father died in a 1934 Bass Strait air crash.)

Warren realized how valuable it would be for post-accident safety analysis if a recording were available of what had transpired on the aircraft prior to the accidents. Having recently observed one of the world's first miniature recorders being demonstrated at a trade fair, he began to imagine how such a device could be adapted for use in modern commercial aircraft, eventually developing a first demonstration unit.

"If a businessman had been using one of these in the plane and we could find it in the wreckage and we played it back, we'd say, 'We know what caused this.' Any sounds that were relevant to what was going on would be recorded and you could take them from the wreckage," Warren recalled.

Like many innovations, Warren's recorder first met with skepticism. "But consistent with his passion for innovation, and his commitment

The late Dr. David Ronald de Mey Warren with his "black box" invention.

to help prevent accidents and save lives, Dr. Warren persevered with his idea to the benefit of air transport and its now billions of yearly passengers," Dr. Aliu stressed.

Today, audio recordings from cockpit voice recorders supplement flight data by providing related details on flight crew responses, and by aiding in assessments of how radio communications or other outside distractions may have been a factor in an accident. Their data has assisted investigators' understanding of how aircraft perform, both before and during an accident or incident, as well as providing useful information for airline flight data analysis programmes.

Warren died in 2010, at age 85, and was buried in a casket bearing the wry label "Flight Recorder Inventor; Do Not Open."

Dr. Warren is the 41st recipient of the Warner Award, named for the first President of the ICAO Council, Dr. Edward Pearson Warner of the United States. Dr. Warner (1894-1958) was an American aviation pioneer, educator in aeronautical engineering, author, scientist and statesman. He was a member of the US Civil Aeronautics Board at its founding in 1938 and a delegate of the United States to the 1944 Chicago Conference for the Convention on International Civil Aviation.

Dr. Warner was one of the leading figures in the transformation of civil aviation from a fledgling industry in the chaos of World War II to a structured and modern world air transport system based on international cooperation. He became the first President of the ICAO Council during its provisional status from 1945 to 1947, and continued as President until his retirement in 1957. ∎

Dr. Warren's children with the 2016 Edward Warner Award. Left to right: Graham, Peter, Jennifer.

ASSEMBLY APPROVES HISTORIC GLOBAL MARKET-BASED MEASURE

✈ The 39th ICAO Assembly adopted Resolutions A39-1 (on general provisions, noise and local air quality), A39-2 (on climate change) and A39-3 (on a global market-based measure scheme), which together are a clear demonstration of the determination of ICAO and its Member States to continue to exercise leadership on environmental issues related to international aviation. They provide the basis for additional concrete steps as ICAO moves forward in demonstrating how it intends to realise the ultimate vision of fully sustainable international aviation.

The Assembly's historic agreement on a global market-based measure (MBM) scheme for international aviation, referred to as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), reflects the strong support of ICAO Member States for a global solution to achieve its carbon-neutral growth aspirational goal, as opposed to a possible patchwork of different measures.

To ensure that international aviation grows in a sustainable manner, ICAO is exploring all possible options to limit or reduce its environmental impact. ICAO's CORSIA is part of the basket of mitigation measures to reduce CO_2 emissions from international aviation, complementing other key elements which include technical advances, such as the development of lighter airframes, higher engine performance, and new certification standards, improved ground operations and air traffic management, and sustainable alternative fuels.

CORSIA – GLOBAL MARKET-BASED MEASURE

The recognition that technological and operational improvements alone will not be enough in the medium term to reduce CO_2 emissions led the Assembly to adopt a Resolution to implement CORSIA. This is the first global MBM scheme that addresses CO_2 emissions from international aviation. According to the Intergovernmental Panel on Climate Change (IPCC), international aviation is responsible for approximately 1.3% of global CO_2 equivalent emissions produced by human activity. Domestic aviation (which is addressed under the 2015 Paris Agreement as part of a State's overall emissions plan) accounts for another 0.7%.

CORSIA provides for a phased-in implementation approach:
- Pilot phase from 2021 through 2023
- First phase from 2024 through 2026
- Second phase from 2027 through 2035

For the first two phases from 2021 to 2026, participation by States is voluntary.

Already by the end of October 2016, 66 States representing more than 86.5% of international traffic have volunteered to participate in the pilot phase of CORSIA. To ensure the successful implementation of CORSIA from 2021 onwards, ICAO will assist States to put in place the necessary infrastructure through capacity-building activities, development of Standards and Recommended Practices (SARPs), as well as guidance for a robust monitoring, reporting and verification (MRV) system, emissions units criteria (EUC) and registries.

The successful implementation of CORSIA relies on the completion of an ambitious work programme over the next triennium:
- The MRV system under CORSIA is expected to include procedures on how States and operators can monitor fuel use, collect data and calculate CO_2 emissions; report emissions data; and verify emissions data to ensure accuracy and avoid mistakes. All Member States whose aircraft operators undertake international flights are requested to develop the necessary arrangements for implementation from 1 January 2019.

- The development of a robust and comprehensive EUC will ensure that operators purchase appropriate emissions units from eligible mechanisms, programmes or projects. The Council will take into account relevant developments in the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. It will also establish a standing technical advisory body on the EUC to make recommendations .

- The development of national registries by Member States will assist in the tracking of emissions units and checking that operators are in compliance with the offsetting requirements under CORSIA. The Council will also establish a consolidated central registry under the auspices of ICAO, for operationalization no later than 1 January 2021.

The Council will develop SARPs and related guidance material for the implementation of the MRV system, EUC, and registries for adoption by the Council by 2018.

For further information on CORSIA, visit the website: **www.icao.int/ environmental-protection/Pages/market-based-measures.aspx**

NEW NVPM (ULTRAFINE BLACK CARBON) STANDARD

The Assembly welcomed the development of the first of its kind Standard for non-volatile Particulate Matter (nvPM) emissions, ie ultrafine soot particles, for all turbofan and turbojet engines with

rated thrust greater than 26.7kN. The new nvPM Standard was recommended by the Committee on Aviation Environmental Protection (CAEP/10) as an amendment to Annex 16, Volume II - Aircraft Engine Emissions. Once adopted by the Council, this Standard will apply to engines manufactured from 1 January 2020.

NEW CO_2 EMISSIONS STANDARD

A global certification standard for CO_2 emissions from aeroplanes, the first for any sector, coupled with a production cut-off for current production aircraft that do not comply with the new standard, paves the way for more efficient aircraft that have lower environmental impact.

Once adopted by the Council, the standard will apply to new aeroplane type designs from 2020 and to aeroplane type designs that are already in-production in 2023.

AIRCRAFT NOISE

For the first time, the CAEP's noise trends assessment demonstrated the possibility of "noise neutral growth" from 2030 under an advanced technology and operational improvements scenario.

The Assembly also recognized the ongoing work on development of a new supersonic noise Standard for future aircraft. Understanding the current state of sonic boom knowledge, research and supersonic aeroplane projects will continue in the next triennium. It is anticipated that the certification of a supersonic aeroplane could occur in the 2020-2025 timeframe. ■

"CORSIA is part of the basket of mitigation measures to reduce CO_2 emissions from international aviation."

STRATEGIC PRIORITY: ENVIRONMENTAL PROTECTION
39TH ASSEMBLY MAIN OUTCOMES

- Endorsement of a **global market-based measure** (GMBM), the first-ever market-based measure adopted by an entire industry sector.
- Recognition of the ongoing work to develop a **new supersonic noise Standard** for future aircraft.
- Recognition of the development of a **new non-volatile Particulate Matter (nvPM) emissions Standard** for all turbofan and turbojet aircraft with rated thrust greater than 26.7kN (first-ever).
- Support for the ICAO aspirational goals on CO_2 emissions reduction and recognition of progress on all elements of the **Basket of Measures**.
- Recognition of the development of a **new global CO_2 emissions certification Standard** for new type and in-production aeroplanes (first-ever).
- Welcome the partnership agreement between ICAO and ACI that focuses on various cooperative initiatives for **greener airports**.
- Recognition of significant achievements in assisting States to develop their **State action plans** for CO_2 emissions reduction, leading to the submission of 102 State plans to ICAO.
- Request for advancement on **emerging issues** such as: environmental aspects of aircraft end-of-life (e.g. aircraft recycling); climate change risk assessment for international aviation, including identification of adaptation measures; and renewable sources of energy for aviation.

GLOBAL AVIATION SECURITY PLAN (GASeP) TO BE DEVELOPED

Global aviation security enhancement remains a formidable undertaking characterized by a complex and continually shifting landscape with a need greater than ever for concrete risk management. Intensified collaborative effort by States and industry is required to promote technology and process innovation to meet future and existing aviation security challenges. An integrated approach to aviation safety and security is needed, as illustrated by issues such as cybersecurity and remotely piloted aircraft systems; aviation security requires a cross-functional approach that ensures appropriate coordination with facilitation, aviation safety, air navigation and other relevant fields. More real-time sharing of critical information between States and industry, and between aviation security professionals and partners who have a need to know, should be encouraged, as highlighted by recent events related to civil aviation operations near conflict zones.

The ICAO Comprehensive Aviation Security Strategy (ICASS), mandated by the 37th Assembly, has been the Organization's primary aviation security programme framework for two trienna (2011-16). In reflecting on the trends, challenges and opportunities to which a future framework should respond, the 39th Session of the ICAO Assembly determined that it is time to define a vision and roadmap for transitioning to a new forward-looking and holistic *Global Aviation Security Plan (GASeP)*.

The *GASeP* will provide guidance for priority setting at the international, regional and State levels, creating a framework where States can work together and with stakeholders to meet shared objectives, support global solutions to common challenges, and guide efforts to further enhance aviation security.

"Under ICAO's new *Global Aviation Security Plan*, States, regions, industry and other stakeholders will be unified through a strategic framework that offers clarity on priorities for aviation security enhancement," remarked Dr. Fang Liu, ICAO Secretary General. She noted that the *GASeP* will provide ICAO with invaluable support in achieving its aviation security objectives and in effectively contributing to the UN Security Council resolutions as well as the UN Global Counter-Terrorism Strategy.

The *GASeP* will be developed in close coordination with ICAO's Aviation Security Panel of aviation security experts. Consultation with States, other international and regional organizations, industry and other stakeholders will be an extremely important part of this work. The *GASeP* will be submitted to the ICAO Council for approval, with implementation to begin as soon as possible.

Key considerations of the *Global Aviation Security Plan*:
- The seven Strategic Focus Areas of the ICASS as a solid foundation for addressing current and future aviation security challenges.
- The foundational element of the framework should be based on progressive aviation security enhancement as the core objective, consistent with ICAO's Strategic Objective.
- The main components for defining the *GASeP* should be built around key themes, under which specific goals and targets could be pursued, and broad areas of "enablers," which contribute toward achieving goals across all themes.

Until the *GASeP* is approved for implementation, the Organization will continue to be guided by the ICASS to ensure that an overarching policy and programming framework in ICAO remains in place.

FIRST CYBERSECURITY RESOLUTION ADOPTED
To promote a consistent and coherent approach in managing cyber threats and risks, Assembly 39 adopted the first-ever Resolution on ways to better address cybersecurity in civil aviation. The Resolution aims to address cybersecurity through a horizontal, cross-cutting and functional approach, reaffirming the importance and urgency of protecting civil aviation's critical infrastructure systems and data against cyber threats. It also seeks to obtain global commitment to action by ICAO, its Member States and industry stakeholders.

The United States, European Union Member States, the other Member States of the European Civil Aviation Conference and EUROCONTROL promoted a coordinated approach to mitigate the threat posed by cyber attacks. They endorsed a joint aviation risk management approach that would define common principles and methods to identify, and assess and mitigate the risks associated with cyber attacks to achieve global and coherent cyber resilience. They highlighted the critical need for sharing of information on cyber incidents and threats. (See also Cybersecurity: Information-Sharing is Critical to Building Aviation System Resiliency on page 38).

UN SECURITY COUNCIL ADOPTS RESOLUTION ON COUNTERING TERRORIST THREATS TO CIVIL AVIATION
In September 2016, a ministerial session of the United Nations Security Council unanimously adopted Resolution 2309, calling on States to work within ICAO to ensure that its international security standards are reviewed and adapted to effectively address the threat posed by terrorist targeting of civil aviation.

"An important aspect of our work involves mobilizing political will for the improvement of national capacities," ICAO Secretary General Dr. Fang Liu said to the ministers. "The UN Security Council's focus will

serve to heighten the efforts by the global community on aviation security, encourage intensified political engagement by the States to effectively implement ICAO's Security Standards, and support ICAO's technical assistance activities to the States in need."

"More real-time sharing of critical information between States and industry ... should be encouraged ..."

Improvised explosive devices concealed in baggage and cargo, MANPADS (man-portable air defence systems), drones, cybersecurity, and insider threats were among the current priority security challenges Dr. Liu cited in her briefing. These can be mitigated, she noted, through effective implementation of ICAO's Security Standards, adding that this requires coordination with national and multilateral bodies.

In the resolution, the UN Security Council noted that the "terrorism threat has become more diffuse," with an increase, in various regions of the world, of terrorist acts, including those motivated by intolerance or violent extremism. The UN Security Council expressed its determination to combat the threat, and expressed grave concern over terrorist attacks against civil aviation and that civil aviation may be used as a transportation means by foreign terrorist fighters.

The UN Security Council called on States to:
- Ensure that effective, risk-based measures are in place at the airports within their jurisdiction;
- Take all necessary steps to ensure that such measures are effectively implemented on the ground on a continuing and sustainable basis;
- Ensure that such measures take into account the potential role of those with privileged access to areas, knowledge or information that may assist terrorists in planning or conducting attacks;
- Urgently address any gaps or vulnerabilities that may be highlighted by ICAO or national self-risk assessment or audit processes.

In addition, States should strengthen security screening procedures and maximize the promotion, utilization and sharing of new technologies and innovative techniques that maximize the capability to detect explosives and other threats.

The UN Security Council also encouraged continued cooperation between ICAO and the UN Counter-Terrorism Committee (CTC) to identify gaps and vulnerabilities relevant to aviation security. ■

STRATEGIC PRIORITY: SECURITY & FACILITATION
39TH ASSEMBLY MAIN CONCLUSIONS

- Endorsement to commence development of the ICAO *Global Aviation Security Plan*, which will provide direction to all entities involved in AVSEC enhancement, with focus on internationally agreed goals and targets.
- Endorsement of ICAO's AVSEC and FAL key priorities for the coming triennium:
  - New and evolving threats, including **cybersecurity, landside security**, and **insider threats**.
  - Technical assistance and strengthened **regional coordination**.
  - Implementation of the first **cybersecurity resolution**, which stresses the importance of information-sharing and coordination across civil aviation safety and security fields of expertise.
  - The **ICAO Traveller Identification Programme** (TRIP) strategy, including travel documents, the **ICAO Public Key Directory** (PKD), and provision of related assistance and training to the States.
  - Continued support for the **Universal Security Audit Programme Continuous Monitoring Approach** (USAP CMA), including seconding short- and long-term experts, training courses, and regional seminars, as well as reviewing the scope and methodology of the USAP CMA.
  - Support for creation of a Comprehensive Regional Implementation Plan for Aviation Security and Facilitation (SECFAL) in the **Middle Eastern Region**, and continued support for the AFI SECFAL in **Africa**.

GLOBAL AVIATION SAFETY PLAN
INCORPORATES NEW ROADMAP

Safety is the number one priority for all involved in aviation, and a commitment to global standards has contributed to making flying the safest form of long-distance transportation the world has even known. "Our global sector experienced fewer than 2.8 major accidents per million departures in 2015. If you compare that to almost any other safety measure in the world, in any domain, it's clearly apparent that international standards for civil aviation are very effective," said Dr. Fang Liu, ICAO Secretary General.

During the ICAO 39th Assembly, delegates discussed a wide range of safety topics, including strategies to improve States' implementation of Standards and Recommended Practices (SARPs) related to aviation safety; regional accident and incident investigation organizations; protection of safety data, safety information and related sources; health management systems for pilots; qualification requirements for key aerodrome personnel; heliport certification; the new global reporting format for runway surface condition assessment and reporting; the role just culture principles play in a successful safety culture; and many more.

The Assembly endorsed the 2017-19 update to the *Global Aviation Safety Plan (GASP)*, which includes a roadmap outlining specific safety initiatives and supporting actions associated with each of the four safety performance enablers (standardization, resources, collaboration and safety information exchange). Each safety initiative is supported by a set of actions. The roadmap includes specific initiatives targeted to the different streams of stakeholders (States, regions and industry) at different levels of maturity.

The GASP roadmap contains three distinct phases:
Phase I: Effective safety oversight
Phase II: State safety programme (SSP) implementation
Phase III: Predictive risk management.

ICAO introduced the first version of the *GASP* in 1997 by formalizing a series of conclusions and recommendations developed during an informal meeting between the Air Navigation Commission (ANC) of ICAO and industry. The *GASP* has significantly changed since its introduction in 1997, and has evolved through continuous review. ■

STRATEGIC PRIORITY: SAFETY
39TH ASSEMBLY MAIN CONCLUSIONS

- Endorsement of the **ICAO *Global Aviation Safety Plan (GASP)*** as the strategic direction for ICAO's technical work programme in air navigation:
  - New edition maintains objectives from previous, focused on effective safety oversight for States and safety management for operators.
- *GASP* objectives going forward will be to:
  - Continue to work on **Safety Management System (SMS)** implementation.
  - Work with State regulators on **State Safety Programme** implementation activities, including safety performance measurement.
  - Develop **safety performance indicators** and continue evolution toward predictive risk management once SMS implementation is complete.
- Endorsement of continuation of ICAO's Comprehensive Regional Implementation Plan for Aviation Safety in Africa **(AFI Plan)** activities beyond 2016, and within the work programmes of the regional offices, as well as its expansion to cover all safety areas.
- Noted and appreciated ICAO's progress on items resolved at the last **ICAO High Level Safety Conference** (2015).

ICAO PRESENTS COUNCIL PRESIDENT CERTIFICATES TO FOURTEEN STATES

During ICAO's 39th Assembly, States representing all ICAO Regions received inaugural Council President Certificates in recognition of significant progress in resolving safety oversight deficiencies and improving the effective implementation of ICAO Standards and Recommended Practices (SARPs), as identified through the objective and transparent 2015 results determined by ICAO's Universal Safety Oversight Audit Programme (USOAP). These States were recognized:

1. Austria
2. Botswana
3. Cameroon
4. Ecuador
5. El Salvador
6. Israel
7. Italy
8. Lao People's Democratic Republic
9. Latvia
10. Madagascar
11. Mali
12. Niger
13. San Marino
14. United Arab Emirates

REPUBLIC OF KOREA AND ICAO AGREE TO NEW COOPERATION ON AVIATION SAFETY

ICAO Council President, Dr. Olumuyiwa Benard Aliu, and Mr. Hoin Kang, Minister of Land, Infrastructure and Transport of the Republic of Korea, signed a Memoranda of Understanding (MoU) at ICAO's 39th Assembly focussed on enhancing aviation safety. The MoU will enable Korea to continue providing ICAO with highly skilled resources and expertise to support Member States. The MoU will also foster enhanced global aviation safety through the further development of both the Ministry of Land, Infrastructure and Transport's Standards and Recommended Practices (SARPs) Management and Implementation System (SMIS) and the OLF (ICAO's Universal Safety Oversight Audit Programme–USOAP– Continuous Monitoring Approach Online Framework).

ICAO AND IAC DEEPEN COOPERATION ON GLOBAL AVIATION SAFETY

ICAO and the Interstate Aviation Committee (IAC) have agreed to further collaborate on enhancing global aviation safety, signing a Supplementary Memorandum of Understanding (MoU) at the 39th Assembly. The MoU recognizes the importance of the contributions to the development of international aviation that has resulted from the collaboration between the two organizations to date, and calls for further cooperation on the enhancement of aviation safety, notably through ICAO's *No Country Left Behind* initiative. Signing for ICAO was President of the ICAO Council, Dr. Olumuyiwa Benard Aliu, and for IAC Dr. Tatiana Anodina, President of the Interstate Council and Chairperson of the Interstate Aviation Committee. The IAC is the official civil aviation authority in the Russian Federation and oversees civil aviation in the Commonwealth of Independent States (CIS).

The MoU calls for direct support from the IAC on activities undertaken through the ICAO Technical Cooperation Programme. The IAC will also maintain close cooperation with ICAO through the framework of the European Air Navigation Planning Group (EANPG) and the European Regional Aviation Safety Group (RASG-EUR). The MoU also provides for the exchange of aviation expertise. ◼

GLOBAL AVIATION NAVIGATION PLAN (GANP) UPDATE EMPHASIZES PBN

The fifth edition of the *Global Air Navigation Plan (GANP)* identifies Performance-based Navigation (PBN) as the highest implementation priority because it is a key enabler to enhance safety, increase airspace capacity, improve operational efficiency, and reduce environmental impact from aviation. PBN is becoming the mainstream for both flight operations and pilot training.

The Aviation System Block Upgrades (ASBU) modules were also updated to take into account recent technological developments and standards' availability. ICAO expert groups were tasked to update the ASBU document and all technical roadmaps in the *GANP*. Each was assigned responsibility for a set of modules. One of this group, the Air Traffic Management Requirements and Performance Panel (ATMRPP), played the role of global architect and reviewed the document last to ensure consistency.

ASBU implementation is to be realized through tailored regional work programmes based on specific operational needs. ICAO's Planning and Implementation Regional Groups (PIRGs) design these work programmes first by identifying the operational characteristics of their homogeneous air traffic management (ATM) areas, major traffic flows and major international aerodromes. Analysis of this operational data identifies performance improvement opportunities and ASBU modules are then evaluated to identify which of them best delivers the needed operational improvements.

The Assembly endorsed the updated *GANP* as the strategic direction for global air navigation and requested States, PIRGs, service providers and airspace users to establish priorities and targets consistent with the *GANP* objectives as well as the operational needs of each region.

The updated *GANP* offers a long-term vision that continues to provide confidence in developing and implementing air navigation infrastructure and avionics advances leading to full global harmonization of the ATM system.

"ICAO has accomplished a tremendous amount in the past three years, most especially in our efforts to drive more targeted and effective assistance for States under our *No Country Left Behind* initiative," commented ICAO Council President Dr. Olumuyiwa Benard Aliu.

The Assembly also agreed to amend Article 56 of the Chicago Convention to increase the membership of the Air Navigation Commission (ANC) from 19 to 21 States.

STRATEGIC PRIORITY: AIR NAVIGATION CAPACITY & EFFICIENCY
39TH ASSEMBLY MAIN CONCLUSIONS

- Endorsed the Fifth Edition of the *ICAO Global Air Navigation Plan* (*GANP*) as the strategic direction for ICAO's technical work programme in air navigation:
- Additions to the current version include:
    - Air Transport Management (ATM) **Logical Architecture**
    - Notion of '**minimum path**'
    - **Performance-based approach**
    - **Financial aspects** (economic impacts of the Aviation System Block Upgrades - ASBUs)
- Urged States to continue **Performance-based Navigation** (PBN) implementation

13TH ICAO AIR NAVIGATION CONFERENCE, 2018

The ICAO Air Navigation Commission will review the *Global Air Navigation Plan* as part of the triennial work programme, reporting to the Council one year in advance of each ICAO Assembly. The ANC report will provide a review of global progress made in achieving the *GANP* objectives and will consider lessons learned by States, industry and PIRGs. Moreover, the ANC report will consider possible changes in future aviation needs, the air navigation context and other influencing factors, proposing suitable adjustments to the *GANP* to accommodate these eventualities. The sixth edition in 2019, at the beginning of Block 1, will undergo deeper updates to provide more up-to-date planning timelines, technology adjustments and guidance for easier implementation.

Proposed Conference Topics:
- Convergence on the next generation of Datacom
- Agreement on the system architecture for a Global SWIM (System Wide Information Management)
- Introduction of the Basic Building Blocks for the *GANP* (BBBGs)
- Introduction of the business case templates for the individual Aviation System Block Upgrade modules for Block 1 and their associated influence diagrams
- Agreement on the Air Navigation Capacity and Efficiency Indicators
- Consolidation of the work programme required for Block 2
- Development of a new ASBU Block 4

SUDAN & SOUTH SUDAN AGREE ON AIR NAVIGATION ROADMAP, NEW FIR

Sudan and South Sudan signed a high-level agreement during ICAO's 39th Assembly which will assist South Sudan in taking greater responsibility for the air navigation services obligations over its territory. The agreement was signed by Sudan's Director General of Civil Aviation, Mr. Ahmed Satti Abdelrahman Bajouri (left in photo), and South Sudan's Acting Civil Aviation Chief Executive Officer, Mr. David Subek Dada (right) in the presence of South Sudan's Transport Minister, the Honourable John Luk Jok.

It allows both States to address critical communications and surveillance requirements, and covers the installation of new air navigation infrastructure in South Sudan. Sudan will support the maintenance of the equipment until South Sudan takes full responsibility for the provision of its air traffic services.

A preliminary transition plan to be monitored by ICAO was also agreed to establish a new Flight Information Region (FIR) under the operational responsibility of South Sudan. Also to be established is a South Sudan-Sudan Implementation Monitoring Team (SSIMT) that will be comprised of representatives from the two States,

adjacent States, specialists from ICAO Regional Offices and the International Air Transport Association (IATA).

A revised route structure to support more efficient operations over Sudan and South Sudan as well as eventual flight information boundary adjustments have also been agreed.

"This agreement helps to highlight how air transport cooperation continues to bring nations and peoples together to their common benefit," commented ICAO Council President Dr. Olumuyiwa Benard Aliu. The agreement was facilitated by the ICAO Eastern and Southern African and the Middle East Regional Offices and officials from the Organization's Air Navigation Bureau.

"ICAO's Regional Offices have become more and more important in helping to assure that our Organization's priorities for assistance and capacity building are as targeted and effective as possible," ICAO Secretary General Dr. Fang Liu underscored, "and we will be working closely with our Sudanese and South Sudanese partners to ensure they realize as many benefits as possible from their new cooperation." ∎

GLOBAL AVIATION TRANSPORT PLAN (GATP) URGED

Three years ago, the 38th Assembly requested the ICAO Council "develop and adopt a long-term vision for international air transport liberalization, including examination of an international agreement by which States could liberalize market access…", "develop a specific international agreement to facilitate further liberalization of air cargo services," and "initiate work on the development of an international agreement to liberalize air carrier ownership and control."

This year, the 39th Assembly requested that the Council continue this undertaking in accordance with the mandate and guidance given by Assembly Resolution A38-14, including consideration for development of a new ICAO *Global Air Transport Plan (GATP)*.

The Air Transport Regulation Panel (ATRP) has reached general agreement on certain provisions of an administrative and technical nature, while other core elements of the agreement involving the exchange of commercial rights and safeguard provisions remain open for discussion. It is envisaged that the final draft text of the agreements will be presented to the next panel meeting in mid-2017, followed by consideration by the Air Transport Committee and the Council. Member States will be consulted on the draft text of the agreements, prior to their finalization.

STRATEGIC PRIORITY: ECONOMIC DEVELOPMENT OF AIR TRANSPORT
39TH ASSEMBLY MAIN CONCLUSIONS

- Acknowledgement of need to consider a new ICAO *Global Air Transport Plan*.
- Endorsement of action plan for the finalization of the international agreements being developed by ICAO for the **liberalization of market access, air cargo and air carrier ownership and control.**
- Endorsement of the action plan for further customization of long-term traffic forecasts for global and regional **forecasts for aviation personnel** (Doc 9956) to meet the requirements of the ICAO Next Generation Aviation Professional (NGAP) programme.
- Promote the strengthening of **partnerships in the area of data sharing and analysis** with the UN, its agencies, international, regional organizations and academia to increasing financing and investments for the development of air transport activities.
- Increased awareness and promotion of various **updated policy guidance and tools**.
- Increased awareness and promotion of the ICAO long-term vision for **air transport liberalization** and core principles on **consumer protection**.
- Increased awareness and promotion of various **tools and analysis** jointly developed by partners.

ICAO SIGNS TRAINING PARTNERSHIP WITH FRANCE

ICAO's Secretary General, Dr. Fang Liu, has signed a partnership agreement with France's Director General of Civil Aviation, Mr. Patrick Gandil. The partnership will facilitate the provision of aviation training by France to aspiring professionals in developing countries. "ICAO sees this partnership as a model that should encourage other developed States to offer similar programmes. This assistance will directly contribute towards the sustainable development of international civil aviation by addressing the substantial human resources that will be required in light of the tremendous growth forecast in this sector," Dr. Liu said. ■

ICAO AND UN-HABITAT TO ENHANCE AIRPORT SUSTAINABLE DEVELOPMENT

A new agreement between ICAO and UN-Habitat is aimed at developing new global guidelines for enhancing sustainable development synergies between airports and urban areas and make important contributions to States' pursuit of the UN's Agenda 2030 for Sustainable Development. A Memorandum of Understanding (MoU) enhancing the synergies between urban development and aviation was signed by Dr. Fang Liu, Secretary General of ICAO (left in photo), and Dr. Joan Clos, Executive Director of the United Nations Human Settlements Programme (UN-Habitat).

UN-Habitat's mission is to promote socially and environmentally sustainable human settlements development and adequate shelter for all.

"Well-managed, ICAO-compliant airports are crucial to global socio-economic development, providing essential links between the world's markets and peoples," remarked Dr. Liu. "Supported by the transport corridors that link them, airport and urban development go hand-in-hand, and this partnership with UN-Habitat will help bring renewed focus to the role of modernized aviation infrastructure in ensuring the efficient movement of people and goods."

ICAO and UN-Habitat kicked-off their collaboration with a joint pilot project involving five airports in four different African cities – Addis Ababa, Ethiopia; Ekurhuleni, South Africa; Johannesburg, South Africa; and Nairobi, Kenya. Their goal is to foster increased cooperation between civil aviation, land, planning and urban development authorities, as well as international organizations, airlines and aircraft manufacturers.

Civil aviation is in a position to make critical contributions to States' achievement of the UN Agenda 2030, such as effective implementation of international standards, timely coordination with other sectors of the economy, and seamless integration between aviation and other modes of transportation. The MoU directly supports Sustainable Development Goals (SDGs) 9, 11, and 13, which pertain to economic development, urban well-being, and climate change.

The relationship is reciprocal as urban conditions impact on aviation safety, navigation, efficiency, and security, and consequently the economic development of air connectivity and its environmental consequences.

"By 2050, the percentage of the world's population residing in metropolitan areas is expected to nearly double. Air traffic volumes are expected to double over the next 15 years. Urbanization has a potential positive implication on this growth, but it also represents important challenges. The New Urban Agenda represents an important opportunity to further steer related policies and planning approaches to optimize aviation's benefits for urban populations," Dr. Liu said. ∎
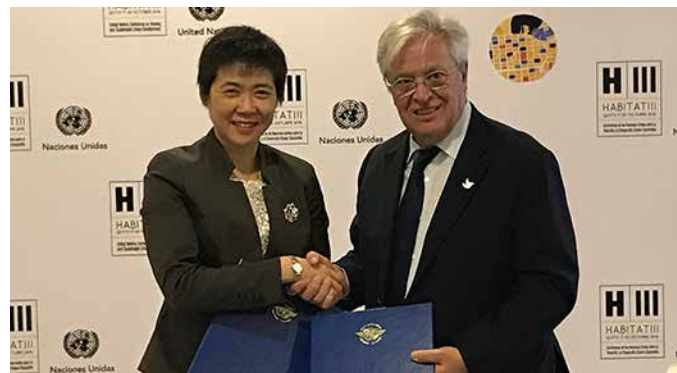
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BEHIND THE SCENES, ICAO ADMINISTRATION TEAM MAKES ASSEMBLY RUN SMOOTHLY

A record number of attendees – so many that they could not all fit in the main conference room. A record number of working papers and other documents – 30% more than previously. A revamped electronic voting system. Livestreaming of open sessions on YouTube. A new "app" for mobile phones and tablets. Expanded WiFi coverage. And, as typical, translation of everything into the six official United Nations languages.

The 39th ICAO Assembly posed a herculean task for the Organization's Bureau of Administration and Services (ADB) and, collaborating with the other bureaus of the Secretariat, they managed a virtually flawless event.

ELECTRONIC VOTING – INSTANT RESULTS

The most visible example of Administration's behind-the-scenes efforts was the electronic voting system used for electing the 36 Member States of the ICAO Council. "This was one of the critical points of the whole Assembly," explained Vincent Smith, ADB Director, who joined the ICAO staff in January. "We had to make sure it was a credible process, which means the internal auditor was involved. The external supplier had to be onsite. And we ran the whole thing from our own servers."

"It was an area that was ripe for potential complaints, people questioning the process, much like in many countries where when people lose an election, the first thing they do is question the democratic process."

Smith's team went through "endless reviews, consultations, and full practices" to make sure the system was ready.

When it came time for the voting during the Assembly, it was first necessary to confirm the correct, accredited persons eligible to vote. They received electronic notebooks and personal identification numbers (PINs) to access the virtual ballot. Instructional videos were shown on how to use the voting system.

Once all 171 accredited States' delegates voted, the results were presented within 30 seconds. In the past, voting (when it was manual) took an entire day. This time, Smith said, "the entire thing took an hour from start to finish. Due process was followed; nothing was called into question. Everything went smoothly. It was one of the points that everybody was most concerned about … and most relieved over."

RECORD DOCUMENTS – OVERNIGHT TRANSLATIONS

The record number of working papers meant a record number of translations, each of which had to be translated into Arabic, Chinese, English, French, Russian and Spanish – and reviewed and approved – literally overnight. For each paper presented, there was a discussion on the topic among the delegates, and therefore meeting "minutes" were generated. The minutes were reviewed by the appropriate ICAO bureau and delivered to the translators by 8:00 pm each evening. The translators worked through the night so the documents could be made available (both online and in hard copies) when delegates arrived the next morning for the next Assembly session.

For late-day sessions, say, a discussion that concluded at 5:00 pm, that allowed only three hours to write and review the minutes in time for the translators to begin.

One of the critical points of the 39th Assembly – electronic voting for the ICAO Council – performed without a glitch, thanks to the preparation of the ICAO Bureau of Administration and Services team.

"Everything counts. Everything matters."

– Vincent Smith, Director
ICAO Bureau of Administration and Services (ADB)

REGISTRATIONS AND REQUESTS

Prior to the Assembly, the ADB was responsible for registration of the more than 2,200 delegates from 185 States and 56 Observer organizations. When the delegates arrived, the team processed them into the building, including security checks. They also managed seating arrangements. "It's not just one or two seats per country; it depends on the size of the delegation," Smith explained. Because of the record attendance, an overflow conference room needed to be set up, including audio and visual connections.

ADB also had special requests. For example, the European Union countries had more than 200 attendees, and wanted a meeting room for an hour each morning for their internal discussions. The room then had to be re-set for the plenary and breakout sessions. Smith admitted, "A lot of juggling goes on."

Each day at 5:30 pm, representatives of the ICAO bureaus gathered for a coordination meeting – lessons learned, plans for the next day. "Everyone knew that timelines were very short and what they had to do," said Smith.

The ADB team included about 700 regular staff, supplemented by contractors and interns, many of them students at local Montréal universities. The were all trained on ICAO's standards and ethics, as well as how to be professional. With attendees coming from all around the world, they also needed to understand cultural sensitivities of how to address different people. "A lot of work goes into the presentational point of view," Smith explained, "because that's the first thing that people see."

TEAM, TRUST, PREPARATION

Smith's experience for such a hot-seat role included 21 years with the UN, 18 of those at emergency duty stations, trying to keep the peace in war zones.

"What I learned right from the start is that you build a team, build trust and give them confidence," he said. "I'm averse to micromanagement. I land on an issue when I have to; otherwise I withdraw and let people get on with it. They know they can come to me for support when they need it."

The next element is preparation. "We have a proper process and then you go through lots and lots of practices. With each practice you iron out things you hadn't thought of before. When something happens, like in Kabul when a compound was attacked, it's too late to assemble the team, too late to establish the procedure. It's all got to be automatic. It doesn't matter what the consequences are; you apply the same philosophy. You're not guaranteeing it, but you're really maximizing your chances of succeeding."

After the Assembly, Smith met personally with every staff member, thanked them, and passed on the positive feedback he had received from the delegates, Council members, and Secretariat colleagues. "They were extremely grateful for the team spirit between bureaus and with our clients."

"I want to make sure each person on the team is aware that their job makes a difference and give them examples of where it made a difference. Everything counts. Everything matters." ∎

Members of the ICAO Bureau of Administration and Services team, led by Vincent Smith (centre in grey suit).

STATE PERSPECTIVES ON THE ICAO 39TH ASSEMBLY

BURKINA FASO

"The participation of Burkina Faso to the 39th Assembly of ICAO was a great privilege in regard to the unprecedented number of participants and issues at hand, which forcibly include the GMBM scheme. The historic success achieved in effectiveness and efficiency is mostly due to the tremendous efforts of the workforce of ICAO. Indeed, ICAO Assemblies pose a number of complex policy challenges for States, but these are much easier to effectively manage and resolve when the event's Organization is as smooth and efficient as we encountered at this years' 39th Session. Bravo and continued success to all stakeholders!"

CHINA

"The 39th Session of ICAO Assembly provided a forum for all Member States and relevant stakeholders to exchange views extensively and thoroughly on facing challenges and finding solutions for the future development of international civil aviation, where the spirit of Uniting Aviation was demonstrated through the joint efforts of all people caring for aviation. We wish to commend ICAO for making a successful event."

FRANCE

"France believes A39 was an historic vintage for ICAO by the range and depth of issues covered. Adoption of the CORSIA resolution was the session's highlight, bringing international aviation in sync with goals and achievements set in the Paris COP21 agreement. Beyond GMBM, a lot of progress was made on many topics, such as aviation safety and security, which are crucial for the development of international aviation. The mobilization of every stakeholder was unprecedented and we wish to particularly thank the ICAO Secretariat and our fellow States for making A39 such a productive event. The bar is high for A40!"

SPAIN

"This was an historical Assembly, and thanks to the professional support of the Secretariat officials it was also a resounding success. Now we have a challenging way ahead, and as the Spanish poet Machado said: "Caminante no hay camino, se hace camino al andar" *(Wayfarer, the only way is your footprints and no other. Wayfarer, there is no way, make your way by going farther)."*

STATE PERSPECTIVES ON THE ICAO 39TH ASSEMBLY

SUDAN

"The 39th Assembly is different than all previous Assemblies in terms of participation and in achieving maximum success in conducting its work. This was the first Assembly that had the opportunity to actively promote the principle of "No Country Left Behind" adapted by ICAO as an initiative to forward its objectives. In this respect, although we are glad that it is being pushed forward, we do also sense that there is a need to do more to realize it. We appreciate very much the support provided by the President of the Council and the Secretary General in their active interest to promote safety within the Khartoum FIR and enabling Sudan and South Sudan to sign off the Memorandum of Agreement on the margins of the Assembly."

UNITED KINGDOM

"The 39th ICAO Assembly in particular posed a massive challenge in terms of preparation and management. The ICAO Secretariat certainly rose to the occasion to produce an event that ran smoothly and efficiently and meant the focus could remain on achieving results. We would like to thank ICAO and its staff for the commitment and support we received – it was certainly appreciated."

UNITED STATES

"The United States is proud to have been an active participant in making the 39th Session of the ICAO Assembly one of the most successful and efficient assemblies ever. Collectively, the international community tackled a large number of high-priority civil aviation issues covering the full range of areas under ICAO's purview. We commend the tremendous dedication and hard work of the ICAO Secretariat, which enabled the Assembly President, the Council President and all of the Member States to cover such a large and important agenda in an efficient and effective manner. On behalf of our government, we wish to thank ICAO, the Assembly President, the Council President and our fellow States for making this such an outstanding event."

ICAO WORLD AVIATION FORUM

The high-level participants at the second ICAO World Aviation Forum (IWAF) agreed to work together to significantly boost the current 4.2% of annual Official Development Assistance (ODA) financing presently earmarked for air transport development globally. They also reaffirmed the critical importance of safe, secure and efficient air transport operations to the sustainable socio-economic development of cities, States, and regions, while exploring new means of creating momentum for greater cooperation to optimize these benefits.

The event at ICAO's Montréal Headquarters brought together more than 800 senior government, air transport industry, UN, finance, development, and other leaders , forging progress on new aviation partnerships for sustainable development.

"As we embark on this year's Forum, we must remind ourselves of the enormous transformational power of aviation to improve the lives of people everywhere," highlighted ICAO Council President Dr. Olumuyiwa Benard Aliu in his keynote address. "Air transport connects States to regional and global markets, which in turn enhances travel, tourism and trade. It is the most efficient, and at times the only viable means to deliver humanitarian aid during crises, and for landlocked and small-island developing States especially, it represents a veritable lifeline, a critical aerial bridge to the rest of the world."

Event panel discussions called on ICAO and world governments to accelerate the implementation of international civil aviation global standards and policies, plans and programmes, in support of ICAO's *No Country Left Behind (NCLB)* initiative. They also called for sufficient resources to be made available for sustainable aviation development, and for States to include air transport infrastructure, modernization and related priorities at the heart of their national development strategies.

Angela Gittens, Director General of Airports Council International (ACI), said, "regulators, financial bodies and aid agencies need to actively support the development of business cases that demonstrate the economic, social and environmental benefits of aviation as an accessible medium to all."

Her counterpart at the Civil Air Navigation Services Organisation (CANSO), Jeff Poole, told the working breakfast session, "Modernizing ATM (air traffic management) is critical to cater for growth in traffic and to ensure efficient airspace." He said States targeted by *NCLB* can "leapfrog" to the latest technologies, but need help with implementation. One issue is that "investment in ATM is treated in isolation rather than as part of a holistic aviation and economic strategy."

"All States should have access to the significant socio-economic benefits of safe and reliable air transport"

– Dr. Olumuyiwa Benard Aliu,
ICAO's Council President,
at the 2nd ICAO
World Aviation Forum

Dr. Elijah Chingosho, Secretary General of the African Airlines Association (AFRAA), encouraged consideration of aircraft as infrastructure to facilitate the modernization of African fleets cost-effectively. "In Africa, development financing institutions have traditionally provided concessionary and affordable financing for infrastructure projects such as airports, runways and air navigation facilities. However, there is no point in having a world-class airport with limited aircraft movements."

Regulatory oversight was the focus for Andrew Herdman, Director General, Association of Asia Pacific Airlines (AAPA). "Effective regulatory oversight is a fundamental requirement for sustainability," he stated. "The role of regulatory oversight is a quality assurance safeguard." He cautioned against the "latent risks of weak regulatory oversight."

Alexandre de Juniac, new Director and CEO of the International Air Transport Association (IATA), said, "there are no silver bullets to accelerate *NCLB*." He outlined key steps for success as:
- promoting the benefits of aviation across all departments of government,
- reinforcing the implementation of global standards through training,
- real alignment and partnerships between industry and government,
- solid business cases,
- including aviation in national strategies.

International Business Aviation Council (IBAC) Director General Kurt Edwards advocated for "flexible airspace access solutions, including impact assessments, respectful of the needs of all air transport stakeholders." A holistic view of infrastructure planning is key: "it needs to take into account the unique needs of all users in order to benefit comprehensively from the wider range of aviation activity in localities around the world."

ICAO Secretary General Dr. Fang Liu listed several of the important new partnerships forged during the event with the European Union, Germany, France, ACI, World Bank, UN-Habitat, and others, while noting that ICAO will explore new ways of building on these successes.

In her closing remarks, Dr. Liu suggested a bold new direction for IWAF events: "ICAO will consider organizing future Forums as one-stop facilities where projects looking for funding would become the main presenters, using their time on stage to substantiate their business cases to the audience of donor, development, financing and related stakeholders ICAO would assemble for them. We would also have a key role in helping States to prepare these business cases, notably by ensuring that objective metrics are employed, that the return on investment is properly evaluated, and importantly so that all national goals being identified are fully aligned with established ICAO global and regional planning."

The event concluded with the issuance of an official Communique (see page 31). ■

SMALL ISLANDS ARE AVIATION-DEPENDENT

Mr. Boubacar Djibo, Director of the Air Transport Bureau (ATB), ICAO, led a discussion at the ICAO World Aviation Forum on *Connectivity in Small Island Developing Countries*. Small Island Developing States (SIDS) are a distinct group of developing countries with specific social, economic and environmental vulnerabilities and therefore require special support from the international community.

Common challenges faced by SIDS include:
- Narrow resource base, depriving them of the benefits of economies of scale;
- Small domestic markets and heavy dependence on a few external and remote markets;
- High costs for energy, infrastructure, transportation, communication and servicing;
- Long distances from export markets and import resources;
- High volatility of economic growth;
- Fragile natural environments and little resilience to natural disasters.

As of 2014, 1.4 million jobs and US$25.3 billion of economic impact were generated by air transport in small islands. More than half (54%) of international tourists arrive by air. Tourism accounts for over one quarter of the GDP in at least seven SIDS.

Examples of the more than 50 SIDS around the world are Aruba, the Bahamas, Cape Verde, Cuba, Fiji, Jamaica, Maldives, Palau and Seychelles.

"Tourism expansion relies heavily on air transport, providing substantial economic benefits for anyone involved in the value chain of tourism, said Mr. Djibo. "However, separate sectorial policies on air transport and tourism result in a fundamental and too often even conflicting disconnect which constitutes a severe constraint on the development of travel and tourism."

Panel participants for the SIDS discussion included Mr. Jacques Evelt Eveillar, Minister of Public Works, Transport and Communication, Haiti; the Hon. Mr. Ped Peter Shanel Agovaka, Minister of Communication and Aviation, Solomon Islands; Mr Benjamina Ramarcel Ramanantsoa, Minister of Transport and Meteorology, Madagascar; H.E. Mr. Abdallah Said Sarouma, Vice President in charge of the Ministry of Transport, Post and Telecommunications, Comoros; and Mr. Charles Schlumberger, Lead Air Transport Specialist, World Bank.

COMMUNIQUE: ICAO WORLD AVIATION FORUM 2016

Excerpts from the Concluding Communique of the 2nd ICAO World Aviation Forum

We will work to renew cooperative momentum to:

- *Identify* and enhance the **partnership and financing** required to accelerate the implementation of international civil aviation global standards and policies, plans and programmes in support of the *No Country Left Behind (NCLB)* initiative;
- *Ensure* sufficient **resources for sustainable aviation development** by placing aviation in the heart of national development strategies;
- *Highlight* that **aviation receives limited funds** and resources to support its future sustainable development;
- *Reaffirm* that **strong, long-term partnerships** between States, international and regional organizations, the industry, the donor community as well as financial institutions, are essential to mainstream the priorities of the aviation sector into the *NCLB* initiative.

Mindful of these points, IWAF participants will furthermore:

- 1) *Acknowledge* the **steady progress being made under the *NCLB* initiative** and indicate a strong will to accelerate its implementation, which aims to provide direct support to States requiring the most assistance.

- 2) *Recognize* the **special needs and structural characteristics** of Small Island Developing States (SIDS) and Landlocked Developing Countries (LLDCs), as well as Least Developed Countries (LDCs), in the coordination, prioritization, facilitation and implementation of assistance programmes through the ICAO Aviation Partnerships for Sustainable Development.

- 3) *Request* ICAO, in cooperation with the United Nations, States and international organizations, develop a universally accepted **methodology to measure aviation's gross domestic product** (GDP) relative to overall economic activity.

- 4) *Emphasize* the urgent need to strengthen capacity for States to **develop business cases** and analyze high-quality disaggregated aviation data, which can be used to accurately estimate the requirements for identified projects, reduce investment risks and uncertainty, and evaluate the return on the investments.

- 5) *Encourage* States to **share information, best practices, data and statistics, and training and guidance**, in the development of their aviation industry including funding and financing of infrastructure, capacity building, emission reduction and safety and security improvements efforts.

- 6) *Encourage* States to **establish autonomous entities to operate airports and/or air navigation services** in view of the experience gained worldwide.

- 7) *Encourage* States to take pragmatic measures to **build a transparent, stable and predictable investment climate** to support aviation development.

- 8) *Reiterate* that **innovation and technology enhances global connectivity** while improving economic and operational efficiency of the civil aviation system in view of safety, security, life-cycle costs, resilience against natural disasters and environmental sustainability.

- 9) *Reaffirm* ICAO's leadership role in developing a **coherent global regulatory framework** for civil aviation, removing impediments to sustainability of air transport and creating better business environments to promote tourism, trade and investment.

10) Welcome the commitments by:

- *States:* develop their respective **civil aviation master plans** linked to national development plans, in line with the global and regional aviation plans and priorities established by ICAO;
- *International and regional organizations:* **broaden outreach** in States to obtain the engagement of high-level authorities beyond the transport sector;
- *Financial institutions:* **alleviate constraints** on financing development for the aviation sector;
- *Industry:* clearly demonstrate where financing is required through **gap-analyses**;
- *All stakeholders:* establish **strong partnerships** with a view to mobilizing and coordinating all available resources for sustainable aviation development.

- 11) *Welcome* the work of the United Nations Secretary General's High-Level Advisory Group on Sustainable Transport, highlighting the need to **integrate all sustainable transport planning efforts** with a balanced development of transport modes; create supportive institutional, legal and regulatory **frameworks at the national level**; and foster an **informed, engaged public** as a crucial partner.

- 12) *Acknowledge* that the implementation of the *NCLB* initiatives will contribute ultimately to the **realization of international development priorities**, particularly the United Nations 2030 Agenda for Sustainable Development.

"WE ARE IN THE BUSINESS OF FREEDOM"

AN INTERVIEW WITH ALEXANDRE DE JUNIAC, DIRECTOR GENERAL AND CEO, INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

As the seventh person to lead the International Air Transport Association (IATA), Alexandre de Juniac has a tough act to follow in succeeding the passionate and outspoken Tony Tyler as Director General and CEO.

Nonetheless, Mr. de Juniac brings his own lengthy set of credentials to the role: almost three decades of experience in the private and public sectors. This includes senior positions in the airline and aerospace industries and the French government. He served as Chairman and CEO of Air France-KLM (2013-2016) and Air France (2011-2013). He also served on the IATA Board of Governors since 2013. Mr. de Juniac spent 14 years at French aerospace, space, defence, security and transportation company Thales and its predecessor companies. He also held positions in the French government at the Conseil d'Etat, the Department of Budget and in the Ministry of Economy, Industry and Employment as Chief of Staff to then-Minister Christine Lagarde.

ICAO Journal Editor Rick Adams questioned Mr. de Juniac a few weeks after he became DG/CEO in September.

This is the eighth in a series of interviews with world aviation leaders.

What challenges have you found in your IATA role thus far, and what experiences in your background do you think prepared you for this position?

Over my career I have seen the industry from various perspectives. While at Thales the focus was on infrastructure and aircraft equipment manufacturing. When in government I viewed the industry from the perspective of public policy and economic issues. And then five years at Air France and Air France-KLM gave me a good grounding in how airlines operate and the challenges that they face. I also served on the IATA Board of Governors, so I was involved in industry issues. The job of leading IATA is truly unique. You see the whole industry from 40,000 feet – 265 airlines and the collective challenges that they face.

From that perspective, the importance of global standards really comes into focus. IATA's job is to work with stakeholders to make it easier for airlines to provide the connectivity that the world needs. When we are working with our members to position the industry for future success, the focus is squarely on global standards – getting governments to adopt or conform to global standards. You know these things inherently when you work in the industry. But you get a very clear view of this at IATA – and at ICAO as well.

In taking on the leadership of IATA, you can expect some continuity and some change. My predecessor, Tony Tyler, saw the industry as a force for good in the world. I fully agree, but I have a different way of expressing the point. For me, we are in the business of freedom. Aviation makes our world a much better place. It gives people the means to better their lives. So I plan to strongly argue against proposals that would restrict the freedom to travel or to trade. It's a worrying trend for air transport and, more broadly, for the world which grows stronger and more prosperous when we interact with others across borders.

I must also confess that I am not very patient. The pace of change in our world is accelerating. That's a challenge for many governments – which move more slowly. And it's a challenge for air transport. Here we are in 2016 trying to drive a change to common XML electronic communication standards for cargo handling. It is something that most others did a decade ago!

Our strong track record on safety is, of course, not the result of winning a race. We can never lose our focus on what it takes to provide ever-safer air transport and take whatever time is needed to do so. But on pretty much everything else I think that we need to accelerate.

Now that the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) has been adopted at the ICAO Assembly, what are the next steps for IATA's airline members with regard to monitoring, offsetting, and continuing to reduce carbon emissions? And what role might IATA play in convincing reluctant States to participate in the voluntary phase?
The new global market-based measure, CORSIA, is not the only solution to aviation and the environment that we are pursuing. It is a part of a solution or package of measures that also involves improvements in technology, modern infrastructure and more efficient operations. Together with CORSIA, these are the elements of our four-pillar strategy to combat climate change.

Over the next few years we will continue to work with ICAO on the technical side of CORSIA. This includes important things like the definition of carbon units and the kinds of credits that can be applied to CORSIA. We will also closely monitor the discussion among governments on how the system can fairly accommodate the special circumstances of fast-growing airlines or those that have already made significant investments to mitigate their climate change impact. IATA will also be working with our member airlines to build the needed capacity for monitoring, reporting and verification. They have a bit of a head-start because airlines already report much of the needed data to IATA. And, while many of our members have experience in the carbon markets, the industry's level of understanding is not uniform. So there will be some capacity building in this area as well.

As an industry, we want the broadest participation possible by governments in the voluntary phase. There is an impressive mix of developed and developing nations among them. When you have nations as diverse as the US, China, Zambia and the Marshall Islands agreeing to participate, you know that you are on solid ground. It is a pretty strong argument to encourage the participation of others – which I plan to do tirelessly.

"I would like to see the principles of a risk-based approach at the core of *GASeP*"

Security continues to be a concern – inconsistent application of airport security procedures around the world, cybersecurity concerns, terrorism at airports such as Brussels, unruly passengers. What solutions would IATA like to see emphasized in the new ICAO *Global Aviation Security Plan* in development?
The issue of security is hovering over our industry. Terrorists are targeting aviation. That was clear from the terrible attacks at airports earlier this year. And travel is impacted, even when aviation is not the specific target. But let's also remember that terrorism has very few boundaries. We have seen attacks in community centres, shopping malls, office buildings, supermarkets, night clubs, public streets, bars, stadiums and so on. The threat of terrorism must be addressed as part of national security strategies under the leadership of governments supported by their national intelligence, policing and military capabilities. The new UN Resolution 2309 on aviation security signed in September is reinforcing that point.

It is also clear that keeping aviation secure needs the combined efforts of industry and government. We welcome ICAO's commitment to lead the development of the ICAO *Global Aviation Security Plan (GASeP)* and IATA is committed to be a part of the process by contributing the industry perspective.

I would not want to pre-judge the *GASeP* development process by making very specific demands when we are at the beginning of the journey involving many partners with unique and legitimate perspectives on our common goal – keeping flying secure. But I hope that the *GASeP* can be an effective guide for governments to implement clear, simple, nimble, sustainable and smart regulation to manage and mitigate security threats. Security is a global challenge that must be met with the effective implementation of global standards. But it must avoid hard-wired prescriptions that are sure to be obsolete before the ink is dry if not constantly adjusted to the threat environment and appreciative to the security improvements already in place. This is the equivalent of a "performance-based" approach that will allow industry players and governments alike to effectively align and adjust their actions to achieve effective results rather than tick boxes.

How can we deliver that? Conceptually, I would like to see the principles of a risk-based approach at the core of *GASeP*. And the plan should be sufficiently flexible to effectively mitigate threats that emerge and evolve very quickly, minimize the impact of any successful attack and develop greater resilience capabilities. The *GASeP* also needs to enable greater speed than we currently are able to deliver. And I hope that there will be a great deal of emphasis on capacity building so that governments can have confidence in the security systems of their partners – in normal operations and in their ability to scale-up (or down) as threat levels change. Alongside that, it is also critical that information sharing is more effective than it is

today – among governments and with industry. We must address what information is exchanged and the exchange mechanism or process.

Aircraft tracking has slipped off the front page for the moment, but there has been progress. How are some of IATA's members implementing 15-minute and one-minute tracking systems?

Many airlines already track their aircraft through a variety of methods. The ICAO Council has adopted a normal aircraft tracking standard, making all operators responsible for tracking their aircraft throughout their area of operations. It has established a tracking time interval of 15 minutes required in oceanic airspace and recommended elsewhere. The Standard and associated SARPs will be applicable from November 2018. In a few years, new systems and technology, if adopted universally by air navigation service providers, will allow for global surveillance coverage. The adopted Standard takes this into account.

I would say that it is happening as fast as could be hoped for in view of the challenges involved in developing a global Standard that will be acceptable to all the members of ICAO.

Alexandre de Juniac, Director General and CEO, IATA

How are the world's airlines faring currently? In what regions is there strength, and where are members still struggling?

We are headed for a record year in terms of industry profits. With airlines expected to show a combined global industry profit of nearly $40 billion this year, we are in record territory. And for only the second year in a row and the second in the history of aviation, the industry's return on invested capital (9.8%) is exceeding the cost of capital (6.8%). On a net profit basis, we are looking at a 5% return. Mind you, we have to keep this in perspective: what is a record performance for the airline sector is the bare minimum of what is expected in other industries.

Airlines are in very different circumstances depending on where they are located. For example, about half of the industry's profits are being generated in North America. Our colleagues in Europe have seen improvements, but they still suffer under the burdens of high taxes, inefficient and inadequate infrastructure and onerous regulation. Brazil is in crisis. The Asian carriers are the biggest players in cargo – so even if passenger demand is growing strongly, an important part of their business is suffering. Even the carriers in the Middle East have moderated their growth, reflecting the impact that lower oil is having on their region, as well as the weaker economies.

I am an optimist by nature – business people always see the next opportunity. There is still tremendous growth potential out there. But it is also a time for some prudent caution given the slowdown in world trade, weak economies and significant political risk.

What is your view on progress toward the next-generation ATM system, i.e. ADS-B, PBN, Next Gen, SESAR, etc.? Where is greater emphasis needed?

When I look at the growth projections for air traffic – a doubling in passenger demand by 2035 — I get concerned that we may be heading for an infrastructure crisis. In Europe, the Single European Sky initiative is failing because of a lack of will at the state level. Billions of euros are being spent on new technology, but without political pressure to reform, the inefficiency will not improve. Earlier this year we did a study showing that the foregone benefits to the European economy resulting from this failure could exceed 245 billion euros in 2035.

In the United States, the NextGen air traffic management modernization is being delayed by a politicized budgeting process and special interests. This is preventing much-needed improvements agreed to by nearly all airlines and air traffic controllers. There are also challenges in the fast-growing regions as well, including the Gulf and China.

Of course, we also face huge challenges in terms of airport infrastructure. We have bottlenecks in many major markets such as New York, London, Bangkok and Mumbai. The latest news from the UK government regarding the need for a third runway for Heathrow is a positive development, but the cost of building it must be kept at a competitive level and its usefulness must not be crippled from the start by draconian operational restrictions. ■

CABIN SAFETY ASPECTS IN ACCIDENT INVESTIGATIONS: A CRUCIAL LINK

MARTIN MAURINO
M.Eng. is Safety, Efficiency and Operations Officer at ICAO. He heads the ICAO Cabin Safety Programme. Before joining ICAO, he held safety analysis and safety management roles at Transport Canada and the International Air Transport Association (IATA). Martin began his career in aviation as a cabin crew member at Air Canada.

Cabin safety aspects, including survival factors, should be addressed as part of the aircraft accident or incident investigation process. However, these are often overlooked. States and industry may be missing out on the possibility for further safety enhancements.

A review of ICAO accident data from 2009-2013 involving commercial scheduled air transport indicated that the majority of accidents (87.7%) resulted in no fatalities. The fact that most occupants survive accidents can be linked to improvements made in occupant protection. These improvements resulted from survival factor investigations which address cabin safety aspects during accident investigations.

As highlighted by some of the cases on page 37, findings and recommendations from past accident investigations have led to significant improvements in the fields of cabin safety and aircraft manufacturing over the past 30 years – 16G seats, lavatory smoke detectors and fire extinguishers, floor proximity emergency escape path markings, new requirements for cabin and insulation materials, and inclusion of human performance training for cabin crew members. These improvements have increased the survivability of occupants involved in later accidents and helped reduce fatalities among passengers and crew.

The goal of a cabin safety investigation is to analyze all aspects of an accident or incident, in relation to the actions of cabin crew members and passengers, as well as the cabin environment, and relevant systems and equipment on board, in order to identify safety deficiencies and lessons learned. The investigation may result in the development of recommendations related to operator procedures, fatigue (such as scheduling practices), training, safety and emergency equipment, aircraft systems, etc.

ICAO recently published the *Manual on the Investigation of Cabin Safety Aspects in Accidents and Incidents* (Doc 10062) to encourage the uniform application of the Standards and Recommended Practices (SARPs) contained in Annex 13 – *Aircraft Accident and Incident Investigation*, particularly in relation to survival aspects. It provides information and guidance to States on the procedures, practices and techniques that can be used when investigating cabin safety aspects of an occurrence. It is the first ICAO manual dedicated solely to cabin safety in investigations.

The new manual was developed with the involvement of the ICAO Cabin Safety Group (ICSG), an international, joint industry-regulatory group comprised of cabin safety experts from civil aviation authorities, airlines, aircraft manufacturers and international organizations. The International Society of Air Safety Investigators (ISASI) and the US National Transportation Safety Board (NTSB) were among the members who provided support, advice and input. The content of the manual is consistent with guidance materials contained in the *Manual of Aircraft Accident and Incident Investigation* (Doc 9756).

The new ICAO manual provides recommended qualifications and competencies for cabin investigators (CI), enabling appropriate personnel to carry out necessary functions during an

investigation. ICAO defines a CI as the person responsible for examining and documenting the factors that affect the survival of occupants involved in accidents or incidents. In addition to survival factors, the CI is responsible for determining factors that affect the safety of flight and contribute to an occurrence and its outcomes. ICAO developed a competency framework which encompasses performance criteria, skills, and knowledge that should be demonstrated prior to the issuance of a CI qualification. Guidance includes the content of the CI training programme to assist States and industry implementing such training. The content can be adapted to any role such as a CI employed by an accident investigation authority or by an air operator.

In order to assist States and industry to investigate cabin safety aspects in occurrences, the ICAO manual contains detailed guidance on the types of events which often include a cabin safety dimension and are classified as accidents. These include: evacuation, ditching or inadvertent water contact, fire, smoke, fumes, turbulence, decompression, aircraft damage, and fatal or serious injuries (e.g. where aircraft may not be damaged).

For each of these types of occurrences, the manual contains templates which assist investigators in addressing all areas of the survival factors / cabin safety portion of an investigation. These templates explain what specific information to collect and document and why (the objective of the analysis). Information is presented under six main categories:

1. General information that should be gathered on the occurrence;
2. Documentation that needs to be reviewed from several sources (operator, State of the Operator, aerodrome, etc.);
3. Aircraft and cabin-specific information regarding the examination and recording of relevant aircraft systems (such as emergency exits and evacuation slides), safety and emergency equipment specific to the type of occurrence, and conditions of the cabin;
4. Human performance, including actions by cabin crew members and passengers;
5. Additional information which should be examined, specific to the occurrence, such as emergency response or search and rescue;
6. Guidelines for conducting cabin crew and passenger interviews.

In addition, the manual includes guidance for the investigation of incidents which do not meet the ICAO definition of an accident and do not require a formal investigation by the State of Occurrence.

It highlights that incidents can provide evidence of hazards or deficiencies within the aviation system and should not be overlooked. Guidance is aimed at the State of the Operator as well as the individual air operators, who may wish to conduct voluntary internal investigations. Templates contain detailed guidance for three types of incidents deemed of common concern to air operators: inadvertent slide deployments, medical events on board, and occurrences involving unruly passengers.

Safety improvements over the past 30 years are a result of cabin investigations. As demonstrated in past accidents, the role of cabin crew members expands far beyond that of service on board. Their primary duty is safety and they play a vital role in accident prevention and survivability of occupants in occurrences, such as aircraft evacuations. Further enhancements can be made by focusing a part of an investigation on cabin safety, a crucial link in development and maintenance of a safe aviation system. The ICAO *Manual on the Investigation of Cabin Safety Aspects in Accidents and Incidents* (Doc 10062) was developed to provide in-depth guidance to all stakeholders when conducting investigations in order to promote the examination of cabin safety aspects and further enhance safety in the future. ∎

"... the first ICAO manual dedicated solely to cabin safety in investigations."

ACCIDENT INVESTIGATIONS WHICH LED TO CABIN SAFETY IMPROVEMENT

Several accidents have had significant cabin safety components, and resulted in a turning point in the field of cabin safety. Some of those accidents and the improvements are highlighted here.

June 1983 – a DC-9-32 on a scheduled passenger flight from Dallas to Montréal via Toronto experienced a fire in the aft lavatory during cruise. The crew made an emergency descent, landing at the Greater Cincinnati International Airport. As the cabin crew and passengers began to evacuate, approximately 60 to 90 seconds after the exits were opened, a flash fire enveloped the aircraft interior. Twenty-three of the 41 passengers were fatally injured; the aircraft was destroyed by fire. Recommendations in the accident report included: requirements for smoke detectors and automatic fire extinguishers in lavatories; the need to review cabin crew training and procedures, including firefighting and crew resource management; and the implementation of passenger instructions on how to open emergency exits as an international best practice.

January 1989 – a B737-400 on a scheduled passenger flight from London to Belfast, Northern Ireland experienced a fan blade fracture in the No. 1 (left) engine. However, the flight crew shut down the No. 2 (right) engine and diverted to East Midlands Airport. The No. 1 engine subsequently suffered a major thrust loss and the aircraft crashed in a field near the embankment of a motorway. Of 118 passengers onboard, 47 passengers were fatally injured, and 74 occupants, including seven of eight crew members and one infant, sustained serious injuries. The investigation cited that many people onboard, including three cabin crew members, saw flames from the No. 1 engine but never informed the pilots. During the diversion, the captain made an announcement to passengers explaining that trouble with the right engine had produced smoke and it was shut down. Many of the passengers who saw the fire in the left engine were puzzled by the captain's reference to the right engine but never brought the discrepancy to the attention of the cabin crew. The report recommended that training exercises for pilots and cabin crew be introduced to improve coordination between flight and cabin crew in response to an emergency.

March 1989 – a Fokker F-28 Mk1000 on a scheduled passenger flight from Thunder Bay, Canada to Winnipeg via Dryden crashed off the end of the runway after take-off from the Dryden Municipal Airport. The aircraft failed to gain altitude after its attempted take-off and crashed. Nearly a third (21) of the 65 passengers and three of four crew members, including the captain, the first officer, and one of two cabin crew members, were fatally injured. Contamination on the wings resulted in a loss of control. The final report into the accident noted that one of the cabin crew members and several passengers had noticed ice build-up on the wings, but failed to transmit this information to the flight crew. Poor crew resource management and deficiencies in cabin crew training were also cited as contributing factors. Recommendations included the requirement for each operator to provide to the competent authority an operator cabin crew manual and the need for regulations setting the training and competency requirements for cabin crew members.

February 1991 – a B737-300 collided with a SA 227 AC (Metroliner) at Los Angeles International Airport. All 12 occupants onboard the turboprop as well as 23 of 83 passengers and two of six crew members onboard the Boeing were fatally injured. Several passengers seated aft of the overwing area who made their way to the rear of the cabin reported using emergency floor path lighting. (This improvement was a result of the DC-9 accident in 1983.) The accident report cited that the exit row briefing increased the preparedness of the B737 passengers for the evacuation.

August 2005 – a B737-300 on a scheduled passenger flight from Larnaca to Athens, Greece failed to pressurize due to the aft outflow valve being partially open. As the aircraft climbed, the cabin altitude warning horn sounded. The flight crew misidentified the warning as a takeoff configuration warning and attempted to troubleshoot. Meanwhile, the oxygen masks in the cabin automatically deployed; it is presumed that cabin crew became aware of the decompression. However, the aircraft continued to climb and both flight crew members succumbed to hypoxia. The aircraft continued to fly on autopilot until it suffered from fuel exhaustion and crashed. There were no survivors of the 115 passengers and six crew members onboard. It should be noted that cabin crew are (or should be) trained to know that a decompression is followed by a rapid descent. The fact that the aircraft kept climbing should have been a clear indication to them that there was a problem. In fact, the investigation concluded that one of the factors that could have contributed to the accident was the lack of cabin crew procedures to address events involving loss of pressurization and continuation of the climb despite passenger oxygen mask deployment. As a follow up to the accident, the European Aviation Safety Agency (EASA) issued a Safety Information Bulletin which recommends that operations manuals should be reviewed and amended to address such procedures (an intervention by cabin crew).

August 2005 – an A340-300 on a scheduled passenger flight from Paris overran the runway after landing at Toronto International Airport. The aircraft was not able to stop on the runway and departed the far end. It stopped in a ravine and caught fire. All 297 passengers and 12 crew members were able to evacuate the aircraft before the fire reached the escape routes. A total of 10 passengers and two crew members were seriously injured during the crash and the ensuing evacuation; the aircraft was destroyed by fire. The evacuation was impeded because nearly 50 percent of the passengers retrieved carry-on baggage. The report also stated that the evacuation was successful due to the training and actions of the whole cabin crew, deemed exemplary and professional. The report cited effective communication between the flight crew and the cabin crew members.

CYBERSECURITY
INFORMATION-SHARING IS CRITICAL TO BUILDING AVIATION SYSTEM RESILIENCY

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"… our enemies are also seeking the ability to sabotage our power grid, our financial institutions, our air traffic control systems. We cannot look back years from now and wonder why we did nothing in the face of real threats to our security and our economy."

– US President Barack Obama, State of the Union address, 2013

As organizations around the world and in all sectors are fast discovering, cyber attacks have now become the "new normal." It is no longer a matter of *if* an organization will be attacked. It is a matter of *when*. Luc Tytgat, Director of Strategy and Safety Management at the European Aviation Safety Agency (EASA), said recently that aviation systems were subject to an average of 1,000 attacks each month. In the US, Turkey, Sweden, Spain, and Poland, aviation systems infected with malware or security breaches have provoked delays, loss of information, and growing concern among public officials, regulators, aircraft operators, and passengers.

Critical infrastructure serves as the backbone of the economy, and is essential to the functioning of modern society. Protecting critical infrastructure such as power and water supplies, banking and financial services, and transportation systems from cyber attacks is a global issue that requires governments and industry to work together. The economic impact of a coordinated and sustained cyber attack on critical infrastructure is estimated to easily run into the tens of billions of dollars.

A University of Cambridge Centre for Risk Studies report released earlier this year, for example, found that a cyber attack on the power distribution network in South-East England would see up to 13 million people hit by blackouts, alongside disruption to a million rail and more than 300,000 air passenger journeys *each day*.

The potential of large scale cyber attacks against the aviation system is very real. The global aviation system is one of the most complex and integrated systems of information and communications technology (ICT). ICT is pervasive across the aviation ecosystem, from designing and manufacturing aircraft to flight operations, reservations and ticketing, maintenance, communications, navigation, surveillance, and air traffic management (CNS/ATM). As a growth sector, the global aviation system is also in a continual state of evolution through the rapid adoption of new technologies, and becoming increasingly interconnected through the integration of subsystems and the exchange of data.

The new generation of aircraft are IP-enabled, and by 2025 up to 70% of the global fleet will provide in-flight connectivity. Specific aircraft interfaces are being designed into the wider aviation ecosystem and easily interface with commercial-off-the-shelf (COTS) technologies. Connectivity enhances aircraft capabilities and passenger amenities, but it also increases the number of entry points into systems.

The CNS/ATM system is also becoming more dependent on digital technology enablers. However, certain CNS/ATM technologies were not designed with the cyber threat in mind. Automated Dependent Surveillance-Broadcast (ADS-B) – a cooperative surveillance technology and an integral component to the future air traffic system – is vulnerable to spoofing and jamming because it is unencrypted and unauthenticated, showing aircraft ID, altitude, latitude/longitude position, bearing, and speed. The same holds true for the Aircraft Communication and Reporting System (ACARS), and without encryption and authentication a malicious actor could inject false data or information into the system, causing havoc for air traffic control and flight operations.

Organizations that make up the aviation system must therefore develop and implement cybersecurity strategies to become more secure, vigilant, and resilient. This will involve more than just adopting good security policies and implementing technical fixes. It also requires that organizations collaborate more and acquire new intelligence about cyber threats through the sharing of information within and across industries. Governments have an important role to play to ensure the right conditions exist that will make this happen.

THE IMPORTANCE OF COLLABORATION AND INFORMATION SHARING

It is widely recognized that no one organization can have complete awareness of every security threat, vulnerability, and incident that it may face and the assets and processes that need to be protected. However, organizations in the same or similar business sectors that work in comparable environments often have the same security concerns, and sharing security information can help protect their individual organization and increase the effectiveness of the community's collective response to security attacks. To combat cyber crime, businesses and governments must improve their strategy around cyber threat information-sharing and collaborative communication. The more information organizations have about cyber crime techniques, the better they will understand how cyber criminals operate and what behaviours to look for.

In 2013, the Obama Administration took the step of issuing a Presidential Policy Directive on Critical Infrastructure Security and Resilience that strengthened the partnership with industry and encouraging new information sharing programs such as the creation of the Information Sharing and Analysis Centers (ISACs).

In December 2014, the *Civil Aviation Cybersecurity Action Plan* was signed by Airports Council International (ACI), Civil Air Navigation Services Organisation (CANSO), International Air Transport Association (IATA), International Coordinating Council of Aerospace Industries Associations (ICCAIA), and ICAO. The Action Plan committed to information sharing and the development and promotion of best practices in combating cyber crime.

Reflecting growing international concern, cybersecurity was on the agenda of the ICAO Assembly in September. ICAO urged member States to align cybersecurity responsibilities within respective governments and adopt a flexible, outcome-focused approach to deal with new kinds of risks. (See pages 16-17 for security-related conclusions at the ICAO 39th Assembly.)

In EASA's new cybersecurity centre, an Aviation Computer Emergency Response Team will help understand the nature of the threats, collect evidence of previous cyber attacks, identify security flaws and vulnerabilities, analyze and develop responses to cyber incidents or vulnerabilities. These efforts mirror recommendations by a 2015 US Federal Aviation Administration (FAA) advisory committee.

Nonetheless, many organizations in the aviation sector have not moved much past discussion and good intentions. Information is not adequately being shared for a variety of reasons, with organizations citing legal reasons or business concerns as the main factors. The reality is that businesses are apprehensive about sharing critical cyber information, even on a voluntary basis. This may be due to law, regulation, or contract, which can create obligations of secrecy and expose a company to legal liability risk if information is shared. There are also concerns over reputational risk, as a company that discloses its vulnerabilities may cause concern for its customers and shareholders. Disclosed vulnerabilities may even encourage further attacks.

To overcome the reluctance to share information, businesses need to better understand how they can share information safely and effectively and how they can realize the benefits from information sharing. Fundamentally, information sharing is a matter of trust, and governments can help create this trust by clarifying the rights and obligations of those who share and receive information as well as the protections that are offered when the arrangements on information disclosure and use are respected.

INFORMATION-SHARING COMMUNITIES AND TECHNOLOGY ENABLERS

Developing an effective information-sharing community requires careful consideration of the oversight and governance arrangements so that members can trust that their rights and obligations are clearly governed and that security measures are in place to prevent the sharing of unauthorized data.

Consideration must be given to the information to be shared, its timing, and the audience: anonymization, redaction, obfuscation, and delay in the release of the information must all be considered in order to minimise individual or collective vulnerability yet still inform recipients.

Building effective information-sharing communities can be further enabled through the employment of digital engagement tools and techniques.

Starting small and not initially setting too high ambitions for information-sharing communities will help build trust and the type of industry/government collaborative relationships that are needed to prevent, detect, and respond to cyber attacks.

This can be covered by the terms of use of an information-sharing platform, which will need to be actively enforced. Community membership criteria and a clearly defined member application

process are equally important to ensure members are vetted and duly authorised by their organizations to participate.

The benefits from participating in a digital information sharing community will also need to be realised quickly. The functionality of the technology platform should provide members with the ability to engage, share, and learn of best practices and insights. Value-added content such as statistics, trend analyses, and intelligence reports

provide additional benefits. Further, having agreements in place for cross-sector sharing will allow the community to learn from other industries' experiences and lessons learned from cyber attacks that may not yet have manifested in the aviation system.

The creation of such information-sharing communities could in turn help develop the collaborative relationships with government agencies to provide and be provided with cybersecurity threat information that will help all organizations – public or private – to prevent, detect, and respond to threats in a more timely and effective manner.

Some good practice examples of voluntary online and secure information-

sharing communities already exist. The Gloucestershire Safer Cyber Forum (GSCF) - www.safercybergloucester shire.uk - was launched by the Gloucestershire's Police Constabulary as a means to step up the fight against cyber crime. And, the CSO Alliance – www.csoalliance.com – was launched to tackle organized maritime crime, active in over 60 countries, through real-time intelligence-sharing and to promote a coordinated approach to maritime security, from piracy to smuggling, illegal boarding, theft, and corruption, as well as cyber crime.

The valuable human interactions that are facilitated through such secure online members-only platforms help to enhance "security through community,"

and this same philosophy and approach needs to be explored and encouraged for the aviation sector.

While there is always a risk that shared information will be misused by a recipient, the experience has been that the benefits of sharing security information within closed communities far outweigh the risks, especially when the digital engagement technology and process environment supports the relevant levels of functionality, security, and privacy that are needed by the community. Strength comes from working together – smartly and securely – utilizing the digital engagement technology that exists today. ∎

MARK YOUR CALENDARS

Events on the Horizon

Tentative List of Upcoming ICAO Events and Symposiums

ICAO Alternative Fuels Seminar

ICAO Headquarters, Montréal
8 – 9 February 2017

ICAO African and Indian Ocean (AFI) RPAS Symposium

Abuja, Nigeria
3-4 April 2017

ICAO Cyber Summit & Exhibition
Making Sense of Cyber - Security, Safety and Resilience

United Arab Emirates
5 -6 April 2017

ICAO/UNOOSA Aerospace Symposium (SPACE 2017)

Vienna, Austria
18 – 21 April 2017

ICAO/ACI Wildlife Strike Hazard Reduction Symposium (WSHRS)

ICAO Headquarters, Montréal
16 – 18 May 2017

Seminar on Environment
Global Market-Based Measure MBM Implementation Issues

ICAO Headquarters, Montréal
23 – 25 May 2017

Second Remotely Piloted Aircraft Systems Symposium (RPAS-SYMP/2)

ICAO Headquarters, Montréal
12 – 14 September 2017

ICAO Global Aviation Security Symposium

ICAO Headquarters, Montréal
19-22 September 2017