



| ICAO UNITING AVIATION

GLOBAL AVIATION SAFETY & AIR NAVIGATION UPDATES



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Directors General of Civil Aviation – Middle East Region,
Fourth Meeting (DGCA-MID/4)
17 – 19 October 2017, Muscat, Oman

18 October 2017

1



Global Aviation Safety & Air Navigation Updates

GLOBAL PLANS – VISIONS OF THE FUTURE





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39th

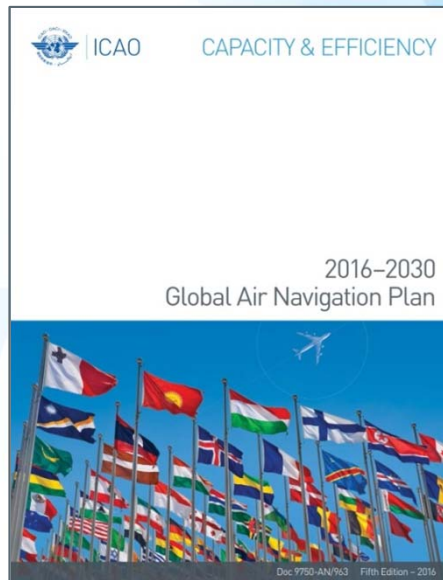
TRIENNIAL ASSEMBLY

ICAO HQ, MONTREAL, 27 SEP-07 OCT 2016



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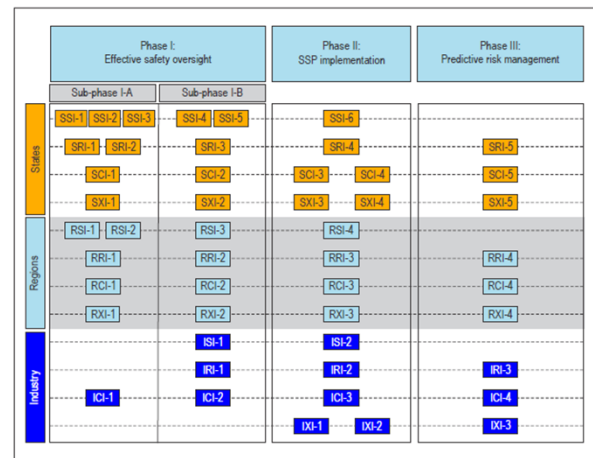


Contents of the 2017-2019 GASP



Effective safety oversight	SSP implementation	Predictive risk management
RASGs and other fora: mechanisms for sharing of safety information	RASGs: mature regional monitoring and safety management programmes	
States with EI > 60%: SSP implementation		All States: implement advanced safety oversight systems, including predictive risk management
	All States: SSP implementation	
All States: achieve 60% EI of CEs		
2017 (near term)	2022 (mid term)	2028 (long term)

GASP objectives and associated timelines



Global aviation safety roadmap diagram



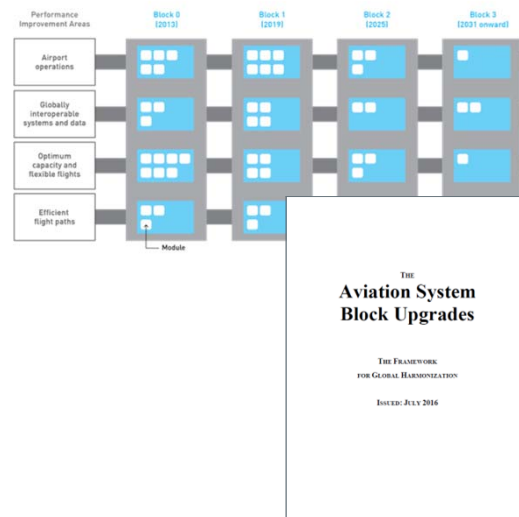
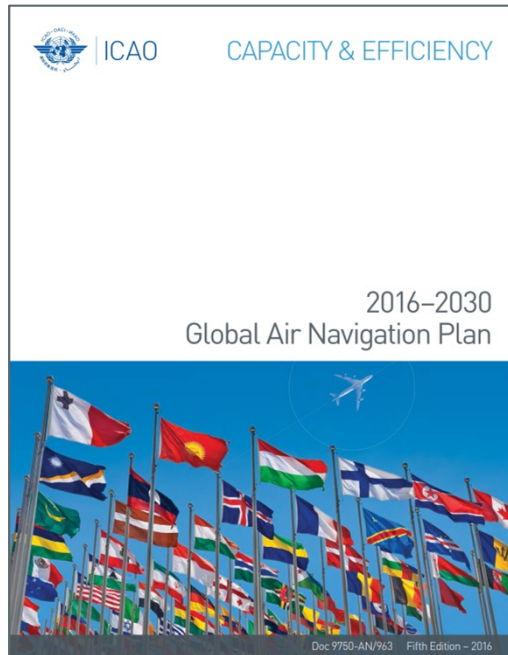
Proposals for Enhancement

- Global Aviation Safety *programme*
- Establishment of GASP-SG
- Focus on implementation support

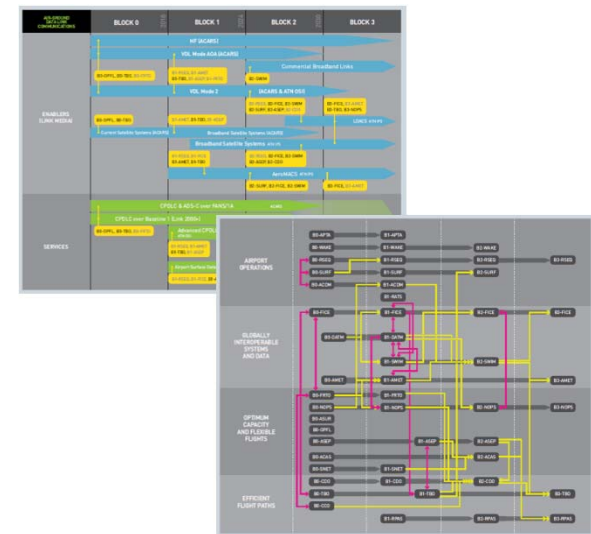




Contents of the 2016-2030 GANP



Aviation System Block Upgrades (ASBU) Methodology



Technology Roadmaps and Module Dependencies

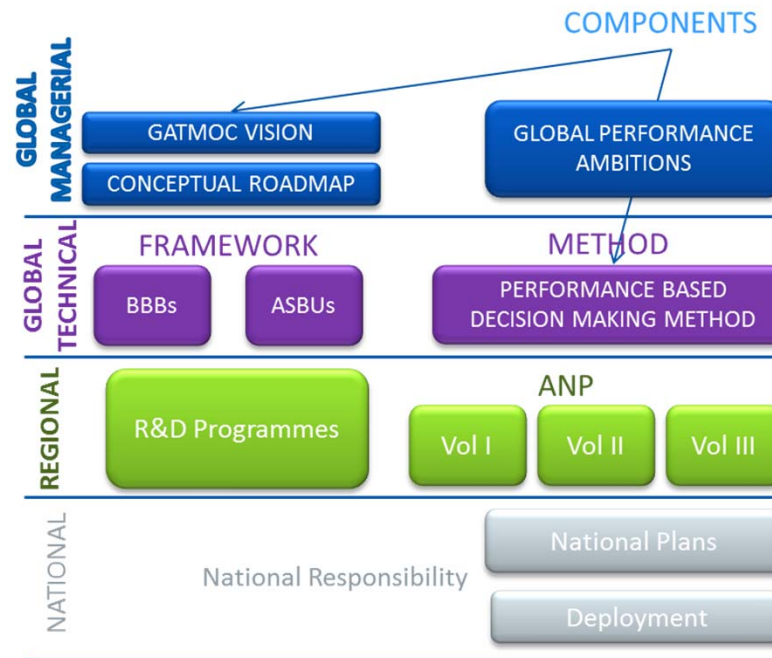
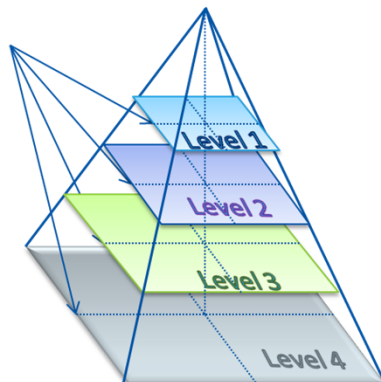


Proposals for Enhancement

2019 Update of GANP:

Creating a Multilayer Structure

LAYERS

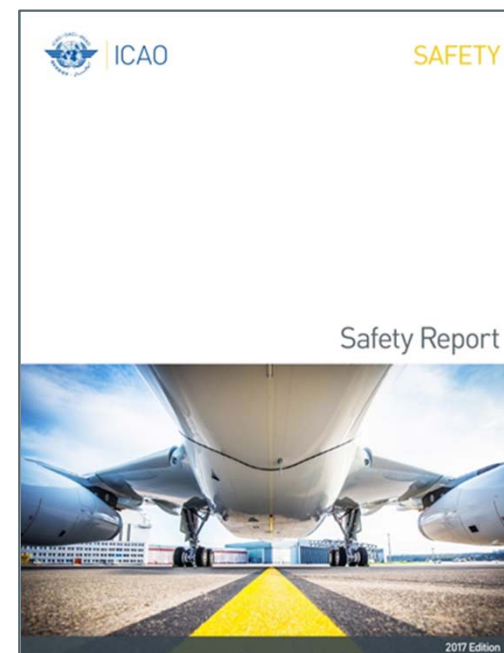




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Global Aviation Safety & Air Navigation Updates

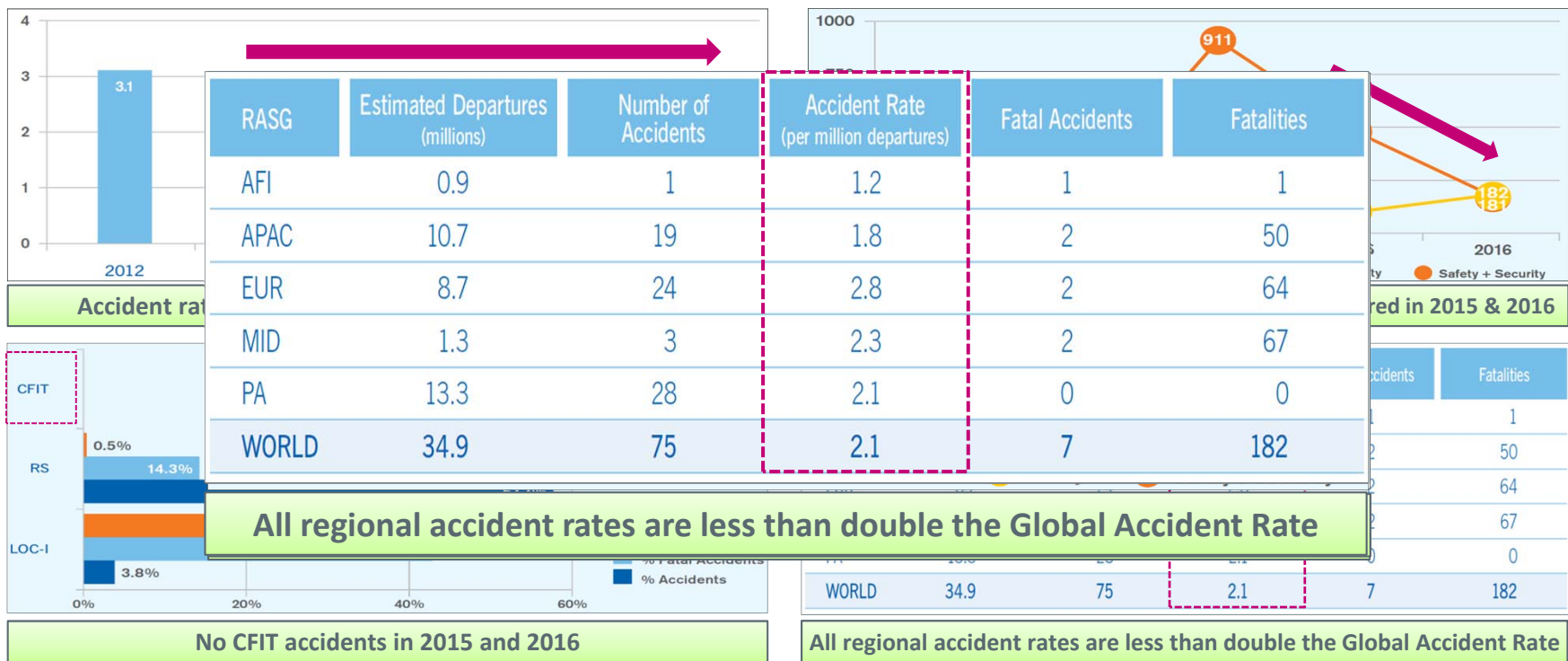
GLOBAL STATUS



Source: **2017 Safety Report** (<https://www.icao.int/safety/Pages/Safety-Report.aspx>)



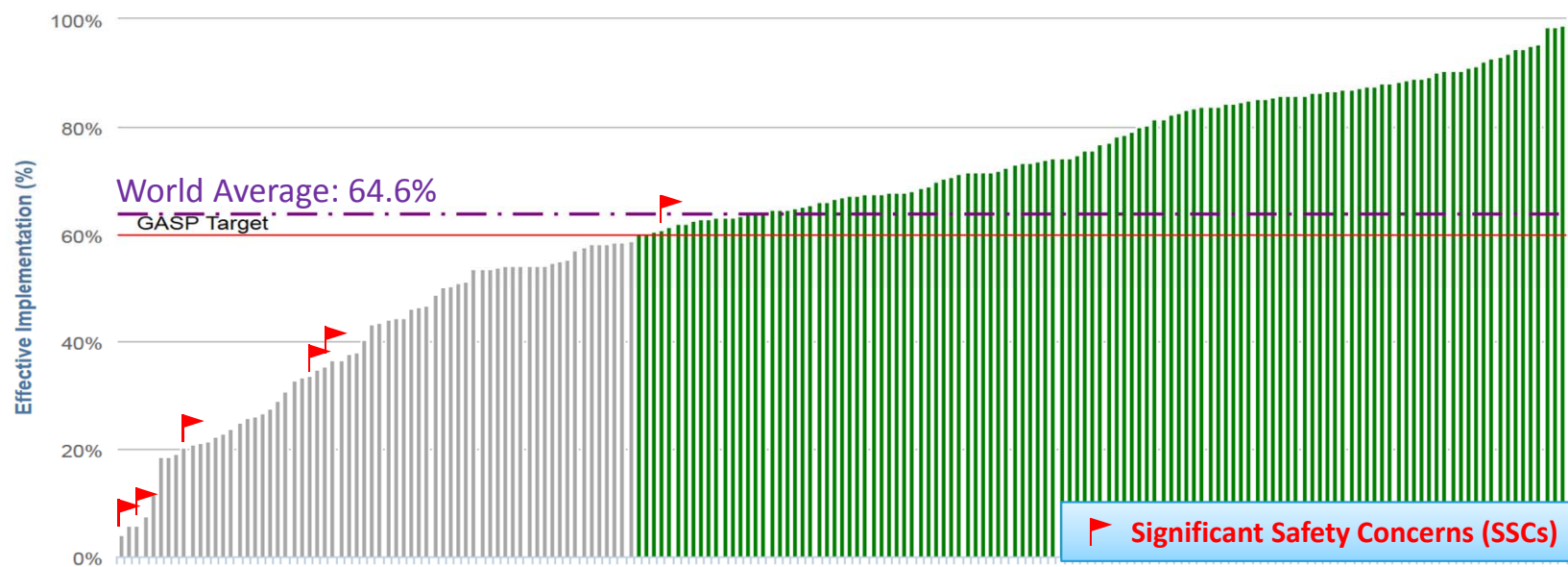
STATE OF AVIATION SAFETY



Source: 2017 Safety Report (<https://www.icao.int/safety/Pages/Safety-Report.aspx>)



Effective Implementation of State Safety Oversight



Effective implementation (%) results through USOAP CMA



Global Aviation Safety & Air Navigation Updates

REGIONAL STATUS – MID



Source: **iSTARS 3.0 – MAP Builder** (<https://portal.icao.int/space>)



Regional Safety Briefing

The thumbnail shows the top portion of the dashboard, including the ICAO logo, the title 'Regional Safety Briefing RASG-MID', and a small version of the dashboard table.

Dashboard	
Indicator	Value
State Safety Oversight - Group Average <i>Average USQAP Overall EI(%)</i>	70.11%
State Safety Oversight - State Levels <i>Percentage of States with USQAP Overall EI above 60%</i>	76.92%
Significant Safety Concerns (SSCs) <i>Number of SSCs</i>	0
Accident Rate <i>Number of accidents per mil. departures over preceding 5 years</i>	3.42
IOSA - Airlines <i>Number of IOSA certified airlines in the region</i>	26
IOSA - State Levels <i>Percentage of States with IOSA certified airlines</i>	80%
EU Safety List <i>Number of States with restrictions</i>	4
FAA IASA <i>Number of States rated as Category 2</i>	0
PBN Implementation - Runways <i>Percentage of instrument runways with PBN approaches</i>	61.01%
PBN Implementation - State Levels <i>Percentage of States having PBN approaches on all instrument runways</i>	46.67%

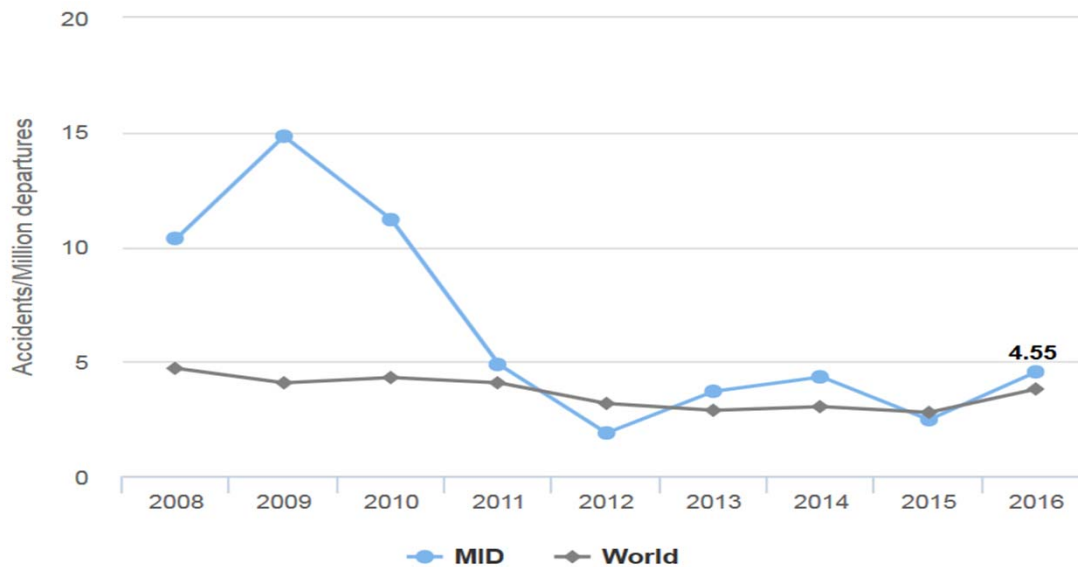


Source: *iSTARS 3.0 – Regional Safety Briefing* (<https://portal.icao.int/space>)



Global and RASG-MID Accident Rates

Scheduled commercial above 5700kg for 2008 - 2016



Accident rate for **RASG-MID** has been **above** the global average (except for 2012 and 2015)



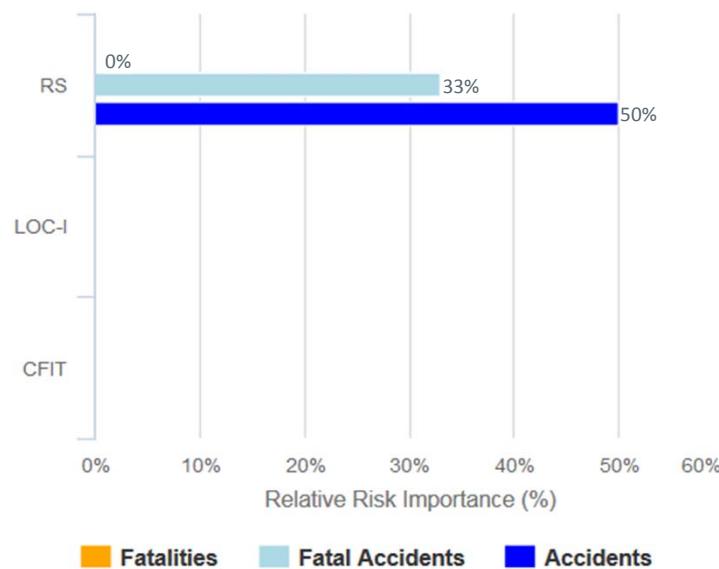
Source: **iSTARS 3.0** – Regional Safety Briefing (<https://portal.icao.int/space>)



Risk Distribution for the Top 3 Safety Priorities

Scheduled commercial above 5700kg for 2012 - 2016

**RASG-
MID**



Continue focus on the
Top 3 Safety Priorities
(RS, CFIT, LOCI)

Specifically
**Runway Safety and
System Component
Failure**



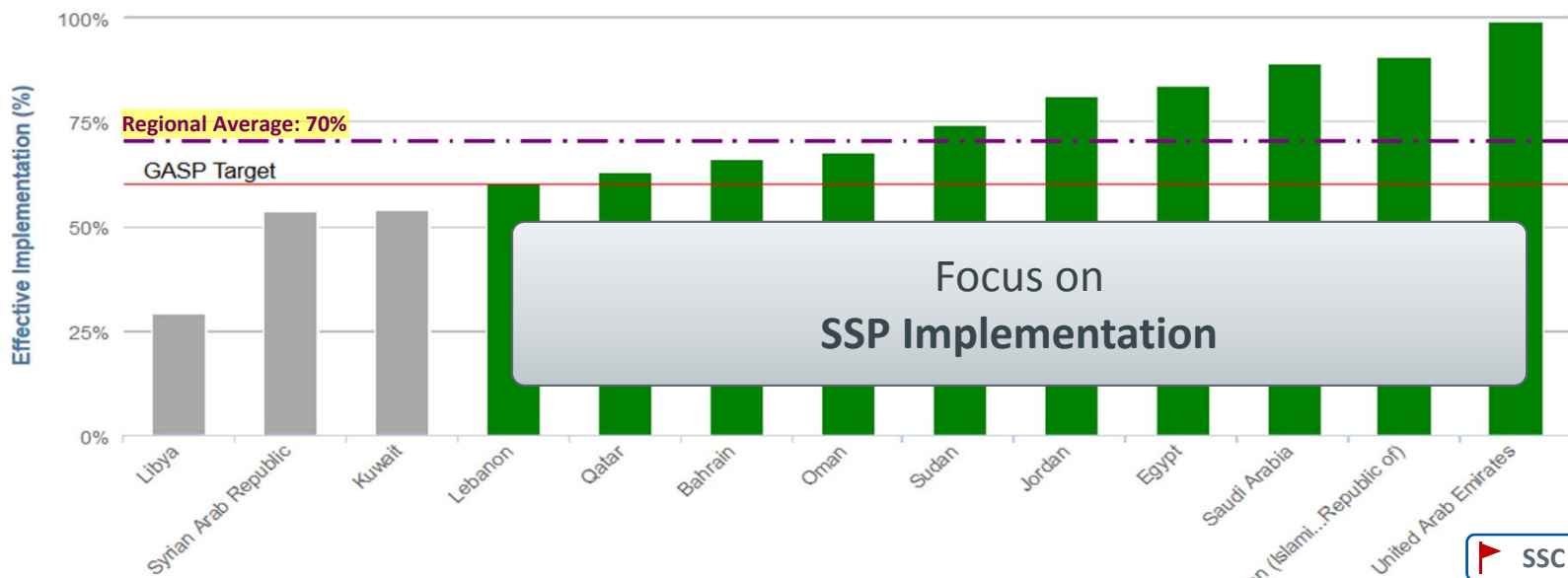
Source: *ISTARS 3.0 – ADREP et al.* (<https://portal.icao.int/space>)



ICAO Safety Audit Results for RASG-MID

Effective implementation of safety oversight systems by State (global average 64.7%)

Focus on meeting the GASP EI target



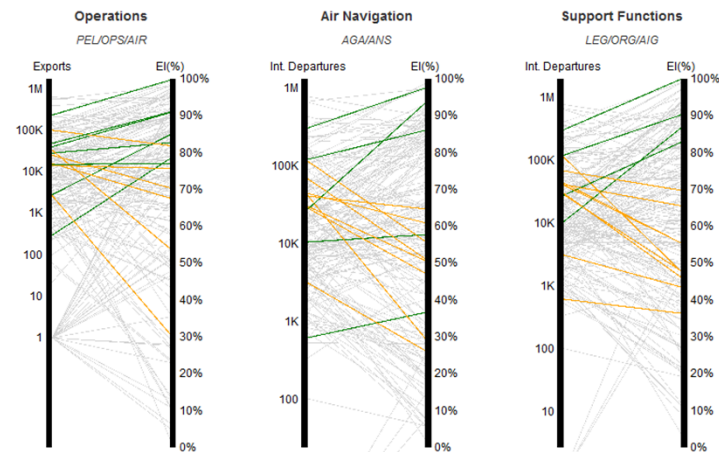
Source: iSTARS 3.0 – Regional Safety Briefing (<https://portal.icao.int/space>)





Regional Priorities

- The States are prioritized by considering the level of EI as well as the related activity at risk in operations, air navigation and support functions
- The profile of each State is benchmarked against all other ICAO member States
- Priority is given to the least performing areas in ascending order



Top-5 States in each Priority area

Libya
Safety margin: -41.31%

Bahrain
Safety margin: -5.61%

Kuwait
Safety margin: 0.71%

Qatar
Safety margin: 1.72%

Lebanon
Safety margin: 1.96%

Kuwait
Safety margin: -33.93%

Libya
Safety margin: -24.14%

Qatar
Safety margin: -14.62%

Lebanon
Safety margin: -9.25%

Syrian Arab Republic
Safety margin: -4.76%

Qatar
Safety margin: -24.78%

Lebanon
Safety margin: -18.1%

Syrian Arab Republic
Safety margin: -13.46%

Libya
Safety margin: -13.33%

Oman
Safety margin: -12.2%



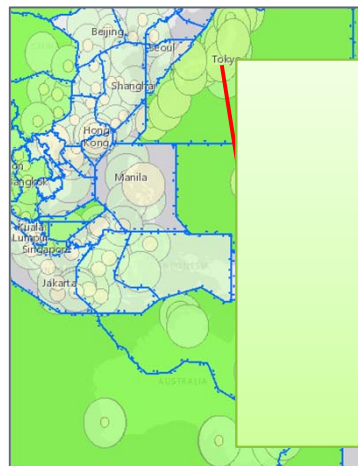
Source: **ISTARS 3.0** – Regional Safety Briefing (<https://portal.icao.int/space>)



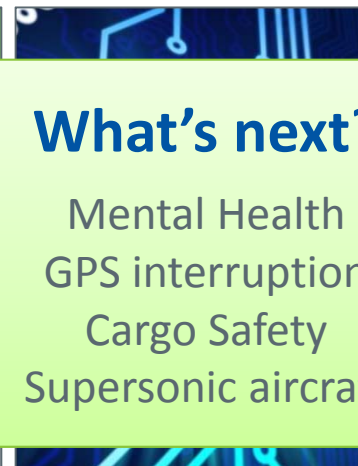
Current and Emerging Issues



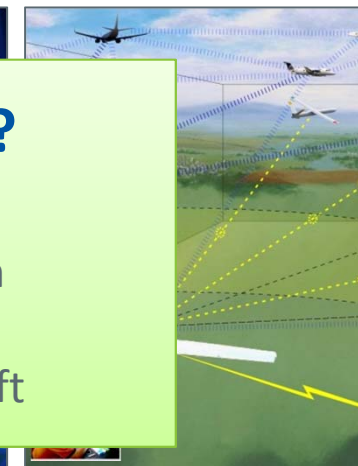
Conflict Zones



Global Tracking



Cyber Safety



RPAS



Space Transportation

What's next?
Mental Health
GPS interruption
Cargo Safety
Supersonic aircraft



Global Aviation Safety & Air Navigation Updates

EVOLVING OUR APPROACH



Evolving Standardization

- **Innovation starts on the flight deck, at the control position and on the tarmac**
 - People using the tools are the first to know how they can be improved





Evolving Standardization

- **SARPs-ready proposals** from Standards-making organizations and other aviation stakeholders
- Currently looking at candidates for further **proof-of-concept** work





Improvement of Implementation Process

- Secretariat is working on improving internal processes to **support State implementation**
- **Project-oriented** perspective enabling more transparency and providing a better decision-making tool
- **Enhance** current tools and methodologies





Evolving Safety Performance

- **iMPLEMENT** is a data-driven decision making process that:
 - Assesses the current status of aviation (**Safety Briefings**)
 - Identifies the best solutions in order to maintain or improve the aviation capability of the State (**Solution Center**)
 - Evaluates the needs of the aviation system (money, people, infrastructure) (**CAA HR Tools, PAINT/iAID, etc.**)
 - Identifies resources through existing national, regional, or global mechanisms (**ASIAP, SAFE Fund, etc.**)
 - Showcases the real added value of air transport and the socio-economic return on investment of aviation



State Safety Briefing



Regional Safety Briefing



Aerodrome Briefing



Solution Center



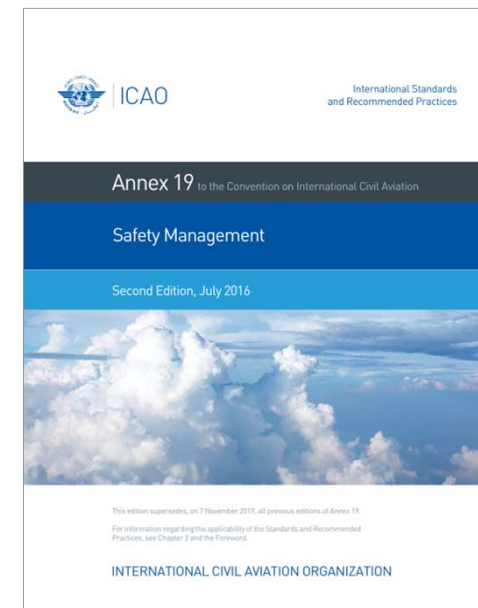
* Site: www.icao.int/iMPLEMENT



Amendment 1 to Annex 19



- ✓ The applicability for the existing safety management provisions as originally introduced continue to apply.
- ✓ The new applicability date only relates to the changes introduced with Annex 19, Amendment 1.
- ✓ States are encouraged to begin working to address Amendment 1 Annex 19 as soon as possible, to ensure implementation is achieved by the applicability date.





Safety Management Manual, 4th ed

Published Document:

- ✓ Supporting guidance for **Amendment 1 to Annex 19**
- ✓ Expanded guidance on **Annex 19 scope and applicability**, including discretionary SMS applicability
- ✓ Expanded guidance for the **development of safety intelligence**
- ✓ **Less prescriptive** and more focused on the **intended outcomes**
- ✓ Emphasis on importance of **system description and interfaces**.

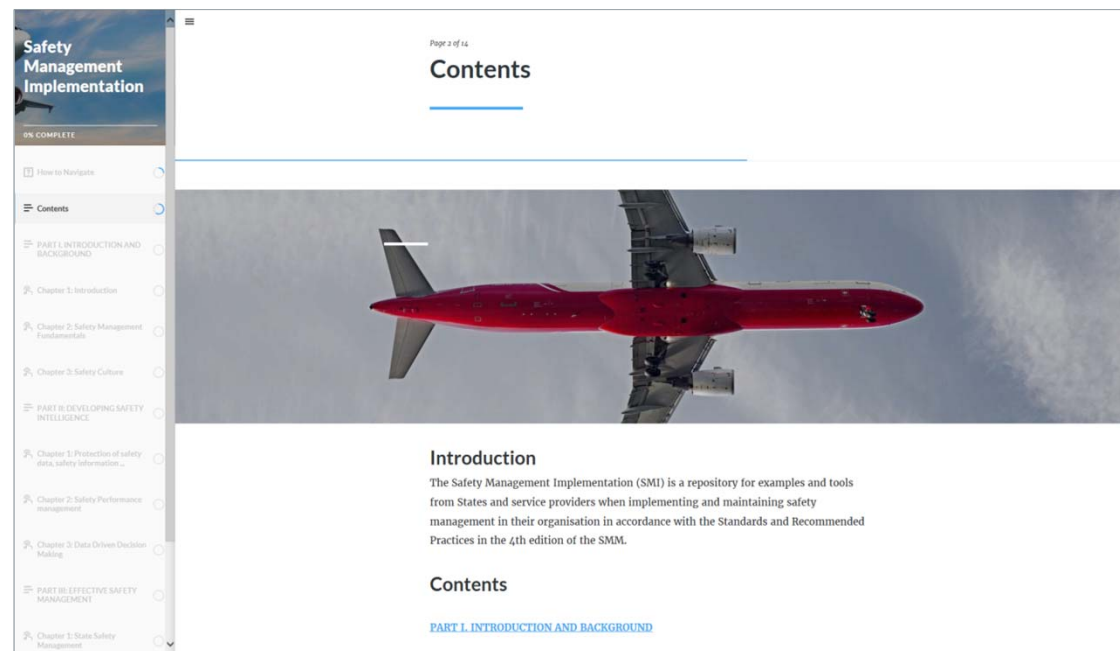




Safety Management Implementation Website

To complement the 4th edition of the SMM;
SMI Website:

- ✓ Will include the **some examples** currently found in the **SMM 3rd edition**; and
- ✓ Provide a mechanism for the sharing of **additional examples** to support effective implementation of SSP/SMS.





Updated SSP Tools

- ✓ SSP Gap Analysis Questions to be harmonized with USOAP SSP-related PQs which will reflect Annex 19 Amendment 1 and 4th edition of the *Safety Management Manual*
- ✓ Feature to allow work on SSP Gap Analysis Tool to be imported to the USOAP Online Framework SSP self-assessment
- ✓ To be linked to Pre-requisites App in order to identify the **REAL GAP**

USOAP PQ Prerequisites	#	Subject
	1	Primary aviation legislation
	2	Specific operating regulations
	3	State system functions
	4	Qualified technical personnel
	5	Accident and incident investigation



ICAO Safety Management Training Programme (SMTP)

Safety Management Online Training

Phase 1 - Released in September 2016, reflected the Amendment 1 to Annex 19

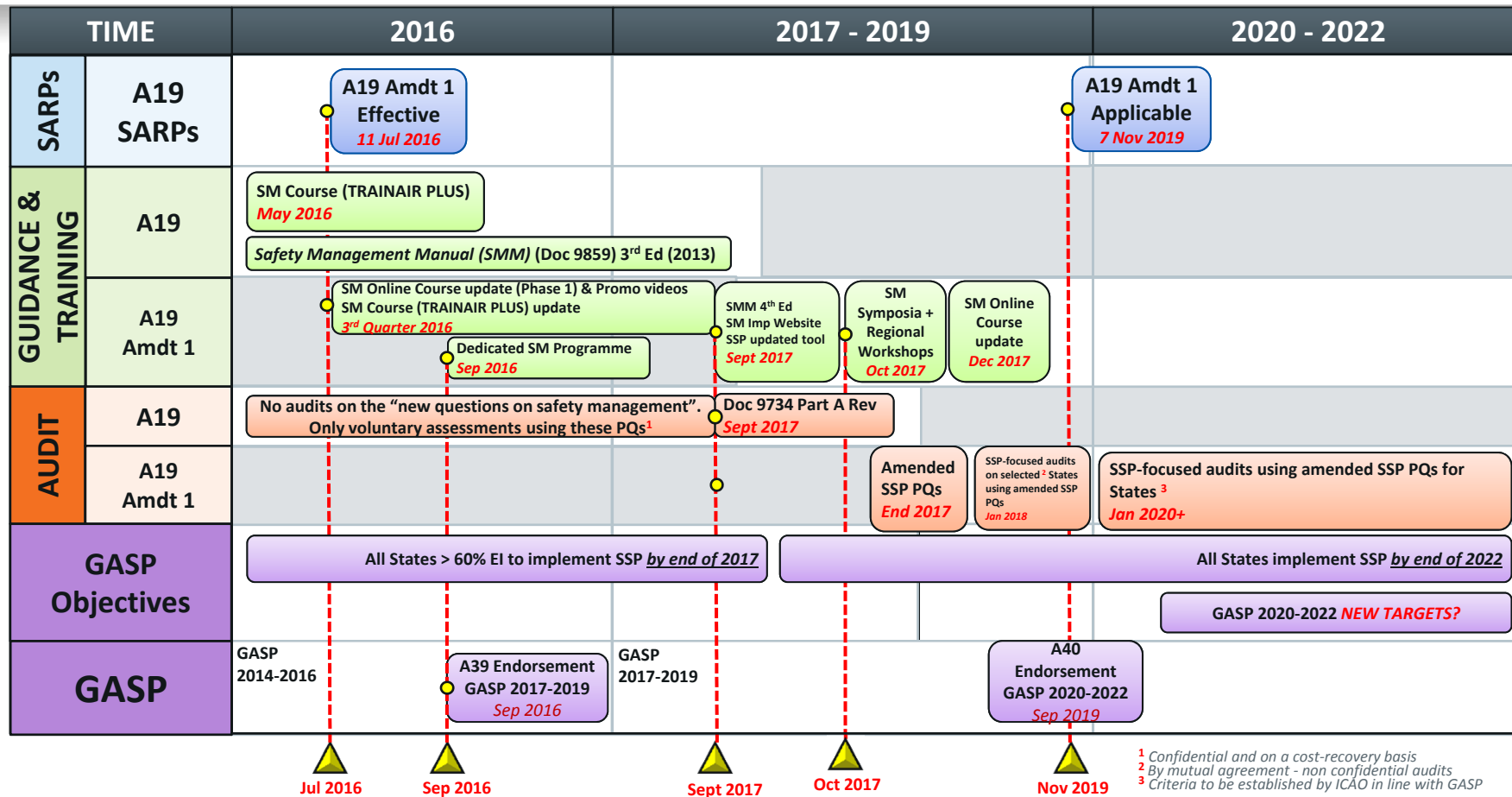
Phase 2 - Expected by end of 2017 to further reflect the 4th edition of the SMM



Safety Management for Practitioners (SMxP) – Classroom

- ✓ Comprehensive application
- ✓ Practical examples of SMS
- ✓ Use of IT tools





¹ Confidential and on a cost-recovery basis
² By mutual agreement - non confidential audits
³ Criteria to be established by ICAO in line with GASP



GLOBAL FORUM ON PIRGs/RASGs

- **13 December 2017, Montréal, Canada**
(to be held during the GANIS/SANIS Symposium)
 - Support implementation of meaningful operational improvements by exchanging information for the improvement of safety, capacity and efficiency through a Global PIRG/RASG Forum
 - Chairperson/Vice-chairperson participation



PIRG/RASG TOR Review

Council Decision C-DEC 210/4

Will be presented during the:

GLOBAL FORUM ON PIRGs/RASGs

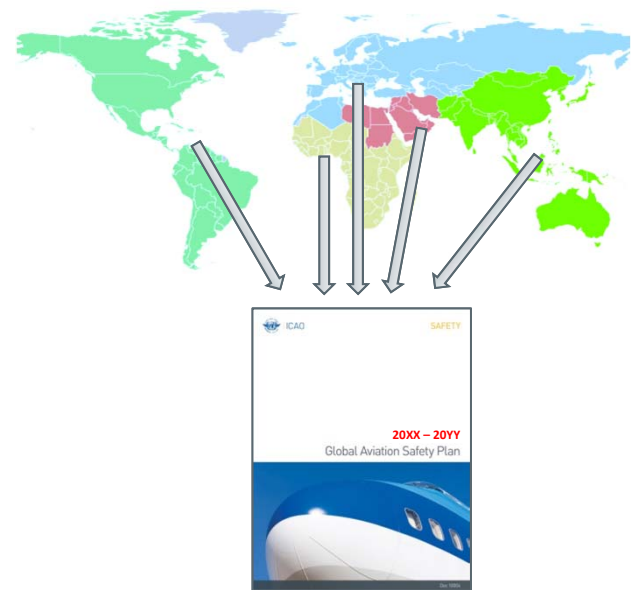
- Result of the ANC report to Council during the 210th Session, referring to the **limited involvement of some States' authorities** in the work, meetings and related activities of PIRGs and RASGs
- **ICAO Council requested a further review of the:**
 - proposed revised terms of reference for RASGs;
 - existing terms of reference for the PIRGs; and the
 - delegated the authority to the President of the Council to approve any consequential amendments to the terms of reference of both the RASG and the PIRG arising as a result of this review.





Evolution of RASGs

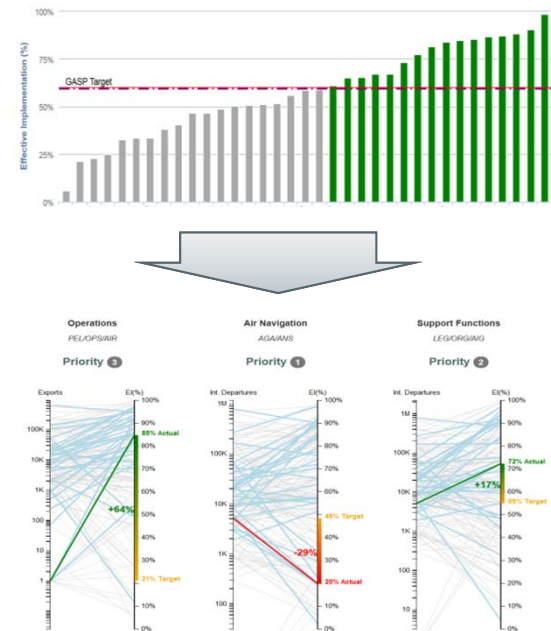
- RASGs as the **leaders for the management of regional operational risk environment**, as reflected in the Global Aviation Safety Plan (GASP)





Evolution of RASGs

- RASGs as the leaders for the management of regional operational risk environment, as reflected in the Global Aviation Safety Plan (GASP)
- RASGs to assist States in identifying hazards and defining their own specific targets
 - From 60% EI to an acceptable Safety Margin for each State
 - Mapping the risk





Evolution of RASGs

- RASGs as the **leaders for the management of regional operational risk environment**, as reflected in the Global Aviation Safety Plan (GASP)
- RASGs to assist States in **identifying hazards and defining their own specific targets**
 - From 60% EI to an **acceptable Safety Margin** for each State
 - Mapping the risk
- **RASGs to harmonize and avoid overlaps**
 - Between States
 - Between RASGs





Global Aviation Safety & Air Navigation Updates

TOPICS OF INTEREST





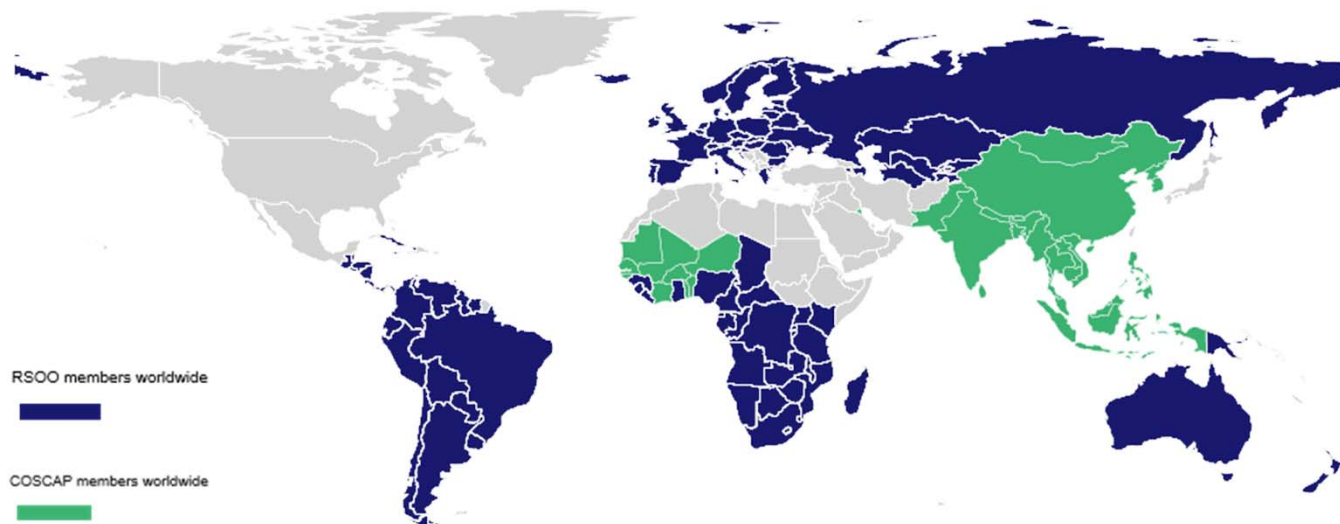
Global RSOO Forum Outcomes

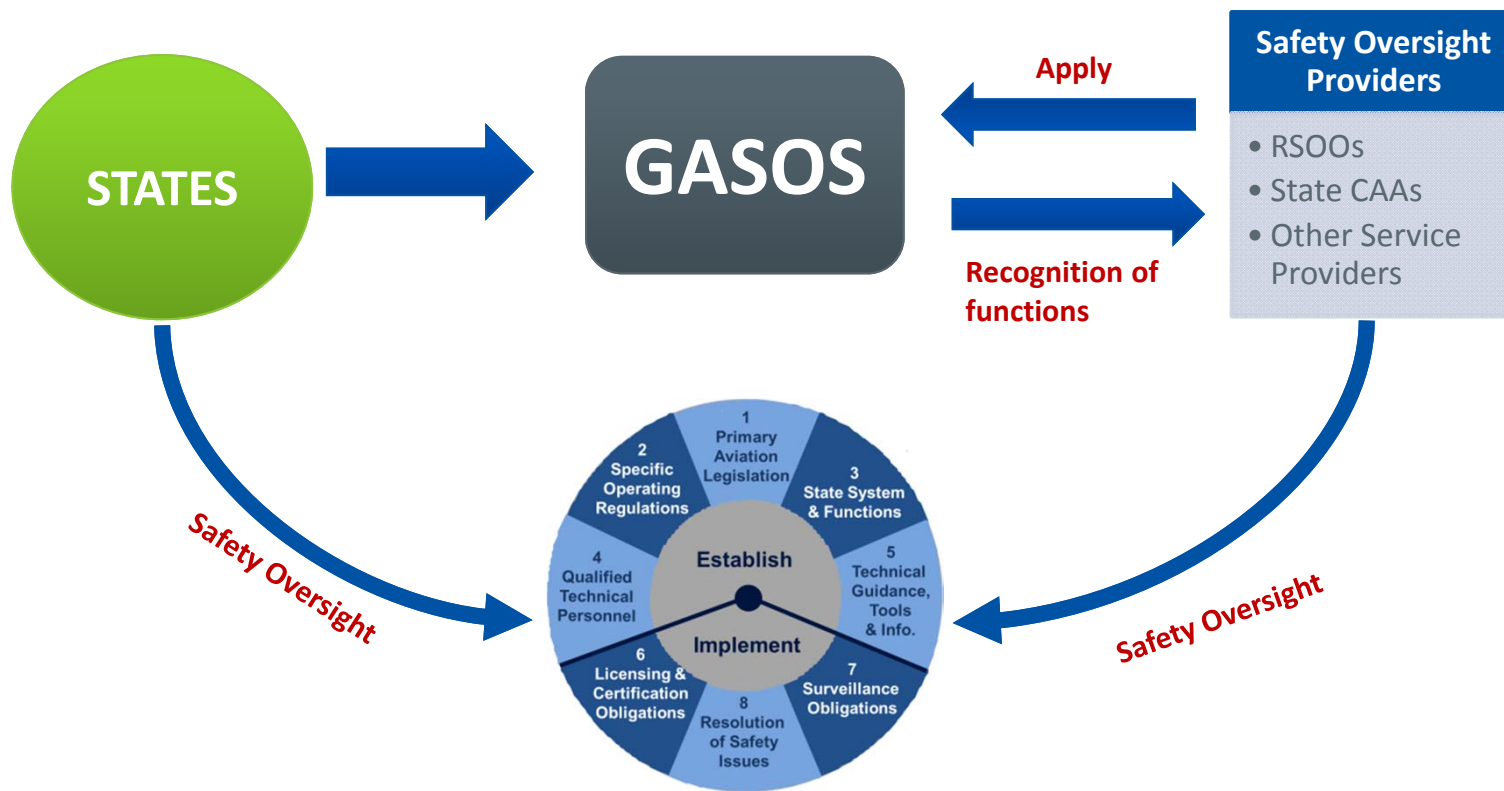


- **Global Strategy and Action Plan for the Improvement of Regional Safety Oversight Organizations (RSOOs) and the Establishment of a Global System for the Provision of Safety Oversight**
 - Improvement and strengthening of RSOOs (evaluation & manual revision)
 - Develop and implement an RSOO cooperative platform
 - **Develop and implement a global aviation safety oversight system (GASOS) – study group & feasibility study**



RSOOs (including COSCAPs)





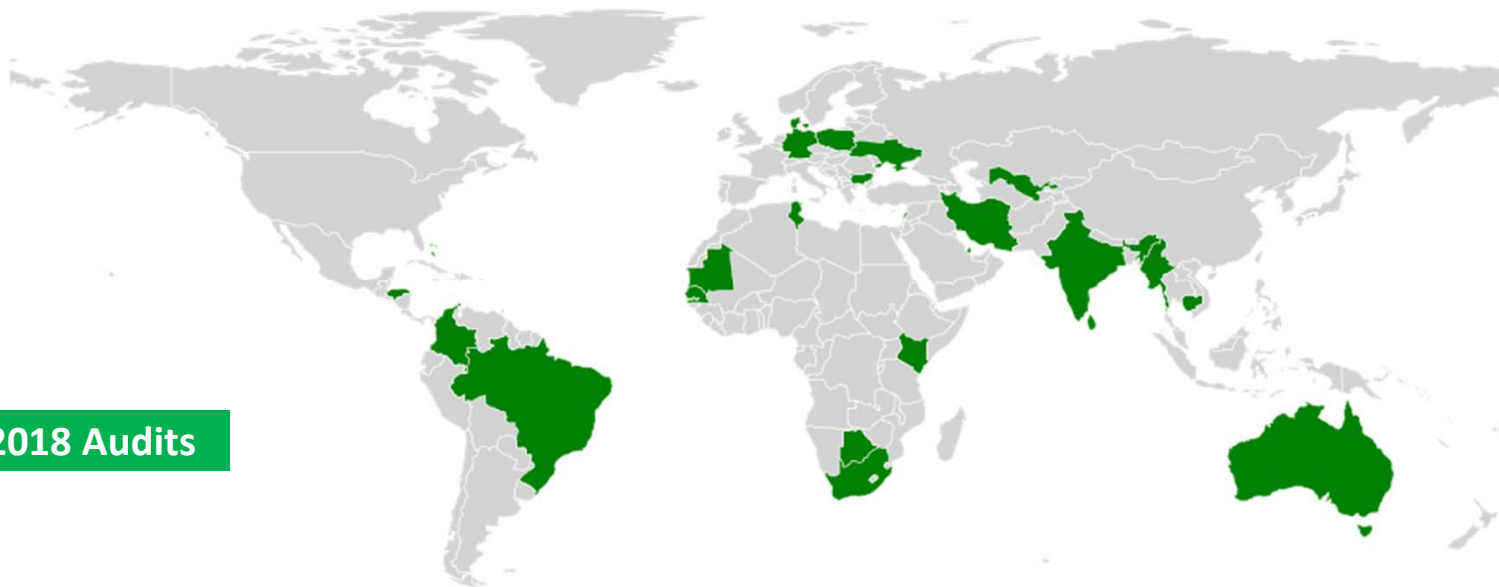


GASOS Objectives

- **Strengthen regional safety oversight support mechanism** to form a global aviation safety oversight system
- ICAO responsible for **establishing and maintaining an inventory of competent safety oversight providers** and the functions that they provide
- Regional mechanisms and safety oversight providers to demonstrate competence in the functions that they offer to provide States, in order to qualify as an **ICAO recognized safety oversight provider**
- **Linked to next edition of the GASP and future evolution of the USOAP**; also considering cross border transfer of aircraft and CAA inspector requirements



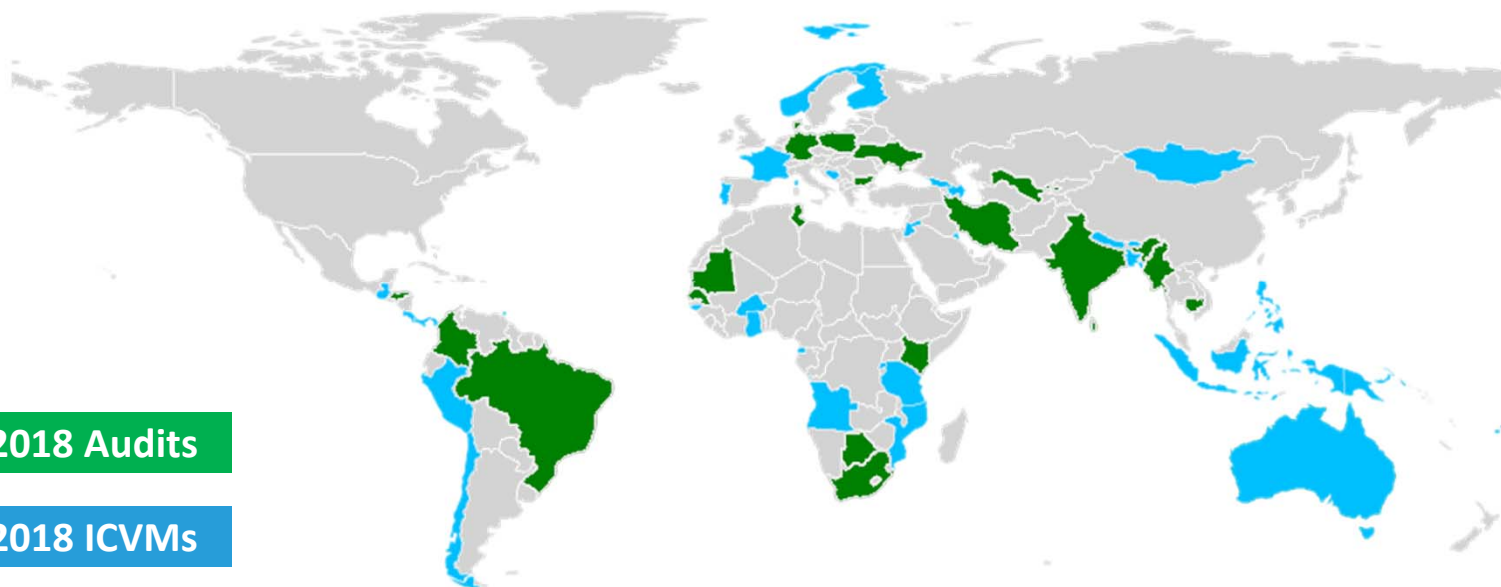
USOAP Activity Plan (EB 2017/35)



2017-2018 Audits



USOAP Activity Plan (EB 2017/35)



2017-2018 Audits

2017-2018 ICVMs



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UPCOMING EVENTS





- Co-organised with the Runway Safety Programme Partners 
- Hosted by the Perú Ministerio de Transportes y Comunicaciones
- Event in English/Spanish, with 300 participants expected
- **Objectives:**
 - provide a global forum to **exchange information on best practices** in improving runway safety through the use of effective and innovative strategies, tools, technology and practices
 - promote improved runway safety worldwide through **global collaboration** and sharing strategies and best practices;
 - promote the ICAO-led collaborative new **Runway Safety Programme Action Plan** for supporting and strengthening runway safety initiatives;
 - promote the **participation of stakeholders in regional initiatives** related to runway safety; and
 - increase the number and improve the effectiveness of **airport Runway Safety Teams (RSTs)** under a risk-based approach in relation to airport safety management systems (SMS).



- **Articulating a worldwide perspective to support regional implementation**
 - Drawing on worldwide expertise to advance regional implementation
 - Organized in collaboration with CANSO, Eurocontrol, the FAA, and IATA with the support of Singapore CAAS.
 - 1st ICAO Conference builds on series of ATFM global events previously organized every two years
 - **Focus on :**
 - Long range solutions and measures; international cooperation
 - Collaborate to managing flows from the airport to cruising altitudes and beyond.
 - **Look ahead: and innovation**
 - A look into the immediate future: advanced flow management:
 - Broadening the scope: innovative flow management.



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NEXT GENERATION OF AVIATION PROFESSIONALS **GLOBAL SUMMIT** ICAO HQ MONTRÉAL, 27-28 NOV 2017



- Provides a unique opportunity to promote **coordination and cooperation** amongst the aviation community, and education sectors for the development of strategies and tools to engage and retain the next generation of aviation professionals.
- **Event Objectives:**
 - Continue to **raise awareness** regarding the impending shortage of aviation professionals and encourage CAAs to communicate and cooperate with government and education bodies to promote aviation as a profession.
 - Promote **cooperation and coordination** for the development of common NGAP guidelines or standards for use by all aviation stakeholders (i.e. civil aviation authorities, industry, international organizations and academia).
 - Promote the **exchange of knowledge, ideas, best practices and experiences** regarding NGAP related activities amongst States, industry, international organizations and academia.
 - Promote **collaboration between States and the aviation community** to identify long-term human resource needs and establish strategies to attract, educate and retain aviation professionals, considering gender equality.



Safety Management Regional Symposia and Workshops



- EUR/NAT – Hosted by EC & Estonian Presidency in Tallinn / 16-18 October 2017
- NACC and SAM – Hosted by Peru in Lima / 12 – 16 March 2018
- APAC and MID – Hosted by Singapore / 23 - 26 April 2018
- ESAF and WACAF – 2018 (exact dates and location to be confirmed)

Note: 4 Workshops to be delivered with Symposia plus additional planned



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Third Global Remotely Piloted Aircraft Systems Symposium (RPAS2018)

Chengdu, China
10 to 12 September 2018

2nd DRONE ENABLED
ICAO'S UNMANNED AIRCRAFT SYSTEMS INDUSTRY SYMPOSIUM
 Chengdu, China | 13 - 14 September 2018

[Discover more](#)



Request for Information Announcement 31 January 2018





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A banner for the GANIS/SANIS 2017 symposium. It features a blue background with a white airplane flying over a globe. A yellow box contains the text 'GANIS SANIS 2017'. To the right, there are two bullet points: '> Second Global Air Navigation Industry Symposium (GANIS/2)' and '> Safety and Air Navigation Implementation Symposium (SANIS)'. At the bottom right, a blue box contains the text 'ICAO Headquarters, Montréal, Canada, 11 to 15 December 2017'.

Global Aviation Safety & Air Navigation Updates

GANIS/SANIS – GLOBAL PLANNING FOR THE 40TH ASSEMBLY



Sustainability and enhancement of safety and air navigation system performance

- **Two back-to-back symposiums from 11 – 15 December 2017 in Montréal, Canada**
 - 2nd **Global Air Navigation Industry Symposium (GANIS)** to discuss issues and chart next steps to achieve a seamless global aviation system
 - 1st **Safety and Air Navigation Implementation Symposium (SANIS)** to offer a performance-based implementation methodology including the first **Global Forum on PIRGs/RASGs**
- **Includes an Industry exhibition of current and emerging technologies**
 - Showcase solutions which will provide a snapshot of the global air navigation industry
 - Provide insight on how all stakeholders can work together to address technical, operational, regulatory and economic challenges
- **A crucial networking and knowledge-sharing opportunity**
 - Presentations from ICAO, international and regional organizations, standards-making organizations and leading industry stakeholders
- **Will lay the foundation for the 13th AN-Conference in 2018**

GANIS (11-13 Dec 2017)					SANIS (13-15 Dec 2017)															
MON		TUE		WED		THU		FRI												
AM	PM	AM	PM	AM	PM	AM	PM	AM	PM											
GANIS/ SANIS Opening	<u>Innovative and Emerging Ops</u> <ul style="list-style-type: none"> • Concept of operations above FL600/FL660 • UTM (UAS traffic management) • Future of space Ops 		<u>Global RASG & PIRG Forum</u> <ul style="list-style-type: none"> • Opening • PIRG • RASG • Way ahead 		GA NIS Wr ap- up	<u>Future of CNS and Avionics</u> <ul style="list-style-type: none"> • Data link comms • GNSS evolution <ul style="list-style-type: none"> • Dual-frequency, multi-constellation • GBAS/SBAS • Phasing out legacy systems • SURV evolution <ul style="list-style-type: none"> • Space-based ADS-B • ACAS evolution • Standardization roadmap 		<u>Cyber threats</u> <ul style="list-style-type: none"> • Current and future threats • A global SWIM enabler • Solutions • Risk mitigation 		Implementation strategies	<u>Information management</u> <ul style="list-style-type: none"> • SWIM developments • SWIM implementation and global interoperability • SWIM demonstrations and applications 		<u>Airport operational performance</u> <ul style="list-style-type: none"> • Aerodrome capacity and efficiency <ul style="list-style-type: none"> • Airport master planning and design • Total airport management • Aerodrome obstacle management 		<u>Airports</u> <ul style="list-style-type: none"> • Runway safety • Ground handling • Certification 		P B N	<u>Perf-based aerodrome operating minima</u> Support to No Country Left Behind Best equipped best served; Advanced aircraft and PB AOM		SANIS Wrap-up
	<u>Civil-military cooperation</u> <ul style="list-style-type: none"> • Airspace, a common resource effectively managed collectively? • Mission trajectories • Cyber threats • RPAS integration • SWIM • Interoperability • Military mission effectiveness 		<u>MET</u> <ul style="list-style-type: none"> • Evolution of MET services requirements • Future aviation MET service delivery • WMO developments 			<u>Modernization of the Air Navigation System</u> <ul style="list-style-type: none"> • Familiarization with the GANP • ASBU framework as support to cost-effective modernization of the ATM system, while ensuring interoperability of systems • Performance management process • GANP deployment tools 		<u>Safety</u> <ul style="list-style-type: none"> • GASP 2020-2022 and global implementation strategies • RSOOs • GADSS • Safety Management • Emerging issues 			<u>Civil-military cooperation</u> <ul style="list-style-type: none"> • How to kick-start civil-military cooperation? • Success stories and return of experience • Flexible use of airspace and airspace management tools • Advanced cooperation and integration 		<u>From concept to operation</u> Implementation success : <ul style="list-style-type: none"> • Remote tower • Free route airspace • Time-based separation (on final) • AIM 							





REFERENCES



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- A Joint ICAO Aviation Safety and Security Event (Dubai, 4-6 April 2017)
- The way forward:
 - Establish a Cyber Regulatory Framework (Safety and Security)
 - Identify current and future threats, and implementing risk mitigation
 - Enable a global SWIM
 - Identify Cross-domains impacts
 - Promote Cyber culture
- Will be presented to GANIS this December



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Second Global Remotely Piloted Aircraft Systems Symposium (RPAS2017)

ICAO Headquarters, Montréal, Canada
19 to 21 September 2017

- **RPAS 2017 Highlights**

- Recognition of the need for an international regulatory framework
- ICAO needs to be the focal point, ensure global harmonization, standardization
- Unregulated operations in complex environments are resulting in aviation safety risks
- Harmonized categorization can assist in addressing regulatory challenges
- Collaboration by all is crucial



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Second Global Remotely Piloted Aircraft Systems Symposium (RPAS2017)

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- **RPAS 2017 Highlights***(continued)*
 - Understanding competency-based training
 - CBT is being used in different fields and is adapted to remote pilots
 - ICAO is promoting CBT in PANS-Training and Annex 1
 - Licensing authorities and RPAS operators must learn to apply and assess CBT programmes



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Second Global Remotely Piloted Aircraft Systems Symposium (RPAS2017)

ICAO Headquarters, Montréal, Canada
19 to 21 September 2017

- **RPAS 2017 Highlights***(continued)*

- Changes required on ATCOs' perspective of RPAS and ATM in different fields
- Not acceptable to change regulations for manned aviation to accommodate UAS
- Automation will be a key driver in the evolution of unmanned aviation
- Consensus for incremental evolution of pragmatic and performance-based regulations as operations and technologies develop
- Security and data management are important emerging issues to be managed
- Interaction between UTM and ATM