ICAO GLOBAL SAFETY UPDATE

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Air Navigation Bureau – ICAO

RASG-PA ESC/28
4 - 5 May 2017

39th
TRIENNIAL ASSEMBLY
ICAO HQ, MONTREAL, 27 SEP-07 OCT 2016

ICAO

UNITING AVIATION

ICAO | CAPACITY & EFFICIENCY

2016–2030
Global Air Navigation Plan

Doc 9750-AN/963   Fifth Edition – 2016

ICAO

Doc 10004

Global Aviation Safety Plan

2017-2019

Approved by and published under the authority of the Secretary General

INTERNATIONAL CIVIL AVIATION ORGANIZATION
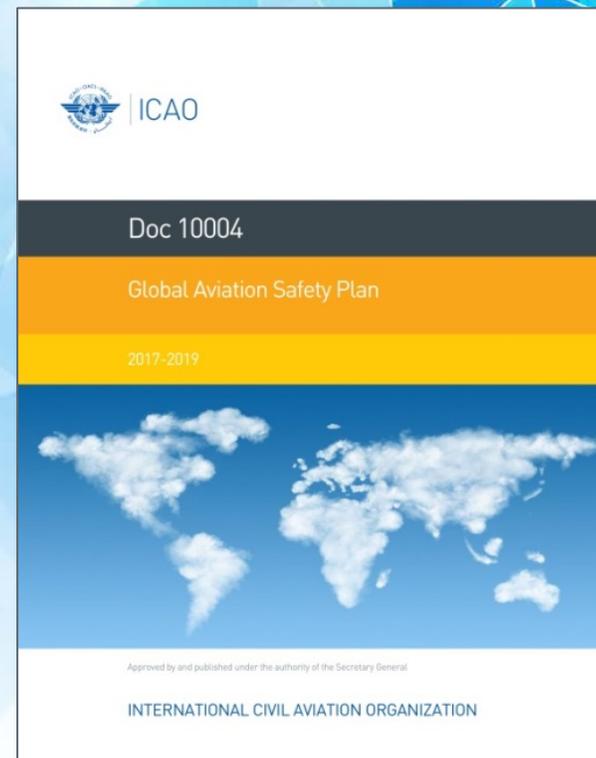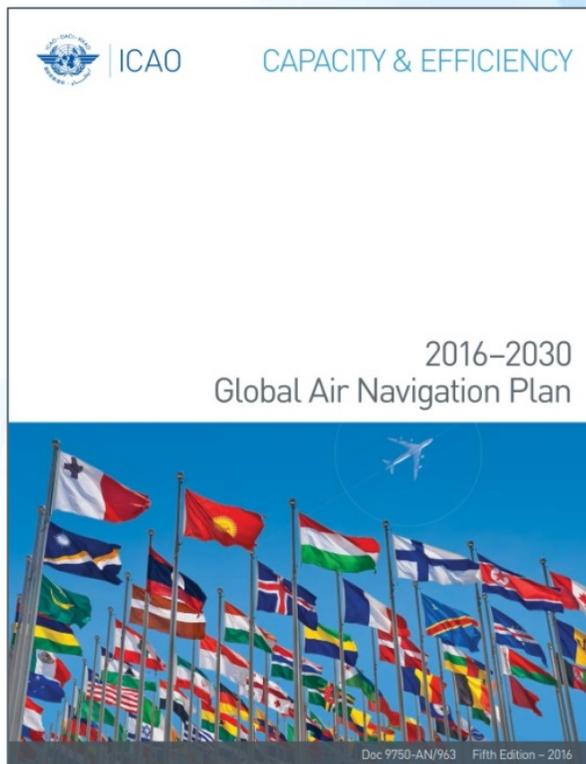
Endorsed: Global Aviation Safety Plan (GASP)

- **2017-2019 Edition**
  - **Maintains** the framework, objectives and safety performance enablers of the 2014-2016 edition
  - New **global aviation safety roadmap** ensures that safety initiatives deliver the intended benefits associated with the GASP objectives through enhanced coordination
    - Reducing inconsistencies and duplication of efforts

- **Cooperative, collaborative, and coordinated approach**
  - Together with all stakeholders and under the leadership of ICAO, the GASP offers a long-term vision in developing a harmonized safety strategy.

ICAO

Doc 10004

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

New GASP Roadmap

- **Goals:**
  - Ensure that safety initiatives deliver the intended benefits associated with the GASP objectives
  - Reduce inconsistencies and duplication of efforts

- **Specific safety initiatives aimed at States, Regions and Industry**

- **Complements the GANP**
  - Some ASBUs address safety
  - Implementation of ASBUs will require safety assessments prior to implementation

	Phase I: Effective safety oversight		Phase II: SSP implementation	Phase III: Predictive risk management
	Sub-phase I-A	Sub-phase I-B		
States	SSI-1 SSI-2 SSI-3	SSI-4 SSI-5	SSI-6	
	SRI-1 SRI-2	SRI-3	SRI-4	SRI-5
	SCI-1	SCI-2	SCI-3 SCI-4	SCI-5
	SXI-1	SXI-2	SXI-3 SXI-4	SXI-5
Regions	RSI-1 RSI-2	RSI-3	RSI-4	
	RRI-1	RRI-2	RRI-3	RRI-4
	RCI-1	RCI-2	RCI-3	RCI-4
	RXI-1	RXI-2	RXI-3	RXI-4
Industry		ISI-1	ISI-2	
		IRI-1	IRI-2	IRI-3
	ICI-1	ICI-2	ICI-3	ICI-4
			IXI-1 IXI-2	IXI-3

Safety Performance Indicators

- New appendix in the GASP

- Provides guidance regarding safety and level of activity indicators

- First step towards the development and implementation of harmonized global indicators

  - Can be adapted at the regional, sub-regional, and national levels

#	Indicators and metrics	Type	Usage
1.	**Effective implementation of State safety oversight system** *Metrics:* • USOAP EI Scores overall • USOAP EI Scores by technical area • USOAP EI Scores by critical element	Predictive	Target
2.	**Progress in SSP implementation** *Metrics:* • Percentage of completed gap analysis questions • Percentage of implemented gap analysis questions overall • Percentage of implemented gap analysis questions by element	Predictive	Target
3.	**Progress in SMS implementation** *Metrics:* • Percentage of completed gap analysis questions by operator • Percentage of implemented gap analysis questions overall by operator • Percentage of implemented gap analysis questions by element and by operator	Predictive	Target
4.	**Frequency and severity of accidents and incidents** *Metrics:* • Number and distribution of occurrences by severity level (accident, serious incidents, etc.) and the ICAO Accident/Incident Data Reporting System (ADREP) occurrence category • Number and distribution of fatalities by ADREP occurrence category • Occurrence per number of departures (rate) *Note.— Occurrences should be limited to specific categories of aircraft and operations, such as aircraft above 5 700 kg operating scheduled commercial flights.*	Reactive/ proactive	Target

Global Aviation Safety Plan (WP/2)

Draft Conclusion

That States:

a) are requested to establish a national safety plan, including priorities and targets consistent with the regional safety plan, in line with the GASP objectives, including the global aviation safety roadmap, and based on their operational safety needs; and

b) are invited to provide ICAO feedback on the new Global Aviation Safety Roadmap and suggestions for the future 2020 – 2022 Edition of the GASP via email to: GASP@icao.int .

Global Aviation Safety Update

ANNEX 19 - AMENDMENT 1

Amendment 1 to Annex 19

1) Integration of the State Safety Oversight **(SSO)** system critical elements **(CEs)** with the State Safety Programme **(SSP)** provisions which are **upgraded from the SSP framework in Attachment A.**

2) Enhancement of safety management system (SMS) provisions to support **uniform implementation**, including **the extension of an SMS** to organizations responsible **for the type design and/or manufacture of engines and propellers**

3) Protection of safety data, safety information and related sources

- Upgrading **Attachment B to** the status of an **Appendix**

- A higher level of protection for **voluntary reporting systems** through a **Standard**

- The protection of **mandatory reporting systems** is reflected in a **Recommendation**

- New provisions to ensure **no overlap** with the protection provisions **in Annexes 6 and 13**

TIME		2016	2017 - 2019	2020 - 2022
SARPs	**A19 SARPs**	**A19 Amdt 1 Effective** *11 Jul 2016*		**A19 Amdt 1 Applicable** *7 Nov 2019*
GUIDANCE & TRAINING	**A19**	**SM Course (TRAINAIR+)** *May 2016* *Safety Management Manual (SMM) (Doc 9859) 3rd Ed (2013)*		
	A19 Amdt 1	SM Online Course update (Phase 1) & Promo videos SM Course (TRAINAIR+) update *3rd Quarter 2016* / Dedicated SM Programme *Sep 2016*	SMM 4th Ed + website SM Online Course (Phase 2) and SSP gap analysis tool update *Jul 2017*	SM Symposia + Regional Seminars
AUDIT	**A19**	No audits on the "new PQs on safety management". Only voluntary assessments using these PQs[1]	Doc 9734 Part A Rev *Jul 2017*	
	A19 Amdt 1		Amended SSP PQs *Jul 2017*	SSP-focused audits on selected [2] States using amended SSP PQs *Jan 2018*	SSP-focused audits using amended SSP PQs for States meeting maturity criteria [3] *Jan 2020+*
GASP Objectives		All States > 60% EI to implement SSP *by end of 2017*		All States implement SSP *by end of 2022* / GASP 2020-2022 *NEW TARGETS?*
GASP		GASP 2014-2016 / A39 Endorsement GASP 2017-2019 *Sep 2016*	GASP 2017-2019 / A40 Endorsement GASP 2020-2022 *Sep 2019*	GASP 2020-2022

Jul 2016   Sep 2016   Jul 2017   Jan 2018   Nov 2019

[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*

Safety Management Implementation (WP/3)

Draft Conclusion

That States are urged to continue the implementation of SSP and report on progress using the SSP Assessment Tool on iSTARS and completing the USOAP SSP-related PQ self-assessments on the online framework (OLF).

Universal Safety Oversight Audit Programme (USOAP)
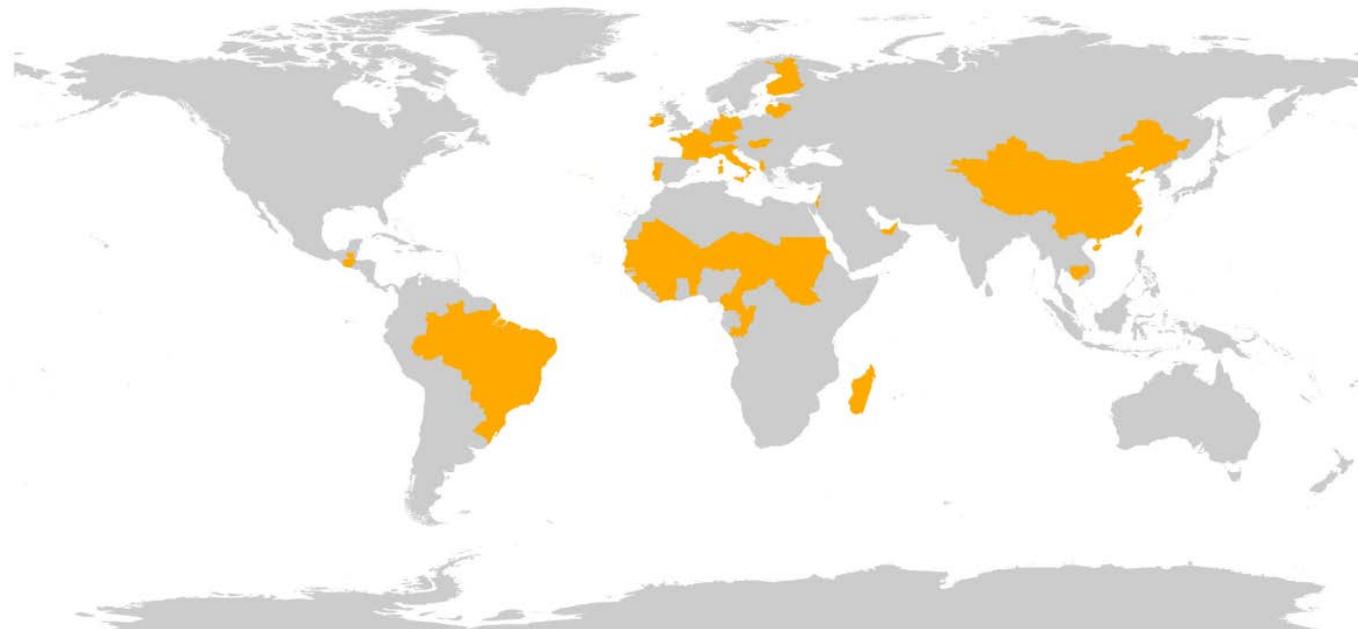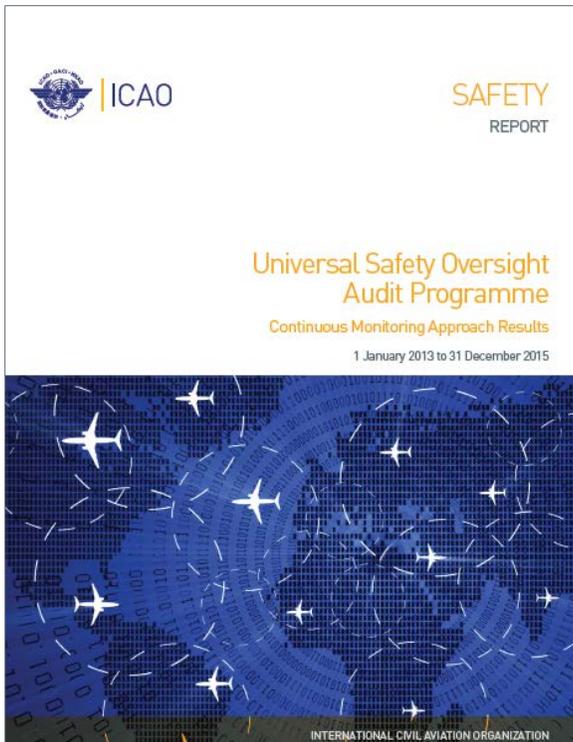
USOAP CMA Off-site Validation from 1 January 2013 to 31 December 2015

USOAP Activity Plan (EB 2017/2)
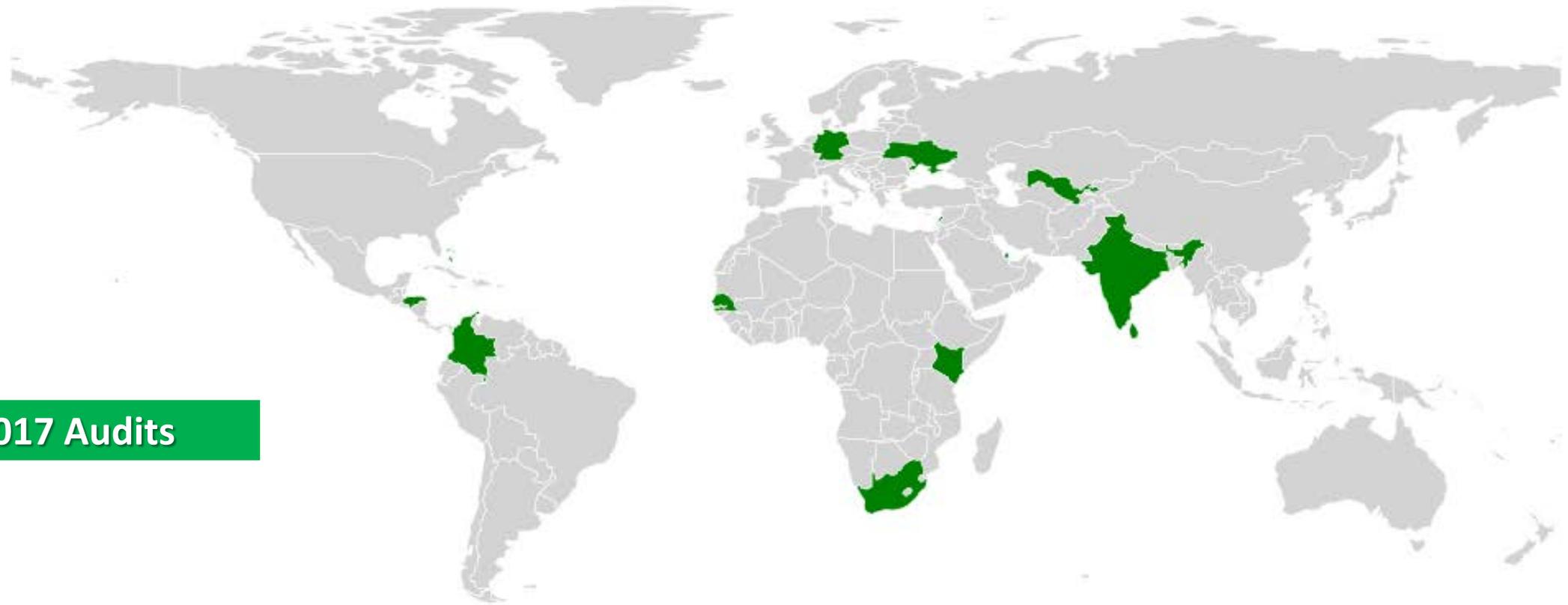
2017 Audits

USOAP Activity Plan (EB 2017/2)
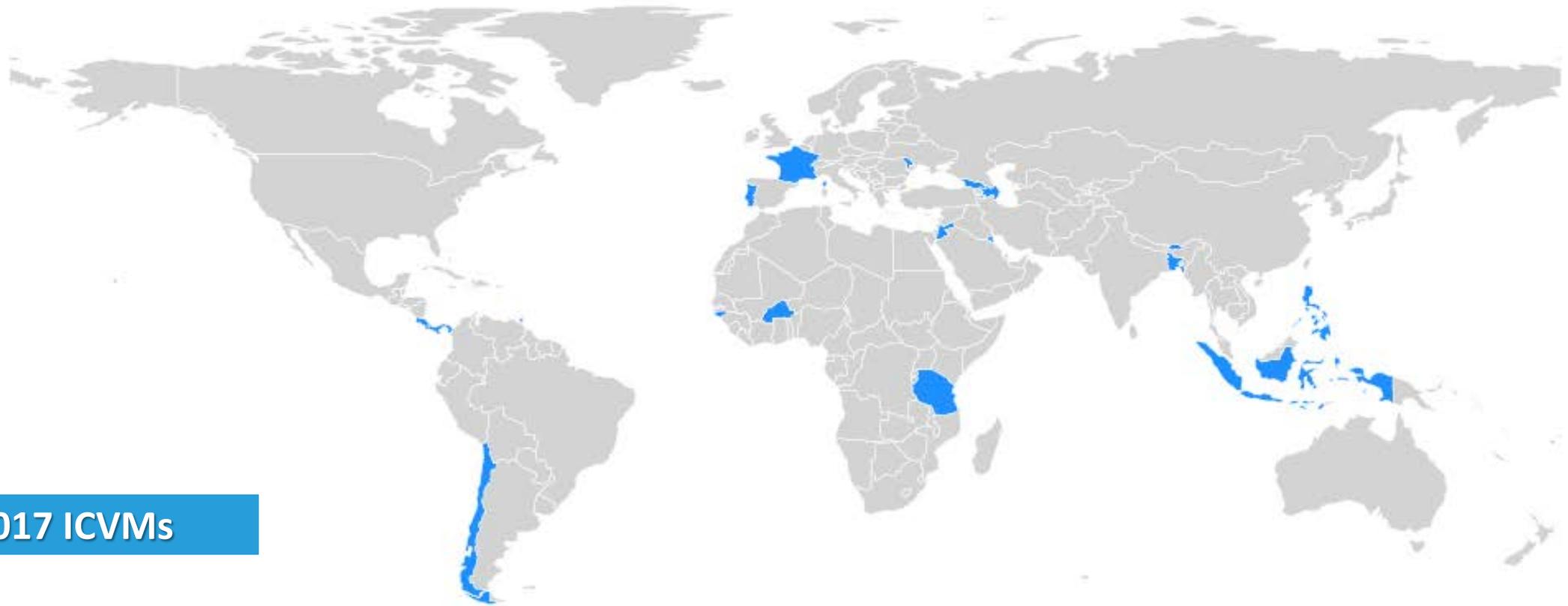
2017 ICVMs

ICAO USOAP CMA Implementation (WP/4)

Draft Conclusion

That States are urged to fulfil their obligations under the USOAP CMA Memorandum of Understanding (MOU) and to take actions as needed to provide up-to-date information on their safety oversight systems, with particular attention to:

a) States with an SSC, focusing on implementing sustainable corrective actions to resolve the SSC with a high priority;

b) updating the content and implementation progress of their CAPs on the OLF;

c) completing the self-assessment of the PQs on the OLF;

d) requesting assistance from the ICAO Regional Office, if required; and

e) informing the ICAO Regional Office once significant updates have been made on the OLF.

Safety and Air Navigation Updates

GLOBAL STATUS

Effective Implementation of State Safety Oversight
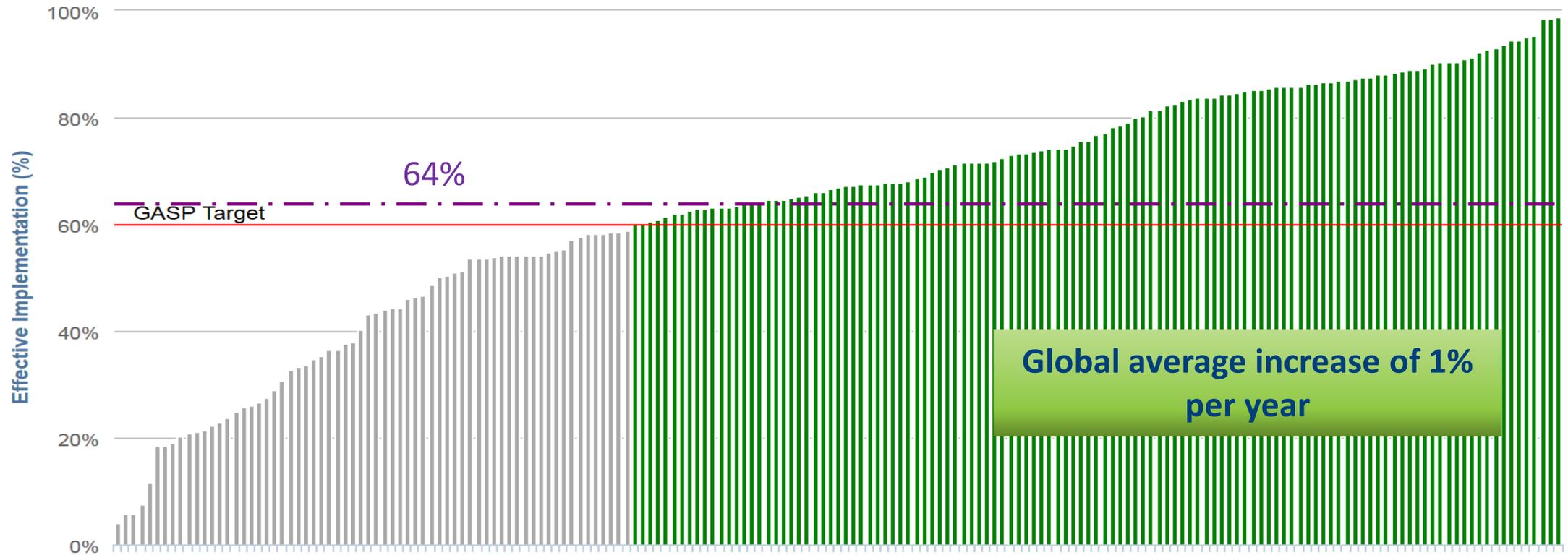
Effective implementation (%) results through USOAP CMA

Fatalities Trend for Scheduled Commercial Flights (2011 – 2016)
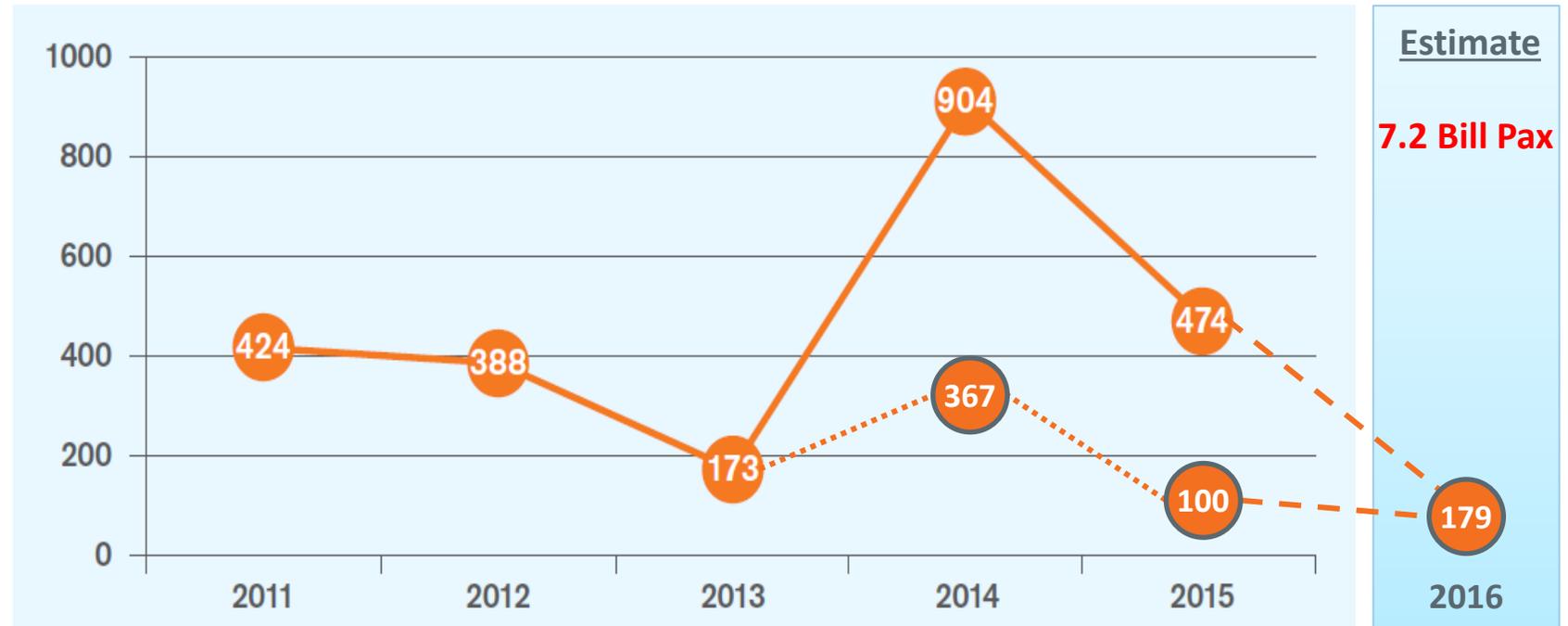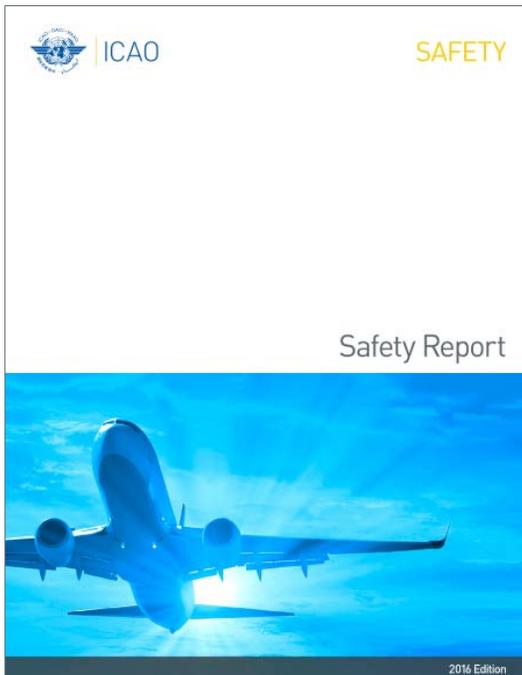
Fatalities showed a spike during 2014, and then recovered in 2015
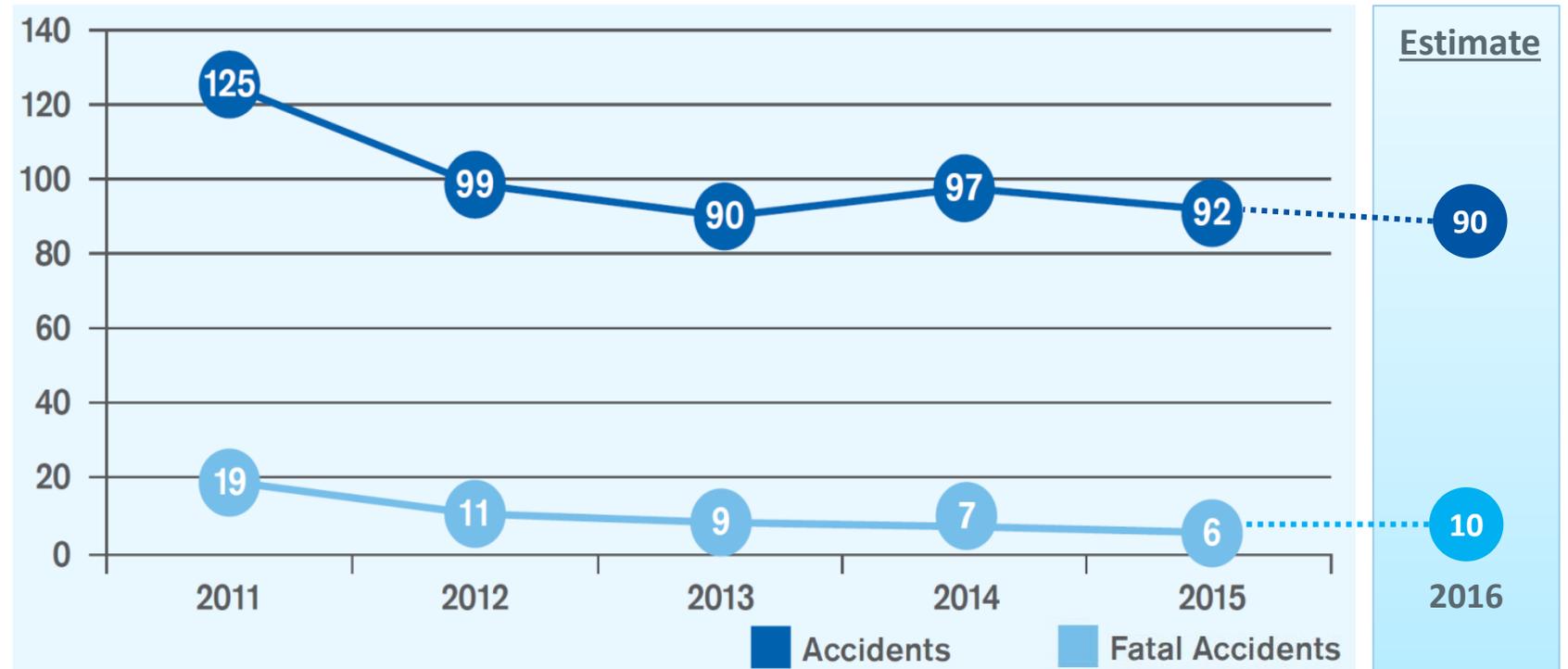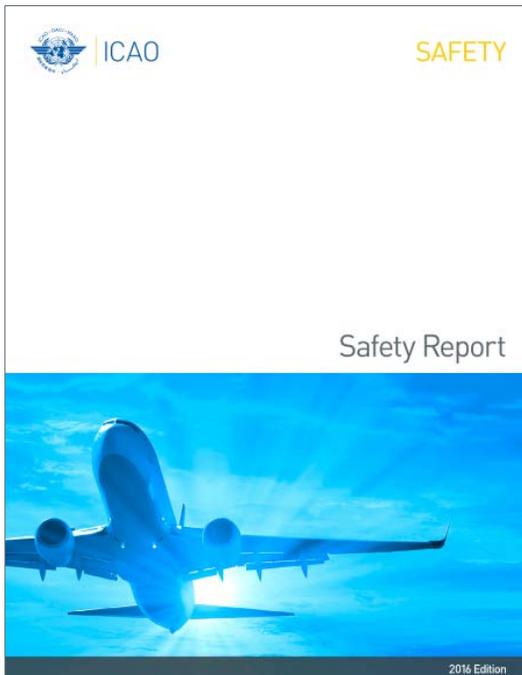
We are not that far…

Regional Accident Statistics: 2013

RASG	Estimated Departures (in millions)	Number of accidents	Accident rate (per million departures)	Fatal accidents	Fatalities
AFI	0.7	9	12.9	1	33
APAC	8.6	19	2.2	1	49
EUR	7.9	21			
MID	1.1	2			
PA	13.8	39			
WORLD	32.1	90			

Regional Accident Statistics: 2015

RASG	Estimated Departures (in millions)	Number of accidents	Accident rate (per million departures)	Fatal accidents	Fatalities
AFI	0.8	6	7.3	0	0
APAC	9.8	24	2.5	3	98
			3.0	1	150
			2.5	1	224
PA	2.6			1	2
			2.8	6	474

Regional Accide...

RASG	Estimated Departures (in millions)	Number of accidents			
AFI	0.7	6			
APAC	10.2	18	1.8	3	449
EUR	8.9	26	2.9	1	298
MID	3.0	7	2.3	2	39
PA	9.9	41	4.1	0	0
WORLD	33	98	3.0	7	904

For **2016** (non validated results)

PA (NAM/CAR/SAM) and AFI (WACAF/ESAF)

ZERO fatalities

In the past, some regions have already achieved zero fatalities
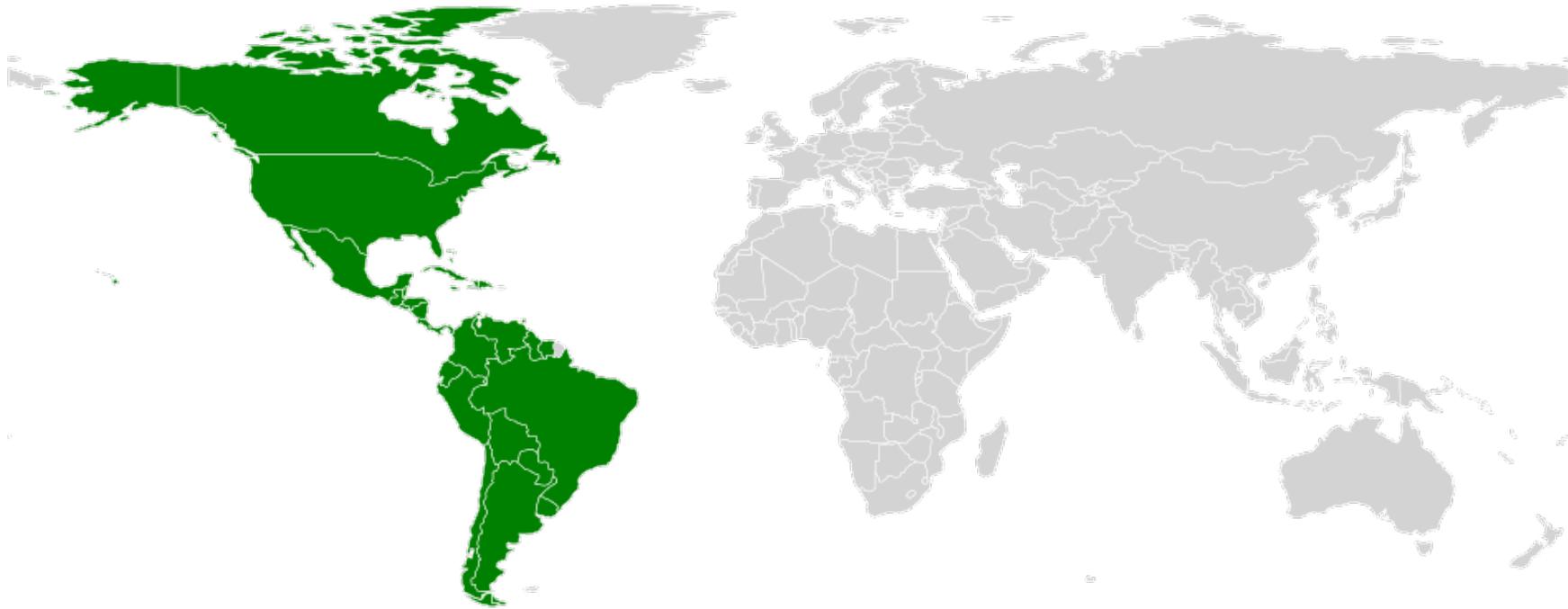
Safety and Air Navigation Updates

REGIONAL STATUS (NAM/CAR/SAM)

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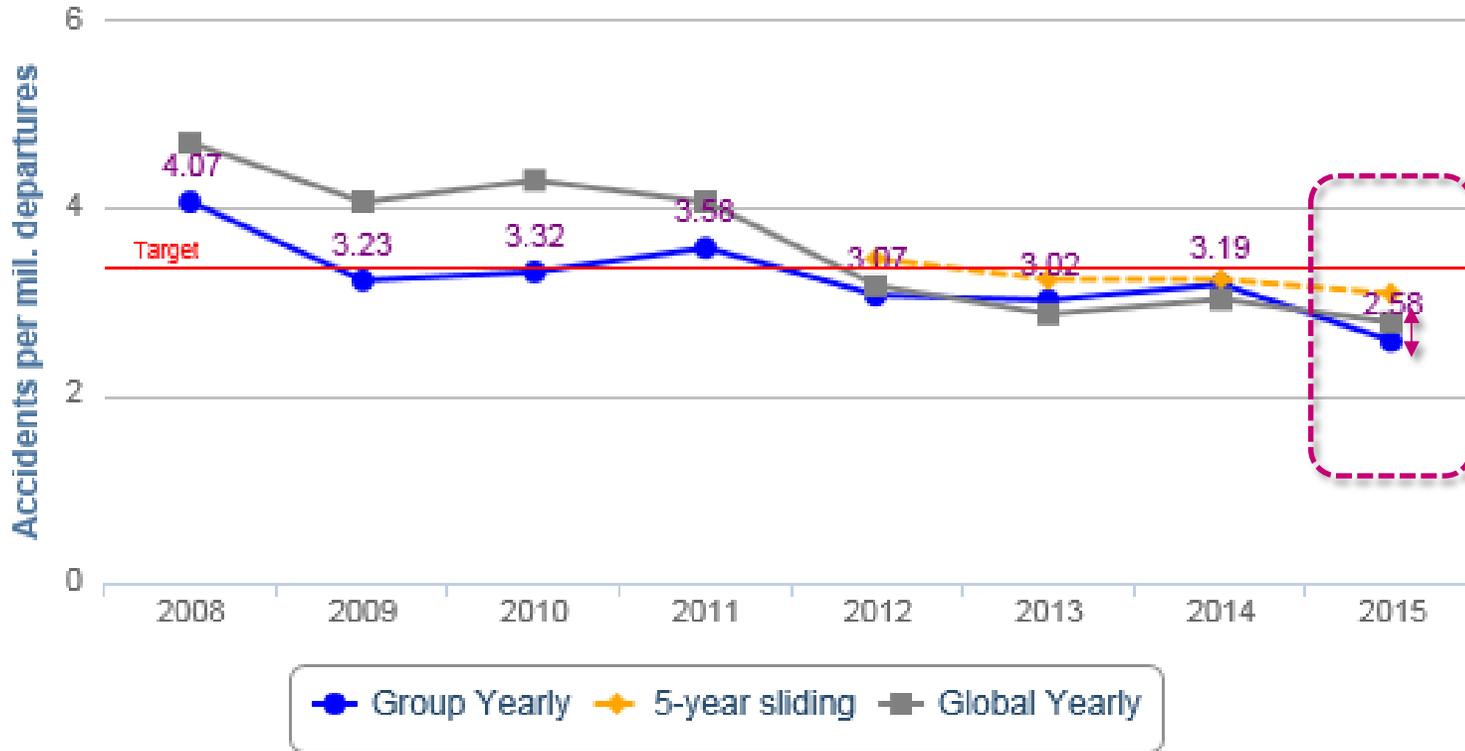
Regional Safety Briefing

Regional Accident Rates (2015)

RASG	Estimated Departures (in millions)	Number of accidents	Accident rate (per million departures)	Fatal accidents	Fatalities
AFI	0.8	6	7.3	0	0
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MID	1.2	3	2.5	1	224
PA	13	34	2.6	1	2
WORLD	33	92	2.8	6	474

1 fatal accident in the PA region

Global and NAM/CAR/SAM Accident Rates

Scheduled commercial above 5,700kg for 2008 - 2015

Average accident rate for NAM/CAR/SAM regions is **lower** than the global average
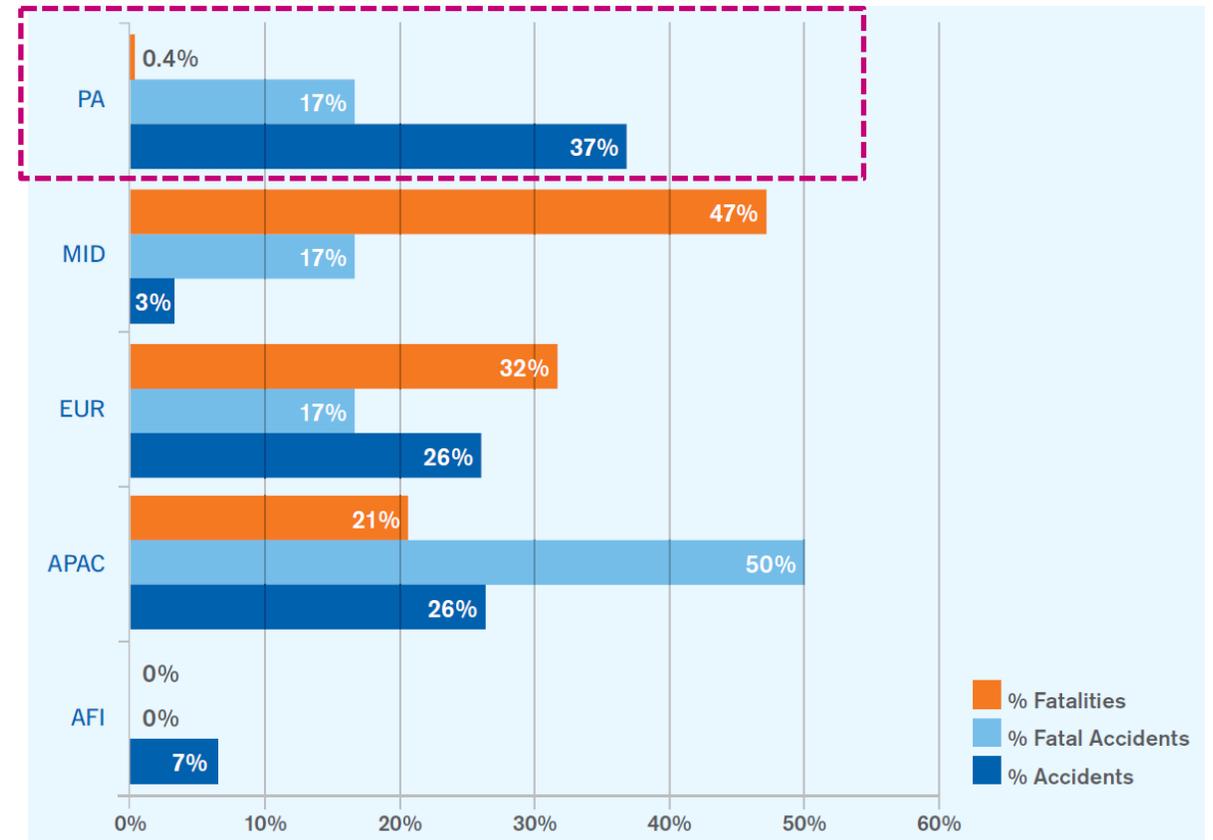
*Source: **iSTARS 3.0 – Regional Safety Briefing** (https://portal.icao.int/space)*

Regional Accidents Overview (2015)

RASP-PA region accounted for 37% of total accidents and 0.4% of fatalities
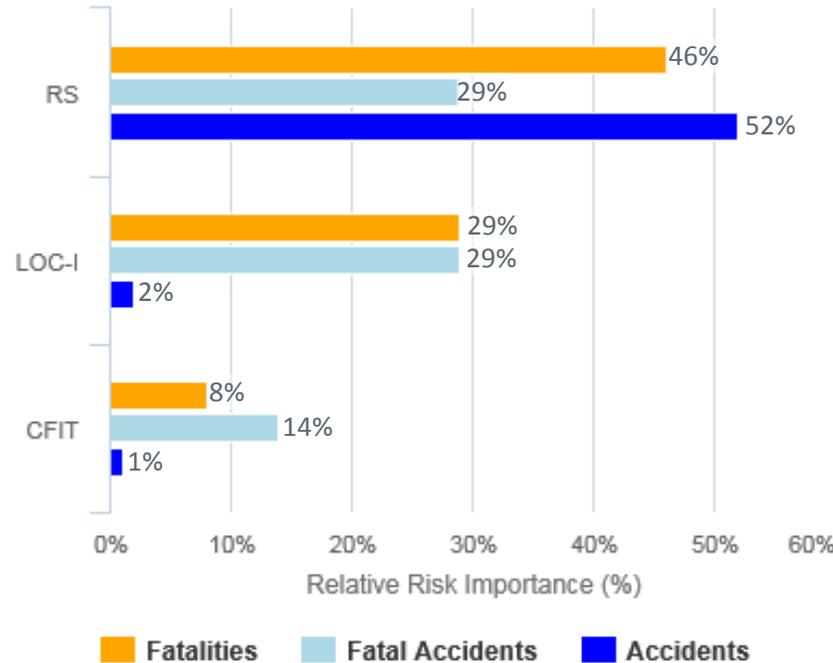
Risk Distribution for the Top 3 Safety Priorities
Scheduled commercial above 5,700kg for 2012 - 2016

NAM/CAR/ SAM

Continue focus
on the
Top 3 Global Safety Priorities
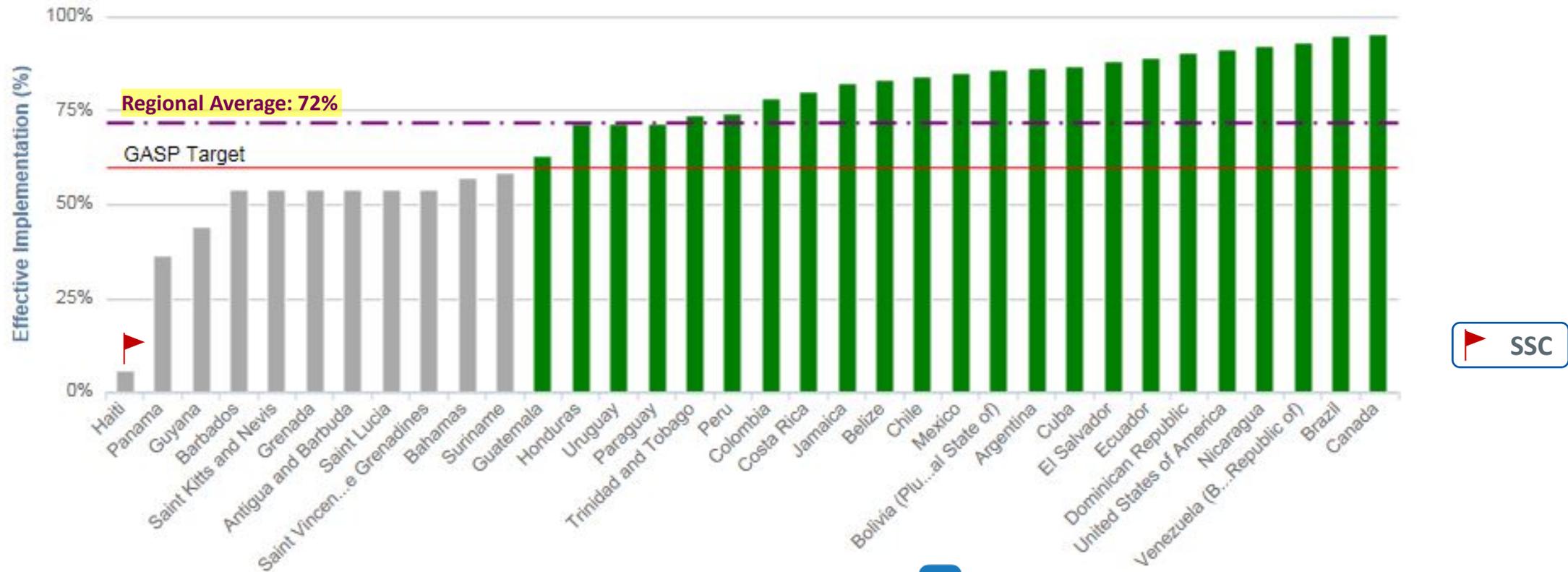*(RS, CFIT, LOC-I)*
and Regional Priority MAC

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

ICAO Safety Audit Results for NAM/CAR/SAM

Effective implementation of safety oversight systems by State (global average 64%)

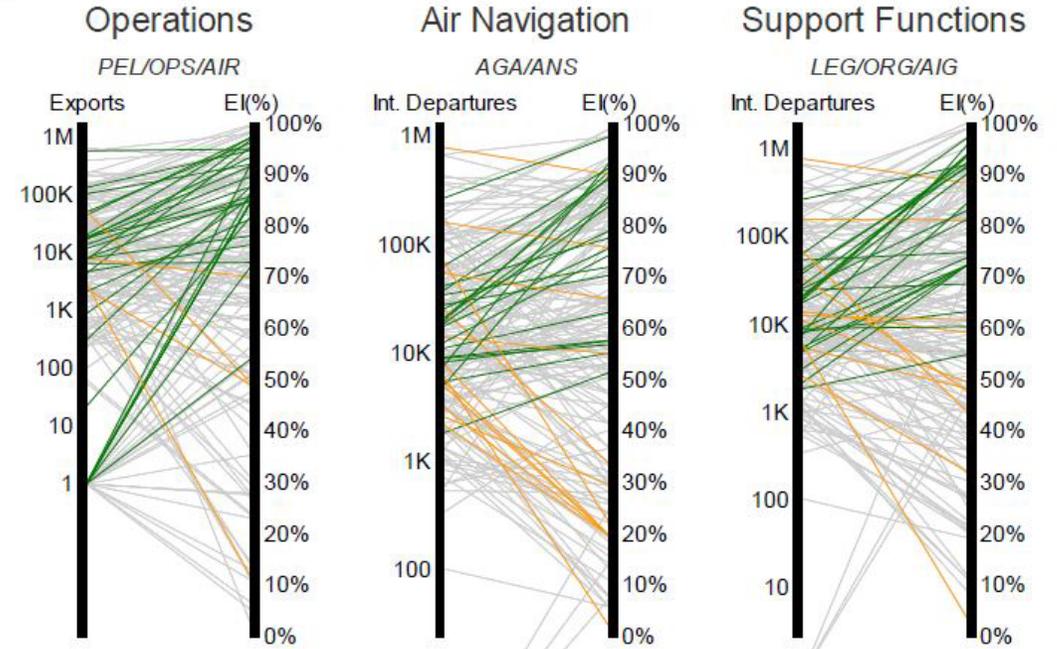*Source: **iSTARS 3.0 – Regional Safety Briefing** (https://portal.icao.int/space)*

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

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

Operations PEL/OPS/AIR · **Air Navigation** AGA/ANS · **Support Functions** LEG/ORG/AIG

Top-5 States in each Priority area

Operations	Air Navigation	Support Functions
Haiti -55.64%	Haiti -48.59%	Haiti -53.37%
Panama -29.12%	Panama -44.87%	Panama -26.07%
Paraguay -1.68%	Bahamas -32.28%	Peru -25.71%
Guatemala -1.41%	Antigua and Barbuda -31.3%	Guyana -17.17%
Bahamas 0.27%	Saint Kitts and Nevis -27.94%	United States of America -11.02%

Air traffic is predicted to **double** by 2030

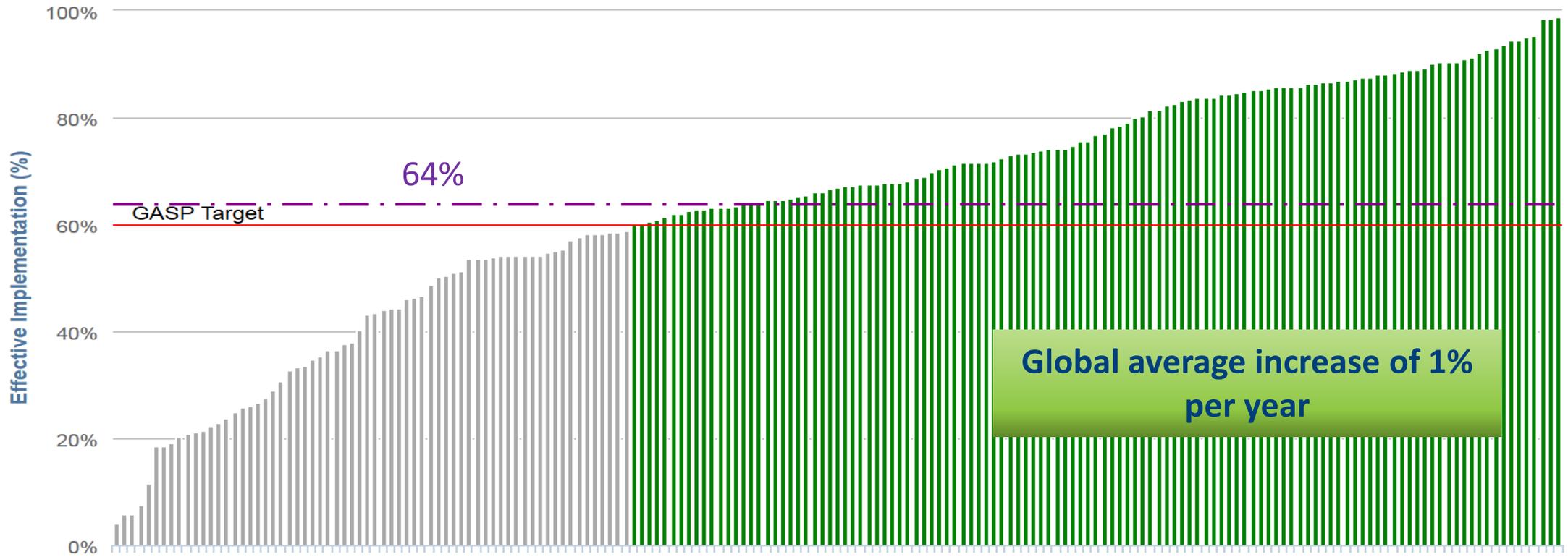How can we ensure the **safe** realization of this growth?

Risks/barriers to achieve our goal

- Effective Implementation of SARPs

- ICAO's Safety priorities: Operational Risks

- Current and emerging issues

Evolution of Analysis: Safety Margins

Operations
PEL/OPS/AIR

Air Navigation
AGA/ANS

Support Functions
LEG/ORG/AIG

Safety Margin

Risk-based prioritization model based on a State's Traffic and the level of Effective Implementation (EI) in the related technical areas at risk (Operations, Air Navigation, Support Functions)
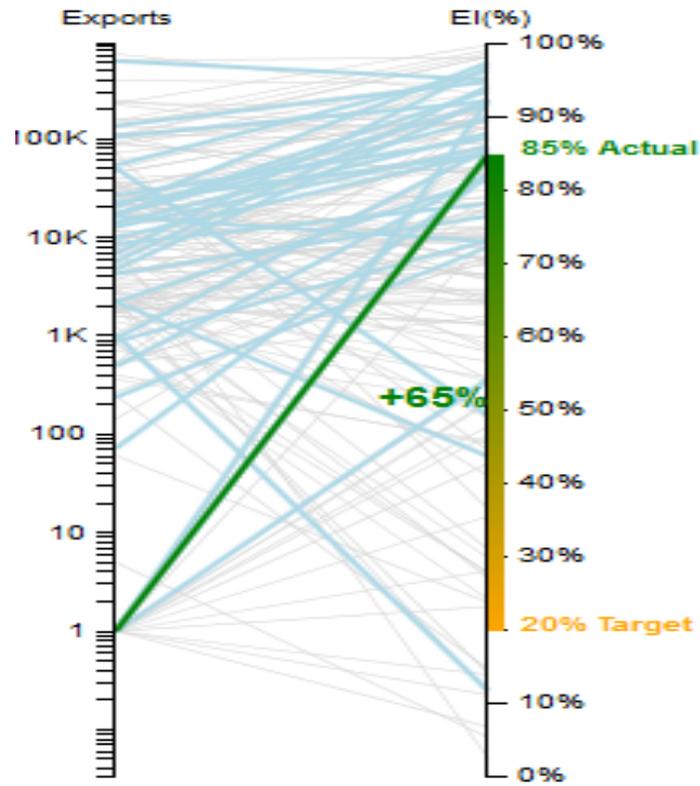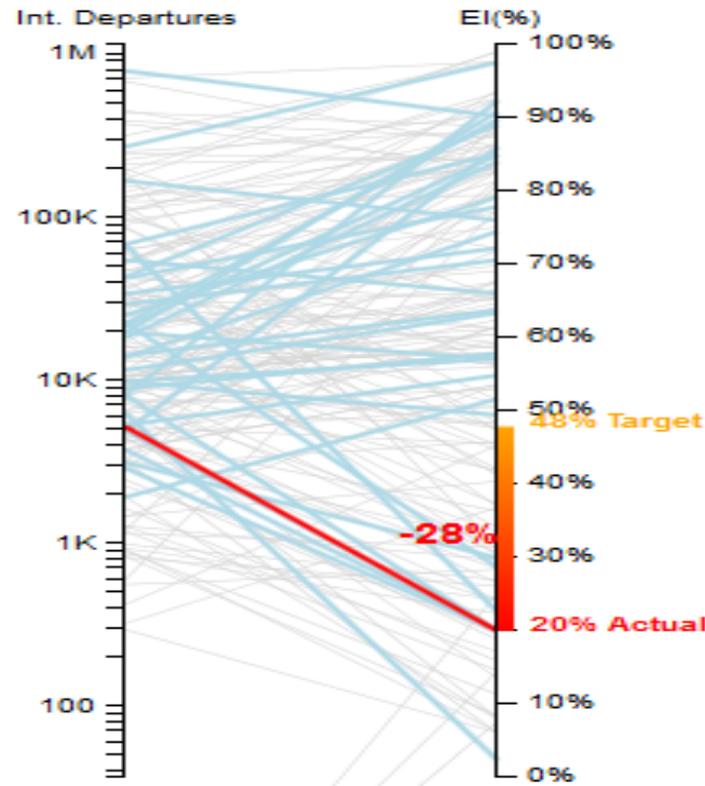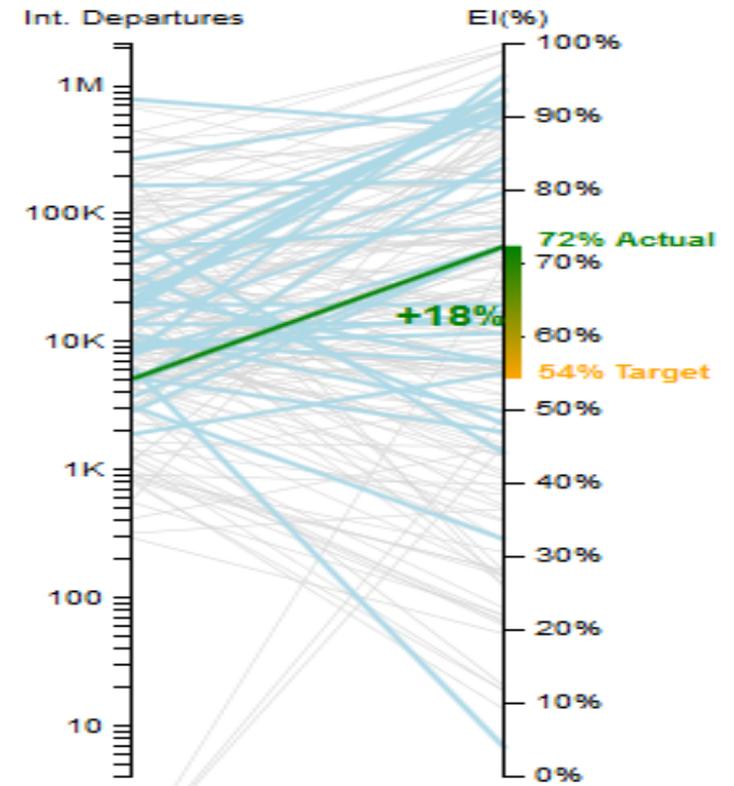
SSP pre-requisites

Identifies pre-requisites to an effective and sustainable SSP implementation

USOAP PQ Prerequisites – Safety Oversight Foundation

A subset of the approx. 1,096 USOAP PQs with more granularity than the 60% EI threshold;

Risks/barriers to achieve our goal

- Effective Implementation of SARPs

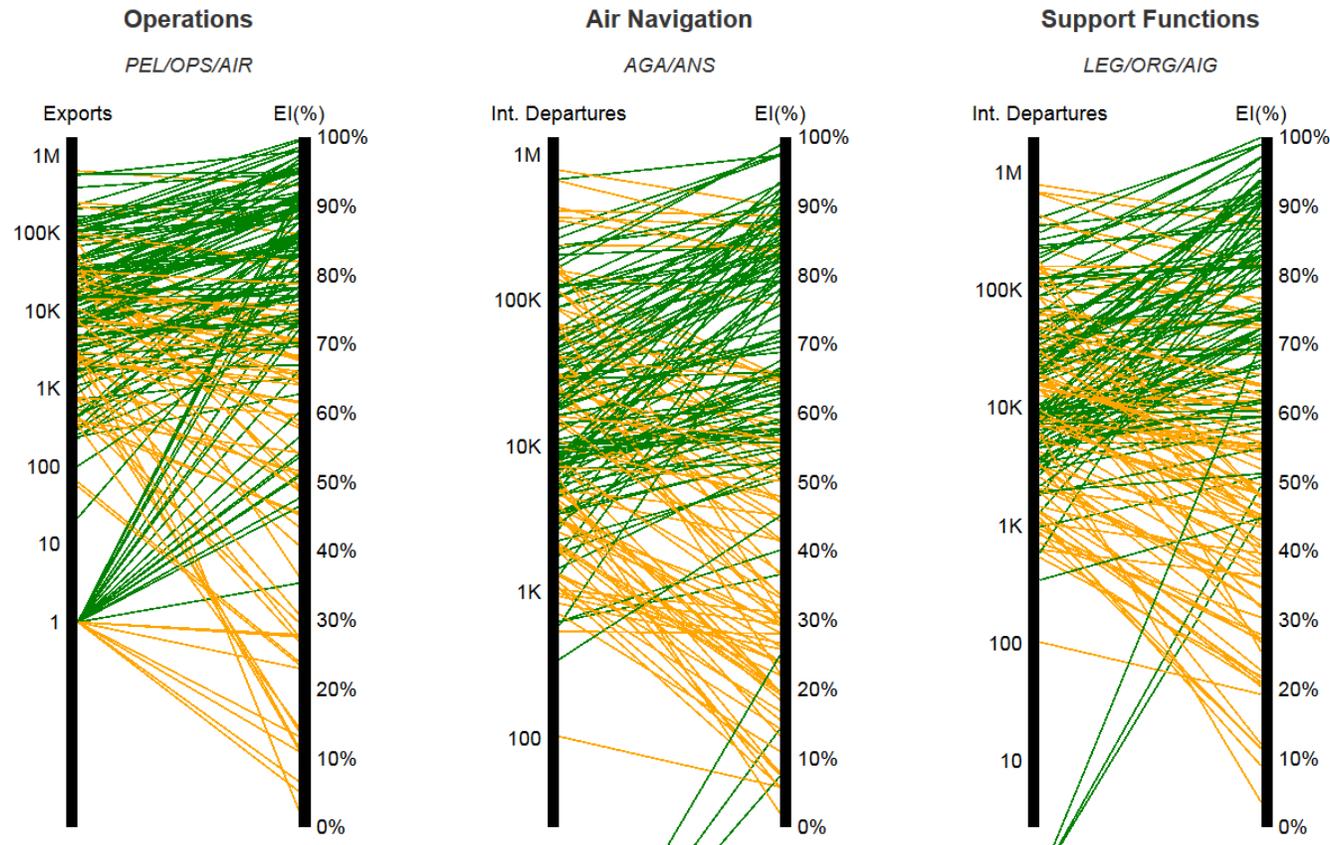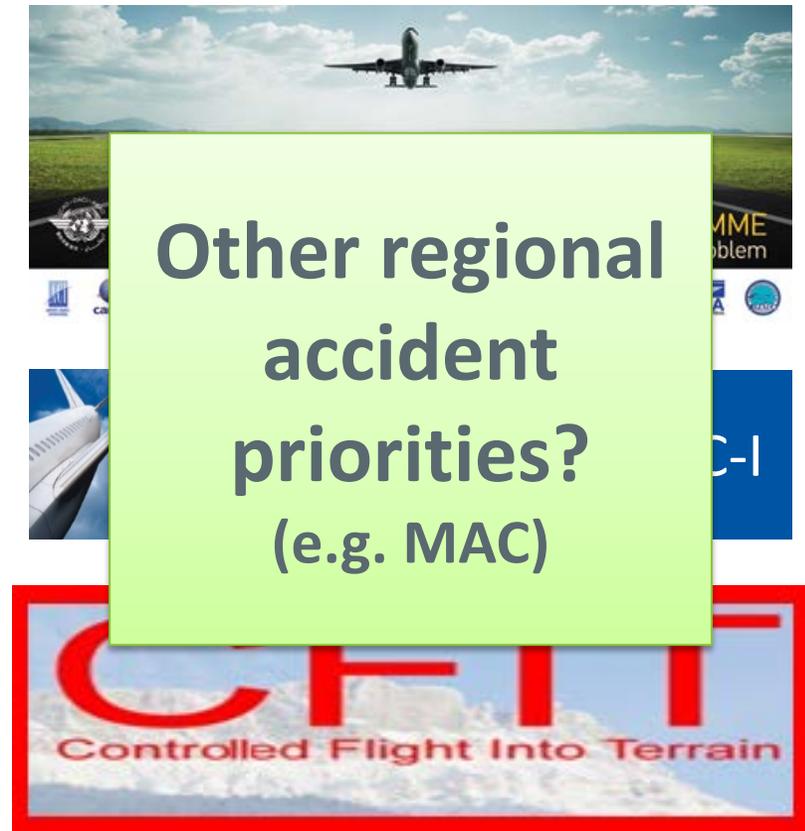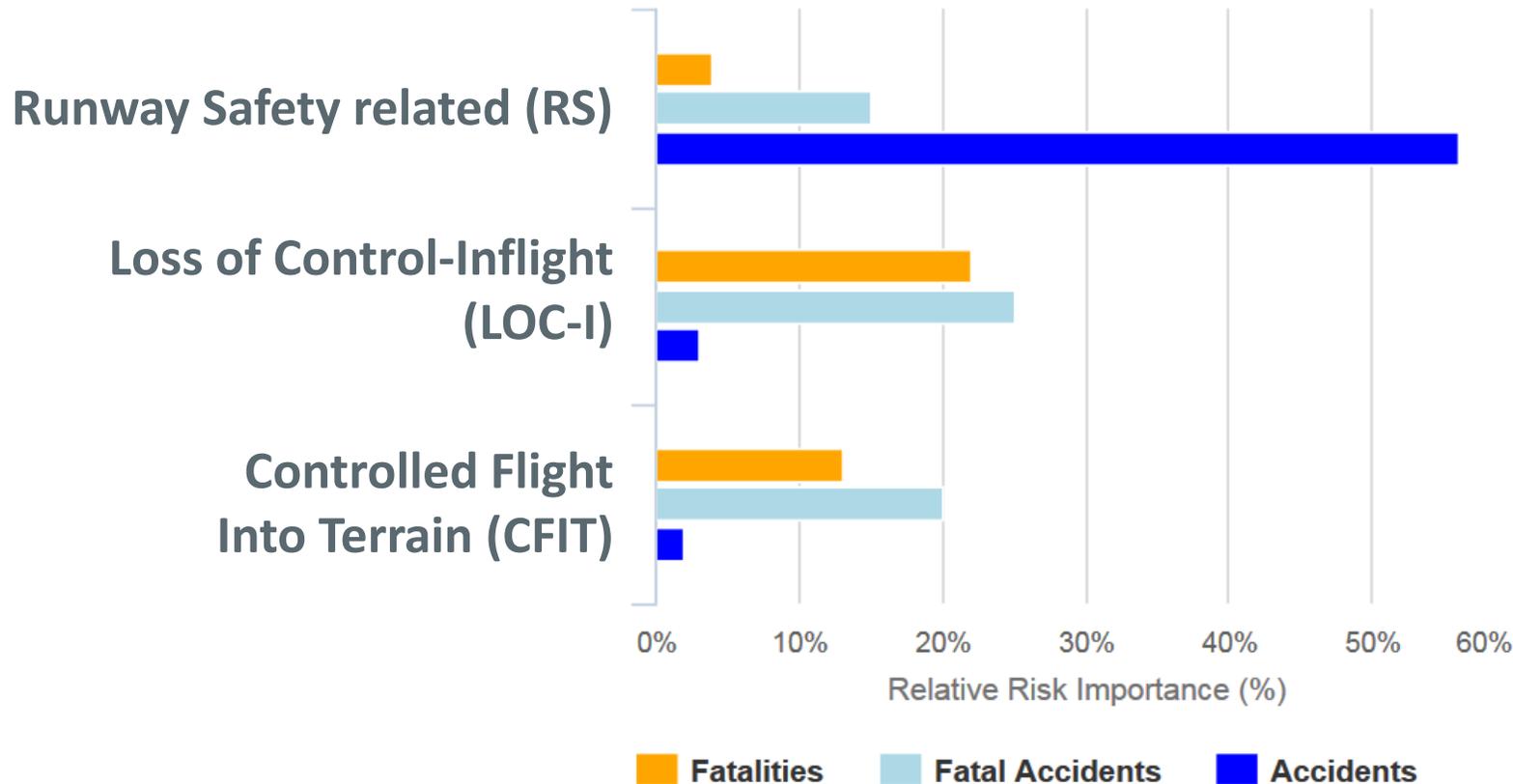- ICAO's Safety priorities: Operational Risks

- Current and emerging issues

Risks/barriers to achieve our goal

- Effective Implementation of SARPs

- ICAO's Safety priorities: Operational Risks

- Current and emerging issues

Current and Emerging Issues

What next?
Mental Health
GPS interruption
Cargo Safety
Supersonic aircraft
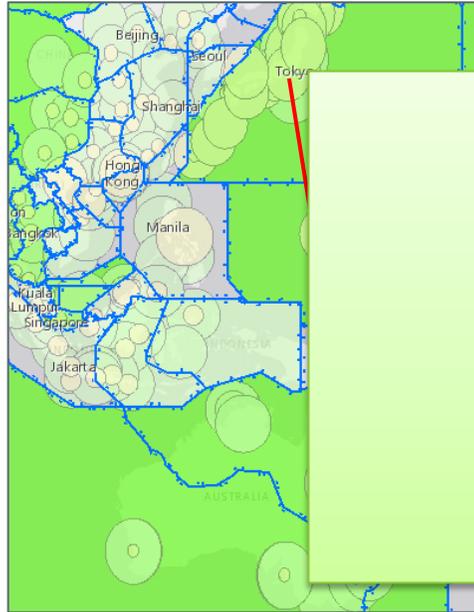
Conflict Zones | **Global Tracking** | **Cyber Safety** | **RPAS** | **Space Transportation**
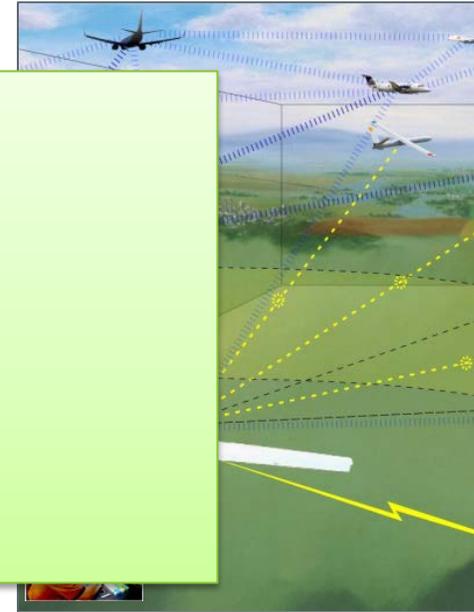
Forum On Regional Safety Oversight Organisations (RSOOs) For Global Aviation Safety

22 – 24 March 2017, Ezulwini, Swaziland

The Challenges for States

- ICAO USOAP global average overall EI increased only 2.6% in 4 years

- Aviation growth, lagging CAA development, more SARPs/PQs and more audits could reduce EI

- All States benefit from collaborative support - regional mechanisms and targeted assistance

- RSOOs need to improve including more effective delegation and financial sustainability

- Regional mechanisms need recognition of functions and tasks by ICAO and USOAP to be effective for States – impact & cost

Regional Aviation Safety Mechanisms

- Safety Promotion/ Implementation
  - RASGs
- Safety Oversight
  - COSCAP
    - Project structure with Manager, Steering Committee, time limited, assisting States in building their capability
  - Other regional safety oversight systems
    - Based on MoC or agreement, dependant on ICAO or States, assistance and oversight tasks in cooperation with State CAAs
  - Regional Safety Oversight Organizations (RSOO)
    - Legal act, permanent, autonomous, legal personality, certification and oversight tasks in cooperation with State CAAs
  - Regional Civil Aviation Authority
    - Legal act, permanent, autonomous, legal personality, certification and oversight tasks on behalf of States
- Accident Investigation
  - Regional Accident Investigation Organization (RAIO)

Cooperative Development of Operational Safety and Continuing Airworthiness Programmes (COSCAPs)

RSOO Forum

- Forum on Regional Safety Oversight Organisations for Global Aviation Safety

- Co-organised by ICAO and EASA

- 22 to 24 March 2017 in Ezulwini, Swaziland

- 2 days global and technical followed by 1 day regional and Ministerial

- 200 participants from 48 States and 32 international organizations

- 13 Ministers responsible for Civil Aviation from AFI Region States

- http://www2010.icao.int/ESAF/EASA-ICAO-RSOO-2017/Pages/default.aspx

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
  - Develop and implement an RSOO cooperative platform
  - Develop and implement a global aviation safety oversight system (GASOS)
- Ministerial Declaration on Regional Safety Oversight Organizations in Africa
  - Development of a Strategic Plan for Supporting and Strengthening RSOOs in the AFI Region
  - Action Plan to implement the Declaration by ICAO through the AFI Plan and in collaboration with AFCAC and partners

ICAO Recognition

- Recognition would be granted in respect to the specific tasks and functions carried out by the safety oversight provider.

- Each task and function would be mapped to a USOAP CMA Protocol Question (PQ) or set of PQs.

- Provider's tasks and functions would be classified in accordance with the level of empowerment granted by a State or group of States.

ICAO Recognition (Cont'd)

- The following three levels of delegation/ empowerment are defined based on the complexity of tasks and functions performed:

Level 1 – advisory and coordinating tasks and functions.

Level 2 – operational assistance tasks and functions.

Level 3 – certifying agency tasks and functions.

ICAO Recognition (Cont'd)

- For Levels 1 and 2 tasks and functions, ICAO recognition would be based on an initial assessment to evaluate the capabilities of the provider.

- For a provider to receive ICAO recognition for Level 3 tasks and functions, it would have to first undergo an activity under the ICAO USOAP CMA.

- For Levels 1 and 2, ICAO recognition would be renewed at a determined frequency, on the basis of a re-assessment.

- For Level 3, ICAO recognition would be dependent on USOAP CMA results.

Global Aviation Safety Oversight System
(endorsed during the Global RSOO Forum - Swaziland)

- **Empower and strengthen regional mechanism** (i.e. RSOO, RAIO, etc.) to form the building blocks of a global safety oversight system

- ICAO responsible for **establishing and maintaining an inventory of competent safety oversight providers** and the tasks and functions that they provide

- Regional mechanisms and safety oversight providers to demonstrate competence in the tasks and functions that they provide to a State, in order to qualify as an **ICAO recognized safety oversight provider**
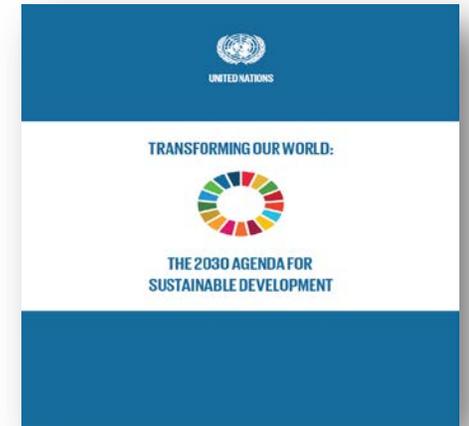
Regional Safety Oversight Organizations (RSOOs) (WP/11)

Draft Conclusion

That States endorse the implementation of the global strategy and action plan to improve RSOOs and the establishment of a global aviation safety oversight system (GASOS).

2020 – 2022 Edition of GASP

Restructuring of GASP Chapters

2017-2019 Edition

Foreword

Chap 1 – Introduction

Chap 2 – Global Safety Strategy

Chap 3 – Focus Areas

Chap 4 – GASP Framework

App A – Roadmap

App B – Implementation & Assistance

App C – Governance

App D – Indicators

App E – Code of Conduct

2020-2022 Edition

Foreword

Chap 1 – Introduction

Chap 2 – Global Safety Strategy

Chap 3 – GASP Goals & Targets

Chap 4 – Roadmap

Chap 5 – SPM

App A – ORG Roadmap

App B – OPS Roadmap

App C – GASP Indicators

How do you drive fatality risk reduction? Let us look at this another way...

Reason's Swiss Cheese Model

"a trajectory of accident opportunity"

Accidents/Fatalities

Aviation System Complexity Assessment

IATA/ACI/CANSO Assessments Service Provider SMS Maturity

Measure

ICAO SO SARPs / State EI Safety Margins by Area Groups

SSP

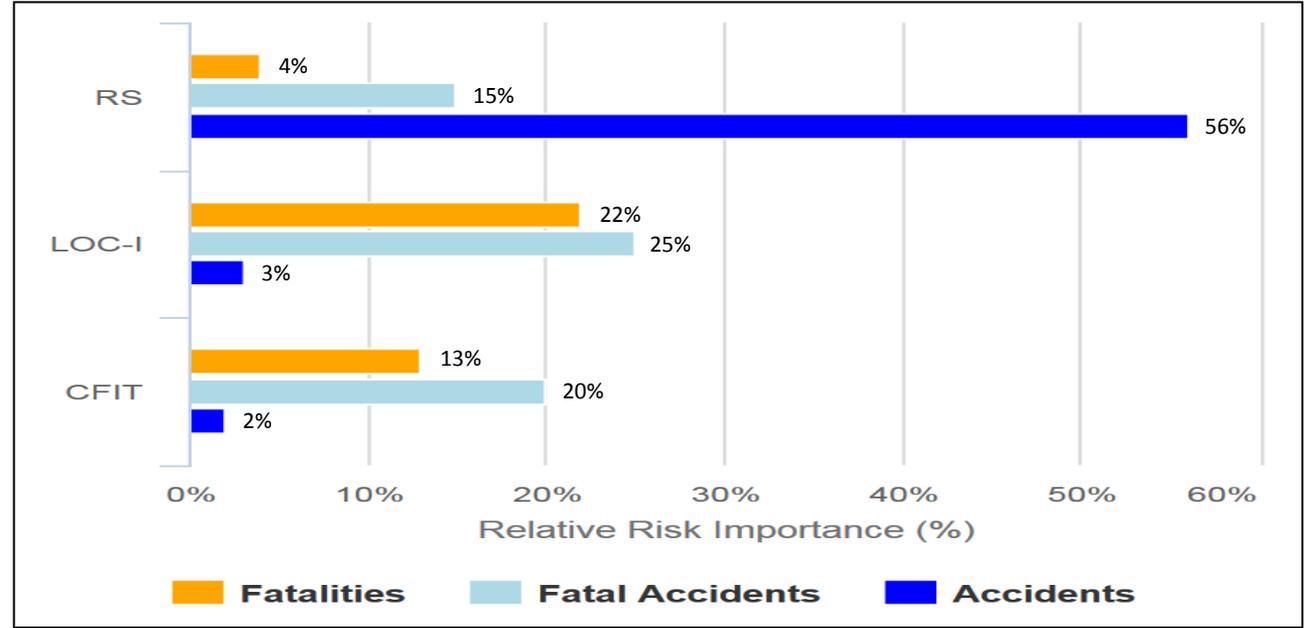RSOO, RASGs Support (Collaboration States, Orgs, industry)

Effective Implementation
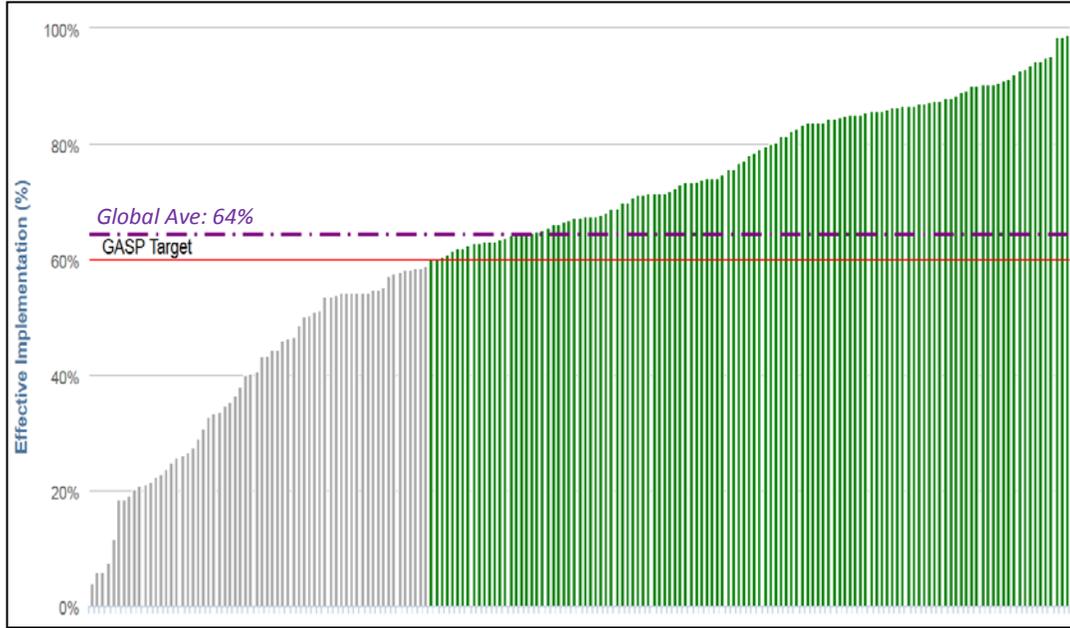
USOAP Audit Results

Operational Risk

Scheduled Commercial flights on airplanes above 5.7t 2012-2016

TARGET 2.1	TARGET 4.1	TARGET 3.1	TARGET 3.2	TARGET 2.2
Safety Margin > 10%	Recognized **RSOO** functions	Sustainable **SSP**	Effective **SSP**	**EI > 95%**
2022	2022	2022	2025	2028

TARGET 1.2	TARGET 5.1	TARGET 4.2	TARGET 4.3	TARGET 5.2	TARGET 1.1
Reduced **Accident rate**	Harmonized KPIs in **SMS**	Safety Risk information to **RASG**	**RASG** Risk Mgmt. Activities	**INDUSTRY** Assessment Programmes	Zero **Fatal** Accidents
Yearly	2020	2022	2022	2022	2030

ICAO Safety Goal: ZERO fatalities

GOAL		TARGET
GOAL 1: Achieve a continuous reduction of operational safety risks	1.1	By 2030, achieve a consecutive 3-years period **without fatalities in aircraft accidents,** and maintain thereafter
	1.2	Maintain an **annual decreasing** trend of **global accident rate**
GOAL 2: Strengthen States' safety oversight capabilities	2.1	By 2022, all States to reach a **positive safety margin of at least 10%,** in all areas
	2.2	By 2028, all States to obtain a score of **95% effective implementation** of the eight critical elements of a safety oversight system, as appropriate to their aviation system complexity
GOAL 3: Implement State Safety Programmes	3.1	By 2022, all States to implement a **Sustainable SSP**
	3.2	By 2025, all States to implement an **Effective SSP**, as appropriate to their aviation system complexity
GOAL 4: Increase collaboration at the regional level to enhance safety performance	4.1	By 2022, States that need support in areas with safety margins below zero, to **use** a **RSOO or other State functions** recognised by ICAO
	4.2	By 2022, all States to **contribute information on safety risks**, including SSP SPIs, to their respective RASGs
	4.3	By 2022, all States with a safety margin of at least 10%, and an Effective SSP, to actively engage in **RASGs' safety risk management activities** (analysis of safety risks, design and implementation of risk mitigation actions)
GOAL 5: Increase the use of industry standards	5.1	By 2020, all Service Providers to use **globally harmonized indicators**, as part of their SMS
	5.2	By 2022, increase the number of Service Providers participating in the corresponding **industry assessment programmes** recognised by ICAO

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OPS

Regional Safety Targets (WP/12)

Draft Conclusion

That RASG-PA updates the regional safety targets for the NAM/CAR/SAM regions based on the proposed new GASP (2020 – 2022) global safety targets.

Safety and Air Navigation Updates

UPCOMING SAFETY EVENTS

2ⁿᵈ RPAS Symposium

19-21 Sep, ICAO HQ

- A forum for participants to **exchange ideas** and **implementation experiences** related to remote pilot training and licensing

- Also highlighting **RPAS operator responsibilities for conducting safe operations** and an understanding of **RPAS in the ATM environment**

  - Annex 1 SARPs and PANS-Training provisions are anticipated for adoption in March 2018; this symposium will provide the first opportunity for **regulators, training facilities, and all aviation professionals to share information on this rapidly evolving new aviation sector**

1st UAS Industry Symposium

22-23 Sep, ICAO HQ

- Response to A39 request for expansion of ICAO's scope to **harmonize domestic regulations for UAS operations**

- Invitation for States, industry and academia to present best solutions to identified problem statement - **Unmanned Aircraft System Traffic Management System (UTM)**

2nd Global Runway Safety Symposium
(20-22 Nov, Lima, Peru)

- Co-organised with the Runway Safety Programme Partners
- Hosted by the Direccion General de Aeronautica Civil de Peru
- 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).

Safety Management Regional Symposia

4 Regional Symposia, starting from Q3 2017

- A forum for participants to **exchange ideas** and **implementation experiences** and contribute to the future of safety management.

- The symposia will provide an important information-sharing opportunity for **regulators, service providers, operational personnel and all aviation professionals involved in safety-management activities**.

- To include a **workshop** with **hands-on exercises**

- **Dates**:
  - **APAC and MID Regions**: Hosted by **Singapore / 12-15 September 2017**
  - **EUR/NAT Region**: Hosted by the EC and Estonian Presidency of the EU, **Tallinn / 16-18 October 2017**
  - **NAM/CAR and SAM Regions: 2018** (exact dates and location to be confirmed)
  - **ESAF and WACAF Regions: 2018** (exact dates and location to be confirmed)

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 RASG/PIRG Forum**
- **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**

THANK YOU!