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# Aviation System Risk Profiles

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Air Navigation Bureau*

iUG/01, Montréal, 18 December 2018

# Hazards & Risks

## Hazard:

A condition or an object with the potential to cause or contribute to an aircraft incident or accident

- Bad weather, wires, fatigue, wildlife

## Safety risk:

The predicted probability and severity of the consequences or outcomes of a hazard

- Increased risk of bird strike winter-time



Figure 2. US Airways Flight 1549 being pulled from the Hudson River in New York City.

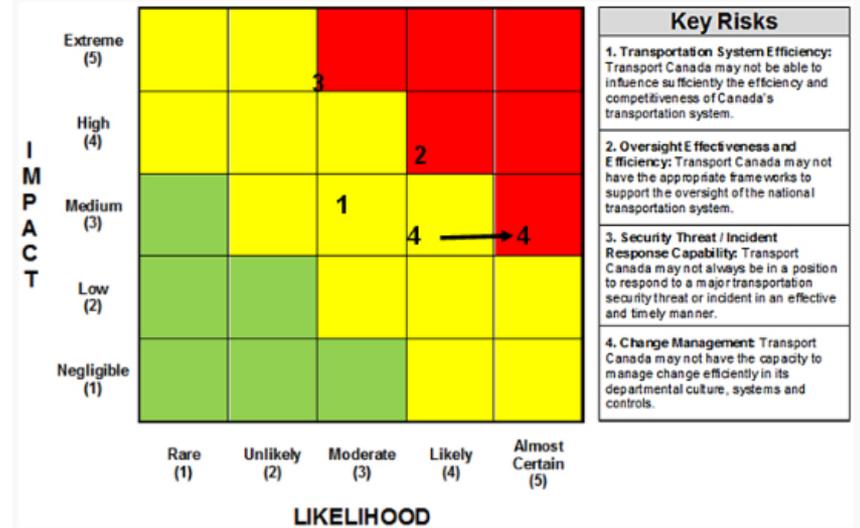
Sources: Doc 9859, CASA, Marra et al., 2009, birdnote.org

# What is a risk profile?

Quantitative analysis of the various types of threats faced

- Non-subjective
- Assists the organization to prioritize its mitigating and corrective measures
- Aids in identification of necessary resources to mitigate risk

Figure 2: Transport Canada's Corporate Risk Profile (as revised in February 2012)



Sources: Transport Canada, TechTarget

# Components of a risk profile

Probability – likelihood that a safety consequence or outcome will occur

**Table 1. Safety risk probability table**

<i>Likelihood</i>	<i>Meaning</i>	<i>Value</i>
Frequent	Likely to occur many times (has occurred frequently)	5
Occasional	Likely to occur sometimes (has occurred infrequently)	4
Remote	Unlikely to occur, but possible (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely improbable	Almost inconceivable that the event will occur	1

# Components of a risk profile

Severity – the extent of harm that might reasonably be expected to occur as a consequence or outcome of the identified hazard

Table 2. Example safety risk severity table

Severity	Meaning	Value
Catastrophic	<ul style="list-style-type: none"> <li>Aircraft / equipment destroyed</li> <li>Multiple deaths</li> </ul>	A
Hazardous	<ul style="list-style-type: none"> <li>A large reduction in safety margins, physical distress or a workload such that operational personnel cannot be relied upon to perform their tasks accurately or completely</li> <li>Serious injury</li> <li>Major equipment damage</li> </ul>	B
Major	<ul style="list-style-type: none"> <li>A significant reduction in safety margins, a reduction in the ability of operational personnel to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency</li> <li>Serious incident</li> <li>Injury to persons</li> </ul>	C
Minor	<ul style="list-style-type: none"> <li>Nuisance</li> <li>Operating limitations</li> <li>Use of emergency procedures</li> <li>Minor incident</li> </ul>	D
Negligible	<ul style="list-style-type: none"> <li>Few consequences</li> </ul>	E

## Components of a risk profile

Tolerability – readiness to bear risk after treatment in order to achieve objectives

- Safety risk index rating is created by combining probability and severity scores

Table 4. Example of safety risk tolerability

<i>Safety Risk Index Range</i>	<i>Safety Risk Description</i>	<i>Recommended Action</i>
5A, 5B, 5C, 4A, 4B, 3A	INTOLERABLE	Take immediate action to mitigate the risk or stop the activity. Perform priority safety risk mitigation to ensure additional or enhanced preventative controls are in place to bring down the safety risk index to tolerable.
5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	TOLERABLE	Can be tolerated based on the safety risk mitigation. It may require management decision to accept the risk.
3E, 2D, 2E, 1B, 1C, 1D, 1E	ACCEPTABLE	Acceptable as is. No further safety risk mitigation required.

Sources: Doc 9859,  
Marsden, 2015

# Elements of a risk profile applied to aviation

**Table 3. Example safety risk matrix**

<i>Safety Risk</i>		<i>Severity</i>				
		<i>Catastrophic A</i>	<i>Hazardous B</i>	<i>Major C</i>	<i>Minor D</i>	<i>Negligible E</i>
<i>Probability</i>						
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely improbable	1	1A	1B	1C	1D	1E

Sources: Doc 9859



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## Risk Profiles and Indicators



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FOR YOUR ORGANIZATION





## Safety Performance Indicators (SPIs)

- A data-based parameter used for monitoring and assessing safety performance which can feed into the safety profile
  - Lagging - measure events that have already occurred; “outcome-based SPIs”
    - low probability/high severity: outcomes such as accidents or serious incidents
    - high probability/low severity: outcomes that did not necessarily manifest themselves in a serious accident or incident, these are sometimes also referred to as precursor indicators
  - Leading - measure processes and inputs being implemented to improve or maintain safety; “activity or process SPIs”

# iSTARS and SPIs

- Web-based system on ICAO Secure Portal
- Hosts web applications which detail SPIs as well as their respective targets
- Aids in making safety, efficiency and risk analyses
- Aligned to data driven decision making



**ICAO iSTARS 3.0**  
Integrated Safety Trend Analysis and Reporting System

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- Air Transport Accessibility
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## Datasets

Web applications are based on a collection of safety and efficiency datasets from various sources



The Aviation Herald

[www.avherald.com](http://www.avherald.com)

# Utilization by CAAs

CAAs can access a snapshot of their State's performance/ activities utilising indicators

- provide specific information on the status, level or condition of something
- expresses achievement, the attainment of a goal or the results of a specific change.

Performance Dashboard			
Indicator	Target	Value	Achieved
USQAP <sup>1</sup> BI	80%	95.17%	Yes
USQAP overall BI(%)			
Significant Safety Concerns (SSCs)	0	0	Yes
Number of SSCs			
Fatal Accidents		3	No
Number of fatal accidents in last 5 years			
Aerodrome Certification	Satisfactory	Satisfactory	Yes
Validated status of USQAP Protocol Questions (PQ) 3.031, 3.033 and 3.036			
State Safety Programme (SSP) Foundation	100%	98.9%	No
Percentage of SSP Foundation protocol questions (PQs) validated by USQAP or submitted as completed			
State Safety Programme (SSP)	Level 2	Level 3	Yes
Level of SSP implementation			
IOSA	>0	9	Yes
Number of IOSA certified operators			
FAA IASA	Cat 1	Cat 1	Yes
IASA categorization			
EU Safety List	Unrestricted	Unrestricted	Yes
Number of operational restrictions			
IFN	100%	99.97%	No
Percentage of International Instrument runways with IFN approaches			
Global Aviation Training Activities	>0	86	Yes
Number of courses delivered or developed by TRAINAIR PLUS Members in the last 12 months			
Corrective Action Plan Update	>0	5	Yes
Number of updates in the last 12 months on the Online Framework (OLF)			
Positive Safety Margins	≥2	3	Yes
Number of areas (Operations, Air Navigation, Support) with a positive Safety Margin			

Note: The targets are agreed global or regional performance targets, as applicable. Fatal accidents are by State of Occurrence or State of Operator on scheduled commercial flights with aircraft over 5.7t for the last 5 years.

## Utilization by Regulatory Bodies

Regulatory bodies such as ICAO can access a snapshot of a State's performance/ activities

- Some indicators are relevant to formulating the State safety risk profile
- Identify and prioritize Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA) activities.

**USOAP**  
Continuous Monitoring Approach



**Promoting global aviation safety**  
by continuously monitoring and updating  
the safety oversight capabilities of all ICAO Member States.



Sources: Doc 9735



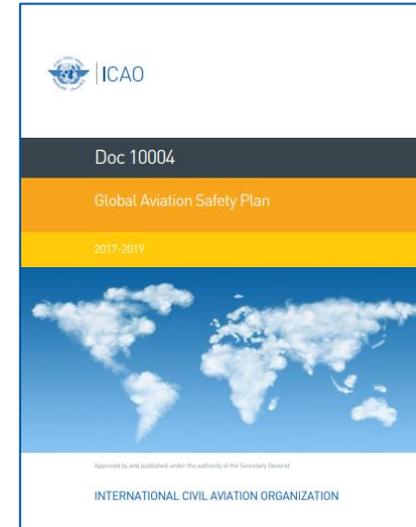
## Utilization by Regional Bodies

- Cooperative Development of Operational Safety and Continuing Airworthiness Programmes (COSCAPs)
- Regional Safety Oversight Organizations (RSOOs)
- Regional Aviation Safety Groups (RASGs)
- Planning and Implementation Regional Groups (PIRGs)



## Utilization by Regional Bodies

- collaborate and share resources, supporting No Country Left Behind (NCLB)
- analyze safety information and hazards to aviation at a regional level and reviewing the action plans
- global guidance and regional harmonization measures
- RASGs develop and implement work programmes that support a regional performance framework for the management of safety on the basis of the Global Aviation Safety Plan (GASP)



# Indicators Featured on iSTARS applications

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integrated Safety Trend Analysis and Reporting System

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# State and Regional Safety Briefings



## Performance Dashboard

Performance Dashboard			
Indicator	Target	Value	Achieved
<b>USQAP EI</b> <small>USQAP overall EI(%)</small>	60%	71%	Yes
<b>Significant Safety Concerns (SSCs)</b> <small>Number of SSCs</small>	0	0	Yes
<b>Fatal Accidents</b> <small>Number of fatal accidents in last 5 years</small>		0	Yes
<b>Aerodrome Certification</b> <small>Validated state of USQAP Protocol Questions (PQ) 2.001, 2.002 and 2.003</small>	Satisfactory	Satisfactory	Yes
<b>State Safety Programme (SSP) Foundation</b> <small>Percentage of SSP Foundation protocol questions (PQ) validated by USQAP or submitted as completed</small>	100%	77.01%	No
<b>State Safety Programme (SSP)</b> <small>Level of SSP implementation</small>	Level 2	Level 2	Yes
<b>IOSA</b> <small>Number of IOSA certified operators</small>	>0	1	Yes
<b>FAA IA SA</b> <small>IA SA categorization</small>	Cat 1	NR	
<b>EU Safety List</b> <small>Number of operational restrictions</small>	Unrestricted	Unrestricted	Yes
<b>PBN</b> <small>Percentage of international instrument runways with PBN approaches</small>	100%	0%	No
<b>Global Aviation Training Activities</b> <small>Number of courses delivered or developed by TRAINAIR PLUS Members in the last 12 months</small>	>0	0	No
<b>Corrective Action Plan Update</b> <small>Number of updates in the last 12 months on the Online Framework (OLF)</small>	>0	12	Yes
<b>Positive Safety Margins</b> <small>Number of areas (Operations, Air Navigation, Support) with a positive Safety Margin</small>	3/3	3	Yes

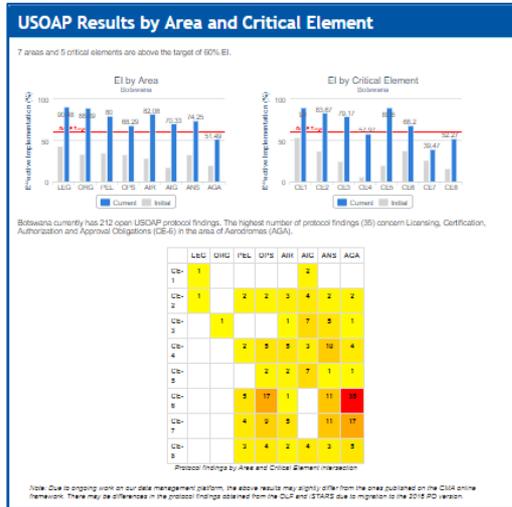
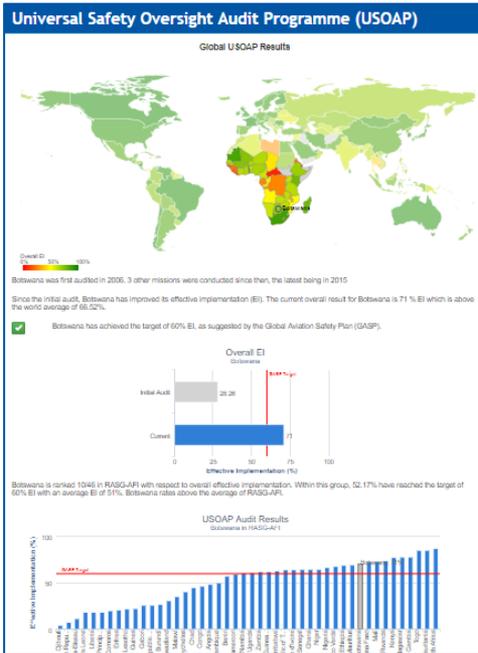
Note: The targets are agreed global or regional performance targets, as applicable. Fatal accidents are by State of Occurrence or State of Operator on scheduled commercial flights with aircraft over 5.7t for the last 5 years.

Provide a comprehensive overview of the state of aviation safety and air transport using indicators

# State Safety Briefings



## USOAP Results



## USOAP CAP Progress

### USOAP CAP Progress

ICAO encourages all States to regularly update their CAP progress, along with a detailed self-assessment, providing all relevant evidence through the CUF, and ensure that the CAP fully addresses the findings and reflects the progress made in its implementation.

Botswana has been actively providing updates to its Corrective Action Plan (CAP) on the CMA online framework (CUF) for uncompleted CAPs.

## Significant Safety Concerns (SSCs)

### Significant Safety Concerns (SSCs)

SSCs indicate that a State is not providing sufficient safety oversight to ensure the effective implementation of applicable ICAO Standards. SSCs may be issued in the area of operations, air navigation services, aerodromes, airworthiness or licensing.

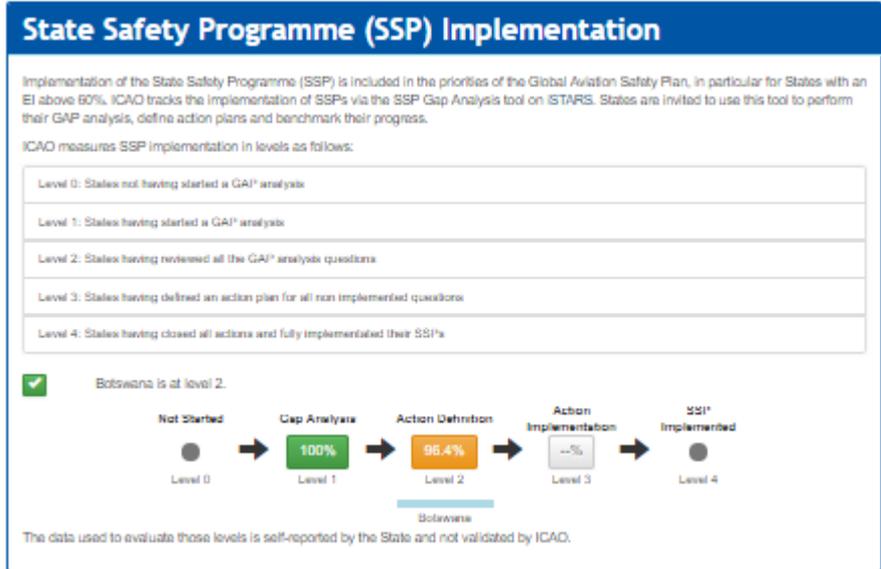
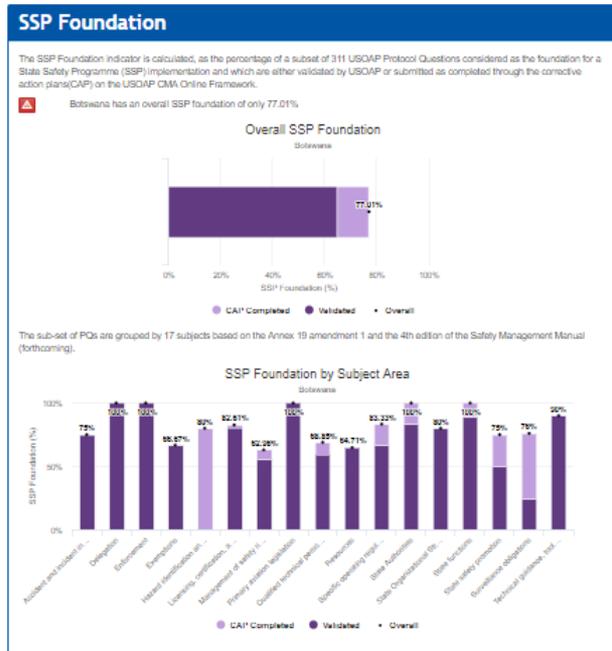
Botswana has no Significant Safety Concerns (SSCs).

# State Safety Briefings



## SSP Foundation

## SSP Implementation



Lead: Ruviana Zimmerman and Safety Management Section

# State Safety Briefings



## Global Aviation Training Activities

## PBN Implementation

### Global Aviation Training Activities

ICAO, through its Global Aviation Training Office, establishes coordinated, effective and efficient mechanisms to support the development of human resources in aviation, appealing to Member States and the industry. Its objective is to develop training to facilitate the global implementation of ICAO provisions, set up acceptable training qualifications processes and frameworks and provide guidance to States and industry in skills development.

Botswana has 1 TRAINAIR PLUS Member. No ICAO-recognized courses have been developed. No ICAO-recognized courses are under development. In total, 1 ICAO-recognized course was delivered with 21 participants.

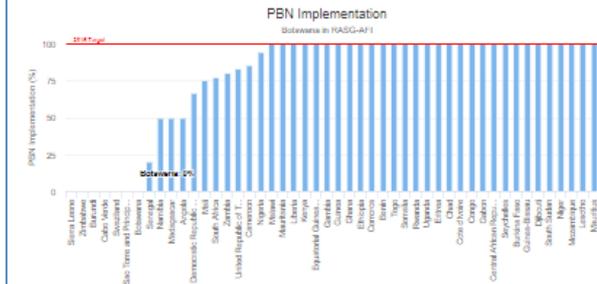
**⚠** Botswana has not developed or delivered any courses in the past 12 months.

**Courses Delivered** 1      **Courses Developed** 0      **Training Centres** 1      **Total Participants** 21



TRAINAIR PLUS Members list:  
IAS Aviation Academy

### PBN Implementation



The implementation of Performance-based Navigation (PBN) is presently the global aviation community's highest air navigation priority. The PBN concept offers significant benefits including improved safety through more straight-in instrument approaches with vertical guidance, increased airspace capacity, increased airport accessibility, more efficient operations, reduced infrastructure costs and reduced environmental impact.

The 37th Session of the Assembly defined targets in terms of the percentage of implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS), including LNAV-only minima, for all instrument runway ends, either as the primary approach or as a back-up for precision approaches: 30% by 2010, 70% by 2014, 100% by 2016.

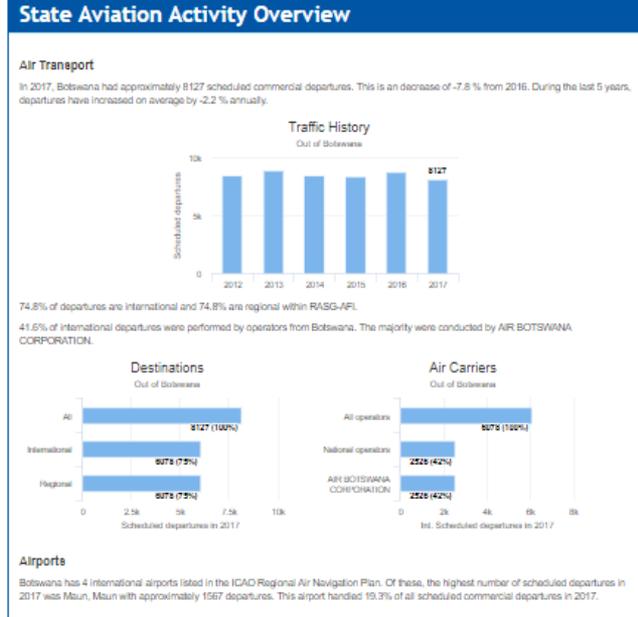


**⚠** Botswana's international airports have 4 instrument runways which have 0 PBN approaches. This establishes the PBN implementation at 0% for Botswana.

In RASG-AP, 75% of States reached the 2014 target of 70% by implementing PBN approaches on more than 70% of their international instrument runways. 62.5% of States reached the 2016 target of 100% by implementing PBN approaches on all of their international instrument runways.

# State Safety Briefings

## State Aviation Activity Overview



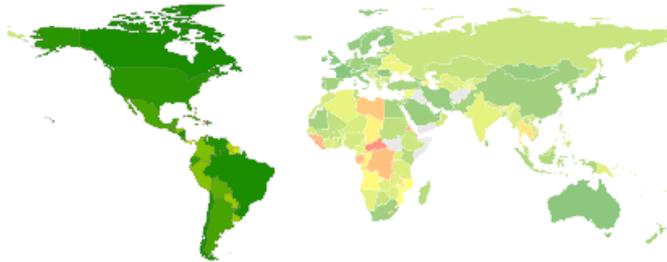
# Regional Safety Briefings



## USOAP Results and inter-State comparison

### Universal Safety Oversight Audit Programme (USOAP)

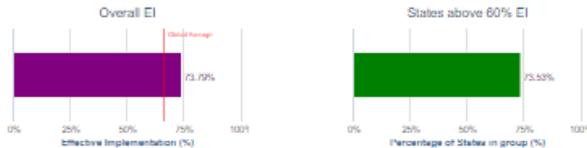
Global USOAP Results



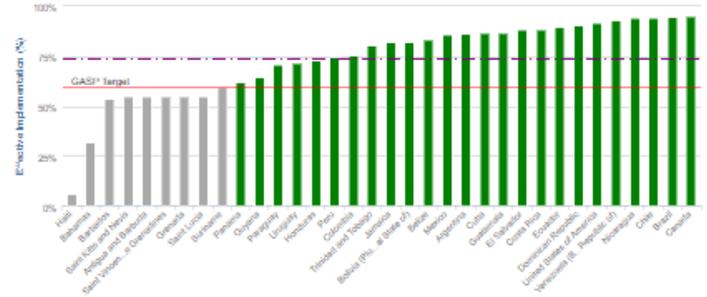
RASG-PA contains 34 States. All States in that region have received a USOAP CMA audit.

The current average USOAP score for States in RASG-PA is 73.79% which is above the world average of 56.27%.

73.53% of the States in RASG-PA have achieved the target of 60% EI, as suggested by the Global Aviation Safety Plan (GASP)

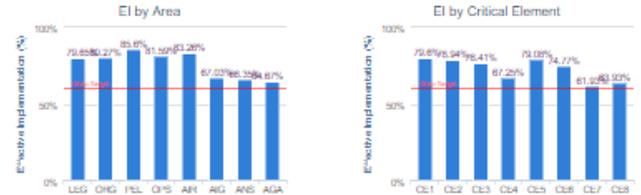


USOAP Audit Results



### USOAP Results by Area and Critical Element

8 areas and 8 critical elements are above the target of 60% EI.



# Regional Safety Briefings



## SSCs

### Significant Safety Concerns (SSCs)

SSCs indicate that a State is not providing sufficient safety oversight to ensure the effective implementation of applicable ICAO Standards. SSCs may be issued in the area of operations, air navigation services, aerodromes, airworthiness or licensing.

RASG-PA has 1 State with 1 SSC.

State	SSCs	SSC Areas				
		Airworthiness	Operations	Licensing	Aerodromes	Air Navigation
Peru	1		X			

## Safety Partner Programmes

### Safety Partner Programs

The Federal Aviation Administration (FAA) rates States through their International Aviation Safety Audit (IASA) programme. The FAA does not allow air carriers from category 2 States to operate to the United States of America.

In RASG-PA, 2 States are rated Category 2: Barbados, Uruguay

The European Commission can decide to ban certain airlines from operating in European airspace, if they are found to be unsafe and/or they are not sufficiently overseen by their authorities.

In RASG-PA, 2 States have operational restrictions with regard to European airspace: Suriname, Venezuela (Bolivarian Republic of)

# Regional Safety Briefings



## Accident Statistics

### Accident Statistics

RASG-PA had 1 fatal accident on scheduled commercial flights with aircraft over 5.7t in 2017. In total, those accidents caused 1 fatality.

RASG-PA has an accident rate of **3.66** accidents per million departures in 2017 trending up.

The current 5-year sliding average accident rate for RASG-PA is **2.37**.

To be in line with the global accident rate and taking into account the traffic volume of RASG-PA, the yearly accident rate for RASG-PA should be between 1.87 and 2.97. The latest accident rate for RASG-PA is **3.66** which is not in line with the global rate.

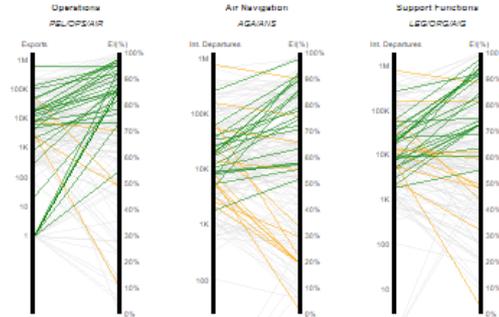
The latest accident rate of RASG-PA is significantly higher than the global rate.



## Regional Priorities

### Regional Priorities

The States are prioritized by considering the level of implementation (EI) as well as the related activity at risk in the areas of 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

State	Operations Safety margin	Air Navigation Safety margin	Support functions Safety margin
Haiti	-63.67%	-42.32%	-63.61%
Bahamas	-30.05%	-45.49%	-26.07%
Panama	-4.46%	-30.27%	-26.05%
Bolivia (Plurinational State of)	-3.08%	-25.45%	-10.32%
Paraguay	-1.54%	-20.27%	-3.41%



Map

**Aerodrome Briefing**  
Grantley Adams Intl (TBPB), Bridgetown - Barbados (UTC-4:00h)

13° 04' 23" N, 059° 23' 32" W  
Automatically Generated by ICAO/iSTAR 2018-10-10

# Airport Briefings

## Performance Dashboard

Dashboard			
Indicator	Benchmark	Value	
Safety Oversight of Aerodromes and Ground Aids USQAP Effective Implementation score of the AGA technical area	80%	57.86%	✖
Safety Management USQAP Effective Implementation of SMS, aeronautical studies and risk assessments at aerodromes	100%	22.22%	✖
Aerodrome Certification Validated status of USQAP Protocol Questions (PQ) 8.081, 8.082 and 8.085	Satisfactory	Unsatisfactory	✖
Runway Safety Programs Validated status of USQAP Protocol Question (PQ) 7.189	Satisfactory	Satisfactory	✔
Performance Based Navigation (PBN) Percentage of Instrument runways with PBN approaches	100%	100%	✔
Terrain Challenge Percentage of terrain above 800m within 20NM of the aerodrome	0%	0%	✔
Meteorological Conditions Percentage of IMC during the worse month	25%	2.87%	✔
Capacity Usage Percentage of total theoretical maximum throughput capacity (MTC) used during the peak 3-hour period	75%	15.98%	✔

# Briefings: Airport

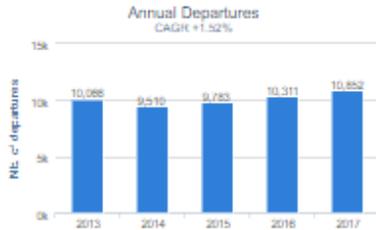


## Traffic

### Traffic

Grantley Adams Intl had 10852 scheduled commercial departures in 2017.

Grantley Adams Intl is number 1 international airport in Barbados in terms of departures. The number of scheduled departures have increased over the last five years. The airports compound annual growth rate (CAGR) is +1.52%.



## International Operations

### International Operations

Grantley Adams Intl served 43 international destinations in 2017 and 0 domestic destinations. The most low international destination is E.T. JOSHLA in Saint Vincent and the Grenadines with 1460 flights per year.

20 airlines operate regularly out of Grantley Adams Intl. The first airline is LIAT (1974) LTD. from Antigua and Barbuda with 5203 departures per year.



International Destinations from Grantley Adams Intl (43)





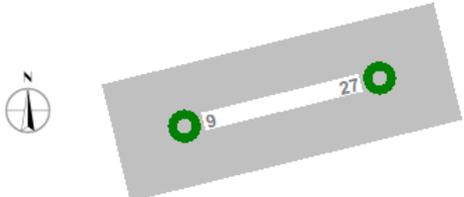
# Briefings: Airport

## Safety Oversight and Aerodrome Certification

### Runways and PBN

#### Runways and PBN

Grantley Adams Intl has 1 runway with a total of 2 runway ends with instrument approach procedures.



100% of the instrument runway ends have performance based navigation (PBN) approach procedures published.

**PBN Implementation**  
Instr. runway ends with PBN approach procedures (%)



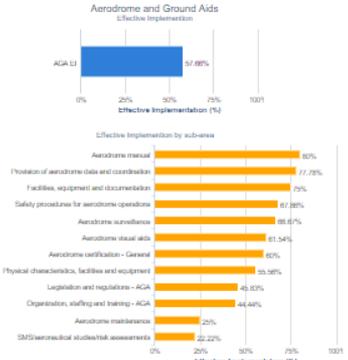
The approach, arrival and departure procedures available on each runway end are listed below. Non-instrument runways are marked in *italic*, if any.

Runway	Landing Distance Available (m)	Conventional		PBN				SID*	STAR*
		Non-Precision	Precision	RNAV	RNAV/VNAV	LTV	HN/TAH		
9	3155	x	x	x	x			x	x
27	3155	x		x	x			x	x

#### Safety Oversight and Aerodrome Certification

Barbados has been audited under the USQAP QMA. The current overall effective implementation is 54.06%. In the area of aerodromes and ground aids, the effective implementation of Barbados is 57.66%. A total of 58 protocol question findings are currently open in that area.

**Aerodrome and Ground Aids**  
Effective Implementation



**Effective Implementation by sub-area**

Sub-area	Effective Implementation (%)
Aerodrome manual	80%
Provision of aerodrome data and coordination	77.78%
Facilities, equipment and documentation	75%
Safety procedures for aerodrome operations	67.86%
Aerodrome surveillance	66.67%
Aerodrome visual aids	61.54%
Aerodrome certification - General	60%
Physical characteristics, facilities and equipment	59.58%
Legislation and regulations - AGA	46.85%
Organization, staffing and training - AGA	44.44%
Aerodrome maintenance	20%
SMS/aeromedical studies/risk assessments	22.22%

Certification of international aerodromes has been raised to a global and regional priority. It is an indicator of the quality, reliability, sustainability and resilience of an aerodrome and directly relates to **Goal 8 of United Nations Sustainable Development Goals (SDGs): Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.**

USQAP Protocol Question 8.081, 8.083 and 8.086 are used to assess whether a State has effectively implemented an aerodrome certification process.

The latest assessments of Barbados show that the State has not effectively implemented an aerodrome certification process.

**Has the State established a process for the certification of aerodromes? (PQ 8.083)**

ICAO is coordinating a global effort to improve runway safety performance. Statistical analysis has shown that accidents occurring in the runway environment are the result of contributing factors across multiple aspects of the aviation system which are meant to be addressed in a State's runway safety program.

**This question "Has the State promulgated a regulation requiring the establishment and implementation of a runway safety programme?" was considered satisfactory for Barbados.**

# Briefings: Airport

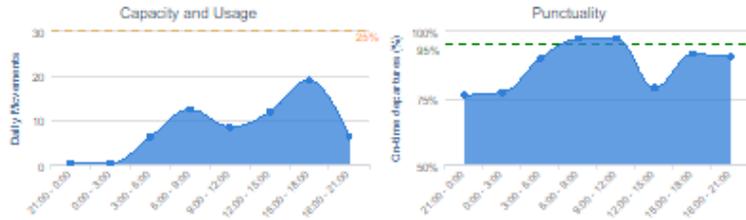


## Capacity and Usage

### Capacity and Usage

Grantley Adams Intl has an average of 66 daily movements. The peak period is between 15:00 and 18:00 local time and counts in average 19 + 16 movements in 3 hours. Based on the runway layout of Grantley Adams Intl, the total estimated maximum throughput capacity (MTC) in every 3-hour period is approximately 120, based on a theoretical hourly MTC per parallel runway of 40 movements per hour.

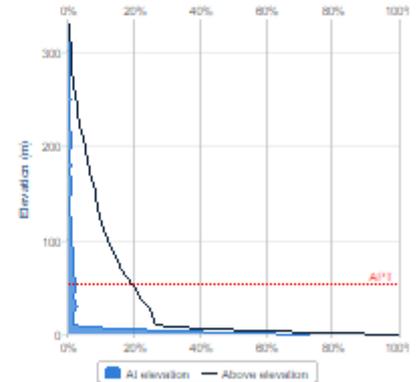
At peak period, Grantley Adams Intl is running approximately at 15.96% of its capacity. The on-time departure performance drops to 76.19% between 21:00 and 0:00.



### Terrain Challenge

Grantley Adams Intl is located at 54m ASL (above sea level).

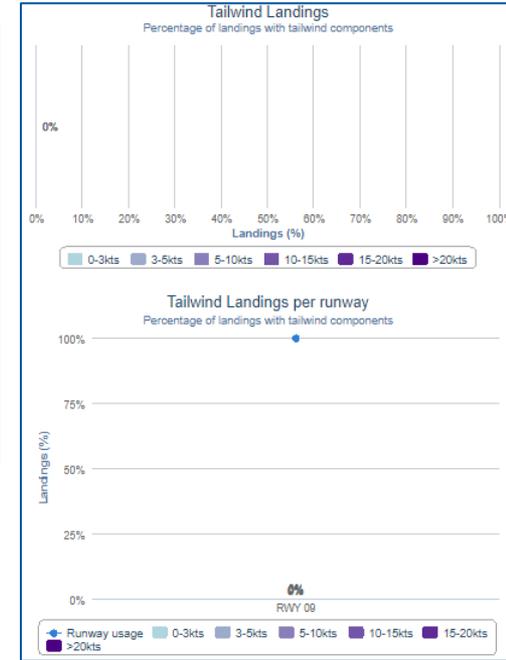
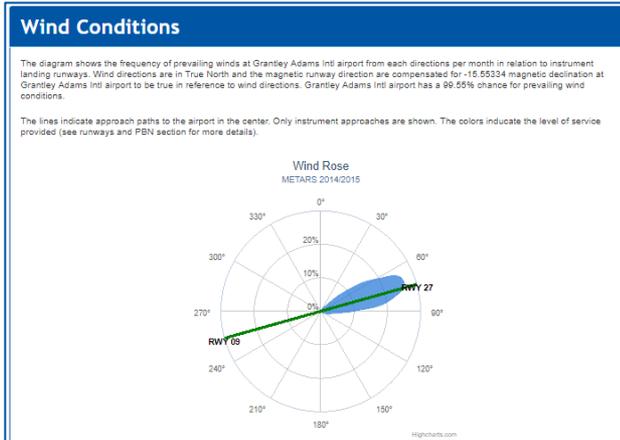
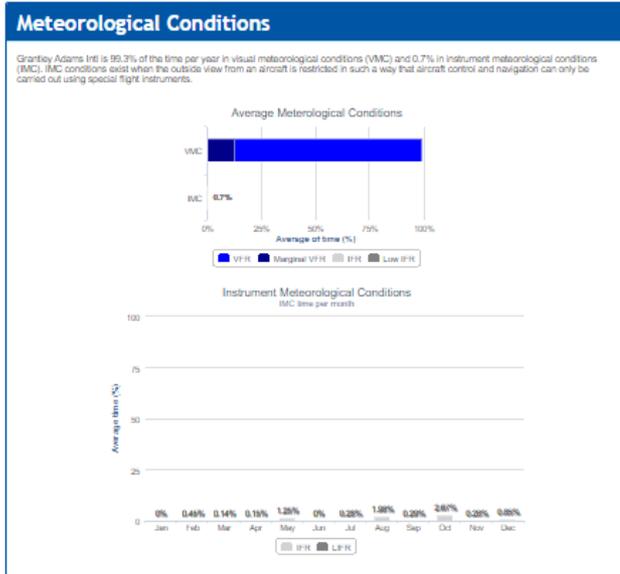
0% of the terrain surrounding the airport in 20NM is higher than 300 m above the airport height.



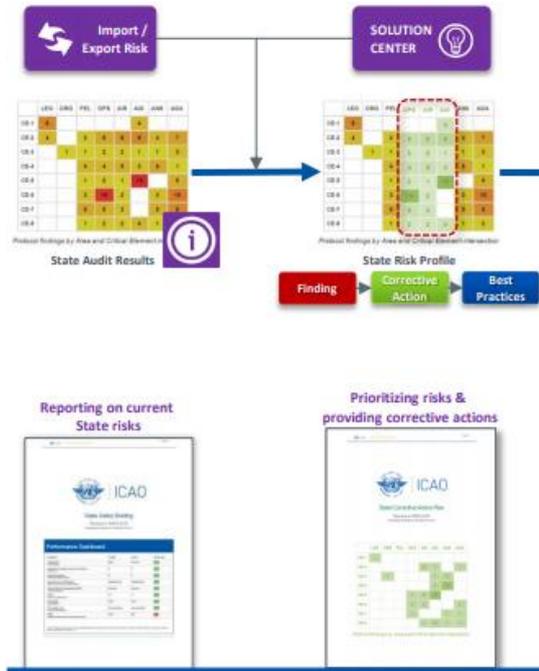


# Meteorological Conditions

# Briefings: Airport Wind conditions



# Applications to Aid in Mitigating Risk



## Risk based surveillance



Risk Based Surveillance

- Data-driven inspection schedules for operations
- By choosing an operator and filling out a questionnaire based on areas such as safety management and flight ops the following is calculated:
  - safety performance level
  - operational complexity level
  - surveillance intensity level
  - risk-based inspection schedule

# Risk based surveillance



## Safety Performance



View All Safety Management Organization Infrastructure Compliance Practices

## Schedule

The schedule is defining a sample size for each inspection type based on the actual number of elements to be inspected.

	Aircraft	Stations	Check Pilots
Population Size	26-50 *	26-50 *	2-8 *

The sample size is defined using the ISO sampling model. The base inspection is unique and its period only depends on the intensity.

Activity Type	Related Population	Minimum Activities	Periodicity
Route Inspection - Cabin	Stations	8	2 months
Route Inspection - Flight Deck	Stations	8	2 months
Ramp Inspections	Aircraft	8	2 months
Station Inspections	Stations	8	2 months
Check Pilot Inspections	Check Pilots	2	6 months
Base inspection	-	1	18 months

Lead: Marco Merens

## Solution Centre



- View Protocol Question findings, priorities, and related guidance by State
- For each PQ:
  - a list of related ICAO documents
  - Trainair Plus Courses
  - States (and contact information) that have already solved this question which can help with the resolution of the finding.
- An AI has been developed to map training solutions against PQs, and will continue to evolve over time to better fit



# Solution Centre



## Unsatisfactory PQs by Area and CE

Click on an area to filter the PQ list

	LEG	ORG	AIG	PEL	OPS	AIR	ANS	AGA
CE-1	1							
CE-2	1			2	2			
CE-3			1					
CE-4					1	1		
CE-5			3		1	3	1	
CE-6					3	2	6	2
CE-7							1	
CE-8			4					

### Licensing, Certification, Authorization and Approval Obligations (CE-6) in Operations (OPS) 9

**4.147 - Does the flight operations inspection organization ensure that the air operator has requirements, in its operations manual, to establish flight time, flight duty period, duty and rest period limitations for flight and cabin crews, in accordance with State regulations?**

CE-6 Operations

Unsatisfactory

Easy | 88.24% EI In RASG-PA

Refs: STD A5 Part I, 4.10.2 & App. 2, 2.1.2 Part III, Section II, 2.2.10.2 01/ Doc 9905 C2, C4, C6, App. A, A1.2 & App. C, C6

**4.149 - Does the flight operations inspection organization ensure that the air operator outlines, in its operations manual, standard operating procedures (SOPs) for each phase of flight?**

CE-6 Operations

Unsatisfactory

Easy | 79.41% EI In RASG-PA

Refs: STD A5 Part I, App. 2, 2.1.17 PANS Doc 0105 (OPS) Vol. I 01/A5 Part III, Att. 0, 2.1.15

**4.151 - Does the flight operations inspection organization ensure that the air operator outlines, in its operations manual, instructions on the clarification and acceptance of air traffic control (ATC) clearances, particularly where terrain clearance is involved?**

CE-6 Operations

Unsatisfactory

Easy | 79.41% EI In RASG-PA

Refs: STD A5 Part I, App. 2, 2.1.22 01/A5 Part III, Att. 0, 2.1.20

Lead: Marco Merens and Dunia Abboud



#### 4.147 - Does the flight operations inspection organization ensure that the air operator has requirements, in its operations manual, to establish flight time, flight duty period, duty and rest period limitations for flight and cabin crews, in accordance with State regulations?

CE-6 Operations

unsatisfactory

Easy | 88.24% EI In RASG-PA

Refs: STD A6 Part I, 4.10.2 & App. 2, 2.1.2 Part III, Section II, 2.2.10.2 G(f) Doc 9986 C2, C4, C6; App. A, A1.2 & App. C, C6

#### Documentation

- Annex 6: Operation of Aircraft Part I - International Commercial Air Transport - Aeroplanes Current edition (consolidated)  
Email as en ar zh ru es fr
- Doc 9986: FRMS - Fatigue Risk Management System. Manual for Regulations Current edition (consolidated)  
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- Annex 1: Personnel Licensing Current edition (consolidated)  
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#### Trainair Plus Courses

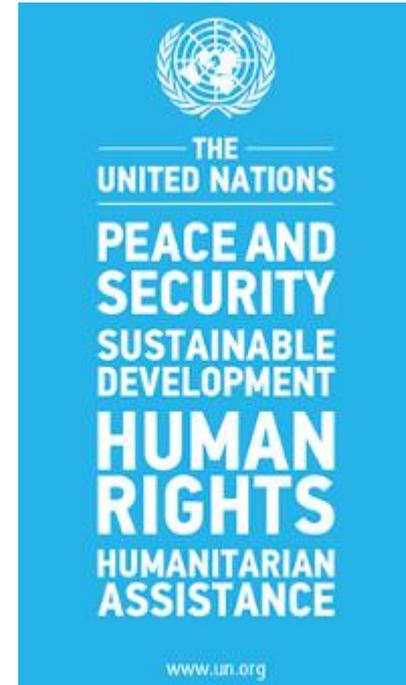
- Aeronautical Information Officer Initial Training developed by Civil Aviation Authority Training Institute (CAATI)

#### Partners

In RASG-PA, the following States have solved this question. The States in **bold** have a comparable aviation activity.

Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, **Brazil**, Chile, Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Honduras, Jamaica, **Mexico**, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, United States of America, Uruguay, Venezuela (Bolivarian Republic of)

# Risk in a Broader Context



## Air Transport Accessibility



Air Transport Accessibility

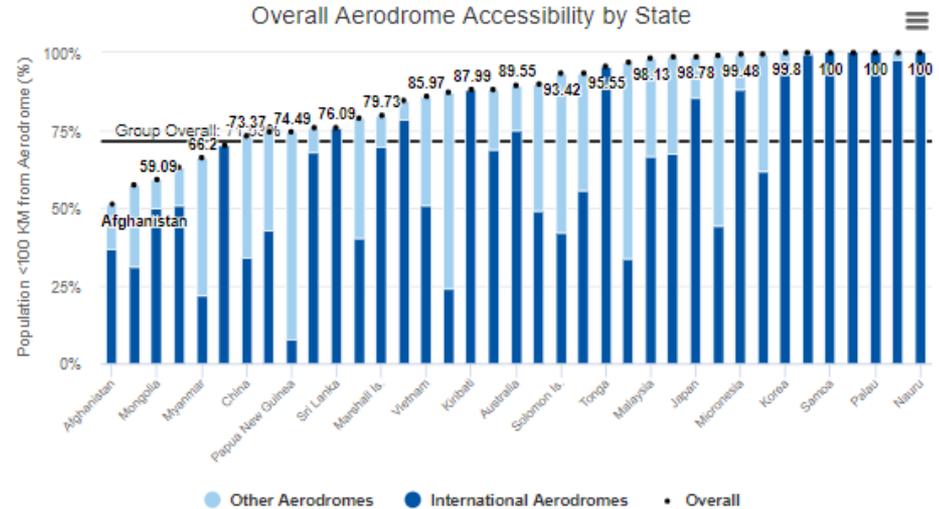
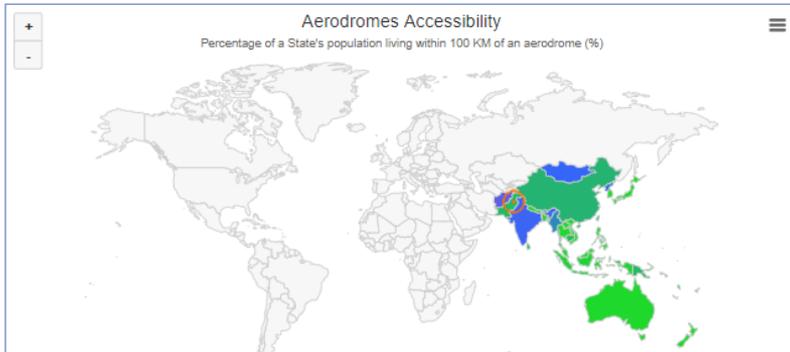
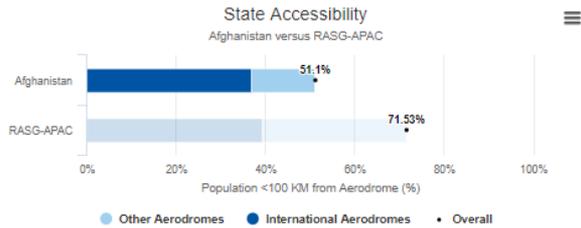
- Measuring people's access to the international air transport system
- Illustrates the fraction of a State's population living within 100 km of an aerodrome
- Aligned to the UN Sustainable Development Goal Target 9.1: Resilient Infrastructure
  - development of reliable, sustainable and resilient regional trans-border infrastructure
  - economic development and human well-being
  - affordable and equitable access for all.



# Air Transport Accessibility



## State vs. Group Accessibility



Lead: Marco Merens

# Contingency Planning



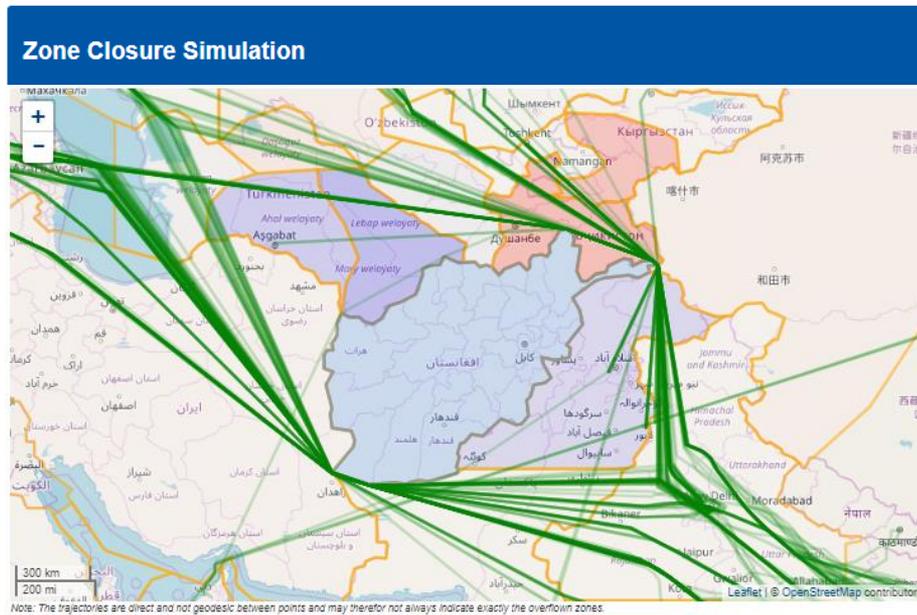
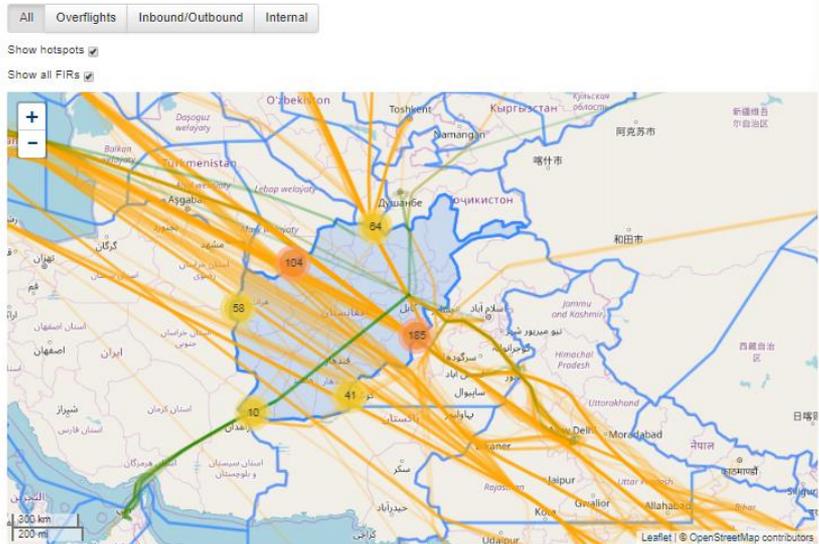
Contingency Planning

- Contingency planning aid for airspace closures
- ICAO Annex 11 — Air Traffic Services, Section 2.31 - Contingency arrangements
  - in the event of air traffic services disruption in the airspace for which they are responsible for.
- Provides an indicative estimation of the effect on traffic flows when an FIR is closed.

# Contingency Planning



The map below shows all traffic in, out or crossing the FIR KABUL (OAKX). Overflights are shown in orange, inbound/outbound flights in green and internal flights in blue. Cluster points indicate the number of flights crossing at a specific area of the boundary of the zone and give an indication of the major flow directions.



Lead: Marco Merens

## Conclusion

iSTARS apps allows for

- the multi-dimensional application of information and indicators to aviation system risk profiles
- organizations to enhance hazard identification by the use of both leading and lagging indicators, as well as select suitable actions which can help to substantially reduce risk



## Learn more about iSTARS

- The Integrated Aviation Analysis Section offers an iSTARS and Data Analysis Workshop
  - Get the most out of iSTARS and learn more about data driven decision making and statistics
- Target audience:
  - Safety analysts and managers
  - SSP/SMS Analysts
  - Accident Data Analysts

**Most Installed Apps**

Total Apps Installed: 27685 (+0 per day)

-  ADREP et al. (1333)
-  ICAO DOCs (1571)
-  USOAP DataTables (1220)

[Go to my Apps >](#)

**Latest Applications** [View full catalogue >](#)

-  Contingency Planning
-  State Safety Briefing 2018
-  Risk Based Surveillance
-  Inspector Benchmarking
-  Air Transport Accessibility
-  SSP Foundation



# iSTARS and Data Analysis Workshop

## Agenda

	09:00	10:30 Coffee break	12:00–13:00 Lunch break	14:30 Coffee break	16:00
Day 1	Opening	USOAP and SSP	SPI Review	SPI Review	Collection
Day 2	Management	Query and Filtering	Metrics Development	Basic Statistics	
Day 3	Advanced Statistics	Trending	Probabilities	Visualizations	
Day 4	Basic Statistics	Safety Briefing	Close		

## Cost

US\$ 5000.00 for the conduct of the workshop plus airfare and daily allowance for the facilitator(s) per ICAO travel rules. Facilities and internet access to be provided by the organizer.

For more information, please contact: [iSTARS@icao.int](mailto:iSTARS@icao.int)



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THANK YOU