



**Thirty First Pan America — Regional Aviation Safety Team Meeting (PA-RAST/31) of the Regional Aviation Safety Group — Pan America (RASG-PA)**  
South Florida, United States, 20 to 22 February 2018

**Agenda Item 9: Topics for the Good of the PA-RAST**

**SRVSOP’s Risk Based Surveillance**

(Presented by the Secretariat)

**EXECUTIVE SUMMARY**

This paper presents the concepts and principles of risk based surveillance (RBS) and the basic framework for its implementation, as part of State Safety Program (SSP), as developed by the SRVSOP. With the implementation of safety management systems and the state safety programs, regulators need to consider the use of a risk based approach to surveillance activities. Additionally, the growth in the aviation industry and the parallel increase in resource demands faced by regulators, require an alternate approach to the traditional fixed-frequency approach. This paper presents RBS as an alternative to prescriptive surveillance method and as a mean to make a more efficient use of limited surveillance resources.

<i>Strategic Objectives:</i>	<ul style="list-style-type: none"> <li>• Safety</li> </ul>
<i>References:</i>	<ul style="list-style-type: none"> <li>• Annex 19 – <i>Safety Management</i></li> <li>• Doc 9859 - <i>Safety Management Manual (SMM)</i></li> <li>• Doc 8335 - <i>Manual of Procedures for Operations Inspection, Certification and Continued Surveillance</i></li> </ul>

**1. Introduction**

1.1 Continuous surveillance is recognized by ICAO on Annex 19 as a Critical Element of a State Safety Oversight System. ICAO SARP’s, however, does not dictate how surveillance is to be conducted or planned; it only requires that an effective system be put in place.

1.2 Historically, surveillance has been conducted at fixed intervals using traditional audit and inspection techniques. This approach does not reflect individual risk, and usually demands excessive Civil Aviation Authority’s (CCA) resources.

1.3 This paper proposes, as part of the implementation of State's Safety Programmes, an alternate approach to surveillance and surveillance planning, based on individual service provider risk profiles.

1.4 For the purpose of this paper, risk based surveillance (RBS) is defined as: a surveillance program that utilizes a service provider's (SP) risk profile to determine the frequency and intensity with which the SP is subject to surveillance. Additional information on how risk profiles are developed is included below.

## 2. Risk based surveillance procedures

2.1 Risk based Surveillance procedures are divided into 3 phases, which are briefly described in the following paragraphs.

- a) **Risk based surveillance planning** - Taking into account the individual service provider's safety performance and operational complexity, an online RBS Application, which is available as part of the integrated Safety Trend Analysis and Reporting System (iSTARS) at the ICAO's Secure portal, will let State's determine the type and frequency of inspections required for that specific SP over a period of 12 months. <https://portal.icao.int/space/Pages/Risk-Based-Surveillance.aspx>

An example of an RBS App-generated surveillance schedule is included as **Appendix 1**.

- b) **Risk based surveillance execution** - A qualified group of Safety Inspectors will determine by consensus, based on all available information, those inspection items which are most likely to result in a finding, and those that have the highest impact on safety. Workload will be distributed based on the group conclusions, and inspectors will prioritize their job accordingly.
- c) **Findings validation and follow-up** - After the inspection, a debrief meeting will discuss and analyze the inspection's results, will classify the findings according to its risk level (Level 1, 2 or 3) and will determine, by consensus, the appropriate course of action. Results will be registered on the CAA's Safety Data Collection and Processing Systems (SDCPS) for further actions and follow-up.

2.2 The following aspects should be taken in account regarding RBS implementation:

- RBS procedures are intended to be applied as part of the State SSP.
- RBS procedures can be applied in combination with prescriptive surveillance methods.
- RBS implementation is not recommended to those States that have not yet developed basic safety oversight capabilities.
- RBS principles where conceived to be implemented in airworthiness, aerodromes, air navigation services, personnel licensing, and operations, however, an initial one year limited scope implementation period in OPS only, will begin in mid-2018.

2.3 Since the development of the procedures, all SRVSOP's surveillance courses incorporate RBS principles and procedures, and include several on-the-job training (OJT) scenarios.

2.4 Several limited-scope trials have demonstrated great and promising results when compared to the traditional prescriptive surveillance method.

2.5 Official lunch of the RBS App as well as the presentation of detailed procedures and guidance material for States will occur during the RBS Workshop as referenced in the following section.

### **3. Risk Based Surveillance Workshop**

3.1 As part of the RBS implementation strategy, the SRVSOP along with ICAO SAM and NACC Regional Offices, and with the support of Transport Canada, UK CAA, Singapore CAAS, France DGCA, EASA, is holding a Risk based surveillance workshop in Lima on March 19 & 20. This event will allow CAA's to learn about RBS advantages, opportunities, and best practices from experienced organizations.

### **4. Conclusion**

4.1 The application of these principles to surveillance planning, execution, and follow-up, provides a mechanism for applying limited resources where they are most required. Those States in the process of implementing SSP and that are still applying prescriptive methods as the only means to determine the type and number of inspections required to be performed in a given period of time, are encouraged to consider SSP implementation.

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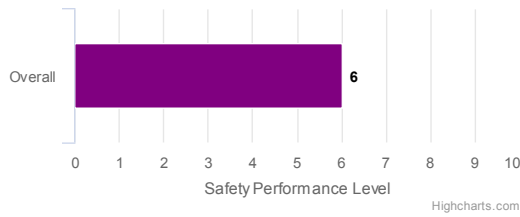
# Risk Based Surveillance Report

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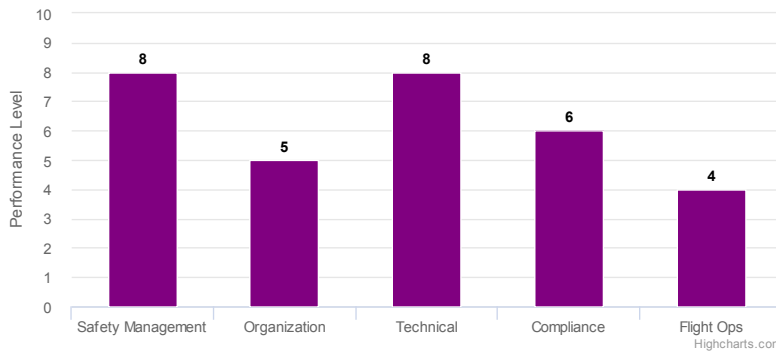
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## Safety Performance

Safety Performance Level



Statement Results by Area



Respond to each statement indicating your level of agreement/disagreement

### Safety Management

Statement	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Q01-01: The operator has a formal safety data collection and processing system (SDCPS) for effectively collecting information about hazards in operations. ⓘ	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q01-02: The operator has a formal process in place to ensure due analysis, assessment and control of the safety risks in operations. ⓘ	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q01-03: The operator's safety performance, as well as the effectiveness of safety risks controls, are continuously monitored. ⓘ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q01-04: The operator has identified and analyzed changes within its organization which may affect established processes and services. ⓘ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Q01-05: The operator has developed and maintains an internal safety investigation process. ⓘ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Q01-06: The operator has developed a documented process to identify training requirements so that personnel are trained and competent to perform the SMS duties. ⓘ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q01-07: The operator has communication processes in place that permit the safety management system to function effectively. ⓘ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q01-08: The operator has adequate measures in place to manage risks associated with crew members' fatigue. ⓘ	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q01-09: The operator has developed and maintains an adequate Flight Data Analysis Program (FDAP) as part of its SMS. ⓘ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

## Organization

Statement	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Q02-01: The operator's personnel have an excellent attitude to all aspects of safety within the operator. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q02-02: The operator has designed and constructed flight schedules and timetables, taking into account all relevant variable factors without pressure on safety. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q02-03: Key safety management positions have remained stable for the last 24 months. <b>1</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q02-04: People at all key safety positions are experienced and qualified. <b>1</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q02-05: People at all key safety positions work full time for the operator. <b>1</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q02-06: The operator's personnel feel motivated and identify with the organization. <b>1</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q02-07: Employees and managers have a good professional relationship and trust each other. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q02-08: The operator is adequately staffed to deal with both normal and abnormal situations. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q02-09: The organization is financially healthy. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Infrastructure

Statement	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Q03-01: The operator has a modern fleet of aircraft. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q03-02: The general conditions and maintenance of flight and ground equipment and tools are considered to be above the minimum industry standards. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q03-03: The fleet is composed of one single type of aircraft. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q03-04: The fleet composition has remained stable for the last 24 months. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Q03-05: All airports served have an adequate level of Rescue and Fire Fighting Services. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Q03-06: All airports served have a straight—in approach available. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q03-07: Technical training is of high quality and effective. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q03-08: All aircraft of the same type are mostly identically configured. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q03-10: The operator continuously invests in new technology and efficiency of its fleet. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q03-09: The operator adopts the safety improvements proposed by the aircraft manufacturer. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

## Compliance

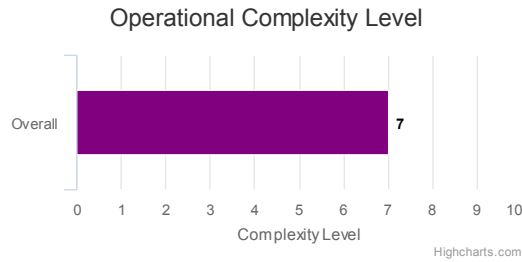
Statement	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Q04-01: The operator accepts regulatory access without question and has an open, cooperative and transparent attitude. <b>1</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q04-02: The operator exceeds rules requirements; views rules holistically as the general good for everyone and, therefore, complies with the rules even if it disagrees with them. <b>1</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q04-03: The operator has fully adopted the IATA Operational Safety Audit (IOSA) standard. <b>1</b> Note: iSTARS data indicates that the operator is not IOSA certified	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q04-04: Surveillance results are usually satisfactory and any finding is analyzed and resolved in a timely manner. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q04-05: The operator has a clean and positive safety record in the last 5 years. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q04-06: No major sanctions have been imposed on the operator in the last 5 years. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q04-07: No MEL extensions have been granted to the operator in the last 24 months. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q04-08: Foreign ramp inspections performed to the operator are satisfactory. <b>1</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q04-09: The State of the operator has adequate safety oversight capability. <b>1</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Practices

Statement	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Q05-01: The operator has an effective Upset Prevention and Recovery Training (UPRT) that is compliant with ICAO Doc 10011. <b>i</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q05-02: The operator has an effective CFIT prevention training in place. <b>i</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q05-03: The operator has effective ACAS procedures training. <b>i</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q05-04: The operator has an adequate computerized flight dispatch system to determine aircraft performance and CG position for all phases of flight. <b>i</b>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q05-05: The operations manual does not allow VFR operations during commercial operations. <b>i</b>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q05-06: The operator does not operate in extreme weather operations, or specific initial and recurrent training is provided for each extreme weather operation. <b>i</b>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q05-07: The operations manual does not allow for mixed fleet flying operation. <b>i</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q05-08: The operator has developed and maintains an adequate Stabilized Approach criteria and procedures. <b>i</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q05-09: The operator has a formal Lithium Battery Risk Mitigation policy, procedures and training. <b>i</b>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Operational Complexity

The following data will establish a complexity level based on the operational environment of the operator.



**Annual Flights**

4000 to 45000

**Aircraft**

4 to 16

**Aircraft Models**

2 to 4

**Destinations**

11 to 50

**Is International**

Yes

**Average Fleet Age**

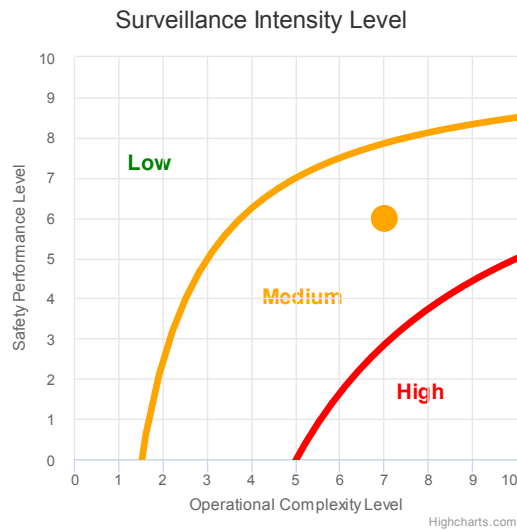
Over 15 years

## Surveillance Intensity

The surveillance intensity is based on a combination of the organization's performance and complexity.

Based in the data provided, the surveillance intensity established is

**Medium**



## 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
<b>Population Size</b>	16-25	16-25	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	5	2 months
Route Inspection - Flight Deck	Stations	5	2 months
Ramp Inspections	Aircraft	5	2 months
Station Inspections	Stations	5	2 months
Check Pilot Inspections	Check Pilots	2	6 months
Base inspection	-	1	18 months

The attached schedule integrates all the above inspections with their respective samples and distributes them over one year, 52 weeks. The base inspection schedule covers 3 years.

# Risk-Based Surveillance Schedule

Operations

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Surveillance Intensity: Medium

Quarter	Week	Inspection Types							
		Base Y1	Base Y2	Base Y3	Route CAB	Route FB	Ramp	Station	Check Pilot
Q1	1						•		
	2								
	3								
	4							•	
	5						•		
	6								
	7								
	8								
	9					•			
	10								•
	11							•	
	12								
	13								
Q2	14							•	
	15						•		
	16	•							
	17								
	18								
	19				•				
	20								
	21							•	
	22								
	23								
	24							•	
	25						•		
	26								
Q3	27								
	28								
	29				•				
	30								
	31								
	32							•	
	33								
	34								
	35							•	
	36						•		•
	37								
	38								
	39								
Q4	40				•				
	41								
	42							•	
	43								
	44								
	45							•	
	46		•				•		
	47								
	48								
	49								
	50				•				
	51								
	52								
<b>Total</b>		<b>1</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>2</b>