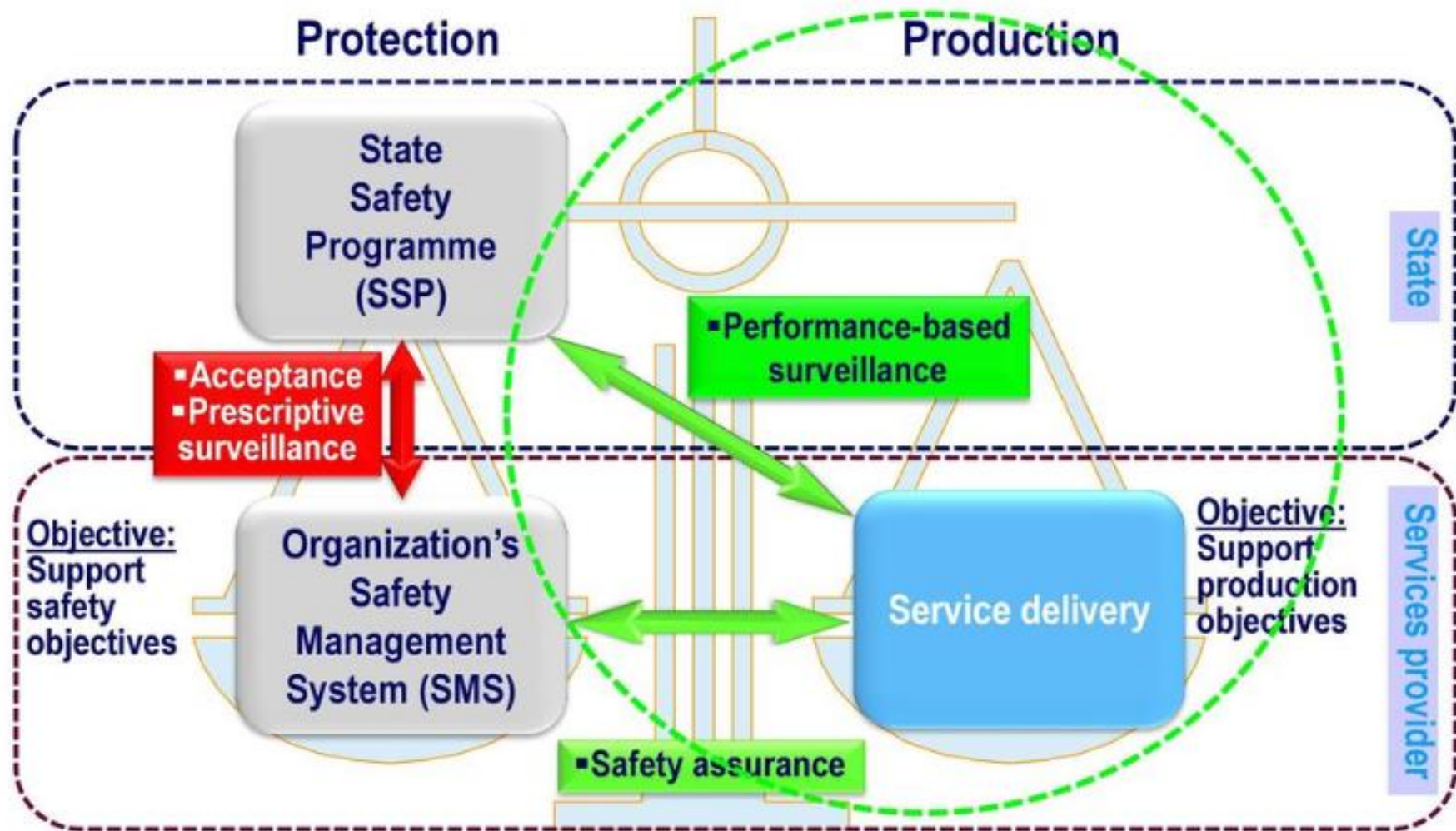




Assessment of Safety Risk Management FOI's Perspective

Capt. Paul Whelan

SM Workshop 13 Feb 2019



Hazard Log / Register / List

- *Is a Hazard Log / Register a Regulatory Requirement?*
- *What is it?*
- Reference - Safety Regulation - ICAO, EASA.
- EASA Management System Assessment Tool (MSAT)
- It **can** be the foundation of a successful Organisation SMS Risk Assessment Policy, but only if used realistically!
 - Continuously Reviewed and Updated
 - Begin with State Safety Plan (Infancy)
 - 'Grow' with Hazards identified from Reactive, Predictive and Proactive SRA processes - MOR's, VOR's, Investigations, Industry data, Change Management etc. (Maturity)

Evaluating SRM

Identified Operator Hazards - Are they...

Appropriate?

Relevant?

Complete?

Reviewed?

Active?

Hazard – A Condition or an Object with the **Potential** to Cause or Contribute to an Aircraft Incident or Accident

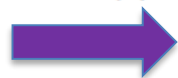
Risk Mitigation – The **Process** of Incorporating Defences, Preventive Controls or Recovery Measures to Lower the Severity and/or Likelihood of a Hazards Projected Consequence (ICAO Doc 9859)



(a) The competent authority shall verify:

- (1) compliance with the requirements applicable to organisations or type of operations prior to the issue of a certificate, approval or authorisation, as applicable;
- (2) continued compliance with the applicable requirements of organisations it has certified, specialised operations it has authorised and organisations from whom it received a declaration;
- (3) continued compliance with the applicable requirements of non-commercial operators of other-than complex motor-powered aircraft; and
- (4) implementation of appropriate safety measures mandated by the competent authority as defined in ARO.GEN.135(c) and (d).

(b) This verification shall:



(1) be supported by documentation specifically intended to provide personnel responsible for safety oversight with guidance to perform their functions;



(2) provide the persons and organisations concerned with the results of safety oversight activity;

(3) be based on audits and inspections, including ramp and unannounced inspections; and

(4) provide the competent authority with the evidence needed in case further action is required, including the measures foreseen by ARO.GEN.350 and ARO.GEN.355.

(c) The scope of oversight defined in (a) and (b) shall take into account the results of past oversight activities and the safety priorities.

How do we do this...



AMC2 ARO.GEN.300 (a);(b);(c) Oversight

- Evaluation of Operational Risk assessment



EVALUATION OF OPERATIONAL SAFETY RISK ASSESSMENT

As part of the initial certification or the continuing oversight of an operator, the competent authority should normally evaluate the operator's safety risk assessment processes related to hazards identified by the operator as having an interface with its operations. These safety risk assessments should be identifiable processes of the operator's management system.

As part of its continuing oversight, the competent authority should also remain satisfied as to the effectiveness of these safety risk assessments.

(a) General methodology for operational hazards

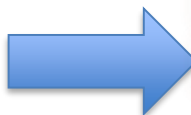
The competent authority should establish a methodology for evaluating the safety risk assessment processes of the operator's management system.

When related to operational hazards, the competent authority's evaluation under its normal oversight process should be considered satisfactory if the operator demonstrates its competence and capability to:

- (1) understand the hazards and their consequences on its operations;
- (2) be clear on where these hazards may exceed acceptable safety risk limits;
- (3) identify and implement mitigations, including suspension of operations where mitigation cannot reduce the risk to within safety risk limits;
- (4) develop and execute effectively robust procedures for the preparation and the safe operation of the flights subject to the hazards identified;
- (5) assess the competence and currency of its staff in relation to the duties necessary for the intended operations and implement any necessary training; and
- (6) ensure sufficient numbers of qualified and competent staff for such duties.

The competent authority should take into account that:

- (1) the operator's recorded mitigations for each unacceptable risk identified are in place;
- (2) the operational procedures specified by the operator with the most significance to safety appear to be robust; and
- (3) the staff on which the operator depends in respect of those duties necessary for the intended operations are trained and assessed as competent in the relevant procedures.



EVALUATION OF OPERATIONAL SAFETY RISK ASSESSMENT


As part of the initial certification or the continuing oversight of an operator, the competent authority should normally evaluate the operator's safety risk assessment processes related to hazards identified by the operator as having an interface with its operations. These safety risk assessments should be identifiable processes of the operator's management system.

As part of its continuing oversight, the competent authority should also remain satisfied as to the effectiveness of these safety risk assessments.

(a) General methodology for operational hazards

The competent authority should establish a methodology for evaluating the safety risk assessment processes of the operator's management system.

When related to operational hazards, the competent authority's evaluation under its normal oversight process should be considered satisfactory if the operator demonstrates its competence and capability to:

- 
- (1) understand the hazards and their consequences on its operations;
 - (2) be clear on where these hazards may exceed acceptable safety risk limits;
 - (3) identify and implement mitigations, including suspension of operations where mitigation cannot reduce the risk to within safety risk limits;
 - (4) develop and execute effectively robust procedures for the preparation and the safe operation of the flights subject to the hazards identified;
 - (5) assess the competence and currency of its staff in relation to the duties necessary for the intended operations and implement any necessary training; and
 - (6) ensure sufficient numbers of qualified and competent staff for such duties.

The competent authority should take into account that:

- (1) the operator's recorded mitigations for each unacceptable risk identified are in place;
- (2) the operational procedures specified by the operator with the most significance to safety appear to be robust; and
- (3) the staff on which the operator depends in respect of those duties necessary for the intended operations are trained and assessed as competent in the relevant procedures.



EVALUATION OF OPERATIONAL SAFETY RISK ASSESSMENT

As part of the initial certification or the continuing oversight of an operator, the competent authority should normally evaluate the operator's safety risk assessment processes related to hazards identified by the operator as having an interface with its operations. These safety risk assessments should be identifiable processes of the operator's management system.

As part of its continuing oversight, the competent authority should also remain satisfied as to the effectiveness of these safety risk assessments.

(a) General methodology for operational hazards

The competent authority should establish a methodology for evaluating the safety risk assessment processes of the operator's management system.

When related to operational hazards, the competent authority's evaluation under its normal oversight process should be considered satisfactory if the operator demonstrates its competence and capability to:

- (1) understand the hazards and their consequences on its operations;
- (2) be clear on where these hazards may exceed acceptable safety risk limits;
- (3) identify and implement mitigations, including suspension of operations where mitigation cannot reduce the risk to within safety risk limits;
- (4) develop and execute effectively robust procedures for the preparation and the safe operation of the flights subject to the hazards identified;
- (5) assess the competence and currency of its staff in relation to the duties necessary for the intended operations and implement any necessary training; and
- (6) ensure sufficient numbers of qualified and competent staff for such duties.

The competent authority should take into account that:

- (1) the operator's recorded mitigations for each unacceptable risk identified are in place;
- (2) the operational procedures specified by the operator with the most significance to safety appear to be robust; and
- (3) the staff on which the operator depends in respect of those duties necessary for the intended operations are trained and assessed as competent in the relevant procedures.



EVALUATION OF OPERATIONAL SAFETY RISK ASSESSMENT

As part of the initial certification or the continuing oversight of an operator, the competent authority should normally evaluate the operator's safety risk assessment processes related to hazards identified by the operator as having an interface with its operations. These safety risk assessments should be identifiable processes of the operator's management system.

As part of its continuing oversight, the competent authority should also remain satisfied as to the effectiveness of these safety risk assessments.

(a) General methodology for operational hazards

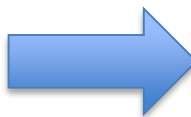
The competent authority should establish a methodology for evaluating the safety risk assessment processes of the operator's management system.

When related to operational hazards, the competent authority's evaluation under its normal oversight process should be considered satisfactory if the operator demonstrates its competence and capability to:

- (1) understand the hazards and their consequences on its operations;
- (2) be clear on where these hazards may exceed acceptable safety risk limits;
- (3) identify and implement mitigations, including suspension of operations where mitigation cannot reduce the risk to within safety risk limits;
- (4) develop and execute effectively robust procedures for the preparation and the safe operation of the flights subject to the hazards identified;
- (5) assess the competence and currency of its staff in relation to the duties necessary for the intended operations and implement any necessary training; and
- (6) ensure sufficient numbers of qualified and competent staff for such duties.

The competent authority should take into account that:

- (1) the operator's recorded mitigations for each unacceptable risk identified are in place;
- (2) the operational procedures specified by the operator with the most significance to safety appear to be robust; and
- (3) the staff on which the operator depends in respect of those duties necessary for the intended operations are trained and assessed as competent in the relevant procedures.



EVALUATION OF OPERATIONAL SAFETY RISK ASSESSMENT

As part of the initial certification or the continuing oversight of an operator, the competent authority should normally evaluate the operator's safety risk assessment processes related to hazards identified by the operator as having an interface with its operations. These safety risk assessments should be identifiable processes of the operator's management system.

As part of its continuing oversight, the competent authority should also remain satisfied as to the effectiveness of these safety risk assessments.

(a) General methodology for operational hazards

The competent authority should establish a methodology for evaluating the safety risk assessment processes of the operator's management system.

When related to operational hazards, the competent authority's evaluation under its normal oversight process should be considered satisfactory if the operator demonstrates its competence and capability to:

- (1) understand the hazards and their consequences on its operations;
- (2) be clear on where these hazards may exceed acceptable safety risk limits;
- (3) identify and implement mitigations, including suspension of operations where mitigation cannot reduce the risk to within safety risk limits;
- (4) develop and execute effectively robust procedures for the preparation and the safe operation of the flights subject to the hazards identified;
- (5) assess the competence and currency of its staff in relation to the duties necessary for the intended operations and implement any necessary training; and
- (6) ensure sufficient numbers of qualified and competent staff for such duties.

The competent authority should take into account that:

- (1) the operator's recorded mitigations for each unacceptable risk identified are in place;
- (2) the operational procedures specified by the operator with the most significance to safety appear to be robust; and
- (3) the staff on which the operator depends in respect of those duties necessary for the intended operations are trained and assessed as competent in the relevant procedures.



ORO.GEN.200(a)(3)

- (a) The operator shall establish, implement and maintain a management system that includes:
- (3) the **identification of aviation safety hazards** entailed by the activities of the operator, **their evaluation** and the **management of associated risks**, including taking **actions to mitigate the risk and verify their effectiveness**;

Identify Safety Hazards and ensure that all Safety Risks have been:

identified

assessed

satisfactorily mitigated

Evaluating SRM

– EASA Identified Issues with Operators:

- Airline Management **unwillingness** to take real safety accountability
- **Inadequate Risk Management Processes**, leading to Questionable Assessments
- **Poor Safety Manager** Qualification and Competence (and Line Managers)
- **Inadequate Monitoring** of Risk Mitigations.



Evaluating SRM

– EASA Identified Issues with Authorities:

- Lack of understanding on how Safety Risk Management should work
- Inspectors not holding appropriate skills to assess Operators SRM
- Acceptance of 'Weak' Safety Managers
- 'Light' challenging of Operators Safety Risk Management output



Evaluating SRM



– Issues for Authorities:

- How do we assess operators Hazard Logs?
- How do we standardise assessment of an operators use of Hazard Logs and associated Risk Assessments?
- How does the inspector prepare for the inspection?
- What should we expect to see?
- How do we avoid 'subjectivity' in our assessment?
- How do we encourage the qualitative use of Risk Assessments in operators Safety Management Systems?

Common IAA observations

- SRA's exist but **isolated** in MS Excel spreadsheet library
- Risk Assessments conducted unilaterally, **not 'cross domain'**
- Risk Mitigations listed which already exist in the organisation
- Risk Mitigations which have not been carried out post op launch
- Risk Assessments filed away and **not updated / revisited**
- Repeated Risk Assessments on similar Risks
- Hazard Register – does such a process exist?
- If so, is the Hazard Register **relevant** to the organisation?
- *Who knows about SRA activity in the Organisation???*

Imparting the SRM Message

- The ‘Operator OWNS the Risk’ – **Key message**
- Total System environment requires **Cross-Domain SRA**
- Cross Domain SRA bestows **Cross Domain Responsibility**, thus allowing a more ‘organisational’ ownership and ‘buy-in’ by the operator.
- SRA Activity should be a SRB agenda item.
- The Operators ‘**Safety Policy**’ says...

Management System Assessment Tool

PRESENT

SUITABLE

OPERATING

EFFECTIVE



2.1 HAZARD IDENTIFICATION

Annex 19 reference & text

2.1.1 The service provider shall develop and maintain a process to identify hazards associated with its aviation products or services.

Hazard identification shall be based on a combination of reactive and proactive methods.

PRESENT	SUITABLE	OPERATIONAL	EFFECTIVE	
There is a process that defines how reactive and proactive hazard identification is gathered from multiple sources (internal and external).		The hazards are identified and documented. Human and organisational Factors related hazards are being identified.	The organisation has a register of the hazards that is maintained and reviewed to ensure it remains up to date. It is continuously and proactively identifying hazards related to its activities and operational environment and involves all key personnel and appropriate stakeholders. Hazards are assessed in a systematic and timely manner	
What to look for				
<ul style="list-style-type: none">Review how hazards are identified, analysed and recorded.Consider hazards related to;<ul style="list-style-type: none">possible accident scenarios.Human and organisational factorsbusiness decisions and processesThird party organisationsReview what internal and external sources of hazards are considered such as: Safety reports / audits / safety surveys / investigations / inspections / brainstorming / Management of Change activities / Commercial and other external influences etc.Investigations of safety occurrences establish causal/contributing factors (why it happened, not just what happened) and identify Human and organisational contributing factors. Hazards identified from occurrences are processed in compliance with Reg. (EU) 376/2014 Article 4 and 5.				
Corresponding EU/EASA Requirements				
Air Operations	Aircrew	Aerodromes	ATM/ANS	ATCO Training Organisations
ORO.GEN.200 'Management system' point (a)(3)	ORA.GEN.200 'Management system' point (a)(3)	ADR.OR.D.005 'Management system' point (b)(3)	ATM/ANS.OR.B.005(a)(5) ATS.OR.200(2)(i)	ATCO.OR.C.001 Management system of training organisations point (c)
AMC1 ORO.GEN.200(a) (3) 'Management system' point (a)(1) - [complex operators]	AMC1 ORA.GEN.200(a) (3) 'Management system' point (a)(1) - [complex organisations]	AMC1 ADR.OR.D.005(b)(3) 'Management system'	AMC1 ATS.OR.205(b)(1) AMC2 ATS.OR.205(b)(1)	AMC1 ATCO.OR.C.001(c) 'Management system of training organisations'
AMC1 ORO.GEN.200(a) (1);(2);(3);(5) 'Management system' points (a), (b) and (d) - [non-complex operators]	AMC1 ORA.GEN.200(a) (1);(2);(3);(5) 'Management system' points (a), (b) and (d) - [non-complex organisations]			

2 SAFETY RISK MANAGEMENT

2.1 HAZARD IDENTIFICATION

Annex 19 reference & text

2.1.1 The service provider shall develop and maintain a process to identify hazards associated with its aviation products or services.

Hazard identification shall be based on a combination of reactive and proactive methods.

PRESENT	SUITABLE	OPERATIONAL	EFFECTIVE
There is a process that defines how reactive and proactive hazard identification is gathered from multiple sources (internal and external).		The hazards are identified and documented. Human and organisational Factors related hazards are being identified.	The organisation has a register of the hazards that is maintained and reviewed to ensure it remains up to date. It is continuously and proactively identifying hazards related to its activities and operational environment and involves all key personnel and appropriate stakeholders. Hazards are assessed in a systematic and timely manner

What to look for

- Review how hazards are identified, analysed and recorded.
- Consider hazards related to;
 - possible accident scenarios.
 - Human and organisational factors
 - business decisions and processes
 - Third party organisations
- Review what internal and external sources of hazards are considered such as: Safety reports / audits / safety surveys / investigations / inspections / brainstorming / Management of Change activities / Commercial and other external influences etc.
- Investigations of safety occurrences establish causal/contributing factors (why it happened, not just what happened) and identify Human and organisational contributing factors. Hazards identified from occurrences are processed in compliance with Reg. (EU) 376/2014 Article 4 and 5.

Corresponding EU/EASA Requirements

Air Operations	Aircrew	Aerodromes	ATM/ANS	ATCO Training Organisations
ORO.GEN.200 'Management system' point (a)(3)	ORA.GEN.200 'Management system' point (a)(3)	ADR.OR.D.005 'Management system' point (b)(3)	ATM/ANS.OR.B.005(a)(5) ATS.OR.200(2)(i)	ATCO.OR.C.001 'Management system of training organisations point (c)
AMC1 ORO.GEN.200(a) (3) 'Management system' point (a)(1) - [complex operators]	AMC1 ORO.GEN.200(a) (3) 'Management system' point (a)(1) - [complex organisations]	AMC1 ADR.OR.D.005(b)(3) 'Management system'	AMC1 ATS.OR.205(b)(1) AMC2 ATS.OR.205(b)(1)	AMC1 ATCO.OR.C.001(c) 'Management system of training organisations'
AMC1 ORO.GEN.200(a) (1);(2);(3);(5) 'Management system' points (a), (b) and (d) - [non-complex operators]	AMC1 ORO.GEN.200(a) (1);(2);(3);(5) 'Management system' points (a), (b) and (d) - [non-complex organisations]			

Effective is 'always' the target

Questions not exhaustive

Applicable Regulation

2.2 RISK ASSESSMENT AND MITIGATION

Annex 19 reference & text

2.2.1 The service provider shall develop and maintain a process that ensures **analysis, assessment** [and control] of the safety risks associated with identified hazards.

See Annex 19 note.

PRESENT	SUITABLE	OPERATIONAL	EFFECTIVE
There is a process for the analysis and assessment of safety risks. The level of risk the organisation is willing to accept is defined.		Risk analysis and assessments are carried out in a consistent manner based on the defined process. The defined risk acceptability is being applied.	Risk analysis and assessments are reviewed for consistency and to identify improvements in the processes. Risk assessments are regularly reviewed to ensure they remain current. Risk acceptability criteria are used routinely and applied in management decision making processes and are regularly reviewed.

What to look for

- Review risk classification scheme and procedures.
- Severity and likelihood criteria defined (or alternative methodology described).
- Review layout of risk register.
- Sample an identified hazard and how it is processed and documented.
- Review what triggers a risk assessment.
- Check any assumptions made and whether they are reviewed.
- Review how issues are classified when there is insufficient quantitative data available.
- Process defines who can accept what level of risk.
- Risk register is being reviewed and monitored by the appropriate safety committee(s).
- Evidence of risk acceptability being routinely applied in decision making processes.

Corresponding EU/EASA Requirements

Air Operations	Aircrew	Aerodromes	ATM/ANS	ATCO Training Organisations
ORO.GEN.200 'Management system' point (a)(3)	ORA.GEN.200 'Management system' point (a)(3)	ADR.OR.D.005 'Management system' point (b)(4) and AMC1 ADR.OR.D.005(b)(4) 'Management system'	ATS.OR.200(2)(f)	ATCO.OR.C.001 'Management system of training organisations' point (c)
AMC1 ORO.GEN.200(a)(3) 'Management system' point (b)(1) - [complex operators]	AMC1 ORA.GEN.200(a)(3) 'Management system' point (b)(1) - [complex organisations]			AMC1 ATCO.OR.C.001(c) 'Management system of training organisations'
AMC1 ORO.GEN.200(a)(1);(2);(3);(5) 'Management system' points (a), (b) and (d) - [non-complex operators]	AMC1 ORA.GEN.200(a)(1);(2);(3);(5) 'Management system' points (a), (b) and (d) - [non-complex organisations]			

Annex 19 Note: The process may include predictive methods of safety data analysis.

Additional Questions based on the operators operational Maturity and nature of SRA

- Who takes part in the SRA? Named?
- Sample proof of mitigations taken?
- Has operator revisited SRA post launch for internal assessment of mitigations taken and their effectivity?
- Who manages SRA process?

Preparing to review SRM

- Review Safety Management Manual and Policy
- Request internal compliance audits of Operators SMS
- Review Hazard Register (if it exists)
- Select a particular operation (existing) and request the SRA in advance of review
- Review SRA for;
 - Safety Risks identified have been assessed?
 - Mitigations applied – do they already exist in the Org? Are there tasks assigned / required?
 - Effectiveness of mitigations? Realistic? Achievable?
 - Ownership?
 - Realistic scores applied to mitigations? Or 'for effect' only?
 - Inclusion of 'Latent Conditions'?

Onsite Review of SRM

- Interview Safety Manager
 - Seek evidence of complete review of mitigations applied / Implementation of Control Measures?
 - Managers assessment for effectiveness / realism
 - Is SRA a 'living' exercise?
 - Does SRA inform other operational areas?
 - Input from SRA participants in review?
 - Competence of SRA participants?
 - Mitigations accepted by Top Management? (SRB / SAG)
 - 'Buy-In' by both SM and Top Management?





Thank
You

A blue, cloud-shaped tag with the words "Thank You" in white, hanging from a string. The tag has a soft shadow on the white background.



Paul.whelan@iaa.ie