EASA
European Union Aviation Safety Agency

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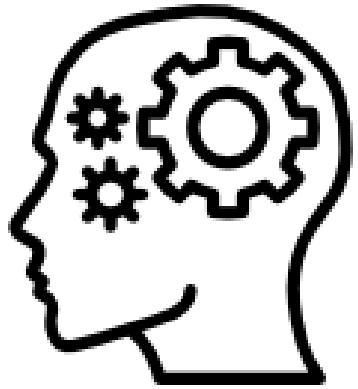
EU-Africa Safety in Aviation (EU-ASA) project
Supporting SSP implementation

Remote Workshop 16th to 20th December 2024
Day 4

Your safety is our mission.

An Agency of the European Union

How to create a ‘State Risk Picture’



Hazard Ident & SRM – changes proposed with SL 23/18

A19 amdt. 2

3.3.4.1 States shall establish and maintain a process to identify **State's civil aviation system level** hazards from collected safety data.

~~Note 1. Further information regarding safety data collection, analysis and the sharing and exchange of safety information can be found in **Chapter 5**.~~

Note ~~2.~~ Additional information to identify hazards and safety issues on which to base preventive actions may be contained in the **Final Reports of accidents and incidents**.

Hazard Ident & SRM – changes following ANC review

A19 amdt. 2

3.3.4.1 States shall establish and maintain a process to identify ~~State's civil aviation system level~~ hazards **at the State level** from collected safety data **and safety information**.

How are you using AIB reports as part of your SRM?

Hazard identification & SRM – changes proposed with SL 23/18

A19 amdt. 2

3.3.4.2 States **shall** develop and maintain a process that ensures the **assessment of safety risks** associated with identified hazards.

New **Note.** Additional provisions related to safety intelligence that support the identification of State's civil aviation system level hazards and the assessment of safety risks can be found in 5.2 and 5.3.

New 3.3.4.3 **Recommendation**.— States should periodically review hazards and associated safety risks related to emerging issues across the State civil aviation system.

Hazard identification & SRM – changes proposed with SL 23/18

Rationale:

The addition of 'State's civil aviation system level' is to clarify that the focus should be on the identification of **hazards which look across the aviation system rather than a duplication of the efforts by individual service providers** who identify hazards specific to them.

Note 1 to 3.3.4.1 is replaced by more **specific references to Chapter 5** in a new note to 3.3.4.2 which aims to build a link between safety intelligence and safety risk management.

The new Recommended Practice 3.3.4.3 was introduced to **address emerging issues,** referred to in the GASP, including **concepts of operations, technologies, public policies, business models or ideas that might impact safety**. It is important that States remain vigilant on emerging safety to identify safety risks, collect relevant data and proactively develop mitigations to address them. The management of emerging issues, particularly safety risks, can also provide opportunities to foster innovation. The use of new technologies, procedures and operations should therefore be encouraged. Proactive efforts such as the prioritization and periodic review of existing hazards and safety risks may support States in proactively managing the safety impact of emerging safety issues.

Hazard identification & SRM – changes following ANC review

A19 amdt. 2

3.3.4.2 States shall develop and maintain a process that ensures the assessment of safety risks associated with ~~identified~~ hazards **identified at the State level.**

New Note. Additional provisions related to safety intelligence that support the identification of ~~State's civil aviation system level~~ hazards **at the State level** and the assessment of **associated** safety risks can be found in 5.2 and 5.3.

New 3.3.4.3 **Recommendation**.— States should periodically review hazards **identified at the State level** and associated safety risk **assessments, including those** related to emerging issues across the State's civil aviation system.

Hazard identification & SRM – changes proposed with SL 23/18

A19 amdt. 2

3.3.5.1 States **shall** establish mechanisms ….. **No change**

Upgraded 3.3.5.2 ~~**Recommendation**~~ States ~~should~~ **shall** develop, maintain and document the processes to manage safety risks.

New text **Note 1.** — Guidance on the process for managing safety risks is conta… … the Safety Management Manual (Doc 9859).

New text **Note 2.** — In order to reduce the overall risk in the aviation system when managing safety risks, it is beneficial to consider the impact on aviation safety from risk management strategies implemented in other domains (for example, aviation security, facilitation, economics and environment) and vice versa.

Hazard identification & SRM – changes proposed with SL 23/18

Rationale:

Upgrading to a Standard provides for a uniform application of risk management among States. A change is made to reflect that States may not have a unique process to manage safety risks and the importance of documenting the process and outcomes, for example, as means to register the acceptance of the residual risk.

Note 1 was added to reflect that guidance material on the process for managing safety risks is provided through the SMM.

The proposed Note 2 aims to create awareness of how the risk mitigation measures implemented from one domain (e.g. safety) can affect another domain (e.g. security).

Guidance to support States on this task will be developed by the Integrated Risk Management Study Group (IRM SG).

Hazard identification & SRM – changes following ANC review

A19 amdt. 2

Upgraded 3.3.5.2 ~~**Recommendation**~~ States ~~should~~ **shall** develop, maintain and document the processes to manage safety risks **arising from hazards at the State level.**

New text **Note 1. — Safety risk assessment results may be used to support the prioritization of actions to manage safety risks**. Guidance on the process for managing safety risks, **including those related to emerging issues,** is contained in the Safety Management Manual (Doc 9859).

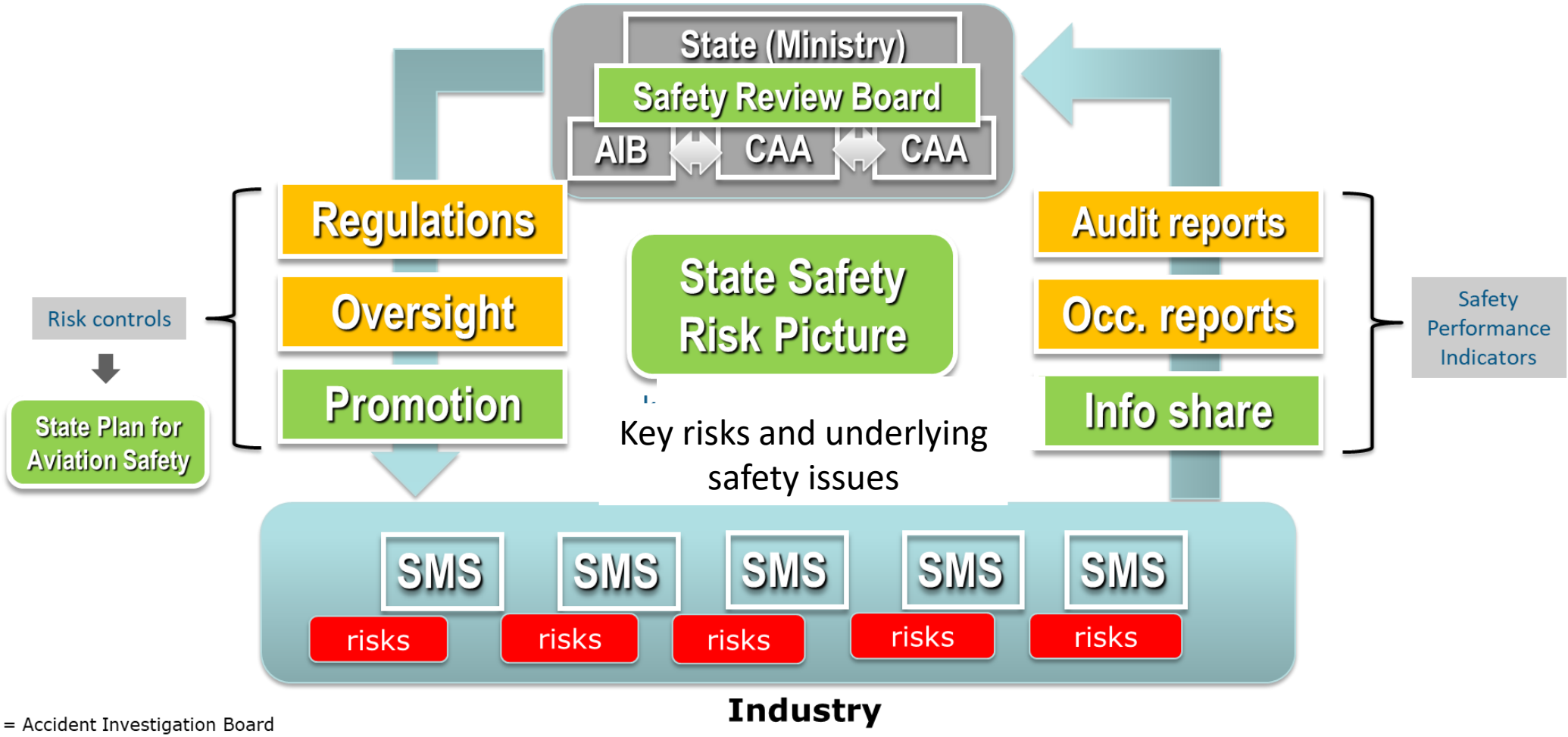
Hazard identification & SRM – changes proposed with SL 23/18

A19 amdt. 2

New 3.3.5.3 **Recommendation.—** States should periodically review the need to extend the SMS applicability to additional aviation sectors beyond those covered under 3.3.2, in accordance with the SMS framework contained in Appendix 2, as a safety risk control.

Rationale: *Each State is responsible for identifying its top systemic cross-cutting safety risks which includes risks potentially introduced by aviation organizations outside the scope of Annex 19. Discretionary SMS applicability for specific sectors allows each State to tailor its approach to achieve the desired improvement in safety performance through careful consideration of various risk control options, including but not limited to: compliance-based requirements, alternative management systems (e.g. quality management systems), promoting voluntary SMS implementation, and mandating an SMS to aviation organizations outside the scope of Annex 19.*

The Risk Picture is at the heart of your SSP



AIB = Accident Investigation Board

Inputs to determining the Safety Risk Picture

- Occurrence data
- Oversight data
- Voluntary data sharing programmes
- Safety intelligence derived from data analysis and accident/serious incident reports
- Safety studies
- AFI RASP - Regional Aviation Safety Plan priorities
- Existing risk pictures, for example the EASA Safety Risk Portfolios (source of ‘inspiration’)
- Expert advice and inputs from CAA staff and Industry

Inputs to determining the Safety Risk Picture (continued)

- Aviation System description
  - National aviation ‘industry’
    - Sectors
    - Size
    - Nature and complexity
  - Economic outlook for the national aviation industry
  - Activities of foreign operators
  - Airspace configuration
  - Geography - topography
  - Geopolitical factors
  - Environmental factors
    - e.g. known exposure to weather phenomena

- Determine related Safety Issues
- Identify causal and contributing factors
- Understand risks in context

Main steps for developing a Safety Risk Picture

- Define the structure
  - Systemic - Operational - Emerging
  - Which aviation sectors to include (start with the most critical ones)
- Designate which group or groups will be tasked with developing and maintaining the Safety Risk Picture
  - Define how they will work
  - Define how the SSP coordination group could facilitate this work
  - Define how service providers can contribute
- Check if any specific tools are needed to describe the risks, to assess and communicate on them
  - e.g. bow-tie, risk matrix, narratives
- Create a safety issue assessment template
- Define how safety issues will be prioritised
  - Criteria, scoring
  - Validation of the priority ranking

What will be done with the priority score?

- → Define priorities for risk mitigation actions
  - → Input to NASP (following the established review process) or need for an immediate action?

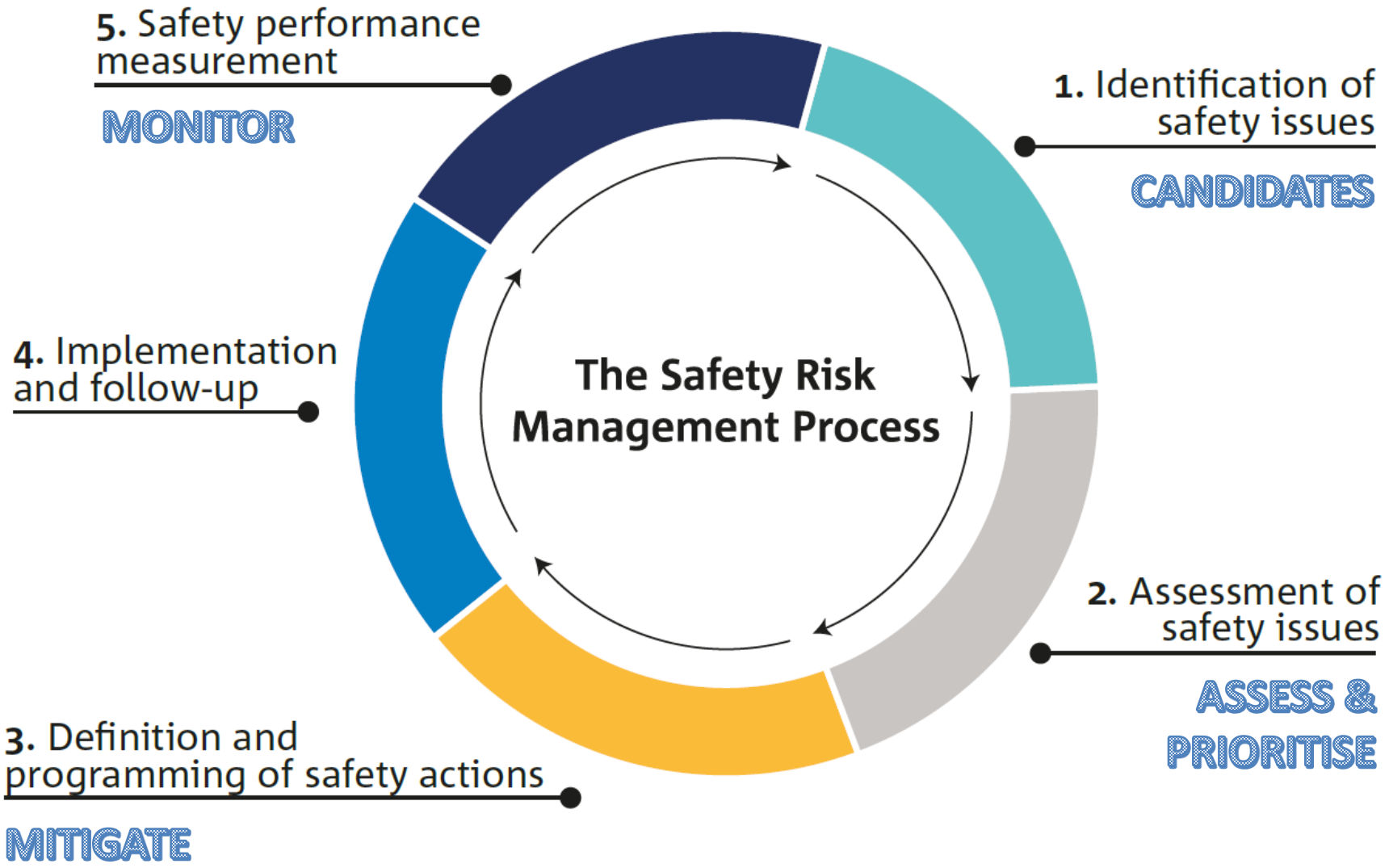
- → Decide which Safety Issues need further assessment to better understand them
  - → Feed them back into the process once the assessment is complete

- → Decide which Safety Issues do not require action now, but need to be monitored
  - → Based on rate of occurrences linked to the action or oversight data

Example -> EASA

European Safety Risk Management process

also described in the European Aviation Safety Programme



EU SRM inputs & outputs

Safety data & information sources

- Expert input, assumptions, exposure data
- Safety data - higher risk occurrences as per European Risk Classification Scheme
- Open findings with high safety concern
- Candidate safety issue form
- Others, e.g. FDM data, etc.

Outputs

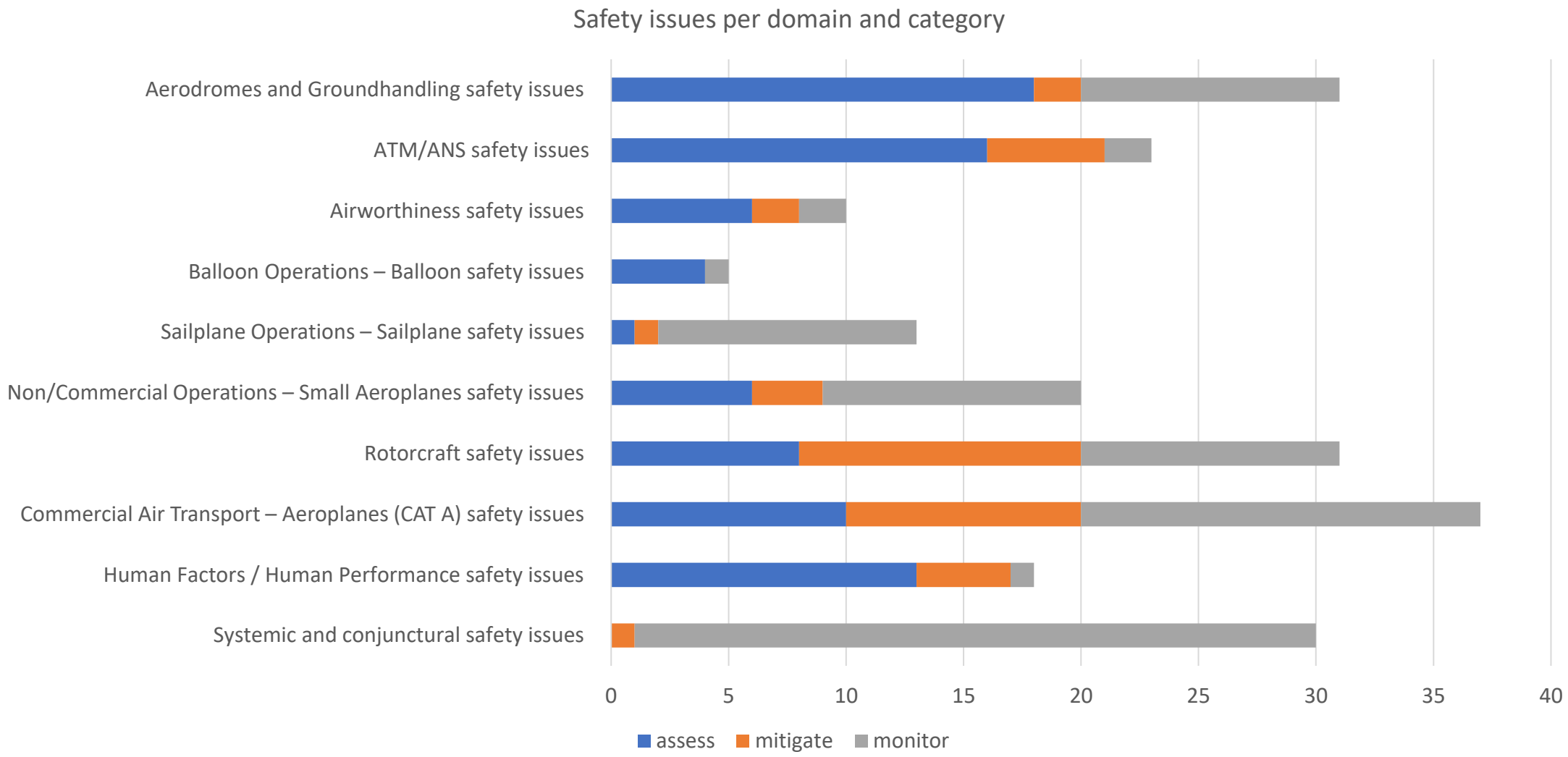
- Safety issues grouped in **Safety Risk Portfolios**:
- prioritised list of safety issues
  - ASSESS
  - MITIGATE
  - MONITOR
- Safety issue assessments
  - Detailed review of priority safety issues
- Definition & programming of actions
  - Best intervention strategy (BIS)
  - Programming: EPAS
- Risk mitigation actions
  - Rulemaking
  - Member State Tasks
  - Safety Promotion
  - Implementation Support
- Monitoring:
  - Annual Safety Review
  - Safety performance indicators

EASA Safety Risk Portfolios

- Safety issues are identified through the Agency's analysis of aviation occurrence data and other safety-related information (such as hazards) or submitted as a safety issue through the Collaborative Analysis Groups (CAGs), Network of Safety Analysts (NoA), EASA's website or internal EASA stakeholders.
- Safety issues identified through aviation data collected by the Agency are published in the EASA ASR Appendices in the form of a data portfolio.
- The Safety Risk Portfolio is an advanced and processed form of the data portfolio that has been augmented with additional layers of qualitative analysis and subject matter expertise (CAGs and NoA).
- The safety issues qualify to enter or exit the Safety Risk Portfolio according to the level of residual risk they bear. The residual risk considers the available mitigations introduced to control the safety issue (new or strengthened barriers, other solutions).

EASA domain Safety Risk Portfolios (introduced in 2021)

EPAS Volume III 2024 edition



EU SRM - Prioritisation of safety issues

→ EASA Safety Issue Prioritisation Index (SIPI)

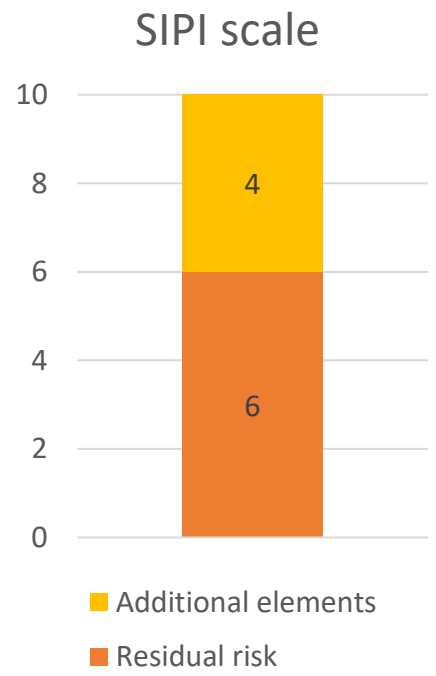
Safety Issue Priority Index

main element: residual risk

- worst likely accident outcome, and
- systemic barriers already implemented, and their effectiveness

additional elements factored in

- whether the safety issue has already resulted in fatalities, or contributed to a high-energy accident outcome
- whether the safety issue is novel (e.g., associated with newly introduced technology, unusual operations, innovative design)
- whether operational exposure to the safety issue is important (e.g., safety issues may only be of concern during training flights, reducing the operational exposure)



SIPI – what is the objective?

Implement a **structured approach** allowing 200+ **safety issues** to be **risk classified** in a **consistent manner**, regardless of:

- *the **operational domains** they belong to*
- *the **source of the safety intelligence** they have been identified from (e.g. occurrence data, accident and serious incident investigations, expert judgement, safety studies)*
- *the **type of the safety issue**, i.e. operational or systemic one*

Determine **which safety issues to assess first**.

Set **priorities for the further process steps** for completed safety issue assessments

- *Programming of actions in the EPAS -> allocate resources in accordance with priorities*
- *Set timelines accordingly and monitor timely implementation*

Where are safety issues and SIPI results published?

- **In the EPAS Volume III** 'Safety Risk Portfolios'
- Safety Issues per domain
- List of top 20 safety issues* in alphabetical order

ID¤	Domain¤	Title·¤
SI-2014¤	ATM/ANS¤	Airborne·Collision·with·Unmanned·Aircraft·System·(UAS)¤
SI-4010¤	NCO·A¤	Airborne·separation¤
SI-5515¤	SYS&CONJ¤	Airspace·infringements·by·military·UAS,·aircraft,·missiles,·or·debris·spilling·over·from·conflict·zones¤
SI-0007¤	CAT·A¤	Approach·path·management¤
SI-0039¤	CAT·A¤	Fatigue·(FTL)¤
SI-1019¤	ADR/GH¤	Ground·staff·movement·around·aircraft¤
SI-9006¤	Airworthiness¤	Inadequate·aircraft·system·design·resulting·in·maintenance·errors¤
SI-8031¤	Rotorcraft¤	Inadequate·obstacle·clearance·during·any·flight·phase¤
SI-0010¤	CAT·A¤	Inappropriate·Flight·Control·Inputs¤
SI-9002¤	Airworthiness¤	Insufficient·consideration·of·flight·crew·human·factors·in·Functional·Hazard·Assessments¤
SI-9003¤	Airworthiness¤	Insufficient·consideration·of·flight·crew·human·factors·in·the·continued·airworthiness·process·of·the·type·design¤
SI-0009¤	CAT·A¤	Insufficient·Crew·Resource·Management·(CRM)·¤
SI-3016¤	HF/HP¤	Lack·of·focus·on·risk-based·decision·making·in·complex·systems¤

* full list of top 20 safety issues: Volume III page 16

EASA Safety Risk Portfolio: Systemic and Conjunctural

- The highest-priority safety issues in the portfolio are
  - **Errors of civil aircraft identification by ground military forces and airborne assets outside the conflict zone**
  - **Reduced adherence to procedures**
  - **Increased Presence of Wildlife on Aerodromes (due to COVID-19)**

- Other safety issues that are also global concerns
  - Cyber attacks (SI-5017)
  - GNSS signal manipulation leading to navigation or surveillance degradation (SI-5501A)
  - Reduced available financial resources (SI-5019)
  - Reduced focus on, or prioritisation of safety (SI-5009)
  - Shortage of operational and technical staff (SI-5018)
  - Spare parts shortages (other than aircraft) (SI-5504)
  - …..

EASA Safety Risk Portfolio: Human Factors/Human Performance

- The highest-priority safety issues in the portfolio are
  - **SI-3016 'Lack of focus on risk-based decision-making in complex systems**
  - **SI-3024 'State of well-being and fit for duties' transferred from the CAT Aeroplanes Safety Risk Portfolio**

- Other safety issues that may be of interest
  - Design and use of procedures (SI-3007)
  - Heavy workload and misaligned tasks (SI-3006)
  - Human factors competence for regulatory staff (SI-3003)
  - Integration of HF/HP principles into the organisations management system (SI-3004)
  - Senior management competence and commitment to HF/HP principles (SI-3001)

EASA Safety Risk Portfolio: Commercial Air Transport

- The highest-priority safety issues in the portfolio are
  - **SI-0007 'Approach path management'**
  - **SI-0039 'Fatigue (FTL)'**
  - **SI-0009 'Insufficient Crew Resource Management (CRM)'**
  - **SI-0010 'Inappropriate Flight Control Inputs'**
- Other safety issues that may be of interest
  - Effects of climate change -> Adverse convective weather (turbulence, hail, lightning, and ice) (SI-0003) (CC effect)
  - Airline systems' vulnerability leading to disruptions due to cyber attacks (SI-5017A)
  - Approach path management (SI-0007)
  - Carriage and transport of lithium batteries (SI-0027)
  - Clear air turbulence and mountain waves (SI-0018) (CC effect)
  - Congestion/interference of the electromagnetic spectrum (5G) (SI-0053)
  - Insufficient crew resource management (CRM) (SI-0009)
  - Effectiveness of safety management (SI-0041)
  - Entry of aircraft performance data (SI-0015) (CC effect)
  - etc

EASA Safety Risk Portfolio: Air Traffic Management/Air Navigation Services

- The highest-priority safety issues in the portfolio are
  - **Airborne conflict with an unmanned aircraft system' (UAS) (SI-2014),**
  - **'Undetected occupied runway' (SI-2006)**
  - **'Mass diversions' (SI-2032).**
- Other safety issues that may be of interest
  - Level bust (SI-2004)
  - High-energy runway conflict (SI-2005)
  - Deconfliction with aircraft operating with a malfunctioning or non-operative transponder (SI-2002)
  - Landing/take-off/crossing without clearance (SI-2007)
  - Safety issues raising from new technologies and automation (e.g. remote tower, SWIM) (SI-2015)
  - Cybersecurity (SI-2013)
  - Inaccurate provision of weather information (wind at low height) (SI-2009)
  - Inaccurate provision of weather information (turbulence/windshear/convective weather) (SI-2008)
  - Etc..

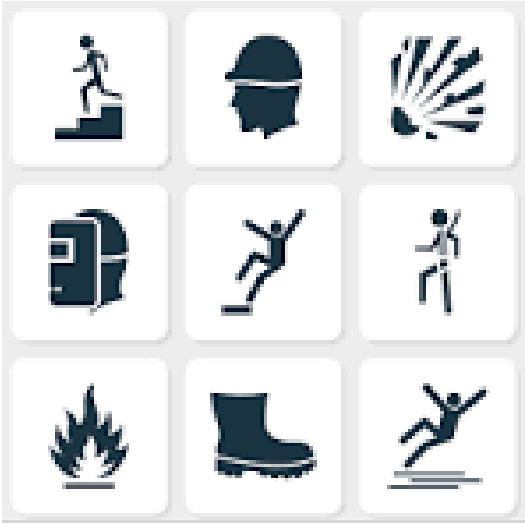
EASA Safety Risk Portfolio: Aerodromes and Ground Handling

- The highest-priority safety issues in the portfolio are
  - **Poor coordination and control of turnarounds' (SI-1010),**
  - **'Ground staff movement around aircraft' (SI-1019).**
- Normal to low priority
  - Poor maintenance and serviceability of runways/taxiways (SI-1032)
  - Incorrect operation of ground support equipment (SI-1024)
  - Poor safety reporting culture of organisation (SI-1038)
  - Worker fatigue leading to human error (SI-1039)
  - Ground conflict during aircraft taxiing operations (SI-1001)
  - Ineffective control of bird and wildlife (SI-1005) (Amended)
  - Errors in load sheets and other documentation/systems (SI-1022)
  - Poor or inadequate runway/taxiway design and layout (SI-1029)
  - Poor maintenance and serviceability of ground support equipment (SI-1033)
  - Ground operations in extreme temperatures (SI-1044)
  - Poor or inadequate apron/stand design and layout (SI-1003)
  - Poor or inadequate design of ground support equipment (SI-1013)
  - …….

EASA Safety Risk Portfolios

- → Benefit from the European Central Repository and European Risk Classification Scheme
- → Supported by the European Network of Analysts (NoA) and Collaborative Analysis Groups
- → AFI Region States do not benefit from a common pool of occurrence data, nor regional safety analysis resources like NoA
- → **AFI Region State Risk Pictures are not expected to meet the standard set with EPAS Volume III**
  - → Start small
  - → Incremental changes

Other Safety Risk Picture examples



France

DSAC_PlanHorizon_2028_FR.pdf

France: Safety issue ‘landscape’ (extract)

1.2
Opérations aériennes avion

Référence	Sujet de sécurité	CFIT	LOC -I	Collision en vol	Collision au sol	Sortie de piste	Dommages / blessures en vol	Dommages / blessures au sol	Feu fumées pressurisation
AC 1	Approche non stabilisée ou non conforme	●	●			●		●	
AC 2	Positions inusuelles (assiette, inclinaison, incidence)		●				●		
AC 3	Evènement lié aux conditions d’aérodrome (état et contamination des chaussées, notamment des pistes)		●			●	●	●	
AC 4	Rencontre de phénomènes météo dangereux (orage, turbulence, givrage)		●	●			●	●	●
AC 5	Mise en œuvre inadaptée des systèmes aéronef (masse et centrage, vitesses, trajectoires, configuration aéronef, insertion paramètres, etc.)	●	●	●	●	●	●	●	
AC 6	Évènement lié à des travaux / maintenance de l’infrastructure sur ou à proximité d’une piste (atterrissage / décollage sur piste «raccourcie» ou fermée, gêne de la mise en œuvre des secours, etc.)		●		●	●		●	
AC 7	Mauvaise coordination / exécution des opérations sol (dégivrage, chargements, arrimages, maintenance en ligne, etc.)	●	●		●		●	●	●
AC 8	Incursion / quasi-incursion sur piste		●		●	●		●	
AC 9	Perte de séparation / rapprochement dangereux en vol (y compris avec drones ou EVTOL) / pénétration d'espaces		●	●	●		●		

United Kingdom

→ CAP2393: The UK National Aviation Safety Plan 2022-2024

CAP2393: The UK National Aviation Safety Plan 2022-2024 | Civil Aviation Authority

→ Systemic

→ Operational

→ Emerging

United Kingdom

→ CAP2393: The UK National Aviation Safety Plan 2022-2024

Type	Risk relates to
Systemic	Restarting of operations in conflict areas
Systemic	Degraded operational performance during regeneration following Covid-19
Systemic	Inappropriately managed contracted activities leading to a reduction in safety performance

United Kingdom

→ CAP2393: The UK National Aviation Safety Plan 2022-2024

Type	Key Risk Area	Risk relates to
Operational	Aircraft Environment	Lithium battery fire in the hold of an inbound aircraft
Operational	Aircraft Environment	Lithium battery fire in the hold of an outbound aircraft
Operational	Airborne Conflict	RPAS collision with Commercial air transport
Operational	LOC-I/CFIT	Helicopter use of unapproved IFR approach procedures
Operational	Aircraft Environment	RPAS carriage of unapproved Dangerous Goods
Operational	Airborne Conflict	RPAS collision with aircraft over the public
Operational	LOC-I	RPAS loss of control over the public

United Kingdom

→ CAP2393: The UK National Aviation Safety Plan 2022-2024

Other safety issues:

- → Innovation
- → Cyber
- → Sustainability
- → Space
- → Industry implementation of SMS
- → Rulemaking !

Placeholder

→ AFI examples

Placeholder

→ AFI examples

Placeholder

→ AFI examples

How the Safety Risk Pictures will support continual improvement of the SSP

→ Common understanding within the CAA and with stakeholders of the most significant risks

→ Promotes informed decision-making

→ Supports allocation of (limited) resources in accordance with the most significant risks

How the Safety Risk Pictures will support continual improvement of the SSP

- → Learning process
  - → continual improvement of analysis capabilities and of safety risk management – maturation of State SRM
- → Encourages coordination and communication
  - → within the various State authorities
  - → with Industry
  - → with other States in the region
- → Fosters a collaborative approach for safety management (State and Industry)

How the Safety Risk Pictures will support continual improvement of your SSP

- Risk ‘mapping’ should be an iterative process
  - Regular review and updating of the Safety Risk Picture based on
    - new data
    - emerging trends
    - changing environment
    - ….
- SSP and NASP can be adapted to evolving risk
  - Strengthening of the risk management capabilities that are at the heart of the SSP
  - Better management of change (internal or external)
    - structured approach to assessing the impact of changes on safety issues and mitigation actions
- Better safety performance over time
    - more and more safety issues will be identified and mitigated

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- end of presentation -

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