

ENCASIA – WORKSHOP

Assessment of Safety Issues - Management of the Flight in Adverse Weather Conditions

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Safety Analysis (SM1.1)

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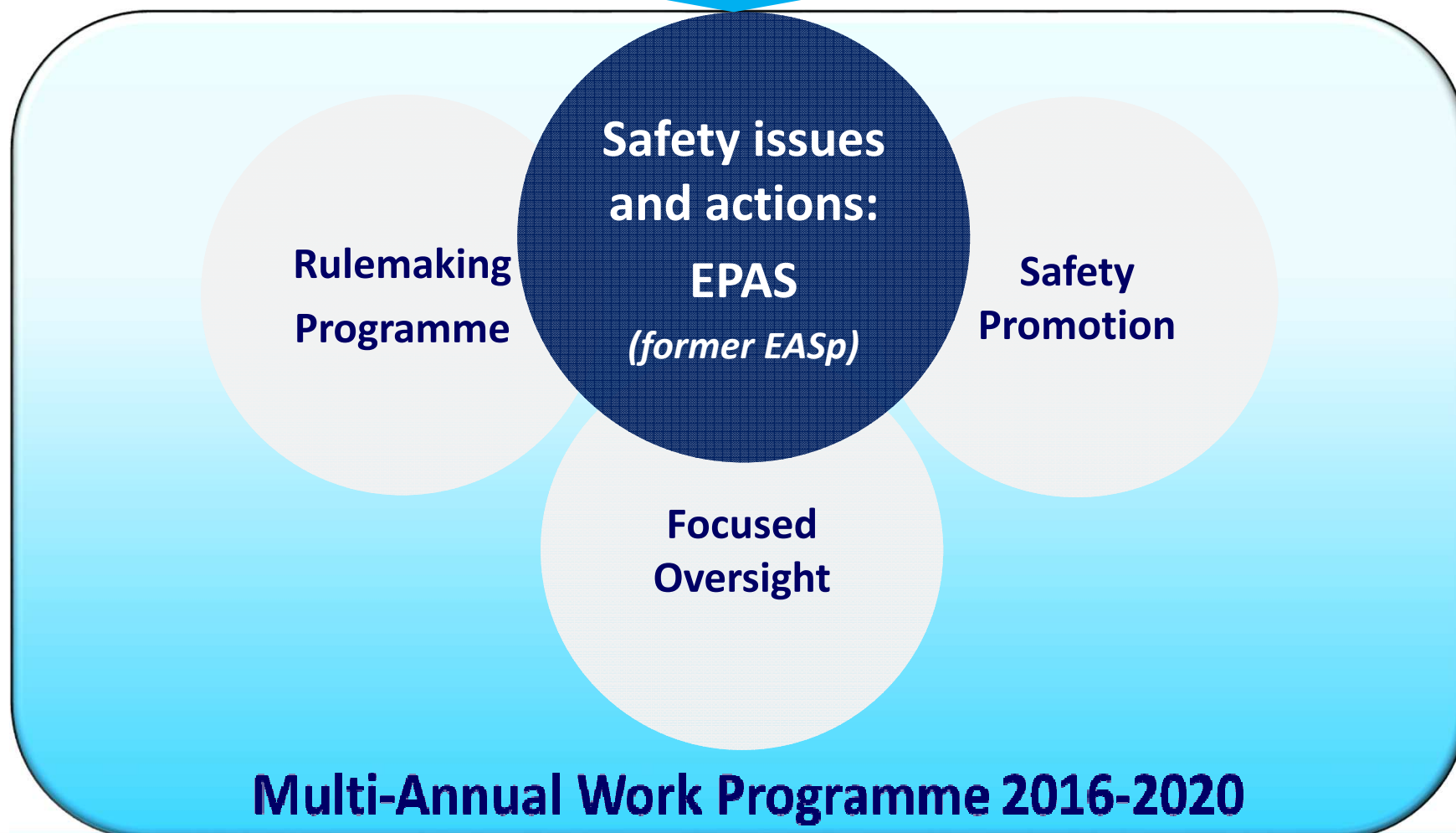
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Introduction - SRMP

Safety Risk Portfolio



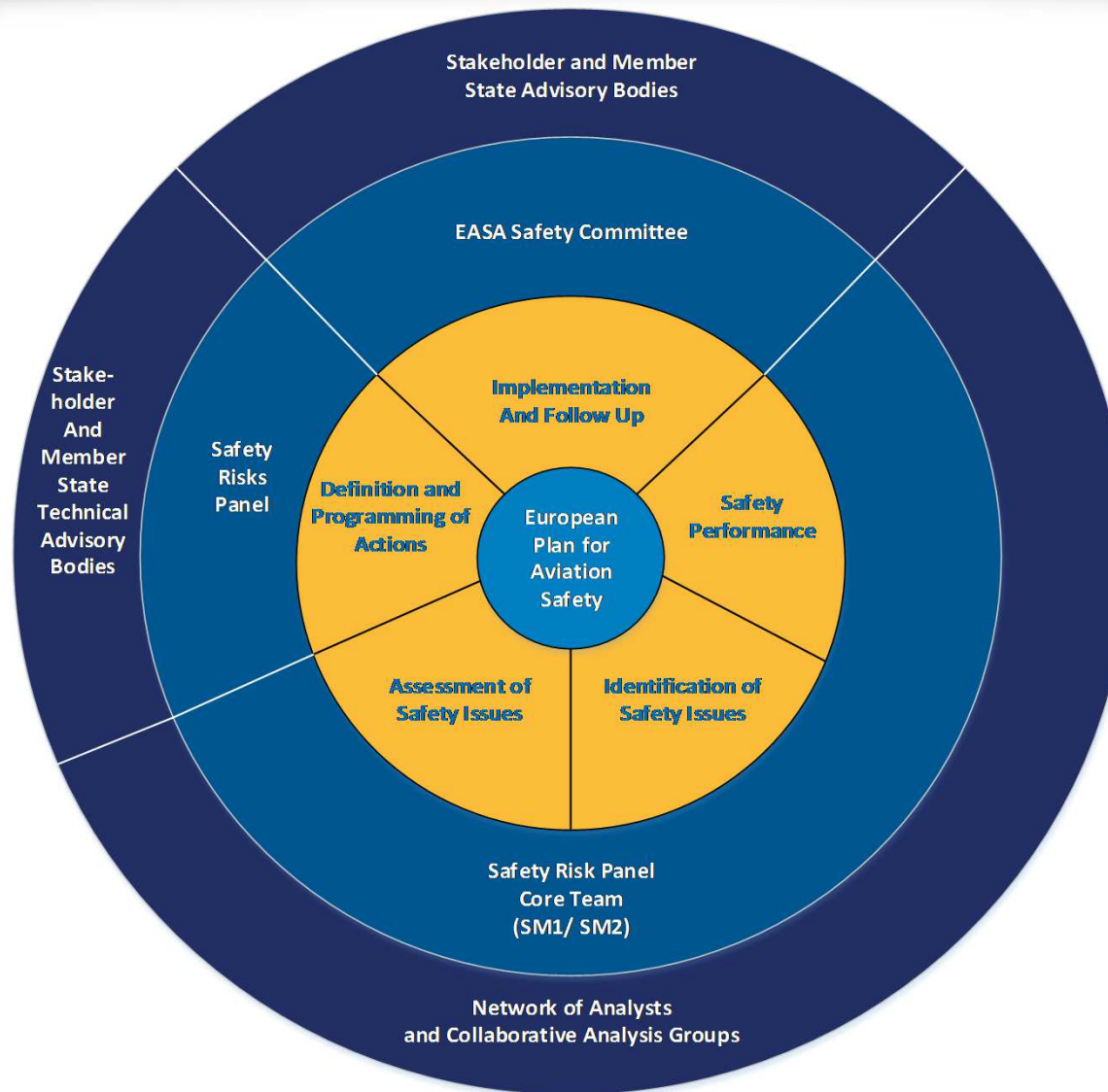


Introduction - SRMP





EPAS Supporting Structure



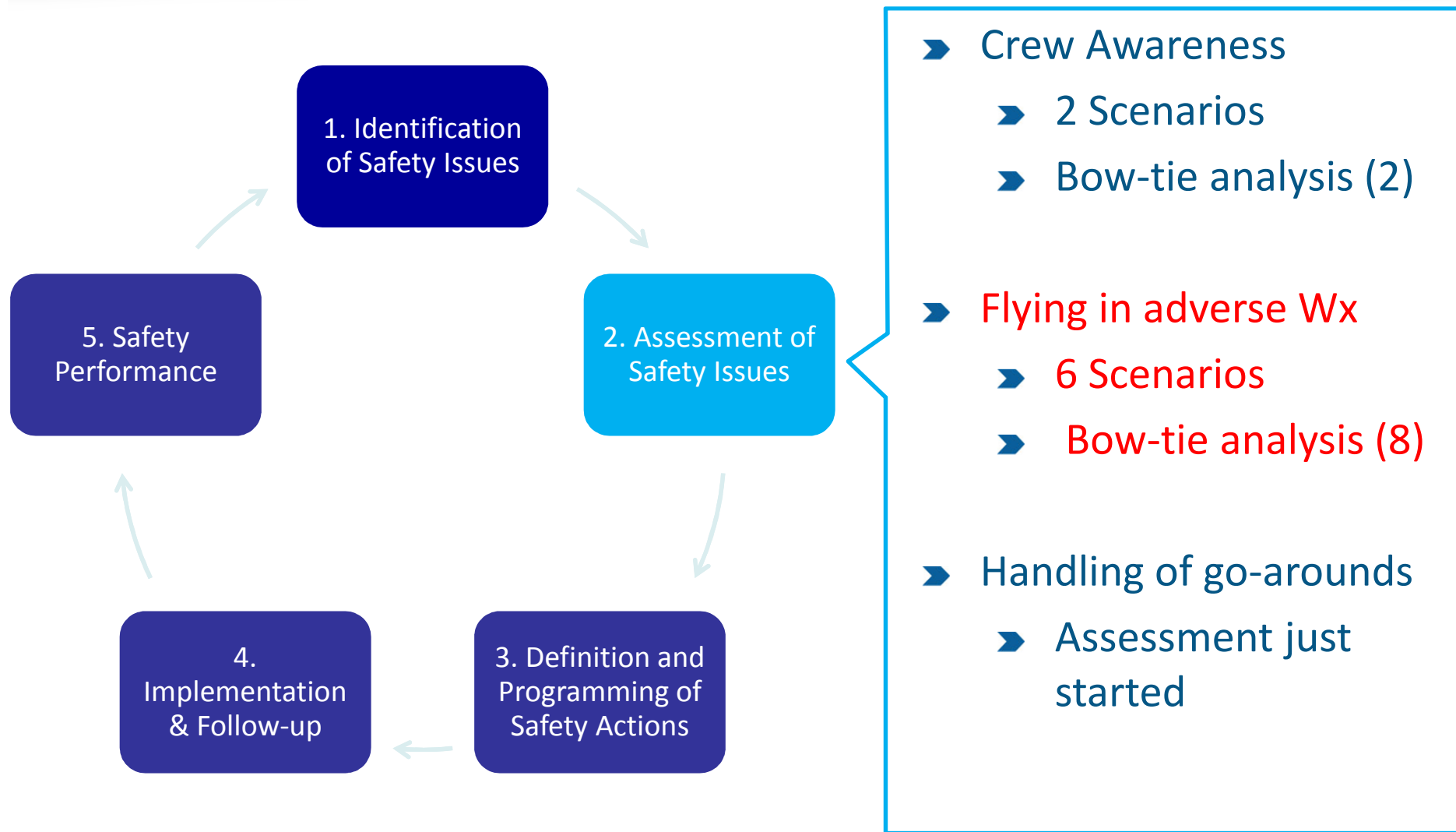


Introduction – CAT Aeroplanes Portfolio

	Outcome Percentage of Fatal Accidents (2010-2014)				41%	25%	16.60%	16.60%	8.30%	0%	0%	0%
	Outcome Percentage of Non-Fatal Accidents (2010-2014)				1.30%	22.60%	31.80%	0.40%	37.60%	3.50%	0.80%	0%
			Total number of accidents in 2011-2015 per safety issue		Key Risk Areas (Outcomes)							
	Safety Issues	Serious Incidents	Total Accidents	Fatal Accidents	Aircraft Upset in Flight	System Failure	Ground Collisions and Ground Handling	Terrain Conflict	Abnormal Runway Contact and Excursions	Fire	Runway Incursions	Airborne Conflict
Operational	Detection, Recognition and Recovery of Deviation from Normal Operations	19	12	2	5	4			7			
	Operation in Adverse Weather Conditions	34	33	1	4	1			12			
	Maintaining Adequate Separation Between Aircraft	82	25	1		1	19		4		1	
	Ground Handling Operations	8	5			1	5					
	Pre-Flight Preparation/ Planning and In-Flight Re-Planning	7	2						1			
	Aircraft Maintenance	6	1			1						
	Fuel Management	7										
	Birdstrikes and Bird Control	3										
	Calculation and Entry of Take-Off and Landing Parameters into Aircraft System	2										
	Handling and Execution of Go-Arounds	2										
	Prevention and Resolution of Conflict with Aircraft Not Fitted With Transponders	1										
	Dangerous Goods Handling											
Technical	Handling and Operation of the Aircraft Following a Technical Failure	7	4		1	4			3			
	False or Disrupted ILS Signal Capture	4										
	Contamination of Controls or Critical Surfaces	2										
	Damage Tolerance of RPAS Collisions											
Consequences	Suitability of Recording Devices	3	4	2	1	1			1			
	Survivability and Evacuation	2	6	1	1	3			1	3		
Human	Personal Readiness and Crew Impairment	38	1	1								
	Flight Crew Perception and Awareness Decision Making and Planning	1	5			1	3		1			
	CRM and Communication	12	4			1	1		2			
	Monitoring of Flight Parameters and Automation Modes	3										
	Knowledge of Aircraft Systems and Use of Associated Procedures	1										
Organisational	Implementation of Reporting Systems and Safety Management	2										
	Oversight of Organisations											



Assessment of safety issues





Definition

- Flying in adverse weather conditions
 - Ability and/or capability of the crew to manage the flight in adverse weather
 - It covers aspects such as:
 - Flight planning
 - Availability of weather information
 - Aircraft dispatch, including ground de-icing
 - Flight crew decision making
 - Adequate tools or procedures for the crew
 - Aircraft certification requirements
 - The term adverse weather includes weather conditions as:
 - Icing
 - Thunderstorm and Inter tropical convergence zone (ITCZ)
 - Windshear
 - Cross-wind
 - Turbulence



Management of adverse Wx

To facilitate the assessment split in **6 operational scenarios** based on the data of the LOC-I analysis:

1. Windshear at landing or short final
2. Crosswind at landing or short final
3. Ice on ground
4. Ice in flight
5. Turbulence in flight
6. Hail in flight

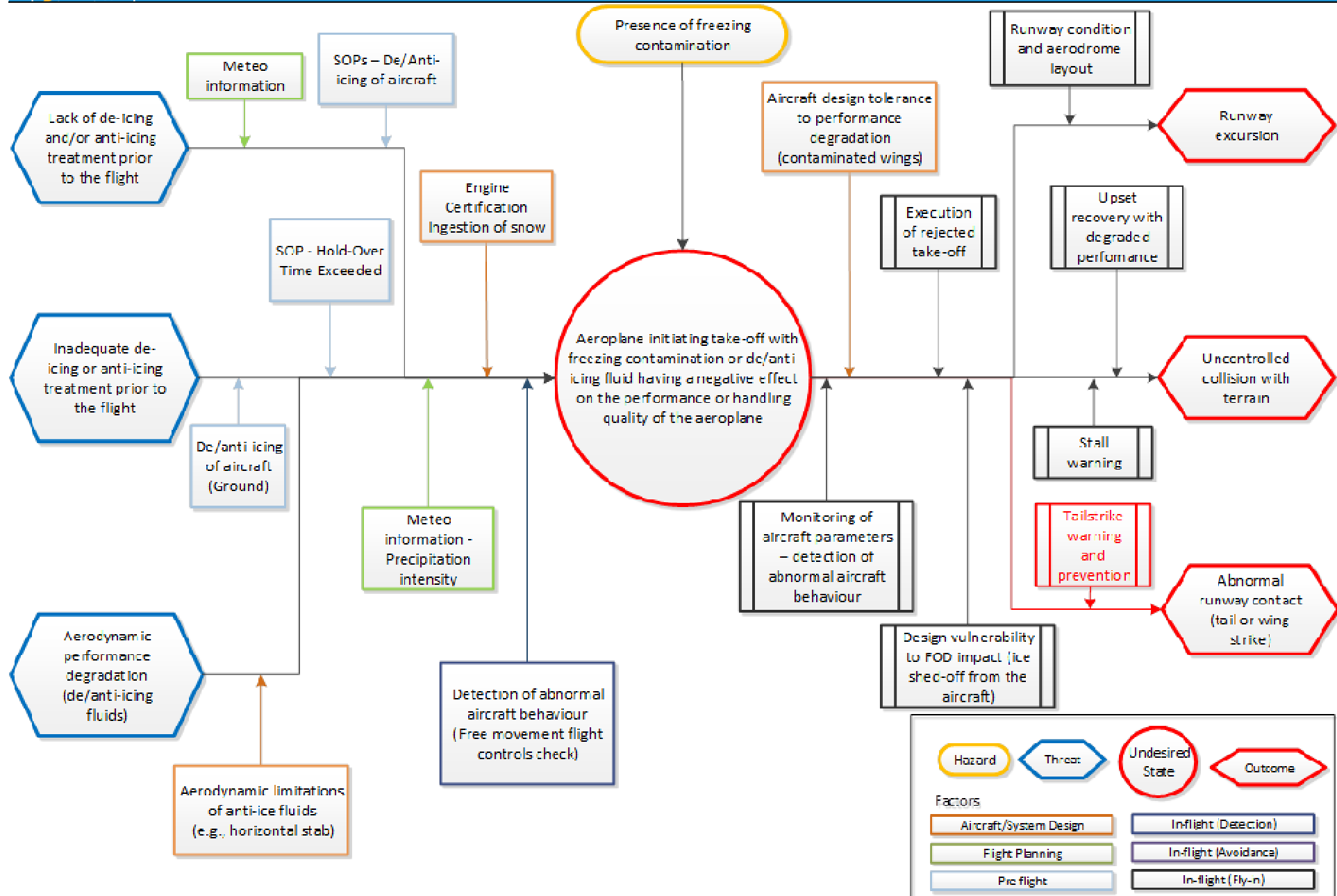


Ice on Ground - Assessment

- Team of Experts (multi-disciplinary team)
- Assessment through high level bow-ties (operational scenarios)
- Goal: To assess current controls in each bow-tie (qualitative assessment)
 - Controls: existing requirements, standards, good practices, safety promotion material, addressed safety recommendations, etc.
 - Data: accidents/incidents, standardisation/organisation surveillance findings, MS SSP, industry SMS, safety studies, research activities, other data sources...
- EASA expert judgement validated by MS and/or Industry partners
- To conclude on the need to strengthen any of the controls or to propose new elements: Is the safety issue under control? If not, what are the weak or missing controls?



Ice on ground – Bow-tie (I)





Assessment sheet

Meteorological Information (pre-flight)	
Definition: The use of current and accurate meteorological information by the flight crew enabling the assessment of the weather conditions before the flight. This meteorological information provides the flight crew with the necessary arguments to decide on de/anti-icing the aircraft prior take-off.	
Controls: <ul style="list-style-type: none">· Regulatory framework for MET provision (Reg 1035/2011 Annex III)· Regulatory framework for AOC (Reg 965/2012 CAT.GEN.MPA.180) and FCL (Reg 1178/2011)· Oversight and Standardisation of regulatory framework· Direct weather observation by the Flight Crew before the flight (pre-flight and before take-off)	Weaknesses: <ul style="list-style-type: none">· Seasonal exposure· Commercial pressure· Difficult decision making at marginal conditions· MET standardisation out of EASA scope
Ongoing actions: <ul style="list-style-type: none">· Opinion on provision of MET services	Relevant Data (2011-2015): <ul style="list-style-type: none">· Accidents/Serious incidents involving poor (or lack of) meteorological information: [IORS DB] 3 accidents, 2 serious incidents related to the availability of meteorological information or its quality. However, none of them related to the lack of information to the crew to decide on the de/anti-icing of the aircraft prior departure. [ECR] 125 incidents related to the availability and/or accuracy of the meteorological information. However, none of them related to the lack of information to the crew to decide on the de/anti-icing of the aircraft prior departure.· Findings on Standardisation visits (ADR, AIR OPS, FCL): TBD
Assessment: <p>The meteorological information provided to the flight crew seems to be systematically available and accurate facilitating the flight crew to decide on the need to conduct the de-icing and anti-icing of the aircraft prior take-off. In addition, the flight crew are normally in the position to assess the meteorological conditions during the pre-flight and during the taxi out.</p>	Remarks: <p>In the context of icing on ground, the meteorological information is of low criticality since the flight crew is normally able to observe and judge the meteorological conditions in-situ. Low residual risk.</p>

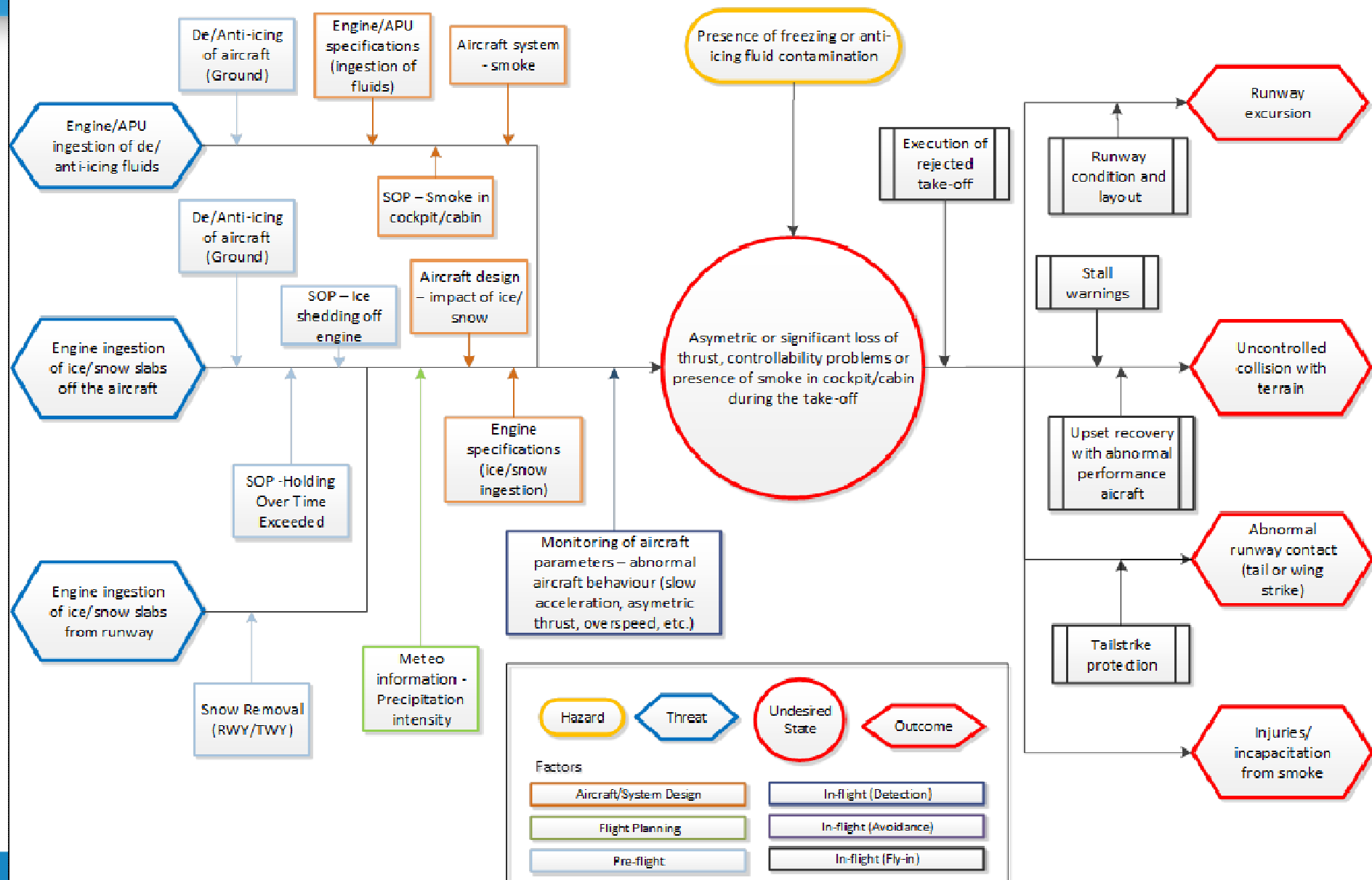


Assessment sheet

De/Anti-icing of aircraft	
Definition: The application and execution of the de-icing and anti-icing procedures by the ground personnel prior the take-off. It includes the knowledge of and the specific trainings to the personnel, the adequacy of the liquids and the availability of technical means to carry out the procedure properly.	
Controls: <ul style="list-style-type: none">· Regulatory framework for AOC (Reg 965/2012 GM2 ORO.GEN.200(a)(6) compliance with monitoring programme, AMC/GM ORO.GEN.205 Contracted activities; Reg 139/2014 ADR.OPS.B.035 winter operations)· Winter Operations briefing (best practices)· Industry Standards for fluids	Weaknesses: <ul style="list-style-type: none">· Seasonal exposure· Commercial pressure· Oversight of de/anti-icing providers (operator and aerodrome operator)· Regulatory framework (de/anti-providers not certified)· Fluids controls
Ongoing actions: <ul style="list-style-type: none">· Regulatory changes on the ground handling organisations (new BR and new IR)	Relevant Data (2011-2015): <ul style="list-style-type: none">· Accidents/Serious incidents involving inadequate application of the de/anti-icing procedures: [IORS] 3 serious incidents, 1 incident. 2 events related to smoke in cabin/cockpit from engine/APU ingestion of de-icing fluids, and 2 leading to THS/elevator control difficulties due to de-icing fluid and water ingress in tail section during ground de-icing. [ECR] 289 incidents related to issues during the ground de/anti-icing of the aircraft.· Findings on Standardisation visits (OPS, ADR): TBD
Assessment: <p>There seems to be frequent issues with regards to the proper application of the de/anti-icing procedures, though not necessarily leading to the aircraft taking off with significant contamination to degrade aircraft performance. The frequent occurrences and the difficult oversight over the de/anti-ice service providers show latent conditions that would need to be addressed.</p>	Remarks: <p>The safety assurance of the de/anti-ice service is eventually responsibility of the operator. However, there are little instruments for operators to ensure a proper de/anti-ice service (reduce number of providers, limit legal requirements, not approved organisations, no oversight, etc.)</p>



Ice on ground – Bow-tie (II)





Conclusions of the Assessment

- Is the safety issue sufficiently controlled in this scenario?
- If not,
 - What is the risk to mitigate (urgency)?
 - What are the weak or missing controls?
 - What are the possible actions to address those weak or missing controls?
- Same for the whole safety issue
 - What are the controls to strengthen?
 - With which possible actions?
 - Which should take priority?



EASA

European Aviation Safety Agency

Comments and Questions?

Thanks!

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