HORIZON 2023

SAFETY RISK PORTFOLIOS

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SAFETY RISK PORTFOLIOS

This document complements the Horizon 2023 strategic safety enhancement plan. It includes tables representing operational safety risk portfolios, in the areas of commercial air transport, helicopters, aerodrome operations, ground handling, and continuing airworthiness. These risk portfolios do not prejudice those of operators, and are, by their nature, evolutive. The latest version can be downloaded from DGAC website: www.ecologique-solidaire.gouv.fr/programme-securite-letat.

Note that in the context of the State safety programme:

- A feared consequence (FC) (in the causal chain) is an accident in the sense of ICAO Annex 13;
- An undesirable event (UE) is an unwanted event in view of the services expected. An undesirable event may be technical, procedural or human.

The occurrence of an undesirable event is likely to lead to the occurrence of an associated feared consequence.

The last page provides a summary describing the issues of the organisational and human factors (OHF) mentioned in the risk portfolios.

KEY AND ABBREVIATIONS	
•	The undesirable event (UE) leads to a significant increase in the probability of occurrence of a feared consequence (FC).
*	A UE may exceptionally or non-trivially lead to a FC.
CFIT	Controlled Flight Into Terrain
LOC-I	Loss Of Control In-Flight
FOD	Foreign Object Debris
OHF	Organisational and Human Factors
RWY-EXC	Runway Excursion

COMMERCIAL AIR TRANSPORT BY PLANE

COMMERCIAL AIR TRANSPORT BY PLANE

NO.	UNDESIRABLE EVENTS (UE)	FEARED CONSEQUENCES (FC)						
		CFIT	LOC-I	Mid-air collision	Ground collision	Runway excursion	Damage / injury during flight	Damage / injury on the ground
UE AC 4.1	Unstabilised or non-compliant approach	•	•			•		•
UE AC 4.2	Unusual flight attitudes (pitch, bank angle, angle of attack)		•				•	
UE AC 4.3	Event relating to aerodrome conditions (condition and contamination of surfaces, notably runways)		•			•	•	•
UE AC 4.4	Encountering dangerous weather phenomena (thunderstorm, turbulence, icing)		•	✶			•	•
UE AC 4.5	Misuse of aircraft systems (weight and balance, speed, trajectory, aircraft configuration, setting parameters, etc.)	•	•	•	•	•	•	•
UE AC 4.6	Event relating to works / maintenance of the infrastructure on or near a runway (landing/take-off on “shortened” or closed runways, hindrance to rescue efforts, etc.)		✶		•	•		•
UE AC 4.7	Poor coordination/execution of ground operations (deicing, loading, stowage, line maintenance, etc.)	•	•		•		•	•
UE AC 4.8	Runway incursion		✶		•	•		•
UE AC 4.9	Loss of separation in flight (including with drones) / airspace infringement		✶	•	✶		•	
UE AC 4.10	Wildlife hazard, including bird hazard		•		•	•	•	•
UE AC 4.11	Failure of air-ground interfaces (misunderstanding, transmission of inappropriate information, etc.)	•	•	•	•	•	•	•
UE AC 4.12	Event relating to the maintenance of the aircraft	•	•		✶	•	•	•
UE AC 4.13	Fire / smoke in flight	✶	•			•	•	•
UE AC 4.14	Onboard system failure resulting in disruption of flight management	•	•	✶	✶	•	•	•
UE AC 4.15	Depressurisation or malfunction of the pressurisation system		•	✶			•	
UE AC 4.16	Aircraft damage due to FOD		•			•	•	•
UE AC 4.17	Disruptive or unruly passengers	✶	✶	✶	✶	✶	✶	✶

Taking into account Organisational and Human Factors (OHF): see dedicated page.

HELICOPTERS OPERATIONS

HELICOPTERS OPERATIONS

NO.	UNDESIRABLE EVENTS (UE)	FEARED CONSEQUENCES (FC)						
		CFIT	LOC-I	Mid-air collision	Ground collision	Runway excursion	Damage / injury during flight	Damage / injury on the ground
UE H 4.1	Navigation and approaches (alarms and significant deviations)	•	•			•		•
UE H 4.2	Unusual attitudes (pitch, bank angle, developments close to the ground)		•				•	
UE H 4.3	Event relating to the conditions of the operating site (and notably their anticipation during flight preparation)		•			•	•	•
UE H 4.4	Encountering dangerous weather phenomena en route (IMC entry in VFR, storm, turbulence, icing, and notably their anticipation during flight preparation)	•	•	✶			•	•
UE H 4.5	Misuse of systems (relating to mass, speed, configuration or planned route)	•	•	•	•	•	•	•
UE H 4.6	Event relating to works / maintenance of infrastructure on or near the operating site		✶		•	•		•
UE H 4.7	Poor coordination/execution of ground operations (deicing, loading, stowing, fastening, etc.)	•	•		•		•	•
UE H 4.8	Incursion onto operating site		✶		•	•		•
UE H 4.9	Loss of separation in flight / airspace infringement		✶	•			•	
UE H 4.10	Bird hazard		•		•	•	•	•
UE H 4.11	Failure of air-ground interfaces (misunderstanding, transmission of inappropriate information, etc.)	•	•	•	•	•	•	•
UE H 4.12	Event relating to the continuing airworthiness of the helicopter	•	•		✶	•	•	•
UE H 4.13	Fire / smoke in flight	✶	•			•	•	•
UE H 4.14	Onboard system failure	•	•	✶	✶	•	•	•
UE H 4.15	Non-compliance with limitations (dimensions, slope, and type of platform covering, etc.)		•				•	
UE H 4.16	Aircraft damage following encounter with FOD or ingestion of materials (sand, snow, etc.)		•			•	•	•
UE H 4.17	Disruptive, unruly or intrusive passengers	✶	✶	✶	✶	✶	✶	✶

Taking into account Organisational and Human Factors (OHF): see dedicated page.

AERODROMES OPERATIONS

AERODROMES OPERATIONS

NO.	UNDESIRABLE EVENTS (UE)	FEARED CONSEQUENCES (FC)						
		CFIT	LOC-I	Mid-air collision	Ground collision	Runway excursion	Damage / injury during flight	Damage / injury on the ground
UE ADR 4.1	Disturbance of air navigation aids (ILS, PAPI, etc.)	•	•			•		•
UE ADR 4.3	Event relating to aerodrome conditions (condition and contamination of surfaces)		•			•	•	•
UE ADR 4.4	Infrastructure and equipment unsuited to weather conditions (condition of aerodrome lighting, including approach ramp)		•	✶	✶		•	•
UE ADR 4.6	Event relating to works / maintenance of the infrastructure on or near a runway (landing / take-off on "shortened" or closed runways, hindrance to rescue efforts, etc.)		✶		•	•		•
UE ADR 4.7	Poor coordination/execution of ground operations (collision on the apron, de-icing management)	•	•		•		•	•
UE ADR 4.8	Lack of/problem with readability of infrastructure (runway incursion of aircraft/vehicle, routing error, take-off line-up on taxiway, etc.)		✶		•	•		•
UE ADR 4.9	Unsuitability of line-up taxiways and runway exits in terms of operations		✶	•	✶		•	
UE ADR 4.10	Wildlife hazard, including bird hazard		•		•	•	•	•
UE ADR 4.11	Failure of air-ground interfaces (misunderstanding, transmission of inappropriate information, etc.)	•	•	•	•	•	•	•
UE ADR 4.13	Fire / smoke on ground	✶	•			•	•	•
UE ADR 4.16	FOD (FOD on the runway, ingestion or projection, aircraft damage, etc.)		•			•	•	•
UE ADR 4.18	Engine blast (projections of objects, damage to aircraft, etc.)	✶	✶		•			•
UE ADR 4.19	Obstacle exceedance of protective surfaces and condition of the cleared strip			•	•			•

Taking into account Organisational and Human Factors (OHF): see dedicated page.

GROUND HANDLING

NO.	UNDESIRABLE EVENTS (UE)	FOLLOWED EVENTS (FE)	FEARED CONSEQUENCES (FC)				
			LOC-I	RWY-EXC	Injuries / deaths of passengers and crews	Injuries / deaths of ground personnel	Other damage
UE GH 1	Aircraft exceeding the operational weight and balance envelope	FE GH 11 - Significant error in the calculation of weight and balance estimate	•	•			
		FE GH 12 - Incorrect loading of luggage, mail, cargo or passengers, which may have a significant effect on the weight and/or balance of the aircraft	•	•			
		FE GH 13 - Locking failure likely to have a significant effect on the weight and/or balance of the aircraft	•				
UE GH 2	Aircraft begins takeoff with contaminated surfaces or engines	FE GH 21 - Absence of, incorrect, or inadequate de-icing/anti-icing treatment	•	•	•		
UE GH 3	Significant damage to the aircraft not detected before the aircraft begins taking off	FE GH 31 - Presence of FOD on the apron	•		•	•	•
		FE GH 32 - Collision or near-collision between an aircraft and a vehicle, machinery or equipment	•				
		FE GH 33 - Damage to aircraft relating to non-compliant parking/positionning	•				
		FE GH 34 - Damage to aircraft relating to towing/pushback operations	•				
		FE GH 35 - Damage in the hold resulting from the transport of luggage, mail or cargo	•				
		FE GH 36 - Damage to aircraft of unknown origin	•				
UE GH 4	On the ground, outbreak of fire on/near an aircraft	FE GH 41 - Spillage of a fluid generating a fire risk				•	•
		FE GH 42 - Non-compliance with fire safety rules inside the fueling safety perimeter				•	•
		FE GH 43 - Obstruction of access to fire-fighting equipment, obstruction of the clearance route of the fueling truck				•	•
UE GH 5	Outbreak of fire during flight	FE GH 51 - Transport of dangerous goods in a manner that does not comply with the rules in force, generating a fire risk	•		•		
		FE GH 52 - Failure to respect the maximum loading height in the hold	•		•		

GROUND HANDLING

NO.	UNDESIRABLE EVENTS (UE)	FOLLOWED EVENTS (FE)	FEARED CONSEQUENCES (FC)				
			LOC-I	RWY-EXC	Injuries / deaths of passengers and crews	Injuries / deaths of ground personnel	Other damage
UE GH 6	The aircraft begins takeoff with a non-compliant fuel load	FE GH 61 - Loading of incorrect quantities of fuel	•				
		FE GH 62 - Loading of an incorrect fuel type or contaminated fuel	•				
UE GH 7	Engines start-up or taxiing generating jet blast onto people or property	FE GH 71 - Engine, rotor or propeller suction/blast, which has or may have damaged the aircraft, or injured its occupants or any other person			•	•	•
UE GH 8	Emergency braking of the aircraft during pushback or taxiing	FE GH 81 - Interference with autonomous departure, pushback or taxiing of the aircraft by a vehicle, piece of equipment, or person			•	•	•
UE GH 9	Passengers, crew and/or ground staff are exposed to falls from heights*	FE GH 91 - Non-compliance with safety rules while using equipment/machinery at heights or during the opening of aircraft doors			•	•	

*Taking into account Organisational and Human Factors (OHF): see the dedicated page. *Depending on circumstances, certain events may be considered as occupational accidents, outside the perimeter of aviation safety.*

CONTINUING AIRWORTHINESS

CONTINUING AIRWORTHINESS			
CONTINUING AIRWORTHINESS ORGANISATIONS	**NO.**	**UNDESIRABLE EVENTS (UE)**	**FEARED CONSEQUENCES (FC)**
CONTINUING AIRWORTHINESS MANAGEMENT ORGANISATIONS	OGMN 1	Incorrect analysis or error in the recording of information defining the initial application (or subsequent application) of a critical maintenance task	Release or operation of an aircraft, engine or non-navigable equipment with an impact on safety
	OGMN 2	Failure in the monitoring of the parameters of an engine or piece of equipment with specific monitoring in the reliability program	
	OGMN 3	Subcontracting a complex continuing airworthiness management task to an unskilled subcontractor	
	OGMN 4	Failure in the planning, triggering, or recording of a work order for a critical maintenance task or an unapproved modification or repair	
	OGMN 5	Ordering, carrying out, and certifying of a critical maintenance task by an organisation that is not approved for the maintenance task in question	
	OGMN 6	Non-detection of a critical maintenance task that was not performed, or not performed in compliance with the applicable rules, or not monitored; Non-detection of an anomaly which has not been dealt with or improperly deferred	
	OGMN 7	Non-detection or non-notification of a particular event during operation which may warrant the launch of a particular inspection (hard landing, lightning strike, etc.), non-detection of a major anomaly within the context of a crew pre-flight check (structure damage, FOD, etc.)	
	OGMN 8	Major error not detected during documentary review or a physical inspection of an aircraft for the issuance of an Airworthiness review certificate	
MAINTENANCE ORGANISATION	OE 1	Supplementary critical task initiated by the maintenance organisation, without being ordered by the continuing airworthiness management organisation, that is not applicable to the aircraft, engine, or equipment	Release or operation of an aircraft, engine or non-navigable equipment with an impact on safety
	OE 2	Introduction of the same anomaly onto systems designed to be redundant via a repeated error on identical tasks	
	OE 3	Undetected NOGO type anomaly during an inspection task designed for this purpose	
	OE 4	Failure in protection during works or inspection at the end of works, with the forgetting of, damage to, or ingestion of a foreign element in a sensitive area of the aircraft, engine or equipment	
	OE 5	Subcontracting a critical task to an unqualified subcontractor, contracting a critical task to a maintenance organisation not authorised for the task	
	OE 6	Non-completion or incomplete carrying out of a maintenance task	
	OE 7	Failure to verify or incorrect verification of a critical task	
	OE 8	Return to service of an aircraft, engine or piece of equipment without the detection of the existence of a critical non-implemented or non-verified task	

Taking into account Organisational and Human Factors (OHF): see dedicated page.

Regulation EU 1321/2014, article 2, defines the concept of a “critical task”, whose details are specified in AMC2 145.A.48 (b), AMC1 M.A.402(h) and GM M.A.402(h) introduced by Decision ED 2016/011.
This non-exhaustive list may be supplemented, at the decision of each organisation, by other tasks classified as critical because of the nature of the acts performed (Non Destructive Testing, welding, torquing, surface treatments, interventions on life safety systems or in fuel tanks, etc.)
The tasks relating to certification (AD, CMR, ALI, etc.), such as those relating to the maintenance program (MRB route 5 & 8), or to limited-life parts, are also to be taken into account in this risk portfolio.

ORGANISATIONAL AND HUMAN FACTORS

Considering safety from a systemic point of view means that it is the product of the efficiency of the acts and interactions of all the actors, professions, and organisations (the aeronautical system) which contribute to it. These acts are structured by standardisation means, which specify, qualify and organise them, in order to make them effective.

However, the permanent and iterative optimisation of these provisions alone is not enough to ensure the highest performance in terms of safety. The actors themselves are divided between compliance with the normative provisions, and adaptation to particular circumstances, sometimes unforeseen, and thus outside of regulation.

Developed in the field of risk in recent years, Organisational and Human Factors contribute to the understanding and improvement of the organisation in place, so as to better coordinate the actions of all actors: from field experts, right up to the top of their hierarchy.

OHF models and knowledge question the involvement and interactions of all strata of the organisation in the analysis of field and managerial actions in risk management; they promote safety and efficiency of human activities.

The Organisational and Human Factors approach consists in identifying and implementing conditions that favour the positive contribution of operators, collectives and organisations to the safety of the aeronautical system.

In this context, the contribution of OHF models is not only to place the actors at all the levels of the organisation into perspective, but also to make coherent and converge a set of barriers and safety measures. Everyone has a role to play in terms of feedback, anticipation and adaptation to difficulties, as well as constant cooperation between professions. These complementary contributions are characteristic of effective systemic operations.

The actions of each actor and specialty can thus be taken into account within the group and favourably influence the organisation of management. It has already been demonstrated within the entities implementing OHFs, that the adaptability of actors at all levels, and the integration of their effective contribution to safety is a source of reliability in the actions undertaken.

The systemic approach, combined with OHF knowledge, also makes it possible to examine the interactions between the elements of the system, so as to avoid silo-type operations, and to ensure a better efficiency and safety at the interfaces: between departments, and between the various actors. It is therefore not a question of blaming, a priori, the actor(s) identified in connection with an event as the only cause of the noted dysfunction.

Ultimately, the application of the just culture, in line with OHF, enables the involvement of all the members of the organisation, with an improved notification about events at the different levels, in order to act in a voluntary and global manner, within the process of improvement and resilience in safety matters.

French Civil Aviation Authority
Civil Aviation Safety Directorate

50, rue Henry Farman 75720 Paris cedex 15

Tel: 01 58 09 43 21 - Fax : 01 58 09 43 38

www.ecologique-solidaire.gouv.fr

contact: rex@aviation-civile.gouv.fr