

An aerial photograph of a tropical coastline. In the foreground, the white wing and tail of an airplane are visible on the left side. Below the wing, a clear, turquoise coral reef extends into the ocean. The water transitions from shallow, light blue near the reef to deeper blue further out. In the background, there are green, hilly mountains under a bright blue sky with scattered white clouds. The overall scene is bright and scenic.

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Addendum A - Fatality Risk

Definition

In 2015, IATA added another measure of air carrier safety to its annual Safety Report: fatality risk. This measure seeks to answer the following question: what was the exposure of a passenger or crew member to a catastrophic accident, where all people on board perished?

The equation to calculate the fatality risk is $Q = V/N$, where:

- N is the number of flights or sectors conducted during the period
- V is the total number of "full-loss equivalents" among the N flights or sectors

The full-loss equivalent for a given flight is the proportion of passengers and crew who do not survive an accident. For example:

- If a flight lands safely, the full-loss equivalent is zero.
- If a flight results in an accident in which all passengers and crew are killed, the full-loss equivalent is one.
- If a flight results in an accident in which half of passengers and crew are killed, the full-loss equivalent is 0.5.

V is the sum of all full-loss equivalents calculated for all N flights. In other words, the fatality risk rate (Q) is the sum of the individual accident full-loss equivalents divided by the total number of flights.

Examples

The following tables illustrate two examples:

Case 1: There were a total of four accidents during the period:

Accident	% of People-Onboard Who Perished	Full-Loss Equivalent
#1	0%	0
#2	100%	1
#3	50%	0.5
#4	50%	0.5
Total Full-Loss Equivalent		2
Number of Sectors		3,000,000
Fatality Risk		0.00000067
Fatality Risk (normalized per 1 million sectors)		0.67

In Case 1, there were a total of four accidents out of three million sectors. Of these four accidents, one had no fatalities, one was a complete hull loss with all on board killed, and two in which half on board perished. In total, there were two full-loss equivalents out of three million sectors, which equates to 0.67 full-loss equivalents per million sectors. In other words, the exposure of all passengers and crew who flew on those sectors to a catastrophic accident was 1 in 1.5 million flights.



Case 2: There were a total of six accidents:

Accident	% of People-Onboard Who Perished	Full-Loss Equivalent
#1	0%	0
#2	10%	0.1
#3	20%	0.2
#4	50%	0.5
#5	30%	0.3
#6	40%	0.4
Total Full-Loss Equivalent		1.5
Number of Sectors		3,000,000
Fatality Risk		0.0000005
Fatality Risk (normalized per 1 million sectors)		0.50

In Case 2, there were a total of six accidents out of three million sectors. Of these six accidents, five experienced some fatalities, but there was no complete full loss. The total of the full-loss equivalents was 1.5. This equates to a fatality risk of

0.50 per million sectors. The exposure, in this case, was of one catastrophic accident per two million flights.

When comparing the above cases, the risk of perishing on a randomly selected flight is lower in Case 2 even though there were more accidents with fatalities. Case 1 had fewer fatal accidents, but they were more severe. Therefore, the odds of a passenger or crew losing their life on a given flight (fatality risk) is higher in Case 1 than in Case 2.

Considerations

It is important to note that the calculation of fatality risk does not consider the size of the airplane, how many people were on board, or the length of the flight. Rather, what is key is the percentage of people, from the total carried, who perished. It does not consider whether the accident was on a long-haul flight on a large aircraft where 25% of the passengers did not survive, or on a small commuter flight with the same ratio. The likelihood of perishing is the same.

Fatality risk, or full-loss equivalent, can easily be mistaken to represent the number of fatal accidents (or the fatal accident rate). Although fatality risk only exists once there is a fatal accident, they are not the same. While a fatal accident indicates an accident where at least one person perished, the full-loss equivalent indicates the proportion of people on board who perished.

Fatality risk provides a good baseline for comparison between accident categories. For example, Loss of Control — In-flight (LOC-I) is known to have a high fatality risk, but a low frequency of occurrence. Runway Excursion, on the other hand, has a low fatality risk, but a higher frequency of occurrence. It is possible, therefore, for the Runway Excursion category to have the same fatality risk as LOC-I if its frequency of occurrence is high enough so that the generally small full-loss equivalent for each individual accident produces the same total full-loss equivalent number as LOC-I (per million sectors).



Appendix 1 – Definitions

Abnormal Disembarkation: Passengers and/or crew exit the aircraft via boarding doors (normally assisted by internal aircraft or exterior stairs) after an aircraft incident or accident and when away from the boarding gates or aircraft stands (e.g., onto a runway or taxiway); only in a non-life-threatening and non-catastrophic event.

Accident:

IATA defines an accident as an event where ALL of the following criteria are satisfied:

- Intent of Flight: The aircraft was boarded by the flight crew and/or passengers with the intention of flight.
 - Type of Operation: A flight conducted for commercial operations¹ under the terms of an Air Operator's Certificate (AOC), intended for the transport of passengers or cargo. This includes, for example, military flights transporting civilians, repositioning flights and chartered humanitarian missions using commercial aircraft.
 - Excluded are: Executive jet operations, Military flights - carrying personnel or cargo for military purposes, Maintenance check flights, Test flights, Piston aircraft
 - Aircraft Criteria: The aircraft has a certificated Maximum Takeoff Weight (MTOW) of at least 5,700 kg (12,540 lb).
 - Damage Criteria: The aircraft sustained major structural damage affecting strength, performance, or flight characteristics, requiring significant repair or replacement exceeding USD 1 million or 10% of the aircraft's hull reserve value (whichever is lower), or the aircraft was declared a hull loss.
 - Fatal Injury: An event in which a person is fatally injured as a result of:
 - Being in the aircraft and the death occurred as a consequence of the accident, i.e. natural causes are excluded
 - Collision with the operating aircraft
 - Contact with any part of the aircraft (including detached parts)
 - Direct exposure to jet blast
- Ad-hoc: if the event is deemed relevant by the IATA Accident Classification Task Force (ACTF), such as certain training flight

Accident Classification: Process by which actions, omissions, events, conditions, or a combination thereof, that led to an accident are identified and categorized.

Aircraft: Involved aircraft, used interchangeably with airplane(s).

Cabin Safety-related Event: Accident involving cabin operational issues (e.g., passenger evacuation, onboard fire, decompression, ditching) that requires actions by the operating cabin crew.

Captain: Involved pilot responsible for the operation and safety of the aircraft during flight time.

¹ Commercial operation refers to an aircraft operation involving the transport of passengers or cargo for remuneration or hire. This definition includes both scheduled and non-scheduled services including charter flights, where remuneration or hire means payment is made for the carriage of people or cargo.



Commander: Involved pilot, in an augmented crew, responsible for the operation and safety of the aircraft during flight time.

Crew member: Anyone on board a flight who has duties connected with the sector of the flight during which the accident happened. It excludes positioning or relief crew, security staff, etc. (see definition of "Passenger" below).

Evacuation (Land): Passengers and/or crew evacuate the aircraft via escape slides/slide rafts, doors, emergency exits or gaps in the fuselage (usually initiated in life-threatening and/or catastrophic events).

Evacuation (Water): Passengers and/or crew evacuate the aircraft via escape slides/slide rafts, doors, emergency exits or gaps in the fuselage and into or onto water.

Fatal Accident: Accident where at least one passenger or crew member is killed or later dies of their injuries, resulting from an operational accident. Events such as slips, trips and falls, food poisoning, or injuries resulting from turbulence or involving onboard equipment, which may involve fatalities, but where the aircraft sustains minor or no damage, are excluded.

Fatality: Passenger or crew member who is killed or later dies of their injuries resulting from an operational accident. Injured persons who die more than 30 days after an accident are excluded.

Fatality Risk: Sum of full-loss equivalents per 1 million sectors, measuring the exposure of a passenger or crew member to a non-survivable accident. A full-loss equivalent is related to the percentage of people on board who perished. Refer to Addendum A for additional information.

Full-Loss Equivalent: Number representing the equivalent of a catastrophic accident where all people onboard died. For an individual accident, the full-loss equivalent is a value between 0 and 1, representing the ratio between the number of people who perished and the number of people on board the aircraft. In a broader context, the full-loss equivalent is the sum of each accident's full-loss equivalent value. Refer to Addendum A for additional information.

Hazard: Condition, object or activity with the potential of causing injuries to persons, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function.

Hull Loss: Accident in which the aircraft is destroyed or substantially damaged and is not subsequently repaired for whatever reason, including a financial decision of the owner.

Hull Loss/Nil Survivors: Accident resulting in a complete hull loss with no survivors (used as a Cabin End State).

IATA Accident Classification System: Refer to Appendix 2 of this document.

IATA Regions: IATA determines the accident region based on the operator's home country as specified in the operator's Air Operator Certificate (AOC). For example, if a Canadian-registered operator has an accident in Europe, this accident is counted as a 'North American' accident. For a complete list of countries assigned per region, consult the following table:



IATA REGIONS

Region	Country	Region	Country	
AFI	Angola		Senegal	
	Benin		Seychelles	
	Botswana		Sierra Leone	
	Burkina Faso		Somalia	
	Burundi		South Africa	
	Cameroon		South Sudan	
	Cape Verde		Tanzania, United Republic of	
	Central African Republic		Togo	
	Chad		Uganda	
	Comoros		Zambia	
	Congo		Zimbabwe	
	Congo, Democratic Republic of		ASPAC	Australia ¹
	Côte d'Ivoire		Bangladesh	Bhutan
	Djibouti	Brunei Darussalam	Cambodia	
	Equatorial Guinea	Fiji	India	
	Eritrea	Indonesia	Japan	
	Eswatini	Kiribati	Korea, Republic of	
	Ethiopia	Korea, Republic of	Lao People's Democratic Republic	
	Gabon	Malaysia	Maldives	
	Gambia	Maldives	Marshall Islands	
	Ghana	Marshall Islands	Micronesia, Federal States of	
	Guinea	Micronesia, Federal States of	Myanmar	
	Guinea-Bissau	Myanmar	Nauru	
	Kenya	Nauru	Nepal	
	Lesotho	Nepal	New Zealand ²	
	Liberia	New Zealand ²	Pakistan	
	Madagascar	Pakistan	Palau	
	Malawi	Palau	Papua New Guinea	
	Mali	Papua New Guinea	Philippines	
	Mauritania	Philippines	Samoa	
	Mauritius	Samoa	Singapore	
	Mozambique	Singapore		
Namibia				
Niger				
Nigeria				
Rwanda				
São Tomé and Príncipe				



Region	Country	Region	Country	
ASPAC	Solomon Islands	EUR	Hungary	
	Sri Lanka		Iceland	
	Thailand		Ireland	
	Timor-Leste		Israel	
	Tonga		Italy	
	Tuvalu		Kosovo	
	Vanuatu		Latvia	
	Vietnam		Liechtenstein	
CIS	Armenia		Lithuania	
	Azerbaijan		Luxembourg	
	Belarus		Malta	
	Georgia		Monaco	
	Kazakhstan		Montenegro	
	Kyrgyzstan		Netherlands ⁵	
	Moldova, Republic of		North Macedonia	
	Russian Federation		Norway	
	Tajikistan		Poland	
	Turkmenistan		Portugal	
	Ukraine		Romania	
	Uzbekistan		San Marino	
EUR	Åland Islands		Serbia	
	Albania		Slovakia	
	Andorra		Slovenia	
	Austria		Spain	
	Belgium		Svalbard and Jan Mayen	
	Bosnia and Herzegovina		Sweden	
	Bulgaria		Switzerland	
	Croatia		Türkiye	
	Cyprus		United Kingdom ⁶	
	Czechia		LATAM/CAR	Antigua and Barbuda
	Denmark ³			Argentina
	Estonia			Bahamas
	Finland	Barbados		
	France ⁴	Belize		
	Germany	Bolivia		
	Greece	Bonaire, Saba, St. Eustatius		
	Holy See	Brazil		



Region	Country
LATAM/CAR	Chile
	Colombia
	Costa Rica
	Cuba
	Dominica
	Dominican Republic
	Ecuador
	El Salvador
	Grenada
	Guatemala
	Guyana
	Haiti
	Honduras
	Jamaica
	Mexico
	Nicaragua
	Panama
	Paraguay
	Peru
	Saint Kitts and Nevis
	Saint Lucia
	Saint Vincent & the Grenadin
	Suriname
	Trinidad and Tobago
Uruguay	
Venezuela	
MENA	Afghanistan
	Algeria
	Bahrain
	Egypt
	Iran, Islamic Republic of
	Iraq
	Jordan
	Kuwait
	Lebanon
	Libya
	Morocco

Region	Country
	Oman
	Palestinian Territories
	Qatar
	Saudi Arabia
	Sudan
	Syrian Arab Republic
	Tunisia
	United Arab Emirates
	Yemen
NAM	Canada
	United States of America ⁷
NASIA	China (People's Republic of) ⁸
	Korea, Democratic People's Republic of
	Mongolia


¹Australia includes:

Christmas Island
 Cocos (Keeling) Islands
 Norfolk Island
 Ashmore and Cartier Islands
 Coral Sea Islands
 Heard Island and McDonald Islands

²New Zealand includes:

Cook Islands
 Niue
 Tokelau

³Denmark includes:

Faroe Islands
 Greenland

⁴France includes:

French Guiana
 French Polynesia
 French Southern Territories
 Guadeloupe
 Martinique
 Mayotte
 New Caledonia
 Saint-Barthélemy
 Saint Martin (French part)
 Saint Pierre and Miquelon
 Reunion
 Wallis and Futuna

⁵Netherlands include:

Aruba
 Curacao
 Netherlands Antilles
 Sint Maarten

⁶United Kingdom includes:

Akrotiri and Dhekelia
 Anguilla
 Bermuda
 British Indian Ocean Territory
 British Virgin Islands
 Cayman Islands
 Falkland Islands (Malvinas)
 Gibraltar
 Montserrat
 Pitcairn
 Saint Helena, Ascension and Tristan da Cunha
 South Georgia and the South Sandwich Islands
 Turks and Caicos Islands
 British Antarctic Territory
 Guernsey
 Isle of Man
 Jersey

⁷United States of America include:

American Samoa
 Guam
 Northern Mariana Islands
 Puerto Rico
 Virgin Islands, U.S.
 United States Minor Outlying Islands

⁸China includes:

Chinese Taipei
 Hong Kong (SAR), China
 Macao (SAR), China



Incident: Occurrence, other than an accident, associated with the operation of an aircraft that affects or could affect the safety of operation.

In-flight Security Personnel: Individual who is trained, authorized and armed by the state and is carried on board an aircraft and whose intention is to prevent acts of unlawful interference.

Investigation: Process conducted for accident prevention, which includes the gathering and analysis of information, the drawing of conclusions (including the determination of causes) and, when appropriate, the making of safety recommendations.

Investigator in Charge: Person charged, based on their qualifications, with the responsibility for the organization, conduct and control of an investigation.

Involved: Directly concerned, or designated to be concerned, with an accident or incident.

Level of Safety: How far safety is to be pursued in a given context, assessed with reference to an acceptable risk, based on the current values of society.

Major Repair: A repair that, if improperly done, might appreciably affect the mass, balance, structural strength, performance, power plant operation, flight characteristics, or other qualities affecting the airworthiness of an aircraft.

Non-operational Accident: Includes accidents resulting from acts of deliberate violence (e.g., sabotage, war) and accidents that occur during crew training, demonstrations and test flights. Violence is believed to be a matter of security rather than flight safety. Crew training, demonstrations and test flights are considered to involve special risks inherent with these types of operations. Also included in this category are:

- Non-airline-operated aircraft (e.g., military or government-operated, survey, aerial work or parachuting flights).
- Accidents where there was no intention of flight.

Normal Disembarkation: Passengers and/or crew exit the aircraft via boarding doors during normal operations.

Occurrence: Any unusual or abnormal event involving an aircraft, including, but not limited to, an incident.

Operational Accident: Accident that is believed to represent the risks of normal commercial operation; generally, an accident that occurs during normal revenue operations or a positioning flight.

Operator: Person, organization or enterprise engaged in, or offering to engage in, aircraft operations.

Passenger: Anyone on board a flight who, as far as may be determined, is not a crew member. Apart from normal revenue passengers, this includes off-duty staff members, positioning and relief flight crew members, etc., who have no duties connected with the sector of the flight during which the accident happened. Security personnel are included as passengers as their duties are not concerned with the operation of the flight.

Person: Any involved individual, including airport and Air Traffic Service (ATS) personnel.

Phase of Flight: The phase of flight definitions developed and applied by IATA are presented in the table on the following page.

Rapid Deplaning: Passengers and/or crew rapidly exit the aircraft via boarding doors and a jet bridge or stairs, as a precautionary measure.



Risk: Assessment, expressed in terms of predicted probability and severity, of the consequence(s) of a hazard, taking as reference the worst foreseeable situation.

Safety: State in which the risk of harm to persons or property is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.

Sector: Operation of an aircraft between one takeoff and one landing.

Serious Injury: Injury sustained by a person in an accident and which meets one of the following:

- Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received.
- Results in a fracture of any bone (except simple fractures of fingers, toes or nose).
- Involves lacerations that cause severe hemorrhage or nerve, muscle or tendon damage.
- Involves injury to any internal organ.
- Involves second or third-degree burns, or any burns affecting more than 5% of the surface of the body.
- Involves verified exposure to infectious substances or injurious radiation.

Serious Incident: Incident involving circumstances indicating that an accident nearly occurred. Note: the difference between an accident and a serious incident lies only in the result.

Substantial Damage: Damage or structural failure, which adversely affects the structural strength, performance or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component.

Notes:

- Bent fairing or cowling, dented skin, small punctured holes in the skin or fabric, minor damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wing tips are not considered "substantial damage" for the purpose of this Safety Report.
- The ICAO Annex 13 definition is unrelated to cost and includes many incidents in which the financial consequences are minimal.

Unstable Approach: Approach where the IATA ACTG has knowledge about vertical, lateral or speed deviations in the portion of the flight close to landing. Note: this definition includes the portion immediately prior to touchdown and in this respect the definition might differ from other organizations. However, accident analysis gives evidence that a destabilization just prior to touchdown has contributed to accidents in the past.



PHASE OF FLIGHT DEFINITIONS

Flight Planning (FLP) This phase begins when the flight crew initiates the use of flight planning information facilities and becomes dedicated to a flight based upon a route and airplane; it ends when the crew arrives at the aircraft for the planned flight or the crew initiates a 'Flight Close' phase.

Preflight (PRF) This phase begins with the arrival of the flight crew at an aircraft for the flight; it ends when a decision is made to depart the parking position and/or start the engine(s). It may also end by the crew initiating a 'Post-flight' phase. Note: the PRF phase assumes the aircraft is sitting at the point at which the aircraft will be loaded or boarded, with the primary engine(s) not operating. If boarding occurs during this phase, it is done without any engine(s) operating. Boarding with any engine(s) operating is covered under 'Engine Start/Depart'.

Engine Start/Depart (ESD) This phase begins when the flight crew take action to have the aircraft moved from the parked position and/or take switch action to energize the engine(s); it ends when the aircraft begins to move under its own power or the crew initiates an 'Arrival/Engine Shutdown' phase. Note: the ESD phase includes the aircraft engine(s) start-up whether assisted or not and whether the aircraft is stationary with more than one engine shutdown prior to 'Taxi-out' (i.e., boarding of persons or baggage with engines running); it includes all actions of power back to position the aircraft for Taxi-out.

Taxi-out (TXO) This phase begins when the crew moves the aircraft forward under its own power; it ends when thrust is increased for 'Takeoff' or the crew initiates a 'Taxi-in' phase. Note: this phase includes taxi from the point of moving under the aircraft's own power, up to and including entering the runway and reaching the Takeoff position.

Takeoff (TOF) This phase begins when the crew increases the thrust for lift-off; it ends when an 'Initial Climb' is established or the crew initiates a 'Rejected Takeoff' phase.

Rejected Takeoff (RTO) This phase begins when the crew reduces thrust to stop the aircraft before the end of the Takeoff phase; it ends when the aircraft is taxied off the runway for a 'Taxi-in' phase or when the aircraft is stopped and engines shutdown.

Initial Climb (ICL) This phase begins at 35 feet above the runway elevation; it ends after the speed and configuration are established at a defined maneuvering altitude or to continue the climb for cruising. It may also end by the crew initiating an 'Approach' phase. Note: maneuvering altitude is that needed to safely maneuver the aircraft after an engine failure occurs, or predefined as an obstacle clearance altitude. ICL includes such procedures applied to meet the requirements of noise abatement climb or best angle/rate of climb.

En Route Climb (ECL) This phase begins when the crew establishes the aircraft at a defined speed and configuration, enabling the aircraft to increase altitude for cruising; it ends with the aircraft establishing a predetermined constant initial cruise altitude at a defined speed or by the crew initiating a 'Descent' phase.

Cruise (CRZ) This phase begins when the crew establishes the aircraft at a defined speed and predetermined constant initial cruise altitude and proceeds in the direction of a destination; it ends with the beginning of the 'Descent' phase for an approach or by the crew initiating an ECL phase.

Descent (DST) This phase begins when the crew departs the cruise altitude for an approach at a destination; it ends when the crew initiates changes in aircraft configuration and/or speeds to facilitate a landing on a specific runway. It may also end by the crew initiating an ECL or CRZ phase.

Approach (APR) This phase begins when the crew initiates changes in aircraft configuration and/or speeds enabling the aircraft to maneuver to land on a specific runway; it ends when the aircraft is in the landing



configuration and the crew is dedicated to land on a specific runway. It may also end by the crew initiating a 'Go-around' phase.

Go-around (GOA) This phase begins when the crew aborts the descent to the planned landing runway during the APR phase; it ends after speed and configuration are established at a defined maneuvering altitude or to continue the climb for the purpose of cruise (same as the end of ICL).

Landing (LND) This phase begins when the aircraft is in the landing configuration and the crew is dedicated to touch down on a specific runway; it ends when the speed permits the aircraft to be maneuvered by means of taxiing for arrival at a parking area. It may also end by the crew initiating a GOA phase.

Taxi-in (TXI) This phase begins when the crew begins to maneuver the aircraft under its own power to an arrival area for parking; it ends when the aircraft ceases moving under its own power with a commitment to shut down the engine(s). It may also end by the crew initiating a TXO phase.

Arrival/Engine Shutdown (AES) This phase begins when the crew ceases to move the aircraft under its own power and a commitment is made to shut down the engine(s); it ends with a decision to shut down ancillary systems to secure the aircraft. It may also end by the crew initiating an ESD phase. Note: the AES phase includes actions required during a time when the aircraft is stationary with one or more engines operating while ground servicing may be taking place (i.e., deplaning persons or baggage with engine(s) running and/or refueling with engine(s) running).

Post-flight (PSF) This phase begins when the crew commences the shutdown of ancillary systems of the aircraft to leave the flight deck; it ends when the flight and cabin crew leave the aircraft. It may also end by the crew initiating a PRF phase.

Flight Close (FLC) This phase begins when the crew initiates a message to the flight-following authorities that the aircraft is secure and the crew is finished with the duties of the past flight; it ends when the crew has completed these duties or begins to plan for another flight by initiating a FLP phase.

Ground Servicing (GDS) This phase begins when the aircraft is stopped and available to be safely approached by ground personnel for the purpose of securing the aircraft and performing the duties applicable to the arrival of the aircraft (i.e., aircraft maintenance); it ends with completion of the duties applicable to the departure of the aircraft or when the aircraft is no longer safe to approach for the purpose of ground servicing (e.g., prior to crew initiating the TXO phase). Note: the GDS phase was identified by the need for information that may not directly require the input of flight or cabin crew. It is acknowledged as an entity to allow placement of the tasks required of personnel assigned to service the aircraft.



Appendix 2 - Accident Classification Taxonomy

1. LATENT CONDITIONS

Definition: Conditions present in the system before the accident and triggered by various possible factors.

Latent Conditions (deficiencies in..)	Examples
Design	<ul style="list-style-type: none"> Design shortcomings Manufacturing defects
	<ul style="list-style-type: none"> From the Cockpit
	<ul style="list-style-type: none"> From the Systems
	<ul style="list-style-type: none"> From the Structures
	<ul style="list-style-type: none"> From the Flight Quality
	<ul style="list-style-type: none"> From the Documentation (all documentation including but not limited to technical, procedural and training)
	<ul style="list-style-type: none"> Design not involving the manufacturer
Regulatory Oversight	<ul style="list-style-type: none"> Deficient regulatory oversight by the state or lack thereof
Management Decisions	<ul style="list-style-type: none"> Cost-cutting Stringent fuel policy Outsourcing and other decisions, which can impact operational safety
	<ul style="list-style-type: none"> From the Regulator
	<ul style="list-style-type: none"> From the Operator
	<ul style="list-style-type: none"> From the Service Provider level including ATC, ANSPs, De-icing, etc...
	<ul style="list-style-type: none"> From the Manufacturer
Safety Management	<ul style="list-style-type: none"> Absent or deficient: <ul style="list-style-type: none"> Safety policy and objectives Safety risk management (including hazard identification process) Safety assurance (including Quality Management) Safety promotion
	<ul style="list-style-type: none"> From the Regulator
	<ul style="list-style-type: none"> From the Operator
	<ul style="list-style-type: none"> From the Service Provider level including ATC, ANSPs, De-icing, etc...
	<ul style="list-style-type: none"> From the Manufacturer



1. LATENT CONDITIONS (CONT'D)

Latent Conditions (deficiencies in...)	Examples
Change Management	<ul style="list-style-type: none"> ▪ Deficiencies in monitoring change; in addressing operational needs created by, for example, expansion or downsizing ▪ Deficiencies in the evaluation to integrate and/or monitor changes to establish organizational practices or procedures ▪ Consequences of mergers or acquisitions
	<ul style="list-style-type: none"> ▪ From the Regulator
	<ul style="list-style-type: none"> ▪ From the Operator
	<ul style="list-style-type: none"> ▪ From the Service Provider level including ATC, ANSPs, De-icing, etc...
	<ul style="list-style-type: none"> ▪ From the Manufacturer
Selection Systems	<ul style="list-style-type: none"> ▪ Deficient or absent selection standards
	<ul style="list-style-type: none"> ▪ Flight Crew Selection
	<ul style="list-style-type: none"> ▪ Cabin Crew Selection
	<ul style="list-style-type: none"> ▪ Ground Staff Recruitment
Operations Planning and Scheduling	<ul style="list-style-type: none"> ▪ Deficiencies in crew rostering and staffing practices ▪ Issues with flight and duty time limitations ▪ Health and welfare issues
Technology and Equipment	<p>See the following breakdown</p>
	<ul style="list-style-type: none"> ▪ Technology & Equipment (available safety equip not installed) on the aircraft
	<ul style="list-style-type: none"> ▪ Technology & Equipment (available safety equip not installed) – Air Navigation Service Providers
	<ul style="list-style-type: none"> ▪ Technology & Equipment (available safety equip not installed) – to airport facilities
Flight Operations	<p>See the following breakdown</p>
	<p>Deficient or absent:</p> <ul style="list-style-type: none"> ▪ Standard operating procedures (SOPs) ▪ Operational instructions and/or policies ▪ Company regulations ▪ Controls to assess compliance with regulations and SOPs
	<ul style="list-style-type: none"> ▪ Omitted training, language skills deficiencies, qualifications and experience of flight crews, operational needs leading to training reductions, deficiencies in assessment of training or training resources such as manuals or CBT devices



1. LATENT CONDITIONS (CONT'D)

Latent Conditions (deficiencies in..)	Examples
Cabin Operations	<p data-bbox="405 517 775 546">See the following breakdown</p> <p data-bbox="405 557 632 586">Deficient or absent:</p> <ul data-bbox="443 591 1190 723" style="list-style-type: none"> <li data-bbox="443 591 555 620">▪ SOPs <li data-bbox="443 624 970 654">▪ Operational instructions and/or policies <li data-bbox="443 658 751 687">▪ Company regulations <li data-bbox="443 692 1190 723">▪ Controls to assess compliance with regulations and SOPs <p data-bbox="443 748 1433 844">▪ Omitted training, language skills deficiencies, qualifications and experience of cabin crews, operational needs leading to training reductions, deficiencies in assessment of training or training resources such as manuals or CBT devices</p>
Ground Operations	<p data-bbox="405 887 759 916">See the following breakdown</p> <p data-bbox="405 960 632 990">Deficient or absent:</p> <ul data-bbox="443 994 1190 1126" style="list-style-type: none"> <li data-bbox="443 994 555 1023">▪ SOPs <li data-bbox="443 1028 970 1057">▪ Operational instructions and/or policies <li data-bbox="443 1061 751 1090">▪ Company regulations <li data-bbox="443 1095 1190 1126">▪ Controls to assess compliance with regulations and SOPs <p data-bbox="443 1180 1433 1276">▪ Omitted training, language skills deficiencies, qualifications and experience of cabin crews, operational needs leading to training reductions, deficiencies in assessment of training or training resources such as manuals or CBT devices</p>
Maintenance Operations	<p data-bbox="405 1301 759 1330">See the following breakdown</p> <p data-bbox="405 1375 632 1404">Deficient or absent:</p> <ul data-bbox="443 1408 1453 1601" style="list-style-type: none"> <li data-bbox="443 1408 555 1438">▪ SOPs <li data-bbox="443 1442 970 1471">▪ Operational instructions and/or policies <li data-bbox="443 1476 751 1505">▪ Company regulations <li data-bbox="443 1509 1190 1538">▪ Controls to assess compliance with regulations and SOPs <li data-bbox="443 1543 1453 1601">▪ Includes deficiencies in technical documentation, unrecorded maintenance and the use of bogus parts/unapproved modifications <p data-bbox="443 1610 1449 1738">▪ Omitted training, language skills deficiencies, qualifications and experience of maintenance crews, operational needs leading to training reductions, deficiencies in assessment of training or training resources such as manuals or CBT devices</p>
Dispatch	<p data-bbox="405 1749 759 1778">See the following breakdown</p> <p data-bbox="405 1823 632 1852">Deficient or absent:</p> <ul data-bbox="443 1856 1190 1989" style="list-style-type: none"> <li data-bbox="443 1856 555 1886">▪ SOPs <li data-bbox="443 1890 970 1919">▪ Operational instructions and/or policies <li data-bbox="443 1924 751 1953">▪ Company regulations <li data-bbox="443 1957 1190 1989">▪ Controls to assess compliance with regulations and SOPs <p data-bbox="443 1998 1433 2080">▪ Omitted training, language skills deficiencies, qualifications and experience of flight crews, operational needs leading to training reductions, deficiencies in assessment of training or training resources such as manuals or CBT devices</p>



1. LATENT CONDITIONS (CONT'D)

Latent Conditions (deficiencies in..)	Examples
Flight Watch	<ul style="list-style-type: none"> ▪ Flight Watch/ Flight Following
Latent Conditions - Other	<ul style="list-style-type: none"> ▪ Not clearly falling within the other latent conditions

Note: All areas such as Training, Ground Operations or Maintenance include outsourced functions for which the operator has oversight responsibility.



2. THREATS

Definition: An event or error that occurs outside the influence of the flight crew, but which requires crew attention and management if safety margins are to be maintained.

Mismanaged threat: A threat that is linked to or induces a flight crew error.

Environmental Threats	Examples
Meteorology	See the following breakdown
	<ul style="list-style-type: none"> Thunderstorms/Convention
	<ul style="list-style-type: none"> low visibility/Instrument Meteorological Conditions (IMC)
	<ul style="list-style-type: none"> Wind/wind shear/turbulence
	<ul style="list-style-type: none"> Icing conditions
	<ul style="list-style-type: none"> Hail
	<ul style="list-style-type: none"> Cold Weather
	<ul style="list-style-type: none"> Hot weather/Extreme heat / Density altitude
Lack of visual reference	<ul style="list-style-type: none"> Darkness/black hole effect
	<ul style="list-style-type: none"> Environmental situation, which can lead to spatial disorientation
Air Traffic Services	<ul style="list-style-type: none"> Tough-to-meet clearances/restrictions Reroutes Language difficulties Controller errors Failure to provide separation (air/ground)
Navigational Aids	See the following breakdown
	<ul style="list-style-type: none"> Lack or unavailable (flight crew are aware of it)
	<ul style="list-style-type: none"> Malfunction, or uncalibrated (Nav aids are not working properly and flight crew are not aware of it)
Loss of separation	<ul style="list-style-type: none"> Loss of separation between airborne aircraft occurs whenever specified separation minima in controlled airspace are breached. Source Skybrary
Communication	See the following breakdown
	<ul style="list-style-type: none"> Use of non-standard phraseology or Language difficulties/competency
Aircraft Impact by Birds/Wildlife/Foreign Objects	See the following breakdown
	<ul style="list-style-type: none"> Birds
	<ul style="list-style-type: none"> Foreign objects, FOD



2. THREATS (CONT'D)

Environmental Threats	Examples
Airport Facility	See the following breakdown
	Poor signage/lighting, faint markings, rwy/txy closures
	Contaminated runways, taxiways, poor braking action
	Trenches/ditches, intruding structures
	Airport perimeter control/fencing / Wildlife control
	Foreign Object (FOD) Runway
	Inadequate Runway End Safety Areas (RESA)
	Geographically Challenged Airports (high/hot, continued cross winds, procedures, mountainous)
Terrain/Obstacles	Self-explanatory
Traffic	See the following breakdown
	Aircraft striking other aircraft (anywhere except on the runway)
	Ground vehicles hitting aircraft (anywhere except on the runway)
Runway Surface Incursion	See the following breakdown
	▪ Aircraft
	▪ Vehicle
	▪ Wildlife
	▪ People
▪ Other – Drones, Balloons, Bins, etc...	
Environmental threats - Other	Not clearly falling within the other environmental threats
Airline Threats	Examples
Aircraft Malfunction / System/Component Failure -Non-Powerplant (SCF-NP)	See the following breakdown
	▪ Landing gear/ tires
	▪ Brakes
Flight Controls	See the following breakdown
	▪ Primary flight controls
	▪ Secondary flight controls
Structural Failure	<ul style="list-style-type: none"> ▪ Failure due to flutter, overload ▪ Corrosion/fatigue ▪ Engine separation
Avionics, Flight Instruments	<ul style="list-style-type: none"> ▪ All avionics except autopilot and the Flight Management System (FMS) ▪ Instrumentation, including standby instruments ▪ ACAS/TCAS Failure, Transponder Failure, ADS-B, GPS ▪ Lack or unavailable of such instruments



2. THREATS (CONT'D)

Airline Threats	Examples
Autopilot/FMS	<ul style="list-style-type: none"> Self-explanatory
Hydraulic System Failure	<ul style="list-style-type: none"> Self-explanatory
Electrical Power Generation Failure	<ul style="list-style-type: none"> Loss of all electrical power, including battery power leading to limitations in/or total loss of aircraft control
Aircraft Malfunction - Other	<ul style="list-style-type: none"> Not clearly falling within the other aircraft malfunction threats
MEL / CDL Items	<ul style="list-style-type: none"> Minimum Equipment List (MEL) / Configuration Deviation List (CDL) items with operational implications
Operational Pressure	<ul style="list-style-type: none"> Operational time pressure Missed approach/diversion Other non-normal operations
Cabin Events	<ul style="list-style-type: none"> Cabin events (e.g., unruly passenger) Cabin crew errors Distractions/interruptions
Ground Events	<ul style="list-style-type: none"> Aircraft loading events Fueling errors Agent interruptions Improper ground support Improper deicing/anti-icing
Dispatch/Paperwork	<ul style="list-style-type: none"> Dispatch/paperwork issues, including but not limited to load sheet errors Crew scheduling events Late paperwork changes or errors
Maintenance Events	<ul style="list-style-type: none"> Aircraft repairs on ground Maintenance log problems Maintenance errors
Dangerous Goods	<ul style="list-style-type: none"> Carriage of articles or substances capable of posing a significant risk to health, safety or property when transported by air
Manuals / Charts / Checklists	<ul style="list-style-type: none"> Incorrect/unclear chart pages or operating manuals Checklist layout/design issues
Aircraft Malfunction Engine Failure/ SCF-PP	<p>See the following breakdown</p> <ul style="list-style-type: none"> Uncontained engine failure
Aircraft Fire / Smoke (cockpit / Cabin / Cargo)	<ul style="list-style-type: none"> Fire due to aircraft systems or Other fire causes.
	<ul style="list-style-type: none"> Cockpit and E&E (electronics equipment)
	<ul style="list-style-type: none"> Cargo
	<ul style="list-style-type: none"> Passenger Cabin and Crew Rest
	<ul style="list-style-type: none"> Engine and APUs
	<ul style="list-style-type: none"> Landing gear
	<ul style="list-style-type: none"> External service vehicles and/or equipment
	<ul style="list-style-type: none"> PEDs carried by passenger and/or crew (including checked bags in the cargo or cabin)



2. THREATS (CONT'D)

Airline Threats	Examples
Electronic Flight Bags	<ul style="list-style-type: none"> The flight crew applies the correct input, but the system does not perform as required, example software bugs.
Incorrect performance calculation from service providers	<ul style="list-style-type: none"> Self-explanatory
Airline Threats - Other	<ul style="list-style-type: none"> Not clearly falling within the other airline threats

Psychological/ Physiological Threats	Examples
Illness	<ul style="list-style-type: none"> Self-explanatory
Medications	<ul style="list-style-type: none"> Self-explanatory
Stress	<ul style="list-style-type: none"> Stress is what happens to our bodies when situational demands exceed our perceived ability to cope. Effects: mood swings, impatience, frustration, indecision, loss of concentration, anger. Social: Bossiness, abrasiveness, curt speech.
Fatigue	<ul style="list-style-type: none"> Fatigue is a state that results from an imbalance between the physical and mental exertion of all waking activities, and recovery from that exertion, which requires sleep. Effects: altered decision-making, reduced attention and vigilance, reduced communication skills, loss of attention to detail, Increased tendency for risk-taking, greater number of judgment errors.
Fatigue	<ul style="list-style-type: none"> Crewmember unable to perform duties due to fatigue.
Diet	<ul style="list-style-type: none"> Potential negative impacts of poor diet: poor concentration, restless mind, impact on decision making (particularly if dehydrated). Social Irritability and low mood, risk of depression, reduced ability to deal with stress, risk of anxiety and depression.
Optical illusion/visual misperception	<ul style="list-style-type: none"> Something that deceives the eye by appearing to be other than it is. Typically used for black hole approaches, which cause this illusion
Spatial disorientation & spatial/ somatogravic illusion	<ul style="list-style-type: none"> The somatogravic illusion is a vestibular illusion which is prevalent during high accelerations/decelerations when a pilot has no clear visual reference.
Crew Incapacitation	<ul style="list-style-type: none"> Crewmember unable to perform duties due to physical or psychological impairment. Includes intoxicated crews
	<ul style="list-style-type: none"> Psychological/physiological Condition - Others



3. FLIGHT CREW ERRORS

Definition: An observed flight crew deviation from organizational expectations or crew intentions.

Mismanaged error: An error that is linked to or induces additional error or an undesired aircraft state.

Aircraft Handling Errors	Examples
Manual Handling/ Primary Flight Controls	<ul style="list-style-type: none"> Hand flying vertical, lateral, or speed deviations Approach deviations by choice (e.g., flying below the glide slope) Missed runway/taxiway, failure to hold short, taxi above speed limit Incorrect flaps, speed brake, autobrake, thrust reverser or power settings
Incorrect Automation Settings and/or Selections	<ul style="list-style-type: none"> Incorrect altitude, speed, heading, auto throttle settings, mode executed, or entries. Controls the aircraft flight path through automation, including appropriate use of flight management system(s) and guidance.
Systems / Radios / Instruments	<ul style="list-style-type: none"> Including but not limited to Incorrect packs, altimeter, fuel switch settings, or radio frequency dialed Wrong Altimeter Reference Settings (QNH, QFE)
Aircraft Handling Errors - Other	<ul style="list-style-type: none"> Not clearly falling within the other errors
Crew Response / Situational Awareness	<ul style="list-style-type: none"> This includes Perception, Comprehension, and Projection Errors
No/wrong/Late Visual Detection/ Visual/Aural/ Kinaesthetic Signal	<ul style="list-style-type: none"> The operator's flight crew does not detect (or detects too late or inaccurately) a visual or aural or kinaesthetic signals (e.g., stick shaker or pusher) necessary to formulate a proper action plan or make a correct decision.
Failure to Comprehend	<ul style="list-style-type: none"> Inadequate Comprehension Lack of Comprehension. Loss of alertness, vigilance and/or understanding
Failure to Respond	<ul style="list-style-type: none"> Inadequate Response to Warnings and/or Alerts Lack of Response or Acknowledgment to Warnings and/or Alerts
Procedural Errors	Examples
Standard Operating Procedures Adherence	<p>See the following breakdown</p> <ul style="list-style-type: none"> Intentional Unintentional Unknown
Checklist	<p>See the following breakdown</p> <ul style="list-style-type: none"> Normal Checklist (errors) Abnormal Checklist (error)
Callouts	<ul style="list-style-type: none"> Omitted departure, takeoff, approach, or handover briefing; items missed. Briefing does not address expected situation
Briefings	<ul style="list-style-type: none"> Checklist performed from memory or omitted Wrong challenge and response Checklist performed late or at wrong time Checklist items missed



3. FLIGHT CREW ERRORS (CONTD)

Procedural Errors	Examples
Documentations	<ul style="list-style-type: none"> Incorrect weight and balance information/ fuel information
	<ul style="list-style-type: none"> Incorrect Automatic Terminal Information Service (ATIS) / clearance
	<ul style="list-style-type: none"> Misinterpreted items on paperwork
	<ul style="list-style-type: none"> Incorrect or missing log book entries
No Go Around	<ul style="list-style-type: none"> No go around after destabilization on approach No go around after a bounced landing No Go-Around after instructed by ATC No Go-Around- Other
Crew Response	See the following breakdown
	<ul style="list-style-type: none"> Lack of response or acknowledgment to warnings and/or alerts
	<ul style="list-style-type: none"> Inadequate response to warnings and/or alerts
Electronic Flight Bag	<ul style="list-style-type: none"> The system is working correctly, but flight crew misapplies EFB provided information or incorrect inputs.
Incorrect performance calculation from flight crew	Self-explanatory
Procedural Errors - Others	Self-explanatory
Crew to External communication	See the following breakdown
	<ul style="list-style-type: none"> With Air Traffic Control
	<ul style="list-style-type: none"> With Cabin Crew
	<ul style="list-style-type: none"> With Ground Crew
	<ul style="list-style-type: none"> With Dispatch
	<ul style="list-style-type: none"> With Maintenance
Pilot to Pilot	See the following breakdown
	Pilot to Pilot from the same aircraft
	Pilot to Pilot from the other aircraft



4. UNDESIRED AIRCRAFT STATES (UAS)

Definition: A flight-crew-induced aircraft state that clearly reduces safety margins; a safety-compromising situation that results from ineffective error management. A UAS is **recoverable**.

Mismanaged UAS: A UAS that is linked to or induces additional flight crew errors.

Undesired Aircraft States	Breakdown
Aircraft Handlining	▪ Abrupt aircraft control
	▪ Vertical, lateral or speed deviations
	▪ Operation outside aircraft limitations
	▪ Unstable Approach
	▪ Continued landing after unstable approach
	▪ Abnormal Runway Contact that includes <ul style="list-style-type: none"> – Long/Fast Landing – Bounced Landing – Canted Landing – Off-Centre Landing (one-third of landing runway width) – Hard Landing
	▪ Rejected takeoff after V1
	▪ Controlled flight toward terrain
	▪ Aircraft Upset (Roll, Spin, Stall, etc...)
	▪ Go-around after thrust reverser activation
	▪ Aircraft Handling - Other
	Ground Navigation
▪ Wrong taxiway, ramp, gate or hold spot	
▪ Runway/Taxiway incursion	
▪ Ramp movements, including when under marshalling	
▪ Loss of aircraft control while on the ground	
▪ Taxiway Excursion	
▪ Ground Navigation - Other	
Air Navigation	▪ Landing on the Wrong Runway at the Correct Airport
	▪ Attempt to Land/Take-off on/from Taxiways
	▪ Unnecessary Weather Penetration
	▪ Unauthorized Airspace Penetration
	▪ Air Navigation – Other



4. UNDESIRED AIRCRAFT STATES (UAS) (CONT'D)

Undesired Aircraft States	Breakdown
Incorrect Aircraft Configuration	▪ Auto Brakes, Ground Spoilers
	▪ Systems (fuel, electrical, hydraulics, pneumatics, air conditioning, pressurization/instrumentation)
	▪ Landing Gear
	▪ Flight Controls/Automation
	▪ Engine
	▪ Weight and Balance
	▪ Aircraft Configuration – Other



5. FLIGHT CREW COUNTERMEASURES

Here thought is given to what could have avoided the accident. The last part of the classification process, therefore, is to apply a coding to flight crew countermeasures. As the name implies, the taxonomy is “flight crew centred. The following list includes countermeasures that the flight crew could have taken to prevent the accident. Countermeasures from other areas, such as ATC, ground operations personnel, maintenance staff are not considered at this time.

Countermeasure	Definition	Example Performance
Application of Knowledge	Demonstrates knowledge and understanding of relevant information, operating instructions, aircraft systems and the operating environment	<ul style="list-style-type: none"> ▪ OB 0.1 Demonstrates practical and applicable knowledge of limitations and systems and their interaction ▪ OB 0.2 Demonstrates required knowledge of published operating instructions ▪ OB 0.3 Demonstrates knowledge of the physical environment, the air traffic environment including routings, weather, airports and the operational infrastructure ▪ OB 0.4 Demonstrates appropriate knowledge of applicable legislation ▪ OB 0.5 Knows where to source required information ▪ OB 0.6 Demonstrates a positive interest in acquiring knowledge ▪ OB 0.7 Is able to apply knowledge effectively
Application of Procedures and Compliance with Regulations	Identifies and applies appropriate procedures in accordance with published operating instructions and applicable regulations	<ul style="list-style-type: none"> ▪ OB 1.1 Identifies where to find procedures and regulations ▪ OB 1.2 Applies relevant operating instructions, procedures and techniques in a timely manner ▪ OB 1.3 Follows SOPs unless a higher degree of safety dictates an appropriate deviation ▪ OB 1.4 Operates aeroplane systems and associated equipment correctly ▪ OB 1.5 Monitors aircraft systems status ▪ OB 1.6 Complies with applicable regulations. ▪ OB 1.7 Applies relevant procedural knowledge



5. FLIGHT CREW COUNTERMEASURES (CONTD)

Countermeasure	Definition	Example Performance
Communication	Communicates through appropriate means in the operational environment, in both normal and non normal situations	<ul style="list-style-type: none"> ▪ OB 2.1 Determines that the recipient is ready and able to receive information ▪ OB 2.2 Selects appropriately what, when, how and with whom to communicate ▪ OB 2.3 Conveys messages clearly, accurately and concisely ▪ OB 2.4 Confirms that the recipient demonstrates understanding of important information ▪ OB 2.5 Listens actively and demonstrates understanding when receiving information ▪ OB 2.6 Asks relevant and effective questions ▪ OB 2.7 Uses appropriate escalation in communication to resolve identified deviations ▪ OB 2.8 Uses and interprets non-verbal communication in a manner appropriate to the organizational and social culture ▪ OB 2.9 Adheres to standard radiotelephone phraseology and procedures ▪ OB 2.10 Accurately reads, interprets, constructs and responds to datalink messages in English
Aeroplane Flight Path Management, Automation	Controls the flight path through automation	<ul style="list-style-type: none"> ▪ OB 3.1 Uses appropriate flight management, guidance systems and automation, as installed and applicable to the conditions ▪ OB 3.2 Monitors and detects deviations from the intended flight path and takes appropriate action ▪ OB 3.3 Manages the flight path safely to achieve optimum operational performance ▪ OB 3.4 Maintains the intended flight path during flight using automation while managing other tasks and distractions ▪ OB 3.5 Selects appropriate level and mode of automation in a timely manner considering phase of flight and workload ▪ OB 3.6 Effectively monitors automation, including engagement and automatic mode transitions



5. FLIGHT CREW COUNTERMEASURES (CONTD)

Countermeasure	Definition	Example Performance
Aeroplane Flight Path Management, Manual Control	Controls the flight path through manual control	<ul style="list-style-type: none"> ▪ OB 4.1 Controls the aircraft manually with accuracy and smoothness as appropriate to the situation ▪ OB 4.2 Monitors and detects deviations from the intended flight path and takes appropriate action ▪ OB 4.3 Manually controls the aeroplane using the relationship between aeroplane attitude, speed and thrust, and navigation signals or visual information ▪ OB 4.4 Manages the flight path safely to achieve optimum operational performance ▪ OB 4.5 Maintains the intended flight path during manual flight while managing other tasks and distractions ▪ OB 4.6 Uses appropriate flight management and guidance systems, as installed and applicable to the conditions ▪ OB 4.7 Effectively monitors flight guidance systems including engagement and automatic mode transitions
Leadership and Teamwork	Influences others to contribute to a shared purpose Collaborates to accomplish the goals of the team	<ul style="list-style-type: none"> ▪ OB 5.1 Encourages team participation and open communication ▪ OB 5.2 Demonstrates initiative and provides direction when required ▪ OB 5.3 Engages others in planning ▪ OB 5.4 Considers inputs from others ▪ OB 5.5 Gives and receives feedback constructively ▪ OB 5.6 Addresses and resolves conflicts and disagreements in a constructive manner ▪ OB 5.7 Exercises decisive leadership when required ▪ OB 5.8 Accepts responsibility for decisions and actions ▪ OB 5.9 Carries out instructions when directed ▪ OB 5.10 Applies effective intervention strategies to resolve identified deviations ▪ OB 5.11 Manages cultural and language challenges, as applicable



5. FLIGHT CREW COUNTERMEASURES (CONTD)

Countermeasure	Definition	Example Performance
Problem-Solving and Decision Making	Identifies precursors, mitigates problems; and makes decisions	<ul style="list-style-type: none"> ▪ OB 6.1 Identifies, assesses and manages threats and errors in a timely manner ▪ OB 6.2 Seeks accurate and adequate information from appropriate sources ▪ OB 6.3 Identifies and verifies what and why things have gone wrong, if appropriate ▪ OB 6.4 Perseveres in working through problems while prioritizing safety ▪ OB 6.5 Identifies and considers appropriate options ▪ OB 6.6 Applies appropriate and timely decision-making techniques ▪ OB 6.7 Monitors, reviews and adapts decisions as required ▪ OB 6.8 Adapts when faced with situations where no guidance or procedure exists ▪ OB 6.9 Demonstrates resilience when encountering an unexpected event
Situation Awareness and Management of Information	Perceives, comprehends and manages information and anticipates its effect on the operation	<ul style="list-style-type: none"> ▪ OB 7.1 Monitors and assesses the state of the aeroplane and its systems ▪ OB 7.2 Monitors and assesses the aeroplane's energy state, and its anticipated flight path. ▪ OB 7.3 Monitors and assesses the general environment as it may affect the operation ▪ OB 7.4 Validates the accuracy of information and checks for gross errors ▪ OB 7.5 Maintains awareness of the people involved in or affected by the operation and their capacity to perform as expected ▪ OB 7.6 Develops effective contingency plans based upon potential risks associated with threats and errors ▪ OB 7.7 Responds to indications of reduced situation awareness



5. FLIGHT CREW COUNTERMEASURES (CONTD)

Countermeasure	Definition	Example Performance
Workload Management	Maintain available workload capacity by prioritizing and distributing tasks using appropriate resources	<ul style="list-style-type: none"> ▪ OB 8.1 Exercises self-control in all situations ▪ OB 8.2 Plans, prioritizes and schedules appropriate tasks effectively ▪ OB 8.3 Manages time efficiently when carrying out tasks ▪ OB 8.4 Offers and gives assistance ▪ OB 8.5 Delegates tasks ▪ OB 8.6 Seeks and accepts assistance, when appropriate ▪ OB 8.7 Monitors, reviews and cross-checks actions conscientiously ▪ OB 8.8 Verifies that tasks are completed to the expected outcome ▪ OB 8.9 Manages and recovers from interruptions, distractions, variations and failures effectively while performing tasks



6. END STATE

Definition: An end state is a reportable event. It is unrecoverable

End State	Definition
Controlled Flight into Terrain	<ul style="list-style-type: none"> In-flight collision with terrain, water, or obstacle without indication of loss of control.
Loss of Control — In-flight	<ul style="list-style-type: none"> Loss of aircraft control while inflight.
Runway Damage	<ul style="list-style-type: none"> Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, person or wildlife on the surface designated for the landing and takeoff of aircraft and resulting in damage.
Mid-Air Collision	<ul style="list-style-type: none"> Collision between aircraft in flight.
Runway Excursion	<ul style="list-style-type: none"> A veer off or overrun off the runway surface <p>Sub-categories:</p> <ul style="list-style-type: none"> Runway Excursion Overrun: Overrun off the runway surface Runway Excursion Lateral: Veer off the runway surface
In-flight Damage	<ul style="list-style-type: none"> Damage occurring while airborne, including: weather-related events, technical failures, bird strikes and fire/smoke/fumes <p>Sub-category</p> <ul style="list-style-type: none"> Collision with Obstacle(s) during Take-Off and Landing (CTOL): Collision with obstacle(s) during takeoff or landing while airborne.
Ground Damage	<ul style="list-style-type: none"> Damage occurring while on the ground, including: <ul style="list-style-type: none"> Occurrences during (or as a result of) ground handling operations Damage while taxiing to or from a runway in use (excluding a runway collision, Ref. S03) Foreign object damage (Not on the runway i.e on taxiway) Fire/smoke/fumes Taxiway Excursion <p>Sub-categories:</p> <ul style="list-style-type: none"> Taxiing Damage: Damage while taxiing to or from a runway in use (excluding a runway collision) Ramp Damage: Occurrences during (or as a result of) ground handling operations
Off or Partial Off Runway Touchdown	<ul style="list-style-type: none"> A touchdown off the runway surface <p>Sub-categories:</p> <ul style="list-style-type: none"> Undershoot (Used for occurrences on landing flare) Overshoot Lateral Touchdown (landing gear touchdown either the left or right of the runway surface)
Hard Landing	<ul style="list-style-type: none"> Any hard landing resulting in substantial damage



6. END STATE (CONT'D)

End State	Definition
Landing Gear	<ul style="list-style-type: none"> ▪ Any gear-up landing/collapse resulting in substantial damage Sub-categories: <ul style="list-style-type: none"> ▪ Gear Up Landing ▪ Gear Collapse
Tail Strike	<ul style="list-style-type: none"> ▪ Tail strike on take-off or landing resulting in substantial damage Sub-categories: <ul style="list-style-type: none"> ▪ Tail Strike on Takeoff ▪ Tail Strike on Landing or Go-around
Off Airport Landing / Ditching	<ul style="list-style-type: none"> ▪ Any controlled landing outside of the airport area and intentional
Fuel Exhaustion	<ul style="list-style-type: none"> ▪ The state in which the aircraft has become devoid of useable fuel. Source ATSB
Any Other End State	<ul style="list-style-type: none"> ▪ Any other accident where: <ul style="list-style-type: none"> – Information available at the ACTF meeting was not enough to determine the accident end state. For example: <ol style="list-style-type: none"> a) The aircraft is missing b) The investigation is still ongoing and the ACTF is unable to assign an end-state classification c) The aircraft crashed but no report is available ▪ The End State does not fit into other categories Sub-categories: <ul style="list-style-type: none"> ▪ Fatalities – no damage to aircraft <ul style="list-style-type: none"> – Fatalities Onboard – Onboard Aircraft – Fatalities Other – Outside Aircraft



Appendix 3 – ICAO Regions

The listing of States in each of the ICAO regions, visit the ICAO Safety Report [Appendix 1](#)



Appendix 4 – Regional Aviation Safety Group (RASG) Regions

Visit RASGs pages on [ICAO Website](#)



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