# AVIATION OCCURRENCE CATEGORIES

## DEFINITIONS AND USAGE NOTES

**December 2017 (4.7)**


Occurrence categories are used to classify occurrences (that is, accidents and incidents) at a high level to permit analysis of the data in support of safety initiatives. Categories, such as CFIT and “loss of control” have been developed specifically for this purpose.

## RECORD OF REVISIONS

| Date | Version | Section | Revision |
|---|---|---|---|
| 12/2017 | 4.7 | LOC–I | Amended usage notes for LOC–I with the manned and unmanned rotorcraft language |
| 12/2017 | 4.7 | FUEL | Amended usage notes for FUEL with the exhausted battery language |
| 12/2017 | 4.7 | ARC | Amended usage notes for ARC with the rotor strikes language |
| 10/2013 | 4.6 | Table of Terms | Added new MED and NAV categories |
| 10/2013 | 4.6 | Aerodrome (ADRM) | Added usage note to include deficiencies with snow, frost, or ice removal from aerodrome surfaces; reformatted usage notes |
| 10/2013 | 4.6 | Airprox/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions (MAC) | Added cross-references to new NAV category, reformatted usage notes |
| 10/2013 | 4.6 | Cabin Safety Events (CABIN) | Some CABIN events are now covered in the new MED category. Updated and reformatted usage notes. |
| 10/2013 | 4.6 | Ground Handling (RAMP) | Added usage note to include deficiencies related to removal of snow, frost, or ice from aircraft; reformatted usage notes |
| 10/2013 | 4.6 | Medical (MED) | New category |
| 10/2013 | 4.6 | Navigation Errors (NAV) | New category |
| 10/2013 | 4.6 | Runway Incursion (RI) | Added cross-references to new NAV category, reformatted usage notes. |
| 10/2013 | 4.6 | Attachment A | Updated to include new MED and NAV categories |
| 7/2013 | 4.5 | Aerodrome (ADRM) | Added usage note to include failure of glider winch launch equipment. |
| 4/2013 | 4.4 | Introduction | Added new sentence to “occurrence” definition to include Unmanned Aircraft Systems (UAS): “This includes accidents or incidents, as defined in Annex 13 to the Convention on International Civil Aviation, involving manned aircraft or unmanned aircraft that have a design and/or operational approval.” |
| 4/2013 | 4.4 | Bird (BIRD) | Removed references to wildlife other than birds, which are covered under the Wildlife (WILD) category. |
| 4/2013 | 4.4 | Controlled Flight Into Terrain (CFIT) | Added usage notes to exclude intentional grounding of UAS or UAS control failures. |
| 4/2013 | 4.4 | Ground Collision (GCOL) | Removed reference to collision with animals. Updated cross references to Runway Incursion (RI) and Wildlife (WILD). |

| Date | Version | Section | Revision |
|---|---|---|---|
| 4/2013 | 4.4 | Ground Handling (RAMP) | Changed “collisions” to “occurrences” in the first usage note bullet to include all occurrences during passenger boarding and deplaning, not just collisions. |
| 4/2013 | 4.4 | Loss of Control–Ground (LOC−G) | Updated cross references to Runway Incursion (RI) and Wildlife (WILD). |
| 4/2013 | 4.4 | Runway Incursion–Vehicle, Aircraft, or Person (RI–VAP)/ Runway Incursion (RI) | Renamed Runway Incursion–Vehicle, Aircraft, or Person (RI–VAP) to Runway Incursion (RI). Added exclusion to events coded as WILD or BIRD. |
| 4/2013 | 4.4 | Wildlife (WILD) | New category to replace Runway Incursion–Animal (RI–A) category and to augment Bird (BIRD) category. |
| 10/2012 | 4.3 | Document | Formatted document and made minor editorial changes |
| 10/2011 | 4.2 | System/Component Failure or Malfunction (Non-Powerplant) (SCF–NP) | Added bullets regarding unmanned aircraft systems: “For unmanned aircraft, includes failure or malfunction of ground-based, transmission, or aircraft-based communication systems or components or datalink systems or components.” and “Includes failures/malfunctions of ground-based launch or recovery systems equipment.” |
| 10/2011 | 4.2 | Loss of Control–Inflight | Added bullet for unmanned aircraft systems: “For unmanned aircraft events, includes hazardous outcomes involving deviation from intended flightpath associated with anticipated or unanticipated loss of datalink. However, if loss of datalink is the direct result of a system/component failure or malfunction, code the occurrence as system/component failure or malfunction–non-powerplant (SCF–NP) only.” |
| 5/2011 | 4.1.5 | Document | Reformatted document |
| 5/2011 | 4.1.5 | Attachment A | Added BIRD, CTOL, EXTL, GTOW, LOLI, and UIMC categories to groupings and alphabetized groupings. |
| 5/2011 | 4.1.5 | Introduction | Replaced the ICAO and CAST contacts with new CICTT email address |
| 4/2011 | 4.1.5 | Entire Document | Alphabetized entries and fixed formatting |
| 4/2011 | 4.1.5 | System/Component Failure or Malfunction (Non-Powerplant) (SCF–NP) | Modified usage notes for Helicopters: replaced “Rotorcraft cyclic, collective, and tail rotor drive and control system failures/malfunctions” with “Rotorcraft main rotor and tail rotor system, drive system and flight control failures or malfunctions” |
| 4/2011 | 4.1.5 | System/Component Failure or Malfunction (Powerplant) (SCF–PP) | Modified usage notes for Helicopters: replaced “rotors, propeller/main rotor drive train (gearbox, transmission)” with “propeller system and engine gearbox”; replaced “Rotorcraft cyclic, collective and tail rotor drive and control failures” with “Rotorcraft main rotor and tail rotor system, drive system and flight control failures” |

| Date | Version | Section | Revision |
|---|---|---|---|
| 4/2011 | 4.1.5 | Controlled Flight Into or Toward Terrain (CFIT) | Added usage notes for Helicopter operations |
| 4/2011 | 4.1.5 | Ground Collision (GCOL) | Added “on designated taxiways” to note |
| 4/2011 | 4.1.5 | Low Altitude Operations (LALT) | Added “on designated taxiways” to note 1; deleted note 2 |
| 4/2011 | 4.1.5 | Low Altitude Operations (LALT) | Modified usage notes, added “with airplanes” after “scud running” |
| 4/2011 | 4.1.5 | Collision with Obstacle(s) During Takeoff and Landing (CTOL) | Modified usage notes, added the phrase “For all aircraft (excluding rotorcraft),” |
| 10/2008 | 4.1.4 | Collision with objects during Takeoff and Landing (CTOL) | Added CTOL to taxonomy |
| 10/2008 | 4.1.4 | Bird (BIRD) | Added Bird category to taxonomy |
| 9/2008 | 4.1.4 | Abnormal Runway Contact (ARC) | Added usage notes on landing for Helicopters and Gliders |
| 9/2008 | 4.1.4 | Loss of Control–Inflight (LOC–I) | Added usage notes for Helicopter stalls and power settling. |
| 9/2008 | 4.1.4 | Ground Handling (RAMP) | Added usage notes for Helicopters |
| 9/2008 | 4.1.4 | Cabin Safety Events (CABIN) | Modified usage notes for Helicopter |
| 9/2008 | 4.1.4 | Aerodrome (ADRM) | Modified usage notes for Helicopter landing |
| 9/2008 | 4.1.4 | Controlled Flight Into or Toward Terrain (CFIT) | Modified usage notes for obstacles on ground |
| 9/2008 | 4.1.4 | Low Altitude Operations (LALT) | Modified usage notes with qualifiers of low flying |
| 9/2008 | 4.1.4 | Evacuation (EVAC) | Added usage notes for ditching |
| 9/2008 | 4.1.4 | Fuel Related (FUEL) | Added “ice” in usage notes for contamination |
| 9/2008 | 4.1.4 | Ground Collision (GCOL) | Modified usage notes, added “ground” qualifier |
| 9/2008 | 4.1.4 | Loss of Control –Ground (LOC–G) | Added usage notes for Helicopter rollover occurrences |
| 9/2008 | 4.1.4 | Airprox/TCAS Alert/Loss of Separation/Near MidAir Collisions/Midair Collisions (MAC) | Added ACAS in the title for Helicopters |
| 9/2008 | 4.1.4 | Controlled Flight Into or Toward Terrain (CFIT) | Modified usage notes for obstacles on ground |
| 9/2008 | 4.1.4 | Low Altitude Operations (LALT) | Modified usage notes with qualifiers of low flying |
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| 9/2008 | 4.1.4 | Airprox/TCAS Alert/Loss of Separation/Near MidAir Collisions/Midair Collisions (MAC) | Added ACAS in the title for Helicopters |
| 9/2008 | 4.1.4 | Runway Excursion (RE) | Added usage notes for Helicopters departing from helidecks and heliports |
| 9/2008 | 4.1.4 | Runway Incursion –Animal (RI–A) | Modified usage notes for Helicopter encounters, changed cockpit crew to flight crew |
| 9/2008 | 4.1.4 | Runway Incursion–Vehicle, Aircraft, or Person (RI–VAP) | Modified usage notes for Helicopter encounters |
| 9/2008 | 4.1.4 | Undershoot/Overshoot (USOS) | Modified usage notes for Helicopter operations |
| 9/2008 | 4.1.4 | External Load Related Occurrences (EXTL) | Category Added for Helicopter operations |
| 9/2008 | 4.1.4 | Loss of Lifting conditions en route (LOLI) | Category Added for Light Aircraft operations |
| 9/2008 | 4.1.4 | Glider Towing related events (GTOW) | Category Added for Light Aircraft operations |
| 9/2008 | 4.1.4 | Wind Shear or Thunderstorm (WSTRW) | Usage notes modified to include Lightning Strikes |
| 2/2006 | 4.1.3 | Introduction | Replaces ICAO co-chair with Yuri Fattah |
| 11/2005 | 4.1.2 | Loss of Control–Ground (LOC–G) | Third bullet: Replaced RI–VA with RI–VAP and replaced RI–O with RI–A. |
| 11/2005 | 4.1.2 | Airprox/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions (MAC) | Title: Replaced Midair/Near Midair Collisions with Airprox/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions (MAC) |
| 11/2005 | 4.1.2 | Airprox/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions (MAC) | Third bullet: Added |
| 11/2005 | 4.1.2 | Airprox/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions (MAC) | Fourth bullet: Added |
| 10/2005 | 4.1 | Rewording of the MAC category, addition of two items to the usages notes | Midair/Near Midair Collision/Loss of Separation/TCAS Alert/Airprox (MAC) |
| 6/2004 | 4.1 | Executive Summary | Added Corey Stephens as the CAST Co-chair |
| 6/2004 | 4.1 | Abnormal Runway Contact (ARC) | Fourth bullet: Added |

| Date | Version | Section | Revision |
|---|---|---|---|
| 6/2004 | 4.1 | Abrupt Maneuver (AMAN) | Third bullet: Added |
| 6/2004 | 4.1 | Wind Shear or Thunderstorm (WSTRW) | First bullet: Deleted the term “only.” |

# TABLE OF TERMS

## INTRODUCTION

The International Civil Aviation Organization (ICAO) and the Commercial Aviation Safety Team (CAST), which includes Government officials and aviation industry leaders, have jointly chartered the CAST/ICAO Common Taxonomy Team (CICTT). The team was charged with developing common taxonomies and definitions for aviation accident and incident reporting systems. The common taxonomies and definitions are intended to improve the aviation community's capacity to focus on common safety issues. CICTT includes experts from air carriers, aircraft manufacturers, engine manufacturers, pilot associations, regulatory authorities, transportation safety boards, and ICAO, and members from Canada, the European Union, France, Italy, Japan, the Netherlands, the United Kingdom, and the United States. CICTT is co-chaired by a representative from ICAO and a representative from CAST.

To accomplish its objectives, CICTT has developed the following:

- International Standard for Aircraft Make, Model and Series Groupings
- International Standard for Engine Make, Model and Submodel Groupings
- Human Factors
- Aviation Occurrence Categories
  - System/Component Failure or Malfunction (Powerplant) (SCF–PP) Subcategory
- Phase of Flight
- Positive Taxonomy

It is important to note that CICTT does not expect governments, international organizations, and corporations to immediately change existing data systems or existing definitions. The intent is to provide "target" taxonomies and definitions for adoption by organizations planning for, and implementing new safety systems.

"Occurrence" is defined as "accident or incident" throughout this document. This includes accidents or incidents, as defined in Annex 13 to the Convention on International Civil Aviation, involving manned aircraft or unmanned aircraft that have a design and/or operational approval. Generally, accidents and incidents differ only in the degree of injury sustained by persons involved or in damage sustained to the aircraft. Each category has a unique name and identifier to permit common coding in accident/incident systems, a text definition, and usage notes to clarify the category and aid in coding occurrences.

An important element of the occurrence category design is that it permits the association of multiple categories with an occurrence. Meaning, for example, if an engine failure occurred, AND loss of control followed, the occurrence would be coded in both categories. Multiple coding supports the primary focus of CICTT—accident *prevention*—in which every pertinent element should be investigated, recorded, and analyzed.

As an aid to organizations using the definitions, a sample table grouping the categories into major operational categories is also included as Attachment A.

Contact point for all CICTT work: CICTT@intlaviationstandards.org

# ABNORMAL RUNWAY CONTACT (ARC)

**Any landing or takeoff involving abnormal runway or landing surface contact.**

*Usage Notes:*

- Events such as hard/heavy landings, long/fast landings, off center landings, crabbed landings, nose wheel first touchdown, tail strikes, and wingtip/nacelle strikes are included in this category.
- Gear-up landings are also recorded here. However, if a system/component failure or malfunction occurred, which led to the gear up landing, the event is also coded under the appropriate system/component failure or malfunction category.
- Do not use this category for runway contacts after losing control, e.g., runway contact after takeoff.
- Occurrences in which the gear collapses during the takeoff run or the landing roll are not included here except if a condition in the usage notes above has been met.

NOTE: Throughout this document the term runway or landing area is taken in its broadest sense and includes runways, landing strips, waterways, unimproved landing areas, and landing pads (which may include offshore platforms, building roofs, roads, ships, and fields), or other landing areas.

NOTE: Does not include helicopter hard/heavy landings after an off-field emergency autorotation when there was no intention to land before the autorotation was entered.

NOTE: Includes any rotor striking the intended landing surface during takeoff and landing. However, collisions with obstacles during takeoff and landing, such as trees or walls, should be coded under Collision With Obstacle(s) During Takeoff and Landing (*CTOL*).

NOTE: Does not include off-field landing by gliders.

# ABRUPT MANEUVER (*AMAN*)

**The intentional abrupt maneuvering of the aircraft by the flight crew.**

*Usage Notes:*

- This category includes the intentional maneuvering of the aircraft to avoid a collision with terrain, objects/obstacles, weather or other aircraft (Note: The effect of intentional maneuvering is the key consideration).
- Abrupt maneuvering may also result in a loss of control or system/component failure or malfunction. In this case, the event is coded under both categories (e.g., *AMAN* and Loss of Control–Inflight (*LOC–I*), *AMAN* and System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*), or *AMAN* and System/Component Failure or Malfunction (Powerplant) (*SCF–PP*)).
- Abrupt maneuvering may also occur on ground; examples include hard braking maneuver, rapid change of direction to avoid collisions, etc.

**Occurrences involving Aerodrome design, service, or functionality issues.**

*Usage Notes:*

Occurrences do not necessarily involve an aircraft.

**Includes:**

- Deficiencies/issues associated with State-approved Aerodromes and Heliports, including:
  - Runways and Taxiways
  - Buildings and structures
  - Crash/Fire/Rescue (CFR) services
  - Obstacles on the Aerodrome property
  - Lighting, markings, and signage
  - Procedures, policies, and standards
- Deficiencies with snow, frost, or ice removal from aerodrome surfaces
- Closed runways, improperly marked runways, construction interference, lighting failures, signage limitations, etc.
- Effects of Aerodrome Design (See crossovers below)
- Loose foreign objects on aerodromes and heliports (See exceptions below)
- Failures of glider winch launch equipment (See crossovers below)

**Does NOT include:**

- Deficiencies or loose foreign objects at unprepared or natural landing sites, which are coded as OTHR.
- Occurrences related to snow, frost, or ice removal from aircraft, which are coded as RAMP.

Crossover to/from other occurrence categories:

- For effects of aerodrome design, code both ADRM and the phenomenon encountered. For example, building layout and architecture leading to surface wind disruptions would be coded as both ADRM and WSTRW or TURB, as appropriate.
- If a glider winch launch equipment failure causes an event meeting the criteria for the GTOW category, code both ADRM and GTOW.

# AIRPROX/TCAS ALERT/LOSS OF SEPARATION/NEAR MIDAIR COLLISIONS/MIDAIR COLLISIONS (*MAC*)

**Air proximity issues, Traffic Collision Avoidance System (TCAS)/Airborne Collision Avoidance System (ACAS) alerts, loss of separation as well as near collisions or collisions between aircraft in flight.**

*Usage Notes:*

**Includes:**

- All collisions between aircraft while both aircraft are airborne.
- Separation-related occurrences caused by either air traffic control or cockpit crew.
- AIRPROX reports
- Genuine TCAS/ACAS alerts.

**Does NOT include:**

- False TCAS/ACAS alerts caused by equipment malfunctions, which are coded as SCF-NP.
- Loss of separation with at least one aircraft on the ground, which may be coded as ATM, GCOL, NAV, and/or RI if the occurrence meets the criteria and usage notes for those categories.

**Crossover to/from other occurrence categories:**

- Code both MAC and NAV if the event was caused by a navigation error and the event meets the usage notes of both categories.
- Code both MAC and ATM if the event was caused by an ATC/ATM error and the event meets the usage notes of both categories.

# ATM/CNS (*ATM*)

**Occurrences involving Air Traffic Management (*ATM*) or Communication, Navigation, Surveillance (CNS) service issues.**

*Usage Notes:*

- Includes Air Traffic Control (ATC) facility/personnel failure/degradation, CNS service failure/degradation, procedures, policies, and standards.
- Examples include NAVAID outage, NAVAID service error, controller error, supervisor error, ATC computer failure, radar failure, and navigation satellite failure.
- Occurrences do not necessarily involve an aircraft.

NOTE: *ATM* includes all of the facilities, equipment, personnel, and procedures involved in the provision of State-approved Air Traffic Services.

# BIRD (*BIRD*)

**Occurrences involving collisions/near collisions with bird(s).**

*Usage Notes:*

- May occur in any phase of flight.

NOTE: Bird strikes were previously categorized as "other". Users may wish to update their historic data by replacing "other" with "*BIRD*" where the occurrence involved a bird strike.

**Miscellaneous occurrences in the passenger cabin of transport category aircraft.**

*Usage Notes:*

**Includes:**

- Events related to carry-on baggage, supplemental oxygen, or missing/non-operational cabin emergency equipment.
- Inadvertent deployment of emergency equipment.
- Injuries of persons while in the passenger cabin of an aircraft (see below for exceptions).

**Does NOT include:**

- Injuries sustained as a result of—
  - Thunderstorms and/or wind shear, which are coded as WSTRW;
  - Turbulence (excluding turbulence caused by wind shear and/or thunderstorms), which is coded as TURB;
  - Intentional acts (suicide, homicide, acts of violence, self-inflicted injury, or laser attacks), which are coded as SEC;
  - Icing events, which are coded as ICE.
- Illnesses or non-injury medical emergencies, which are coded as Medical (MED).

**Crossover to/from other occurrence categories:**

- Medical emergencies involving persons other than crew members or a medical evacuation patient were coded as CABIN before October 2013. All medical emergencies are now coded as MED.

# COLLISION WITH OBSTACLE(S) DURING TAKEOFF AND LANDING (*CTOL*)

**Collision with obstacle(s) during takeoff or landing while airborne.**

*Usage Notes:*

- For all aircraft (excluding rotorcraft), to be used only in cases in which the crew was aware of the true location of the obstacle, but its clearance from the aircraft flightpath was inadequate.
- Includes contact with obstacles, such as vegetation, trees and walls, snowdrifts, power cables, telegraph wires and antennae, offshore platforms, maritime vessels and structures, land structures and buildings.
- Includes collisions during takeoff to and landing from the hover.
- Includes water obstacles during takeoff from water (e.g., waves, dead-heads, ships, swimmers).
- Not to be used for occurrences classified under Controlled Flight Into or Toward Terrain *(CFIT)*, Loss of Control–Inflight (*LOC–I*) or System/Component Failure or Malfunction (Powerplant)(*SCF–PP*).

# CONTROLLED FLIGHT INTO OR TOWARD TERRAIN (*CFIT*)

**In-flight collision or near collision with terrain, water, or obstacle without indication of loss of control.**

*Usage Notes:*

- Use only for occurrences during airborne phases of flight.
- Includes collisions with those objects extending above the surface (for example, towers, trees, power lines, cable car support, transport wires, power cables, telephone lines and aerial masts).
- Can occur during either Instrument Meteorological Conditions (IMC) or Visual Meteorological Conditions (VMC).
- Includes instances when the cockpit crew is affected by visual illusions or degraded visual environment (e.g., black hole approaches and helicopter operations in brownout or whiteout conditions) that result in the aircraft being flown under control into terrain, water, or obstacles.
- If control of the aircraft is lost (induced by crew, weather or equipment failure), do not use this category, use Loss of Control–Inflight (*LOC–I*) instead.
- For an occurrence involving intentional low altitude operations (e.g., crop dusting, aerial work operations close to obstacles, and Search and Rescue (SAR) operations close to water or ground surface) use the Low Altitude Operations (*LALT*) code instead of *CFIT*.
- Do not use this category for occurrences involving intentional flight into/toward terrain in manned aircraft or intentional ground impact of unmanned aircraft. Code all collisions with obstacles during takeoff and landing under Collision With Obstacle(s) During Takeoff and Landing *(CTOL)*. Code all suicides under Security Related (*SEC*) events. Code system, equipment, or command and control failures involving unmanned aircraft under System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*) or *LOC–I* as applicable.
- Do not use this category for occurrences involving runway undershoot/overshoot, which are classified as Undershoot/Overshoot (*USOS*).
- Includes flying into terrain during transition into forward flight.
- For helicopter operations, not to be used for takeoff and landing phases, except when the occurrence involves flying into terrain without indication of loss of control during transition into forward flight.

# EVACUATION (*EVAC*)

**Occurrence in which either, (a) a person(s) was/were injured during an evacuation, (b) an unnecessary evacuation was performed, (c) evacuation equipment failed to perform as required, or (d) the evacuation contributed to the severity of the occurrence.**

*Usage Notes:*

- Includes cases in which an injury(ies) was (were) sustained during the evacuation through an emergency exit or main cabin door.
- Includes cases in which the evacuation itself is the accident (in essence, had there not been an evacuation there would not have been an accident).
- An unnecessary evacuation is one that was either erroneously commanded by the crew or uncommanded.
- Only used for passenger-carrying operations involving transport category aircraft.
- Includes evacuation following a ditching or survivable crash landing in water provided one of the conditions above is met.

# EXTERNAL LOAD RELATED OCCURRENCES (*EXTL*)

**Occurrences during or as a result of external load or external cargo operations.**

*Usage Notes:*

- Includes cases in which external load or the load lifting equipment used (e.g., long line, cable) contacts terrain, water surface, or objects.
- Includes cases in which the load or, in the absence of a load, the load lifting equipment strikes or becomes entangled with the main rotor, tail rotor, or the helicopter fuselage.
- Includes injuries to ground crew handling external loads as result of contact with/dropping/inadvertent release of external load.
- Includes ground injuries to ground crew handling external loads due to the downwash effect or falling branch, tree, etc.
- Includes external hoist, human external cargo, and long lines.
- If the preparation of the external load by ground crew played a role, also code under Ground Handling (*RAMP*).
- Failures or malfunctions of the onboard external load handling lifting equipment or release systems should be coded under System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*), as these are considered to be aircraft systems.

# FIRE/SMOKE (NON-IMPACT) (*F–NI*)

**Fire or smoke in or on the aircraft, in flight, or on the ground, which is not the result of impact.**

*Usage Notes:*

- Includes fire due to a combustive explosion from an accidental ignition source.
- Includes fire and smoke from system/component failures/malfunctions in the cockpit, passenger cabin, or cargo area.
- Non-combustive explosions such as tire burst and pressure bulkhead failures are coded under System/Component Failure–Non-Powerplant (*SCF–NP*).
- Fire/Smoke resulting from an accident impact is coded under Fire/Smoke (Post-Impact) (*F−POST*).

# FIRE/SMOKE (POST-IMPACT) (*F–POST*)

**Fire/Smoke resulting from impact.**

*Usage Notes:*

- This category is only used for occurrences in which post impact fire was a factor in the outcome.
- This category is only used in conjunction with another category. For example, a system/component failure that also results in a post-impact fire will be coded as System/Component Failure or Malfunction (Powerplant) (*SCF–PP*) and *F–POST* or System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*) and *F–POST*.

# FUEL RELATED (*FUEL*)

**One or more powerplants experienced reduced or no power output due to fuel exhaustion, fuel starvation/mismanagement, fuel contamination/wrong fuel, or carburetor and/or induction icing.**

*Usage Notes:*

- The following fuel-related definitions are provided for clarity:
  - Exhaustion: No usable fuel remains on the aircraft.
  - Starvation/mismanagement: Usable fuel remains on the aircraft, but it is not available to the engines.
  - Contamination: Any foreign substance (for example, water, oil, ice, dirt, sand, bugs) in the correct type of fuel for the given powerplant(s).
  - Wrong fuel: Fuel supplied to the powerplant(s) is incorrect, for example, Jet A into a piston powerplant, 80 octane into a powerplant requiring 100 octane.
- Includes flight crew or ground crew-induced fuel-related problems that are not the result of mechanical failures. Interruptions of the fuel supply caused by mechanical failures are coded elsewhere as non-powerplant or powerplant system/component failures (System/Component Failure or Malfunction (Powerplant) (*SCF–PP*) or System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*)), as appropriate.
- Also used when the wrong fuel causes a powerplant failure (e.g., through detonation). In this case it should be coded as *FUEL*, not as a system/component failure or malfunction–powerplant (System/Component Failure or Malfunction (Powerplant) (*SCF–PP*).
- Includes cases in which there was a high risk of fuel exhaustion but there was no actual loss of power.
- Includes exhaustion of battery(s) used as an energy source for the powerplant(s) (e.g., electrically propelled aircraft), including unmanned aircraft.

# GLIDER TOWING RELATED EVENTS (*GTOW*)

**Premature release, inadvertent release or non-release during towing, entangling with towing, cable, loss of control, or impact into towing aircraft/winch.**

*Usage Notes:*

- Applicable both to aircraft under tow by winch or by another aircraft, or to aircraft executing towing.
- To be used in events only after reaching airborne phase.
- Includes loss of control because of entering the towing aircraft wake turbulence and events in which airspeed is out of limits during tow.

# GROUND COLLISION (*GCOL*)

**Collision while taxiing to or from a runway in use.**

*Usage Notes:*

- Includes collisions with an aircraft, person, ground vehicle, obstacle, building, structure, etc., while on a surface other than the runway used for landing or intended for takeoff.
- Ground collisions resulting from events categorized under Runway Incursion (*RI*), Wildlife (*WILD*), or Ground Handling (*RAMP*) are excluded from this category.

NOTE: Taxiing includes ground and air taxiing for rotorcraft on designated taxiways.

# GROUND HANDLING (*RAMP*)

**Occurrences during (or as a result of) ground handling operations.**

*Usage Notes:*

**Includes:**

- Occurrences that occur while servicing, boarding, loading, and deplaning the aircraft
- Occurrences involving boarding and disembarking while a helicopter is hovering
- Deficiencies or issues related to snow, frost, and/or ice removal from aircraft
- Injuries to people from propeller/main rotor/tail rotor/fan blade strikes
- Pushback/powerback/towing events
- Jet Blast and Prop/rotor downwash ground handling occurrences
- Aircraft external preflight configuration errors (e.g., improper loading and improperly secured doors and latches) that lead to subsequent events.
- All parking areas (ramp, gate, tiedowns).
- Operations at aerodromes, heliports, helidecks, and unprepared operating sites

**Does NOT include:**

- Collisions while the aircraft is moving under its own power in the gate, ramp, or tiedown area, which are coded as GCOL (except during powerback, which is coded here)

**Crossover to/from other occurrence categories**

- If an external load is involved with an event during ground handling operations, code both RAMP and EXTL.

# ICING (*ICE*)

**Accumulation of snow, ice, freezing rain, or frost on aircraft surfaces that adversely affects aircraft control or performance.**

*Usage Notes:*

- Includes accumulations that occur in flight or on the ground (i.e., deicing-related).
- Carburetor and induction icing events are coded in the Fuel Related (*FUEL*) category.
- Windscreen icing which restricts visibility is also covered here.
- Includes ice accumulation on sensors, antennae, and other external surfaces.
- Includes ice accumulation on external surfaces including those directly in front of the engine intakes.

# LOSS OF CONTROL–GROUND (*LOC–G*)

**Loss of aircraft control while the aircraft is on the ground.**

*Usage Notes:*

- Used only for non-airborne phases of flight, i.e., ground/surface operations.
- The loss of control may result from a contaminated runway or taxiway (e.g., rain, snow, ice, slush).
- The loss of control during ground operations can occur as the result of other occurrence categories as well. For example, *LOC–G* may result from a system/component failure or malfunction to the powerplant (System/Component Failure or Malfunction (Powerplant) (*SCF–PP*)) or non-powerplant (System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*)), or from evasive action taken during a Runway Incursion (*RI*) or Wildlife (*WILD*) encounter. For these occurrences, the event is coded under both categories (e.g., *LOC–G* and *SCF–PP*, *LOC–G* and *SCF–NP*, *LOC–G* and *RI*, or *LOC-G and WILD*).
- Do not use when a mechanical failure rendered the aircraft uncontrollable.
- Rotorcraft during sloping ground or moving helideck operations, dynamic rollover and ground resonance events are also included here.

# LOSS OF CONTROL–INFLIGHT (*LOC–I*)

**Loss of aircraft control while, or deviation from intended flightpath, in flight.**

**Loss of control inflight is an extreme manifestation of a deviation from intended flightpath. The phrase "loss of control" may cover only some of the cases during which an unintended deviation occurred.**

*Usage Notes:*

- Used only for airborne phases of flight in which aircraft control was lost.
- Loss of control can occur during either Instrument Meteorological Conditions (IMC) or Visual Meteorological Conditions (VMC).
- The loss of control during flight may occur as a result of a deliberate maneuver (e.g., stall/spin practice).
- Occurrences involving configuring the aircraft (e.g., flaps, slats, onboard systems, etc.) are included as well as rotorcraft retreating blade stall.
- Stalls are considered loss of control and are included here.
- Manned and unmanned rotorcraft (including multi-rotor) occurrences which involve power settling (vortex ring), or settling with power to ground contact are coded here and as Abnormal Runway Contact (*ARC*) if during normal landing or takeoff. Rotorcraft External Load operations involving loss of control related to the external load should be coded as *LOC–I* as well as External Load Related Occurrences (*EXTL*).
- Includes Rotorcraft "Loss of Tail Rotor Effectiveness."
- Includes loss of control during practice or emergency autorotation.
- Includes pilot-induced or assisted oscillations.
- For unmanned aircraft events, includes hazardous outcomes involving deviation from intended flightpath associated with anticipated or unanticipated loss of datalink. However, if loss of datalink is the direct result of a system/component failure or malfunction, code the occurrence as System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*) only.
- For icing-related events, which are also loss of control, code both *LOC–I* and Icing (*ICE*)).
- If the loss of control is a direct result of a system/component failure or malfunction (SCF), code the occurrence as an System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*), or System/Component Failure or Malfunction (Powerplant) (*SCF–PP*) only. However, loss of control may follow less severe system/component failures, and in this case, code both categories.
- Cockpit crew vision-related events and flight in degraded visual environments (for example, obscuration, black hole approach events, brownouts, or whiteout events), in which the aircraft is flown under control into terrain, water, or obstacles, are coded under Controlled Flight Into or Toward Terrain (*CFIT*), not *LOC–I*.

# LOSS OF LIFTING CONDITIONS EN ROUTE (*LOLI*)

**Landing en route due to loss of lifting conditions.**

*Usage Notes:*

- Applicable only to aircraft that rely on static lift to maintain or increase flight altitude, namely sailplanes, gliders, hang gliders and paragliders, balloons and airships.
- All static lift forms to be considered, including atmospheric lift, namely from orographic, Thermal, mountain wave and convergence zone, and buoyancy lift namely from lighter than air gas or hot air.
- Also include motorglider and paramotor aircraft if operating under static atmospheric lift conditions, and the engine could not be started.
- If the aircraft was flying intentionally at low height above the terrain, use Low Altitude Operations (*LALT*) instead (typical cases occur with gliders in competition flying).

# LOW ALTITUDE OPERATIONS (*LALT*)

**Collision or near collision with obstacles/objects/terrain while intentionally operating near the surface (excludes takeoff or landing phases).**

*Usage Notes:*

- "Terrain" includes water, vegetation, rocks, and other natural elements lying on, or growing out of, the earth.
- Includes ostentatious display, maneuvering at low height, aerobatics, sightseeing, demonstration flights, aerial inspection, avalanche mining, human hoist or human cargo sling, search and rescue operations, aerial application, intentional helicopter operations close to obstacles during aerial work and scud running with airplanes (ducking under low visibility conditions).
- Also includes intentional maneuvering in close proximity to cliffs, mountains, into box canyons, and similar flights in which the aircraft aerodynamic capability is not sufficient to avoid impact.
- If there is a loss of control during low altitude operations, both Loss of Control–Inflight (*LOC–I*) and *LALT* are coded.

NOTE: Excluding rotorcraft air taxi phase of flight on designated taxiways.

**Occurrences involving illnesses of persons on board an aircraft.**

*Usage Notes:*

**Includes:**

- Crewmembers unable to perform duties due to illness.
- Medical emergencies due to illness involving any person on board an aircraft, including passengers and crew.

**Does NOT include:**

- Injuries sustained during flight operations. Injuries are coded as—
  - WSTRW for injuries sustained as a result of thunderstorms or wind shear,
  - TURB for injuries sustained as a result of turbulence (excluding turbulence caused by wind shear and/or thunderstorms),
  - SEC for injuries resulting from intentional acts (suicide, homicide, acts of violence, or self-inflicted injury),
  - CABIN for any injury sustained on an aircraft not occurring as a result of any events above, such as sprains, cuts, or burns resulting from normal cabin operations (handling bags, operating galley equipment, etc.)
- Injuries, temporary blindness, or other incapacitation resulting from laser attacks, which are coded as SEC.

**Crossover to/from other occurrence categories:**

- Medical emergencies involving persons other than crew members or a medical evacuation patient were coded as CABIN before October 2013. All medical emergencies are now coded as MED.

# NAVIGATION ERRORS (NAV)

**Occurrences involving the incorrect navigation of aircraft on the ground or in the air.**

*Usage Notes:*

**Includes:**

- Lateral navigation errors caused by navigating using the improper navaid or improper programming of aircraft navigation systems,
- Airspace incursions resulting from improper navigation, uncertainty of position, improper planning, or failure to follow procedures prior to entering airspace,
- Failure to accurately track navigation signals (lateral or vertical),
- Altitude/level busts (see below for exceptions),
- Deviating from ATC/ATM clearances or published procedures (SID/DP, STAR, approach procedures, charted visual procedures),
- Failure to follow clearances or restrictions while operating on the surface of an aerodrome, including—
    - Taxiing or towing an aircraft on an unassigned taxiway or runway (see crossover section below),
    - Taxiing or otherwise operating an aircraft on a restricted portion of an aerodrome (cargo ramp, air carrier ramp, general aviation ramp, military ramp, wingspan- or weight-restricted taxiways or runways, etc.)
    - Take-offs, aborted take-offs, or landings on a taxiway, unassigned runway, or closed runway (see below for exceptions),
    - Approaches or landings to/on unassigned runways or to/at the wrong aerodrome.
- Taxiway excursions (except following a loss of control on the ground or intentionally steering an aircraft off a taxiway to avoid a collision).

**Does NOT include:**

- Intentional deviations resulting from a PIC exercising emergency authority.
- Deviations from assigned altitude or course to avoid other aircraft as a result of visual detection or complying with a TCAS RA, which are coded as MAC.
- Deviations from assigned altitude or electronic navigation path as a result of wind shear or turbulence, which are coded as WSTRW or TURB.
- Lateral or vertical deviations resulting from extreme manifestations of loss of aircraft control in flight, which is coded as LOC-I.
- Taxiway excursions due to a loss of control on the ground, which is coded as LOC-G.

- Taxiway excursions to avoid a ground collision, which are coded as AMAN.
- Takeoffs, aborted takeoffs, landings, or approaches to engaged runways due to ATC/ATM error, which are coded as ATM (and MAC if it resulted in a loss of separation).
- Navigation errors at an aerodrome made by vehicles or pedestrians. Code RI if the navigation error results in the vehicle or pedestrian incorrectly entering a runway. Code RAMP if the error meets the usage notes for the RAMP category.

**Crossover to/from other occurrence categories:**

- Code both NAV and MAC if a navigation error causes an AIRPROX/loss of separation.
- Code both NAV and RI for any navigation error that also meets the RI usage notes, including takeoffs/landings without a clearance, wrong runway takeoffs/landings, and wrong aerodrome landings.
- Code both NAV and RAMP if a navigation error occurs during pushback or towing operations.

## OTHER (*OTHR*)

**Any occurrence not covered under another category.**

## RUNWAY EXCURSION (*RE*)

**A veer off or overrun off the runway surface.**

*Usage Notes:*

- Only applicable during either the takeoff or landing phase.
- The excursion may be intentional or unintentional. For example, the deliberate veer off to avoid a collision, brought about by a Runway Incursion. In this case, code both categories.
- Use RE in all cases in which the aircraft left the runway/helipad/helideck regardless of whether the excursion was the consequence of another event.

## RUNWAY INCURSION (RI)

**Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.**

*Usage Notes:*

- Definition from Procedures for Air Navigation Services–Air Traffic Management (ICAO DOC 4444) and Manual on the Prevention of Runway Incursions (ICAO DOC 9870), first included in April 2004.

**Does NOT include:**

- Events at unprepared/natural landing sites.
- Occurrences involving animals or birds on the runway which are coded as Wildlife (*WILD*) or Bird (*BIRD*).

**Crossover to/from other occurrence categories:**

- Code both RI and NAV for runway incursions resulting from the improper navigation of an aircraft at an aerodrome, or takeoffs, aborted takeoffs, or landings on an unassigned runway.
- Code both RI and ATM for runway incursions resulting from an ATC/ATM error.
- Code both RI and MAC if a runway incursion event causes an AIRPROX/loss of separation while airborne.

# SECURITY RELATED (*SEC*)

**Criminal/Security acts which result in accidents or incidents (per Annex 13 to the Convention on International Civil Aviation).**

*Usage Notes:*

- While security-related acts can lead to accidents as defined as by Annex 13 to the Convention on International Civil Aviation, they are not considered accidents by some organizations. Regardless, these events have similar consequences in that they result in serious injury or death to person(s) and/or substantial damage to the aircraft. For these reasons, they are categorized as security-related occurrences for prevention purposes only.
- Examples include, (a) hijacking and/or aircraft theft, (b) interference with a crewmember (e.g., unruly passengers), (c) flight control interference, (d) ramp/runway/taxiway security, (e) sabotage, (f) suicide, and (g) acts of war.

# SYSTEM/COMPONENT FAILURE OR MALFUNCTION (NON-POWERPLANT) (*SCF–NP*)

**Failure or malfunction of an aircraft system or component other than the powerplant.**

*Usage Notes:*

- If the failure renders the aircraft uncontrollable it is coded as *SCF–NP* only, not as loss of control (Loss of Control–Inflight (*LOC–I*) or Loss of Control–Ground (*LOC–G*)). However, if the failure does not render the aircraft uncontrollable, but leads to a loss of control, code the event under both *SCF–NP* and *LOC–I* or *LOC–G*, as appropriate.
- Rotorcraft main rotor and tail rotor system, drive system and flight control failures or malfunctions are also coded here.
- Includes errors or failures in software and database systems.
- Includes non-powerplant parts or pieces separating from an aircraft.
- For unmanned aircraft, includes failure or malfunction of ground-based, transmission, or aircraft-based communication systems or components or datalink systems or components.
- Includes failures/malfunctions of ground-based launch or recovery systems equipment.
- Includes all failures/malfunctions, including those related to or caused by maintenance issues.

# SYSTEM/COMPONENT FAILURE OR MALFUNCTION (POWERPLANT) (*SCF–PP*)

**Failure or malfunction of an aircraft system or component related to the powerplant.**

*Usage Notes:*

- If the failure renders the aircraft uncontrollable it is coded as *SCF–PP* only, not as loss of control (Loss of Control–Inflight (*LOC–I*) or Loss of Control–Ground (*LOC–G*)). However, if the failure does not render the aircraft uncontrollable, but leads to a loss of control, code the event under both *SCF–PP* and *LOC–I* or *LOC–G*, as appropriate.
- Includes failures or malfunctions of any of the following: propellers, propeller system and engine gearbox, reversers, and powerplant controls.
- Includes powerplant parts or pieces separating from a powerplant.
- Includes all failures/malfunctions, including those related to or caused by maintenance issues.
- Rotorcraft main rotor and tail rotor system, drive system and flight control failures or malfunctions are coded as System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*), not *SCF–PP*.
- The following fuel-related powerplant problems are coded under the category Fuel Related (*FUEL*), not under the category *SCF–PP*: fuel exhaustion, fuel starvation/mismanagement, fuel contamination, wrong fuel, carburetor and induction icing.

NOTE: For subcategorization of *SCF–PP*, a separate taxonomy has been developed and can be found on the CICTT Web site.

# TURBULENCE ENCOUNTER (*TURB*)

**In-flight turbulence encounter.**

*Usage Notes:*

- Includes encounters with turbulence in clear air, mountain wave, mechanical, and/or cloud-associated turbulence.
- Wake vortex encounters are also included here.
- Flights into wind shear or thunderstorm-related turbulence are coded as Wind Shear or Thunderstorm (*WSTRW*).
- Includes turbulence encountered by aircraft when operating around or at buildings, structures, and objects.

# UNDERSHOOT/OVERSHOOT (*USOS*)

**A touchdown off the runway/helipad/helideck surface.**

*Usage Notes:*

- An undershoot/overshoot of a runway/helipad/helideck occurs in close proximity to the runway/helipad/helideck and includes offside touchdowns and any occurrence in which the landing gear touches off the runway/helipad/helideck surface.
- Off-airport emergency landings are excluded from this category.
- To be used for occurrences during the landing phase.
- Includes offside touchdowns on heliports, helidecks and other defined areas to be used wholly or in part for the arrival, departure and surface movement of helicopters (does not include helicopter unprepared or natural landing sites).

# UNINTENDED FLIGHT IN IMC (*UIMC*)

**Unintended flight in Instrument Meteorological Conditions (IMC).**

*Usage Notes:*

- May be used as a precursor to Controlled Flight Into or Toward Terrain (*CFIT*), Loss of Control–Inflight (*LOC–I*) or Low Altitude Operations (*LALT*).
- Applicable if the pilot was flying according to Visual Flight Rules (VFR), as defined in Annex 2 to the Convention on International Civil Aviation, Rules of the Air, and by any reason ended up inadvertently in IMC.
- Only to be used when loss of visual references is encountered.
- Only to be used if pilot not qualified to fly in IMC and/or aircraft not equipped to fly in IMC.

# UNKNOWN OR UNDETERMINED (*UNK*)

**Insufficient information exists to categorize the occurrence.**

*Usage Notes:*

- Includes cases in which the aircraft is missing.
- Includes those occurrences in which there is not enough information at hand to classify the occurrence or in which additional information is expected in due course to better classify the occurrence.

# WILDLIFE (*WILD*)

**Collision with, risk of collision, or evasive action taken by an aircraft to avoid wildlife on the movement area of an aerodrome or on a helipad/helideck in use.**

*Usage Notes:*

- Includes encounters with wildlife on a runway in use or on any other movement area of the aerodrome.
- Includes instances where evasive action is taken by the flight crew that leads to a collision off the movement area of the aerodrome or to consequences other than a collision (e.g., gear collapsing).
- Wildlife encounters may occur at controlled or uncontrolled airports, or on unprepared/natural landing sites.
- Excludes bird strikes, which are coded as Bird (*BIRD*).

# WIND SHEAR OR THUNDERSTORM (*WSTRW*)

**Flight into wind shear or thunderstorm.**

*Usage Notes:*

- Includes flight into wind shear and/or thunderstorm-related weather.
- Includes in-flight events related to hail.
- Includes events related to lightning strikes.
- Includes events related to heavy rain (not just in a thunderstorm).
- Icing and turbulence encounters are coded separately (see Icing (*ICE*) and Turbulence Encounter (*TURB*)).

# ATTACHMENT A
## SAMPLE OPERATIONAL GROUPING OF CATEGORIES

| | |
|---|---|
| ***Airborne*** | |
| **ABRUPT MANEUVER** | ***AMAN*** |
| **AIRPROX/TCAS ALERT/LOSS OF SEPARATION/NEAR MIDAIR COLLISIONS/MIDAIR COLLISIONS** | ***MAC*** |
| **CONTROLLED FLIGHT INTO/TOWARD TERRAIN** | ***CFIT*** |
| **FUEL RELATED** | ***FUEL*** |
| **GLIDER TOWING RELATED EVENTS** | ***GTOW*** |
| **LOSS OF CONTROL–INFLIGHT** | ***LOC–I*** |
| **LOSS OF LIFTING CONDITIONS EN ROUTE** | ***LOLI*** |
| **LOW ALTITUDE OPERATIONS** | ***LALT*** |
| **NAVIGATION ERRORS** | ***NAV*** |
| **UNINTENDED FLIGHT IN IMC** | ***UIMC*** |
| ***Aircraft*** | |
| **FIRE/SMOKE (NON-IMPACT)** | ***F–NI*** |
| **SYSTEM/COMPONENT FAILURE OR MALFUNCTION (NON-POWERPLANT)** | ***SCF–NP*** |
| **SYSTEM/COMPONENT FAILURE OR MALFUNCTION (POWERPLANT)** | ***SCF–PP*** |
| ***Ground Operations*** | |
| **EVACUATION** | ***EVAC*** |
| **FIRE/SMOKE (POST-IMPACT)** | ***F–POST*** |
| **GROUND COLLISION** | ***GCOL*** |
| **GROUND HANDLING** | ***RAMP*** |
| **LOSS OF CONTROL–GROUND** | ***LOC–G*** |
| **NAVIGATION ERRORS** | ***NAV*** |
| **RUNWAY EXCURSION** | ***RE*** |
| **RUNWAY INCURSION** | ***RI*** |
| **WILDLIFE** | ***WILD*** |
| ***Miscellaneous*** | |
| **BIRD** | ***BIRD*** |
| **CABIN SAFETY EVENTS** | ***CABIN*** |
| **EXTERNAL LOAD RELATED OCCURRENCES** | ***EXTL*** |
| **MEDICAL** | ***MED*** |
| **OTHER** | ***OTHR*** |
| **SECURITY RELATED** | ***SEC*** |
| **UNKNOWN OR UNDETERMINED** | ***UNK*** |
| ***Non-aircraft-related*** | |
| **AERODROME** | ***ADRM*** |
| **ATM/CNS** | ***ATM*** |
| ***Takeoff and Landing*** | |
| **ABNORMAL RUNWAY CONTACT** | ***ARC*** |

| | |
|---|---|
| **COLLISION WITH OBSTACLE(S) DURING TAKEOFF AND LANDING** | ***CTOL*** |
| **UNDERSHOOT/OVERSHOOT** | ***USOS*** |
| ***Weather*** | |
| **ICING** | ***ICE*** |
| **TURBULENCE ENCOUNTER** | ***TURB*** |
| **WIND SHEAR OR THUNDERSTORM** | ***WSTRW*** |