AVIATION OCCURRENCE CATEGORIES

DEFINITIONS AND USAGE NOTES

June 2004 (4.1)

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. CICCT includes experts from several air carriers, aircraft manufacturers, engine manufacturers, pilot associations, regulatory authorities, transportation safety boards, ICAO, and members from Canada, European Union, France, Italy, Japan, Netherlands, United Kingdom, and United States. CICTT is co-chaired by a representative from ICAO, and the U.S. National Aeronautics and Space Administration (representing CAST).

To accomplish its objectives, CICTT plans the development of the following common taxonomies and definitions: Phase of Flight (already released); Accident Categories (already released), Occurrence Categories (the subject of this release); Aircraft Make/Model/Series tables; Engine Make/Model/Series tables; and a detailed taxonomy for accident/incident data systems.

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 so that as organizations make plans for, and implement new safety systems, these new taxonomies and definitions are adopted.

"Occurrence" is defined as "accident or incident" throughout this document. 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 further clarify the category and aid in coding occurrences. This version focuses on powered fixed-wing land and rotorcraft operations. Future updates will cover other aircraft operations.

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

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Note: revision 4.1 includes two additional usage notes related to "Abnormal runway contact" and "abrupt Maneuvre" which were suggested by the SISG/4 meeting in June 2004.

ABNORMAL RUNWAY CONTACT
(ARC)

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

UsageNotes:

- 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 loosing control, e.g. runway contact after take-off.

- Occurrences, in which the gear collapses daring the take-off 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 intended landing areas.

ABRUPT MANEUVRE
(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 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 LOC-I, AMAN and SCF-NP, or AMAN and SCF-PP).

- Abrupt maneuvering may also occur on ground, examples include hard braking maneuver, rapid change of direction to avoid collisions etc.

AERODROME
(ADRM)

Occurrences involving Aerodrome design, service, or functionality issues.

Usage Notes:
- Includes anything associated with a State approved Aerodrome- runways, taxiways, ramp area, parking area, buildings and structures, Crash/Fire/Rescue (CFR) services, obstacles on the Aerodrome property, lighting, markings, signage, procedures, policies, and standards.
- Examples include closed runways, improperly marked runways, construction interference, lighting failures, signage limitations, etc.
- Occurrences do not necessarily involve an aircraft.

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- Effects of Aerodrome design are also included here. For example, building layout and architecture which leads to surface wind disruptions would be coded as both ADRM and WS/TRW or TURB as appropriate.

ATM/CNS
(ATM)

Occurrences involving Air traffic management (ATM) or communications, navigation, or surveillance (CNS) service issues.

Usage Notes:
- Includes 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.

CABIN SAFETY EVENTS
(CABIN)

Miscellaneous occurrences in the passenger cabin of transport category aircraft

Usage Notes:
- Includes significant events related to carry-on baggage, supplemental oxygen, or missing/non-operational cabin emergency equipment.
- Includes inadvertent deployment of emergency equipment.
- Includes medical emergency for a person other than a flight crewmember or a medical evacuation patient.
- Excludes turbulence and other weather related events, which are covered under TURB, ICE, or WSTRW respectively

NOTE: Transport Category Aircraft includes:
-All jets with 10 or more seats or greater than 12,500 lb Maximum Takeoff Weight
-All propeller driven airplanes with greater than 19 seats or greater than 19,000 lb Maximum Takeoff Weight

CONTROLLED FLIGHT INTO OR TOWARD TERRAIN
(CFIT)

Inflight collision or near collision with terrain, water, or obstacle without indication of loss of control

Usage Notes:
- CFIT is used only for occurrences during airborne phases of flight.
- CFIT includes collisions with those objects extending above the surface (for example: towers.).
- CFIT can occur during either Instrument Meteorological Conditions (IMC) or Visual Meteorological Conditions (VMC).

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- Includes instances when the cockpit crew is affected by visual illusions (e.g., black hole approaches) 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) use the Low Altitude Operations (LALT) code instead of CFIT.

- Do not use this category for occurrences involving intentional flight into/toward terrain. Code all suicides under Security Related (SEC) events.

- Do not use this category for occurrences involving runway undershoot/overshoot, which are classified as Undershoot/Overshoot (USOS).

EVACUATION
(EVAC)

Occurrence where either; (a) person(s) are injured during an evacuation; (b) an unnecessary evacuation was performed; (c) evacuation equipment failed to perform as required; or (d) the evacuation was a factor in the outcome.

Usage Notes:
- Includes cases where an injury(ies) was(were) sustained during the evacuation through an emergency exit or main cabin door.

- Includes cases where 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.

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 where 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 SCF-PP and F-POST or 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, 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 cockpit 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 (SCF-NP or SCF-PP), 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 (SCF-PP).

GROUND HANDLING
(RAMP)

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

Usage Notes:
- Includes collisions that occur while servicing, boarding, loading, and deplaning the aircraft.
- Includes propeller/rotor/fan blade strikes.
- Includes pushback/powerback/towing events.
- Includes Jet Blast and Prop/rotor wash ground handling occurrences.
- Includes aircraft external preflight configuration errors (examples: improper loading and improperly secured doors and latches) that lead to subsequent events.
- Includes all parking areas (ramp, gate, tiedowns).
- Except for powerback events, which are coded here, if a collision occurs while the aircraft is moving under its own power in the gate, ramp, or tiedown area, code it as a ground collision (GCOL).

GROUND COLLISION
(GCOL)

Collision while taxiing to or from a runway in use.

Usage Notes:

- Includes collisions with an aircraft, person, animal, 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) or Ground Handling (RAMP) are excluded from this category.

NOTE: Taxiing includes air taxiing for rotorcraft.

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 inflight 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

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 (SCF-PP) or non-powerplant (SCF-NP), or from evasive action taken during a Runway Incursion (RI-VA, or RI-O). For these occurrences, the event is coded under both categories (e.g., LOC-G and SCF-PP, LOC-G and SCF-NP, or LOC-G and RI-VA or RI-O).
- Do not use when a mechanical failure rendered the aircraft uncontrollable.
- Rotorcraft dynamic rollover and ground resonance events are also included here.

LOSS OF CONTROL - INFLIGHT
(LOC-I)

Loss of aircraft control while inflight

Usage Notes:
- Used only for airborne phases of flight where 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, on-board systems, etc) are included here
- Stalls are considered loss of control and are included here.
- Rotorcraft occurrences which involve power settling, or settling with power to ground contact are coded here and also as ARC.
- Rotorcraft External Load operations involving loss of control related to the external load are also coded here
- For icing-related events, which are also loss of control, code both LOC-I and ICE).
- If the loss of control is a direct result of a system/component failure or malfunction (SCF), code the occurrence as an SCF-NP, or 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 (for example, black hole approach events or whiteout events), where the aircraft is flown under control into terrain, water, or obstacles, are coded under CFIT, not LOC-I

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 laying, on or growing out of, the earth.
- Includes ostentatious display, low flying, aerobatics, sight seeing, demonstration flights, aerial inspection, aerial application, and scud running (ducking under low visibility conditions).
- Also includes flying in close proximity to mountains, into box canyons, and similar flights where 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.

MIDAIR/NEAR MIDAIR COLLISION
(MAC)

Collision or near collision between aircraft in flight.

Usage Notes:
- Includes all collisions between aircraft while both aircraft are airborne.
- Both air traffic control and cockpit crew separation-related occurrences are included.

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 where the a/c left the runway regardless of whether the excursion was the consequence of another event or not.

RUNWAY INCURSION – ANIMAL
(RI-A)

Collision with, risk of collision, or evasive action taken by an aircraft to avoid an animal on a runway in use.

Usage Notes:

- Includes encounters with wildlife (other than birdstrikes which are coded as OTHER) on a runway in use.
- Includes instances where evasive action is taken by the cockpit crew that leads to a collision off the runway or to consequences other than a collision (e.g., gear collapsing).
- Runway incursions may occur at controlled or uncontrolled airports.

RUNWAY INCURSION – VEHICLE , ARCRAFT OR PERSON
(RI-VAP)

- **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 take-off of aircraft.**

Note:

- From Procedures for Air Navigation Services – Air traffic Management (ICAO DOC 4444), included in April 2004.

SECURITY RELATED
(SEC)

Criminal/Security acts which result in accidents or incidents (per the International Civil Aviation Organization [ICAO] Annex 13).

Usage Notes:

- While security related acts can lead to accidents as defined as by ICAO Annex 13, 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.

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- 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 (LOC-I or 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 cyclic, collective, and tail rotor drive and control system failures/malfunctions are also coded here.
- Includes errors or failures in software and database systems.
- Includes non-powerplant parts or pieces separating from an aircraft.
- 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 (LOC-I or 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, rotors, propeller/main rotor drive train, 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 cyclic, collective and tail rotor drive and control failures or malfunctions are coded as non-powerplant failures (SCF-NP), not SCF-PP.
- The following fuel-related powerplant problems are coded under the category FUEL, not under the category SCF-PP: fuel exhaustion; fuel starvation/mismanagement; fuel contamination; wrong fuel; carburetor and induction icing.

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 windshear or thunderstorm related turbulence are coded as WSTRW.

UNDERSHOOT/OVERSHOOT
(USOS)

A touchdown off the runway surface.

Usage Notes:
- An undershoot/overshoot of the runway occurs in close proximity to the runway and also includes offside touchdowns and any occurrence where the landing gear touches off the runway surface.
- Off-airport emergency landings are excluded from this category.
- To be used for occurrences during the landing phase.

UNKNOWN OR UNDETERMINED
(UNK)

Insufficient information exists to categorize the occurrence.

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

WINDSHEAR OR THUNDERSTORM
(WSTRW)

Flight into windshear or thunderstorm.

Usage Notes:
- Includes flight into windshear and/or thunderstorm related weather ~~ONLY~~.
- Includes inflight events related to hail
- Includes events related to heavy rain (not just in a thunderstorm)
- Icing and turbulence encounters are coded separately (see ICE and TURB).

ATTACHMENT A
SAMPLE OPERATIONAL GROUPING OF CATEGORIES

Takeoff, Landing, and Ground Operations	
GROUND HANDLING	*RAMP*
GROUND COLLISION	*GCOL*
LOSS OF CONTROL - GROUND	*LOC-G*
RUNWAY EXCURSION	*RE*
RUNWAY INCURSION – VEHICLE, AIRCRAFT OR PERSON	*RI-VAP*
RUNWAY INCURSION – ANIMAL	*RI-A*
UNDERSHOOT/OVERSHOOT	*USOS*
ABNORMAL RUNWAY CONTACT	*ARC*
FIRE/SMOKE (POST-IMPACT)	*F-POST*
EVACUATION	*EVAC*

Airborne	
MIDAIR/NEAR MID AIR COLLISION	*MAC*
CONTROLLED FLIGHT INTO/TOWARD TERRAIN	*CFIT*
LOSS OF CONTROL - INFLIGHT	*LOC-I*
FUEL RELATED	*FUEL*
LOW ALTITUDE OPERATIONS	*LALT*
ABRUPT MANEUVRE	*AMAN*

Weather	
WINDSHEAR OR THUNDERSTORM	*WSTRW*
TURBULENCE ENCOUNTER	*TURB*
ICING	*ICE*

Aircraft	
SYSTEM/COMPONENT FAILURE OR MALFUNCTION (POWERPLANT)	*SCF-PP*
SYSTEM/COMPONENT FAILURE OR MALFUNCTION (NON-POWERPLANT)	*SCF-NP*
FIRE/SMOKE (NON-IMPACT)	*F-NI*

Miscellaneous	
SECURITY RELATED	*SEC*
CABIN SAFETY EVENTS	*CABIN*
OTHER	*OTHR*
UNKNOWN OR UNDETERMINED	*UNK*

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Non-aircraft-related	
ATM/CNS	*ATM*
AERODROME	*ADRM*