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Article 11

Implementation

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by ⁽¹⁾. They shall forthwith inform the Commission thereof.

When Member States adopt those measures, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. The methods of making such reference shall be laid down by Member States.

2. Member States shall communicate to the Commission the texts of the main provisions of national law which they adopt in the field covered by this Directive.

Article 12

Entry into force

This Directive shall enter into force on the day of its publication in the Official Journal of the European Communities.

Article 13

Addressees

This Directive is addressed to the Member States.

Done at ..., on ...

For the European Parliament
The President

For the Council
The President

⁽¹⁾ Two years after its entry into force.

ANNEX I

LIST OF REPORTABLE OCCURRENCES RELATED TO AIRCRAFT OPERATIONS,
MAINTENANCE, REPAIR, AND MANUFACTURE

Note 1: Although this Annex lists the majority of reportable occurrences, it cannot be completely comprehensive. Any other occurrences, which are judged by those involved to meet the criteria, should also be reported.

Note 2: This Annex does not include accidents. In addition to other requirements covering the notification of accidents, they should also be recorded in the *databases* mentioned in Article 5(2).

Note 3: This Annex contains examples of reporting requirements covering aircraft operations, maintenance, repair and manufacture.

Note 4: Occurrences to be reported are those where the safety of operation was or could have been endangered or which could have led to an unsafe condition. If in the view of the reporter an occurrence did not endanger the safety of the operation but if repeated in different but likely circumstances would create a hazard, then a report should be made. What is judged to be reportable on one class of product, part or appliance may not be so on another and the absence or presence of a single factor, human or technical, can transform an occurrence into an accident or serious incident.

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Note 5: Specific operational approvals, e.g. RVSM, ETOPS, RNAV, or a design or maintenance programme, may have specific reporting requirements for failures or malfunctions associated with that approval or programme.

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A. AIRCRAFT FLIGHT OPERATIONS

- (i) Operation of the Aircraft
 - (a) *Avoidance* manoeuvres:
 - risk of collision with another aircraft, terrain or other object or an unsafe situation when avoidance action would have been appropriate;
 - an avoidance manoeuvre required to avoid a collision with another aircraft, terrain or other object;
 - an avoidance manoeuvre to avoid other unsafe situations.
 - (b) Take-off or landing incidents, including precautionary or forced landings. Incidents such as under-shooting, overrunning or running off the side of runways. Take-offs, rejected take-offs, landings or attempted landings on a closed, occupied or incorrect runway. Runway incursions.
 - (c) Inability to achieve predicted performance during take-off or initial climb.
 - (d) Critically low fuel quantity or inability to transfer fuel or use total quantity of usable fuel.
 - (e) Loss of control (including partial or temporary) regardless of cause.
 - (f) Occurrences close to or above V_1 resulting from or producing a hazardous or potentially hazardous situation (e.g. rejected take-off, tail strike, engine-power loss etc.).
 - (g) Go-around producing a hazardous or potentially hazardous situation.
 - (h) Unintentional significant deviation from airspeed, intended track or altitude (more than 300 ft) regardless of cause.
 - (i) Descent below decision height/altitude or minimum descent height/altitude without the required visual reference.
 - (j) Loss of position awareness relative to actual position or to other aircraft.
 - (k) Breakdown in communication between flight crew (CRM) or between flight crew and other parties (cabin crew, ATC, engineering)
 - (l) Heavy landing – a landing deemed to require a 'heavy landing check'.
 - (m) Exceedance of fuel imbalance limits.
 - (n) Incorrect setting of an SSR code or of an altimeter subscale.
 - (o) Incorrect programming of, or erroneous entries into, equipment used for navigation or performance calculations, or use of incorrect data.

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- (p) Incorrect receipt or interpretation of radiotelephony messages.
 - (q) Fuel system malfunctions or defects, which had an effect on fuel supply and/or distribution.
 - (r) Aircraft unintentionally departing from a paved surface.
 - (s) Collision between an aircraft and any other aircraft, vehicle or other ground object.
 - (t) Inadvertent and/or incorrect operation of any controls.
 - (u) Inability to achieve the intended aircraft configuration for any flight phase (e.g. landing gear and gear doors, flaps, stabilisers, slats etc.).
 - (v) A hazard or potential hazard which arises as a consequence of any deliberate simulation of failure conditions for training, system checks or training purposes.
 - (w) Abnormal vibration.
 - (x) Operation of any primary warning system associated with manoeuvring the aircraft e.g. configuration warning, stall warning (stick shaker), over-speed warning etc. unless:
 - 1) the crew conclusively established that the indication was false and provided that the false warning did not result in difficulty or hazard arising from the crew response to the warning; or
 - 2) operated for training or test purposes.
 - (y) GPWS/TAWS 'warning' when:
 - 1) the aircraft comes into closer proximity to the ground than had been planned or anticipated; or
 - 2) the warning is experienced in instrument meteorological conditions or at night and is established as having been triggered by a high rate of descent (Mode 1); or
 - 3) the warning results from failure to select landing gear or landing flaps by the appropriate point on the approach (Mode 4); or
 - 4) any difficulty or hazard arises or might have arisen as a result of crew response to the 'warning' e.g. possible reduced separation from other traffic. This could include warning of any mode or type i.e. genuine, nuisance or false.
 - (z) GPWS/TAWS 'alert' when any difficulty or hazard arises or might have arisen as a result of crew response to the 'alert'.
 - (aa) ACAS RAs.
 - (bb) Jet or prop blast incidents resulting in significant damage or serious injury.
- (ii) Emergencies
- (a) Fire, explosion, smoke or toxic or noxious fumes, even though fires were extinguished.
 - (b) The use of any non-standard procedure by the flight or cabin crew to deal with an emergency when:
 - 1) the procedure exists but is not used;
 - 2) the procedure does not exist;
 - 3) the procedure exists but is incomplete or inappropriate;
 - 4) the procedure is incorrect;
 - 5) the incorrect procedure is used.
 - (c) Inadequacy of any procedures designed to be used in an emergency, including when being used for maintenance, training or test purposes.
 - (d) An event leading to an emergency evacuation.
 - (e) Depressurisation.

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- (f) The use of any emergency equipment or prescribed emergency procedures in order to deal with a situation.
 - (g) An event leading to the declaration of an emergency ('Mayday' or 'Pan').
 - (h) Failure of any emergency system or equipment, including all exit doors and lighting, to perform satisfactorily, including when being used for maintenance, training or test purposes.
 - (i) Events requiring any use of emergency oxygen by any crew member.
- (iii) Crew Incapacitation
- (a) Incapacitation of any member of the flight crew, including that which occurs prior to departure if it is considered that it could have resulted in incapacitation after take-off.
 - (b) Incapacitation of any member of the cabin crew which renders them unable to perform essential emergency duties.
- (iv) Injury
- Occurrences, which have or could have led to significant injury to passengers or crew but which are not considered reportable as an accident.
- (v) Meteorology
- (a) A lightning strike which resulted in damage to the aircraft or loss or malfunction of any essential service.
 - (b) A hail strike which resulted in damage to the aircraft or loss or malfunction of any essential service.
 - (c) Severe turbulence encounter — an encounter resulting in injury to occupants or deemed to require a 'turbulence check' of the aircraft.
 - (d) A windshear encounter.
 - (e) Icing encounter resulting in handling difficulties, damage to the aircraft or loss or malfunction of any essential service.
- (vi) Security
- (a) Unlawful interference with the aircraft including a bomb threat or hijack.
 - (b) Difficulty in controlling intoxicated, violent or unruly passengers.
 - (c) Discovery of a stowaway.
- (vii) Other Occurrences
- (a) Repetitive instances of a specific type of occurrence which in isolation would not be considered 'reportable' but which due to the frequency with which they arise, form a potential hazard.
 - (b) A bird strike which resulted in damage to the aircraft or loss or malfunction of any essential service.
 - (c) Wake-turbulence encounters.
 - (d) Any other occurrence of any type considered to have endangered or which might have endangered the aircraft or its occupants on board the aircraft or on the ground.

B. AIRCRAFT TECHNICAL

(i) Structural

Not all structural failures need to be reported. Engineering judgement is required to decide whether a failure is serious enough to be reported. The following examples can be taken into consideration:

- (a) Damage to a Principal Structural Element (PSE) that has not been designated as damage-tolerant (life-limited element). PSEs are those which contribute significantly to carrying flight, ground, and pressurisation loads, and the failure of which could result in a catastrophic failure of the aircraft.
- (b) Defect or damage exceeding admissible damages to a PSE that has been designated as damage-tolerant.

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- (c) Damage to or defect exceeding allowed tolerances of a structural element, the failure of which could reduce the structural stiffness to such an extent that the required flutter, divergence or control reversal margins are no longer achieved.
- (d) Damage to or defect of a structural element, which could result in the liberation of items of mass that may injure occupants of the aircraft.
- (e) Damage to or defect of a structural element, which could jeopardise proper operation of systems. See (ii) below.
- (f) Loss of any part of the aircraft structure in flight.

(ii) Systems

The following general criteria applicable to all systems are proposed:

- (a) Loss, significant malfunction or defect of any system, subsystem or set of equipment when standard operating procedures, drills etc. could not be satisfactorily accomplished.
- (b) Inability of the crew to control the system, e.g.:
 - uncommanded actions,
 - incorrect and or incomplete response, including limitation of movement or stiffness,
 - runaway,
 - mechanical disconnection or failure.
- (c) Failure or malfunction of the exclusive function(s) of the system (one system could integrate several functions).
- (d) Interference within or between systems.
- (e) Failure or malfunction of the protection device or emergency system associated with the system.
- (f) Loss of redundancy of the system.
- (g) Any occurrence resulting from unforeseen behaviour of a system.
- (h) For aircraft types with single main systems, subsystems or sets of equipment: Loss, significant malfunction or defect in any main system, subsystem or set of equipment.
- (i) For aircraft types with multiple independent main systems, subsystems or sets of equipment: The loss, significant malfunction or defect of more than one main system, subsystem or set of equipment.
- (j) Operation of any primary warning system associated with aircraft systems or equipment unless the crew conclusively established that the indication was false, provided that the false warning did not result in difficulty or hazard arising from the crew response to the warning.
- (k) Leakage of hydraulic fluids, fuel, oil or other fluids which resulted in a fire hazard or possible hazardous contamination of aircraft structure, systems or equipment, or risk to occupants.
- (l) Malfunction or defect of any indication system when this results in the possibility of misleading indications to the crew.
- (m) Any failure, malfunction or defect if it occurs at a critical phase of the flight and is relevant to the system operation.
- (n) Significant shortfall of the actual performances compared to the approved performance which resulted in a hazardous situation (taking into account the accuracy of the performance-calculation method) including braking action, fuel consumption etc.
- (o) Asymmetry of flight controls; e.g. flaps, slats, spoilers, etc.

The Appendix to this Annex gives a list of examples of reportable occurrences resulting from the application of these general criteria to specific systems.

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- (iii) Propulsion (including Engines, Propellers and Rotor Systems) and Auxiliary Power Units (APUs)
- (a) Flameout, shutdown or malfunction of any engine.
 - (b) Overspeed or inability to control the speed of any high-speed rotating component (for example: APU, air starter, air cycle machine, air turbine motor, propeller or rotor).
 - (c) Failure or malfunction of any part of an engine or powerplant resulting in any one or more of the following:
 - 1) non-containment of components/debris;
 - 2) uncontrolled internal or external fire, or hot gas breakout;
 - 3) thrust in a direction different from that demanded by the pilot;
 - 4) thrust-reversing system failing to operate or operating inadvertently;
 - 5) inability to control power, thrust or rpm;
 - 6) failure of the engine mount structure;
 - 7) partial or complete loss of a major part of the powerplant;
 - 8) dense visible fumes or concentrations of toxic products sufficient to incapacitate crew or passengers;
 - 9) inability, by use of normal procedures, to shutdown an engine;
 - 10) inability to restart a serviceable engine.
 - (d) An uncommanded thrust/power loss, change or oscillation which is classified as a loss of thrust or power control (LOTC):
 - 1) for a single-engine aircraft, or
 - 2) where it is considered excessive for the application, or
 - 3) where this could affect more than one engine in a multi-engine aircraft, particularly in the case of a twin-engine aircraft, or
 - 4) for a multi-engine aircraft where the same, or similar, engine type is used in an application where the event would be considered hazardous or critical.
 - (e) Any defect in a life-controlled part causing its retirement before completion of its full life.
 - (f) Defects of common origin which could cause an in-flight shut-down rate so high that there is the possibility of more than one engine being shut down on the same flight.
 - (g) An engine limiter or control device failing to operate when required or operating inadvertently.
 - (h) Exceedance of engine parameters.
 - (i) FOD resulting in damage.

Propellers and transmission

- (j) Failure or malfunction of any part of a propeller or powerplant resulting in any one or more of the following:
 - 1) an overspeed of the propeller;
 - 2) the development of excessive drag;
 - 3) a thrust in the opposite direction to that commanded by the pilot;
 - 4) a release of the propeller or any major portion of the propeller;
 - 5) a failure that results in excessive imbalance;
 - 6) the unintended movement of the propeller blades below the established minimum in-flight low-pitch position;
 - 7) an inability to feather the propeller;
 - 8) an inability to change propeller pitch;
 - 9) an uncommanded change in pitch;
 - 10) a uncontrollable torque or speed fluctuation;
 - 11) the release of low-energy parts.

Rotors and transmission

- (k) Damage or defect of main rotor gearbox/attachment which could lead to in-flight separation of the rotor assembly and/or malfunctions of the rotor control.
- (l) Damage to tail rotor, transmission and equivalent systems.

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APUs

- (m) Shut down or failure when the APU is required to be available by operational requirements, e.g. ETOPS, MEL.
- (n) Inability to shut down the APU.
- (o) Overspeed.
- (p) Inability to start the APU when needed for operational reasons.

(iv) Human Factors

Any incident where any feature or inadequacy of the aircraft design could have led to an error of use that could contribute to a hazardous or catastrophic effect.

(v) Other Occurrences

- (a) Any incident where any feature or inadequacy of the aircraft design could have led to an error of use that could contribute to a hazardous or catastrophic effect.
- (b) An occurrence not normally considered as reportable (e.g. furnishing and cabin equipment, water systems), where the circumstances resulted in endangering the aircraft or its occupants.
- (c) A fire, explosion, smoke or toxic or noxious fumes.
- (d) Any other event which could endanger the aircraft, or affect the safety of the occupants of the aircraft, or people or property in the vicinity of the aircraft or on the ground.
- (e) Failure or defect of passenger address system resulting in loss of, or inaudible, passenger address system.
- (f) Loss of pilot seat control during flight.

C. AIRCRAFT MAINTENANCE AND REPAIR

- (i) Incorrect assembly of parts or components of the aircraft found during an inspection or test procedure not intended for that specific purpose.
- (ii) Hot bleed air leak resulting in structural damage.
- (iii) Any defect in a life-controlled part causing retirement before completion of its full life.
- (iv) Any damage or deterioration (e.g. fractures, cracks, corrosion, delamination, disbonding, etc.) resulting from any cause (e.g. as flutter, loss of stiffness or structural failure) to:
 - (a) a primary structure or a PSE (as defined in the manufacturers' Repair Manual) where such damage or deterioration exceeds allowable limits specified in the Repair Manual and requires a repair or complete or partial replacement;
 - (b) a secondary structure which consequently has or may have endangered the aircraft;
 - (c) the engine, propeller or rotorcraft rotor system.
- (v) Any failure, malfunction or defect of any system or equipment, or damage or deterioration thereof found as a result of compliance with an Airworthiness Directive or other mandatory instruction issued by a Regulatory Authority, when:
 - (a) it is detected for the first time by the reporting organisation implementing compliance;
 - (b) on any subsequent compliance, it exceeds the permissible limits quoted in the instruction and/or published repair/rectification procedures are not available.
- (vi) Failure of any emergency system or equipment, including all exit doors and lighting, to perform satisfactorily, including when being used for maintenance or test purposes.
- (vii) Non-compliance or significant errors in compliance with required maintenance procedures.

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- (viii) Products, parts, appliances and materials of unknown or suspect origin.
- (ix) Misleading, incorrect or insufficient maintenance data or procedures that could lead to maintenance errors.
- (x) Any failure, malfunction or defect of ground equipment used for test or checking of aircraft systems and equipment when the required routine inspection and test procedures did not clearly identify the problem, where this results in a hazardous situation.

D. AIR NAVIGATION SERVICES, FACILITIES AND GROUND SERVICES

- (i) Air Navigation Services (ANS)
See Annex II, List of reportable ANS-related occurrences.
- (ii) Aerodrome and Aerodrome Facilities
 - (a) Significant spillage during fuelling operations.
 - (b) Loading of incorrect fuel quantities likely to have a significant effect on aircraft endurance, performance, balance or structural strength.
- (iii) Handling of Passengers, Baggage and Cargo
 - (a) Significant contamination of aircraft structure, systems and equipment arising from the carriage of baggage or cargo.
 - (b) Incorrect loading of passengers, baggage or cargo, likely to have a significant effect on aircraft mass and/or balance.
 - (c) Incorrect stowage of baggage or cargo (including hand baggage) likely in any way to endanger the aircraft, its equipment or occupants or to impede emergency evacuation.
 - (d) Inadequate stowage of cargo containers or other substantial items of cargo.
 - (e) Carriage or attempted carriage of dangerous goods in contravention of applicable regulations, including incorrect labelling and packaging of dangerous goods.
- (iv) Aircraft Ground Handling and Servicing
 - (a) Failure, malfunction or defect of ground equipment used for the testing or checking of aircraft systems and equipment when the required routine inspection and test procedures did not clearly identify the problem, where this results in a hazardous situation.
 - (b) Non-compliance or significant errors in compliance with required servicing procedures.
 - (c) Loading of contaminated or incorrect type of fuel or other essential fluids (including oxygen and potable water).

Appendix to ANNEX I

The following subparagraphs give examples of reportable occurrences resulting from the application of the general criteria to specific systems listed in paragraph B(ii) of Annex I.

1. Air conditioning/ventilation
 - (a) complete loss of avionics cooling;
 - (b) depressurisation.
2. Autoflight system
 - (a) failure of the autoflight system to achieve the intended operation while engaged;
 - (b) significant reported crew difficulty to control the aircraft linked to autoflight system functioning;

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- (c) failure of any autoflight system disconnect device;
 - (d) uncommanded autoflight mode change.
3. Communications
- (a) failure or defect of passenger address system resulting in loss of or inaudible passenger address;
 - (b) total loss of communication in flight.
4. Electrical system
- (a) loss of one electrical distribution system (AC/DC);
 - (b) total loss or loss of more than one electrical generation system;
 - (c) failure of the back up (emergency) electrical generation system.
5. Cockpit/Cabin/Cargo
- (a) pilot seat control loss during flight;
 - (b) failure of any emergency system or equipment, including emergency evacuation signalling system, all exit doors, emergency lighting, etc.;
 - (c) loss of retention capability of the cargo loading system.
6. Fire protection system
- (a) fire warnings, except those immediately confirmed as false;
 - (b) undetected failure or defect of fire/smoke detection/protection system, which could lead to loss or reduced fire detection/protection;
 - (c) absence of warning in case of actual fire or smoke.
7. Flight controls
- (a) asymmetry of flaps, slats, spoilers, etc.;
 - (b) limitation of movement, stiffness or poor or delayed response in the operation of primary flight control systems or their associated tab and lock systems;
 - (c) flight control surface runaway;
 - (d) flight control surface vibration felt by the crew;
 - (e) mechanical flight control disconnection or failure;
 - (f) significant interference with normal control of the aircraft or degradation of flying qualities.
8. Fuel system
- (a) fuel quantity indicating system malfunction resulting in total loss or wrong indication of fuel quantity on board;
 - (b) leakage of fuel which resulted in major loss, fire hazard, significant contamination;
 - (c) malfunction or defects of the fuel jettisoning system which resulted in inadvertent loss of significant quantity, fire hazard, hazardous contamination of aircraft equipment or inability to jettison fuel;
 - (d) fuel system malfunctions or defects which had a significant effect on fuel supply and/or distribution;
 - (e) inability to transfer or use total quantity of usable fuel.

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9. Hydraulics
 - (a) loss of one hydraulic system (ETOPS only);
 - (b) failure of the isolation system;
 - (c) loss of more than one hydraulic circuits;
 - (d) failure of the back up hydraulic system;
 - (e) inadvertent Ram Air Turbine extension.
10. Ice detection/protection system
 - (a) undetected loss or reduced performance of the anti-ice/de-ice system;
 - (b) loss of more than one of the probe-heating systems;
 - (c) inability to obtain symmetrical wing de-icing;
 - (d) abnormal ice accumulation leading to significant effects on performance or handling qualities;
 - (e) crew vision significantly affected.
11. Indicating/warning/recording systems
 - (a) malfunction or defect of any indicating system when the possibility of significant misleading indications to the crew could result in an inappropriate crew action on an essential system;
 - (b) loss of a red warning function on a system;
 - (c) for glass cockpits: loss or malfunction of more than one display unit or computer involved in the display/warning function.
12. Landing gear system /brakes/tyres
 - (a) brake fire;
 - (b) significant loss of braking action;
 - (c) asymmetrical braking action leading to significant path deviation;
 - (d) failure of the landing gear free fall extension system (including during scheduled tests);
 - (e) unwanted landing gear or gear doors extension/retraction;
 - (f) multiple tyre burst.
13. Navigation systems (including precision approach systems) and air data systems
 - (a) total loss or multiple navigation equipment failures;
 - (b) total or multiple air data system equipment failures;
 - (c) significant misleading indications;
 - (d) significant navigation errors attributed to incorrect data or a database coding error;
 - (e) unexpected deviations in lateral or vertical path not caused by pilot input;
 - (f) problems with ground navigational facilities leading to significant navigation errors not associated with transitions from inertial navigation mode to radio navigation mode.

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14. Oxygen for pressurised aircraft:
 - (a) loss of oxygen supply in the cockpit;
 - (b) loss of oxygen supply to a significant number of passengers (more than 10 %), including when found during maintenance or training or test purposes.
15. Bleed air system
 - (a) hot bleed air leak resulting in fire warning or structural damage;
 - (b) loss of all bleed air systems;
 - (c) failure of bleed air leak detection system.

ANNEX II

LIST OF REPORTABLE OCCURRENCES RELATED TO AIR NAVIGATION SERVICES

- Note 1: Although this Annex lists the majority of reportable occurrences, it cannot be completely comprehensive. Any other occurrences, which are judged by those involved to meet the criteria, should also be reported.
- Note 2: This Annex does not include accidents and serious incidents. In addition to other requirements covering the notification of accidents, they should also be recorded in the databases mentioned in Article 5(2).
- Note 3: This Annex includes ANS occurrences which pose an actual or potential threat to flight safety, or can compromise the provision of safe ANS services.
- Note 4: The contents of this Annex shall not preclude the reporting of any occurrence, situation or condition which, if repeated in different but likely circumstances or allowed to continue uncorrected, could create a hazard to aircraft safety.
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- (i) Near collision incidents (encompassing specific situations where one aircraft and another aircraft/the ground/a vehicle/person or object are perceived to be too close to each other):
 - (a) Separation minima infringement
 - (b) Inadequate separation
 - (c) Near-Controlled Flight Into Terrain (Near CFIT)
 - (d) Runway incursion where avoiding action was necessary.
 - (ii) Potential for collision or near collision (encompassing specific situations having the potential to be an accident or a near collision, if another aircraft is in the vicinity):
 - (a) Runway incursion where no avoiding action is necessary
 - (b) Runway excursion
 - (c) Aircraft deviation from ATC clearance
 - (d) Aircraft deviation from applicable Air Traffic Management (ATM) regulation:
 - 1) Aircraft deviation from applicable published ATM procedures;
 - 2) Unauthorised penetration of airspace;
 - 3) Deviation from aircraft ATM-related equipment carriage and operations, as mandated by applicable regulation(s).