



# Cabin Safety Incident Analysis

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<b>Approver</b>	Manager Technical Operations
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## Glossary

### Acronyms and abbreviations

Acronym / abbreviation	Description
CASA	Civil Aviation Safety Authority
ICAO	International Civil Aviation Organisation
ISASI	International Society of Air Safety Investigators

### Definitions

Term	Definition
Able-bodied passengers	Passengers who are clearly physically able and are willing to help cabin crew maintain good order and discipline on board the aircraft
Accident	<p>An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:</p> <p>a) a person is fatally or seriously injured as a result of:</p> <ul style="list-style-type: none"> <li>○ being in the aircraft, or</li> <li>○ direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or</li> <li>○ direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or</li> </ul> <p>b) the aircraft sustains damage or structural failure which:</p> <ul style="list-style-type: none"> <li>○ adversely affects the structural strength, performance or flight characteristics of the aircraft, and</li> <li>○ would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tyres, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the</li> </ul>

Term	Definition
	radome); or c) the aircraft is missing or is completely inaccessible
Accident investigator	Person engaged in the investigation of aircraft accidents, incidents and other aviation safety hazards
Aircraft	Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface
Baggage	Personal property of passengers or crew carried on an aircraft by agreement with the operator
Cabin crew member	A crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew member
Causes	Actions, omissions, events, conditions, or a combination thereof, which led to the accident or incident. The identification of causes does not imply the assignment of fault or the determination of administrative, civil or criminal liability
Crashworthiness	The incorporation in basic design of considerations pertinent to the protection of aircraft occupants in a survivable crash environment. It represents the ability of a structure, and its interiors, to maintain integrity during impact in order to enhance survivability and enable the evacuation of an aircraft
Crew member	A person assigned by an operator to duty on an aircraft during a flight duty period
Dangerous goods	Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions
Direct access	A direct route or passage from a seat to an exit from which a passenger can proceed without entering an aisle or passing around an obstruction
Disruptive passenger	A passenger who fails to respect the rules of conduct at an airport or on board an aircraft or to follow the instructions of the airport staff or crew members and thereby disturbs the good order and discipline at an airport or on board the aircraft
Ditching	Forced landing of an aircraft on water

Term	Definition
Emergency exit	Door, window exit, or any other type of exit (e.g. hatch in the flight deck, tail cone exit) used as an egress point to allow maximum opportunity for cabin evacuation within an appropriate time period
Emergency exit row seating	Each seat in a row of seats located at an emergency exit, having direct access to the exit
Expert/specialist	A person invited to participate in an investigation, on the basis of his or her specialised knowledge, skills or experience
Fatigue	A physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a person's alertness and ability to perform safety-related operational duties
Flight crew member	A licenced crew member charged with duties essential to the operation of an aircraft during a flight duty period
Hands-on exercise	Exercise on the use of equipment/aircraft systems that is conducted without a specific context. Equipment that is removed from operation, or other representative training equipment considered acceptable by CASA, can be used for the purposes of this training
Hypoxia	A deficiency of oxygen in inspired gases, arterial blood or tissue, short of anoxia (almost complete absence of oxygen)
In-charge cabin crew member	Cabin crew leader who has overall responsibility for the conduct and coordination of cabin procedures applicable during normal operations and during abnormal and emergency situations for flights operated with more than one cabin crew member
In-flight	The period from the moment all external aircraft doors are closed following boarding through the moment when one external door is opened to allow passengers to leave the aircraft or until, if a forced landing, competent authorities take over responsibility for the aircraft, individuals and property on the aircraft. For the purpose of the Tokyo Convention, an aircraft is considered to be in-flight from the moment when power is applied for the purpose of take-off until the moment when the landing run ends
Incident	An occurrence, other than an accident, with the operation of an aircraft which could affect the safety of operation
Investigation	A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and/or contributing factors and, when appropriate, the making of safety recommendations

Term	Definition
Investigator-in-charge	A person charged, on the basis of his or her qualifications, with the responsibility for the organisation, conduct and control of an investigation
ISASI guidelines	Guidance developed to provide investigators and other operational personnel with tools to investigate the survival aspects of incidents and accidents. Guidance is provided for documenting damage to the cabin interior and its equipment and conducting cabin crew and passenger interviews. The guidelines are adaptable to any type of occurrence (for example, fumes, smoke events). A copy of the ISASI guidelines can be obtained from the ICAO website in the Cabin Safety Library at <a href="http://www.icao.int/cabinsafety">www.icao.int/cabinsafety</a>
Master minimum equipment list (MMEL)	A list established for a particular aircraft type by the organisation responsible for the type design with the approval of the State of design containing items, one or more of which is permitted to be unserviceable at the commencement of a flight. The MMEL may be associated with special operating conditions, limitations or procedures
Minimum equipment list (MEL)	A list which provides for the operation of aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the master minimum equipment list (MMEL) established for the aircraft type
Mock-up	A training device that is a partial, functional replica of an actual aircraft, without motion
Occurrence	Any accident or incident associated with the operation of an aircraft
Operations manual	A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties
Operator	The person, organisation or enterprise engaged in or offering to engage in an aircraft operation
Passenger	A person who is not an operating crew member
Person with disabilities	Any person whose mobility is reduced due to a physical incapacity (sensory or locomotor), an intellectual deficiency, age, illness or any other cause of disability when using transport and whose situation needs special attention and the adaptation to the person's needs of the services made available to all passengers
Pilot-in-command	The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight

Term	Definition
Safety recommendation	A proposal of an accident investigation authority based on information derived from an investigation, made with the intention of preventing accidents or incidents and which in no case has the purpose of creating a presumption of blame or liability for an accident or incident. In addition to safety recommendations arising from accident and incident investigations, safety recommendations may result from diverse sources, including safety studies
Serious incident	An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down
Serious injury	An injury which is sustained by a person in an accident and which: <ol style="list-style-type: none"> <li>a) requires hospitalisation for more than 48 hours, commencing within seven days from the date the injury was received; or</li> <li>b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or</li> <li>c) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; or</li> <li>d) involves injury to any internal organ; or</li> <li>e) involves second- or third-degree burns, or any burns affecting more than five per cent of the body surface; or</li> <li>f) involves verified exposure to infectious substances or injurious radiation</li> </ol>
Special categories of passengers	Persons who need special conditions, assistance, or equipment when travelling by air. These may include but are not limited to: <ol style="list-style-type: none"> <li>a) infants;</li> <li>b) unaccompanied children;</li> <li>c) persons with disabilities;</li> <li>d) persons with mobility impairments;</li> <li>e) persons on stretchers; and</li> <li>f) inadmissible passengers, deportees or persons in custody</li> </ol>
State of design	The State having jurisdiction over the organisation responsible for the type design
State of manufacture	The State having jurisdiction over the organisation responsible for the final assembly of the aircraft

Term	Definition
State of occurrence	The State in the territory of which an accident or incident occurs
State of the operator	The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence
State of registry	The State on whose register the aircraft is entered
Survivable crash environment	An environment that prevails when the cabin occupants are subjected to crash forces within human tolerance levels, and the structural integrity of the passenger space remains intact such that the occupants can rapidly evacuate an aircraft
Survivor	A victim who is not fatally injured as a result of the aircraft accident
Unstaffed exit	Emergency exit for which no cabin crew member has been positioned for the flight
Victim	An occupant of the aircraft, or any person outside the aircraft, who is unintentionally directly involved in the aircraft accident. Victims may include the crew, revenue passengers, non-revenue passengers and third parties

## Revision history

Amendments/revisions of this handbook are recorded below in order of most recent first.

Version No.	Date	Parts/Sections	Details
1.0	January 2019	All	First issue

## 1 General information

Type of information	Specific information	Objective of the analysis
Flight information	<p>Obtain the following information pertaining to the event (accident/incident):</p> <ul style="list-style-type: none"> <li>▪ Date of occurrence</li> <li>▪ Time of occurrence</li> <li>▪ Operator name</li> <li>▪ Flight number</li> <li>▪ Aircraft manufacturer's serial number (MSN); make/model/series; registration and dated entered into service</li> <li>▪ Location: <ul style="list-style-type: none"> <li>○ general location</li> <li>○ grid reference/coordinates</li> <li>○ elevation and topography</li> </ul> </li> <li>▪ Departure point</li> <li>▪ Phase of flight and flight level</li> <li>▪ Destination and intermediate stops (ETA/ETD); radar tracks</li> <li>▪ Total number of crew members: <ul style="list-style-type: none"> <li>○ flight crew</li> <li>○ cabin crew</li> </ul> </li> <li>▪ Total number of additional personnel assigned non-safety and emergency duties in the cabin by the operator (as appropriate)</li> <li>▪ Total number of passengers, including lap-held infants and other special categories of passengers</li> </ul>	To provide factual information relating to the event (accident/incident)

Type of information	Specific information	Objective of the analysis
Injuries to persons	<p>Obtain the following for the crew, passengers and other:</p> <ul style="list-style-type: none"> <li>▪ Injuries (crew): <ul style="list-style-type: none"> <li>○ fatal</li> <li>○ serious</li> <li>○ minor</li> <li>○ none</li> </ul> </li> <li>▪ Injuries (passengers): <ul style="list-style-type: none"> <li>○ fatal</li> <li>○ serious</li> <li>○ minor</li> <li>○ none</li> </ul> </li> <li>▪ Total in the aircraft: <ul style="list-style-type: none"> <li>○ fatal</li> <li>○ serious</li> <li>○ minor</li> <li>○ none</li> </ul> </li> <li>▪ Injuries (other): <ul style="list-style-type: none"> <li>○ fatal</li> <li>○ serious</li> <li>○ minor</li> <li>○ none</li> </ul> </li> </ul>	To determine the number of casualties/survivors and the extent of injuries
Meteorological conditions	<p>Review meteorological conditions, which may include:</p> <ul style="list-style-type: none"> <li>▪ Atmospheric conditions</li> <li>▪ Wind</li> <li>▪ Any unusual considerations such as: <ul style="list-style-type: none"> <li>○ volcanic ash</li> <li>○ smoke</li> </ul> </li> </ul>	<p>To review the meteorological conditions and evaluate if/how they played a role in the event, for example:</p> <ul style="list-style-type: none"> <li>▪ External sources that may be considered in a fume event (e.g. did the flight path go over a forest fire or other source of odour)</li> <li>▪ Meteorological conditions that impacted the efficiency of firefighting after landing (e.g. wind, heavy rainfall)</li> </ul>

## 2 Operator documentation

Type of information	Specific information	Objective of the analysis
Policies and procedures	<p>Review operations manual and determine pertinent references to:</p> <ul style="list-style-type: none"> <li>▪ Pre-flight checks</li> <li>▪ Firefighting</li> <li>▪ Smoke-removal</li> <li>▪ The management of on-board medical events</li> <li>▪ Crew member incapacitation, including those specific to single cabin crew member operations, if applicable</li> </ul>	<p>To review the operator’s policies and procedures and evaluate the content and adequacy of the following:</p> <ul style="list-style-type: none"> <li>▪ Pre-flight checks of safety and emergency equipment, focusing on: <ul style="list-style-type: none"> <li>○ firefighting equipment and relevant systems (e.g. lavatory smoke detectors)</li> </ul> </li> <li>▪ Firefighting and/or smoke-removal procedures, focusing on: <ul style="list-style-type: none"> <li>○ fire prevention</li> <li>○ means to locate source and identify type of fire/smoke/fumes</li> <li>○ communication with other crew members and passengers</li> <li>○ use of firefighting and protective equipment</li> <li>○ firefighting and/or smoke-removal technique</li> <li>○ managing the cabin</li> <li>○ post-firefighting and/or smoke-removal procedures</li> </ul> </li> <li>▪ Procedures for the management of on-board medical events, focusing on: <ul style="list-style-type: none"> <li>○ recognising, prioritising, and responding to injured occupants</li> <li>○ administering first-aid</li> <li>○ communication procedures</li> <li>○ procedures for seeking ground-based medical and/or on-board volunteer health professional assistance</li> <li>○ use of first-aid, and safety and emergency equipment, as appropriate</li> <li>○ managing assistance from, and providing support to, an on-board volunteer health professional, if available</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>▪ Procedures in the event of flight or cabin crew member incapacitation, focusing on:             <ul style="list-style-type: none"> <li>○ administering first-aid</li> <li>○ moving/securing the incapacitated crew member</li> <li>○ informing or assisting flight crew member(s)</li> <li>○ reassigning required cabin crew stations and duties, if applicable</li> </ul> </li> <li>▪ Procedures in the event of single cabin crew member incapacitation, focusing on:             <ul style="list-style-type: none"> <li>○ notifying the flight crew</li> <li>○ securing the incapacitated cabin crew member</li> <li>○ administering first-aid</li> <li>○ assigning an able-bodied passenger (ABP) to care for the cabin crew member</li> </ul> </li> </ul>
<p>Training programs</p>	<p>Review approved cabin crew safety training programs (e.g. initial and recurrent) and determine pertinent references to:</p> <ul style="list-style-type: none"> <li>▪ Training content regarding abnormal and emergency procedures, specific to firefighting and/or smoke removal</li> <li>▪ Training content regarding the management of on-board medical events</li> <li>▪ Training content regarding crew member incapacitation</li> <li>▪ Human performance training, including CRM and joint flight/cabin crew CRM</li> <li>▪ Aircraft type specific training (for the aircraft model involved in the accident)</li> <li>▪ Training specific to safety and emergency equipment</li> <li>▪ Training facilities and devices</li> </ul>	<p>To review the operator's training programs (e.g. initial and recurrent) and evaluate the content and adequacy of the following:</p> <ul style="list-style-type: none"> <li>▪ training content and crew assessment methods, focusing on:             <ul style="list-style-type: none"> <li>○ firefighting procedures</li> <li>○ smoke-removal procedures</li> <li>○ first-aid and responding to on-board medical events</li> <li>○ flight and cabin crew member incapacitation</li> <li>○ hands-on and simulated exercises on relevant safety and emergency equipment and aircraft systems, such as fire extinguisher and portable breathing equipment (specific to the aircraft model involved in the accident)</li> <li>○ simulated firefighting exercise</li> <li>○ live firefighting exercise</li> <li>○ hands-on exercise on demonstrating cardiopulmonary resuscitation</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>○ personnel files (including date of commencement)</li> <li>○ any other relevant experience</li> <li>▪ Other personnel records, if applicable</li> <li>▪ Aircraft involved:             <ul style="list-style-type: none"> <li>○ aircraft daily report</li> <li>○ cabin defect log</li> <li>○ cabin interior configuration diagram (LOPA/S)</li> <li>○ crew list and crew assignment</li> <li>○ departure report, if applicable</li> <li>○ CVR transcripts, where applicable</li> <li>○ diagram of galley(s) and stowage</li> <li>○ dispatch log</li> <li>○ flight crew flight log</li> <li>○ flight deck log book</li> <li>○ maintenance logs/release forms</li> <li>○ minimum equipment list (MEL)</li> <li>○ other crew documents (e.g. equipment checklists, crew briefing sheets)</li> <li>○ passenger manifest and seat chart</li> </ul> </li> </ul>	<p>negative manner, such as experience (based on date of hire or previous flying experience with another operator)</p> <ul style="list-style-type: none"> <li>○ factors that may affect performance such as fatigue (derived from their flying schedule prior to the accident/incident, layover rest or inflight rest)</li> <li>▪ Aircraft involved:             <ul style="list-style-type: none"> <li>○ layout of the cabin and galley(s) and any features which may have hindered firefighting (e.g. wiring inside a bulkhead)</li> <li>○ location of passengers and crew in the cabin, which may be linked to their survival/death (e.g. if seated in an area that received extensive fire damage)</li> <li>○ technical malfunctions which may have affected the performance of aircraft systems (e.g. overheating of wiring). These may be traced through maintenance or cabin defect logs</li> <li>○ MELs for inoperative items such as emergency equipment and systems that hindered firefighting</li> <li>○ discussions between flight and cabin crew regarding the emergency situation, based on CVR transcripts</li> </ul> </li> </ul>
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Type of information	Specific information	Objective of the analysis
Other	<p>Review other operator documentation and determine pertinent references to:</p> <ul style="list-style-type: none"> <li>▪ Cabin crew recruitment criteria</li> <li>▪ Operator bulletins and notices to cabin crew</li> <li>▪ Master minimum equipment list (MMEL)</li> <li>▪ Aircraft maintenance manual</li> <li>▪ Maintenance control manual</li> </ul>	<p>To review the operator’s documentation and evaluate the content and adequacy of the following:</p> <ul style="list-style-type: none"> <li>▪ Minimum qualifications required for recruitment of new cabin crew</li> <li>▪ Changes in firefighting/smoke-removal procedures (e.g. in the event of a lithium battery fire)</li> <li>▪ Safety information transmitted to cabin crew via internal operator communications (e.g. bulletins) which is required for them to carry out duties and responsibilities as per operator policies and procedures (e.g. update of procedures)</li> <li>▪ Availability of safety and emergency equipment (e.g. from MMEL)</li> <li>▪ Cabin-related information from the aircraft maintenance manual</li> <li>▪ Communication systems               <ul style="list-style-type: none"> <li>○ (PA/interphone)</li> </ul> </li> </ul>

### 3 Documentation—State aviation authority of the operator

Type of information	Specific information	Objective of the analysis
National regulations	<p>Review regulatory requirements and determine pertinent references to:</p> <ul style="list-style-type: none"> <li>▪ Number of cabin crew members on board</li> <li>▪ Number of aircraft type qualifications permitted for a cabin crew member (endorsements)</li> <li>▪ Cabin crew safety training</li> <li>▪ Safety and emergency equipment</li> </ul>	<p>To review the State’s existing regulations and evaluate the content and adequacy of the following:</p> <ul style="list-style-type: none"> <li>▪ Minimum cabin crew requirements</li> <li>▪ Number of aircraft type qualifications that a cabin crew member may hold at any one time</li> <li>▪ Regulatory requirements related to approved cabin crew safety training</li> <li>▪ Regulatory requirements for the equipment located in the cabin</li> </ul>
Oversight	<p>Review State oversight documentation of the operator involved in the accident/incident for cabin safety-related information and determine pertinent references to:</p> <ul style="list-style-type: none"> <li>▪ Approved aircraft flight manual</li> <li>▪ Approved operations manual</li> <li>▪ MMEL</li> <li>▪ Approved MEL</li> <li>▪ Approved cabin crew training manual</li> <li>▪ Last surveillance activity by the State</li> <li>▪ Cabin crew check reports</li> <li>▪ Any exemptions, deviations or policy letter to the operator</li> </ul>	<p>To review the State’s approvals and ongoing surveillance of the operator involved in the accident/incident and evaluate the following:</p> <ul style="list-style-type: none"> <li>▪ Content of the approved/accepted aircraft flight manual in relation to fire/smoke/fumes</li> <li>▪ Content of the approved/accepted operations manual in relation to: <ul style="list-style-type: none"> <li>○ firefighting</li> <li>○ smoke-removal</li> <li>○ on-board medical events</li> <li>○ flight and cabin crew member incapacitation</li> </ul> </li> <li>▪ Cabin-related equipment in the approved MEL</li> <li>▪ Content of the approved cabin crew training curriculum in relation to: <ul style="list-style-type: none"> <li>○ firefighting</li> <li>○ smoke-removal</li> <li>○ on-board medical events</li> <li>○ flight and cabin crew member incapacitation</li> </ul> </li> </ul>

		<ul style="list-style-type: none"><li>▪ Last surveillance activity by the State, including any findings related to:<ul style="list-style-type: none"><li>○ cabin-related policies and procedures</li><li>○ training</li><li>○ cabin crew qualifications and competencies</li><li>○ violations (e.g. flight and duty time violations)</li><li>○ systemic issues</li></ul></li><li>▪ Findings resulting from cabin crew check reports including:<ul style="list-style-type: none"><li>○ cabin crew performance</li><li>○ deficiencies related to aircraft cabin conditions</li><li>○ missing or inoperative safety and emergency equipment or aircraft (cabin) systems (e.g. missing PBE)</li></ul></li><li>▪ Any exemptions, deviations or policy letters issued by the State to the operator, which may be relevant to the accident/incident:<ul style="list-style-type: none"><li>○ exemption/deviation from regulatory requirements</li></ul></li></ul>
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## 4 Documentation (other sources)

Type of information	Specific information	Objective of the analysis
Aerodrome	<p>Review the documentation of the aerodrome where the accident/incident occurred, (if applicable) and determine pertinent references to:</p> <ul style="list-style-type: none"> <li>▪ Aerodrome diagram</li> <li>▪ Aerodrome operations manual</li> </ul>	<p>To evaluate the content and adequacy of the following, if applicable:</p> <ul style="list-style-type: none"> <li>▪ Aerodrome emergency plan, including procedures, responsibilities, and duties of participating organisations in order to facilitate the following points during an emergency at the aerodrome: <ul style="list-style-type: none"> <li>○ efficient rescue</li> <li>○ medical care</li> <li>○ firefighting operations</li> <li>○ aircraft rescue and firefighting</li> <li>○ date of last emergency exercise</li> </ul> </li> </ul> <p>Note: A diagram of the aerodrome may be useful when analysing the emergency response (e.g. difficulties in reaching the accident location due to the layout of runways/taxiways)</p>

Type of information	Specific information	Objective of the analysis
Medical and pathological records	<p>Review medical and pathological records and determine pertinent references to:</p> <ul style="list-style-type: none"> <li>▪ Medical reports</li> <li>▪ Autopsy reports</li> <li>▪ Toxicology reports</li> <li>▪ Cabin crew medical certification-related files, if appropriate</li> </ul>	<p>To provide factual information regarding the accident/incident:</p> <ul style="list-style-type: none"> <li>▪ Cause of occupant death or injury</li> <li>▪ Pre-existing medical conditions that may have affected the cabin crew member's performance during the accident/incident</li> <li>▪ Any specific issues related to special categories of passengers</li> </ul>
Other sources of information	<p>Collect and review any visual, audio or other recorded information from multiple sources:</p> <ul style="list-style-type: none"> <li>▪ Airport cameras</li> <li>▪ PEDs</li> <li>▪ News media reports</li> <li>▪ Social media</li> </ul>	<p>To gather any information available to assist with the investigation</p>

## 5 Aircraft—cabin specific

Type of information	Specific information	Objective of the analysis
Aircraft/cabin systems	<p>Record the presence, condition (failed or damaged, serviceable and/or worked normally), and part/serial number of the following systems, as applicable:</p> <ul style="list-style-type: none"> <li>▪ Air conditioning, ventilation and pressurisation systems</li> <li>▪ Communication systems and associated signaling panels</li> <li>▪ Lighting systems (interior, exterior and emergency lighting)</li> <li>▪ Control panels</li> <li>▪ Electrical systems (e.g. galley, IFE, in-seat, circuit breakers)</li> <li>▪ Oxygen system (cabin and flight deck)</li> <li>▪ Fire prevention system and smoke-removal</li> <li>▪ Water and waste systems</li> </ul>	<p>To evaluate if the systems were useful in managing the fire/smoke/fumes or increasing the survivability of occupants. The analysis should determine if systems worked as intended and, if not, determine the reason:</p> <ul style="list-style-type: none"> <li>▪ The use of PA/interphone to communicate with passengers and crew. If these failed, presence of back-up systems or equipment (e.g. megaphones)</li> <li>▪ The use of lighting to facilitate the location of fire/smoke/fumes. If these failed, presence and use of other equipment (e.g. torches)</li> <li>▪ Electrical systems including the position of circuit breakers (e.g. tripped)</li> <li>▪ Effectiveness of fire prevention system and/or smoke detection system in alerting occupants</li> <li>▪ The use of control panels to manage systems (e.g. to shut down the IFE). If these failed, presence of back-up systems or equipment (e.g. if systems can be overridden from the flight deck)</li> </ul>

Type of information	Specific information	Objective of the analysis
<p>Safety and emergency equipment</p>	<p>Record the presence, condition (failed or damaged, or serviceable and/or worked normally), and part/serial number of the following equipment, as applicable:</p> <ul style="list-style-type: none"> <li>▪ Portable fire extinguishers</li> <li>▪ Crash axe</li> <li>▪ Pry bar</li> <li>▪ Protective gloves</li> <li>▪ Smoke goggles</li> <li>▪ Protective breathing equipment</li> <li>▪ Torch</li> <li>▪ Megaphone</li> <li>▪ AED and associated equipment (CPR masks, shields, resuscitator bags)</li> <li>▪ First aid kit</li> <li>▪ Universal precaution kit</li> <li>▪ Medical kit</li> <li>▪ Smoke barriers</li> <li>▪ Additional equipment used</li> </ul>	<p>To evaluate the type of equipment that was available and to assess if it was useful or a hindrance in managing the fire/smoke/fumes or increased the survivability of occupants. The analysis should determine if:</p> <ul style="list-style-type: none"> <li>▪ The required equipment was available, accessible and functional</li> <li>▪ Instructions on how to use equipment were effective</li> <li>▪ Additional equipment, not found on board, that would have been helpful</li> </ul>

Type of information	Specific information	Objective of the analysis
<p>Conditions of the cabin</p>	<p>Record the presence, condition (failed or damaged or serviceable and/or worked normally), and part/serial number of the following, as applicable:</p> <ul style="list-style-type: none"> <li>▪ Exits</li> <li>▪ Floor structure and floor panels</li> <li>▪ Insulation</li> <li>▪ Ceiling and sidewall panels</li> <li>▪ PSUs including oxygen mask assemblies</li> <li>▪ Overhead bins and closets bulkheads and class dividers</li> <li>▪ Tray tables</li> <li>▪ Passenger seats, including floor fitting and seat tracks</li> <li>▪ Passenger restraints</li> <li>▪ Cabin crew seats</li> <li>▪ Cabin crew restraint systems</li> <li>▪ Galleys including restraints systems (latches, brakes)</li> <li>▪ Lavatories</li> <li>▪ Carpets</li> <li>▪ Flight deck including door</li> <li>▪ Corded devices (e.g. IFE remote controls, headsets)</li> <li>▪ Crew rest areas, if applicable</li> <li>▪ Cabin control panel(s)</li> <li>▪ Seat electronics and IFE under seat fittings</li> <li>▪ Other internal structures or monuments</li> </ul>	<ul style="list-style-type: none"> <li>▪ To evaluate the reason for failures/damage, if applicable and how this may have impacted on the survival of occupants (including injuries sustained):</li> <li>▪ Deformation/breaches in cabin structure</li> <li>▪ Evidence of thermal damage (e.g. melted components)</li> <li>▪ Evidence of burn damage (e.g. cracks, fuselage skin wrinkle, charred material)</li> <li>▪ Location of upset/damaged seats, exits, panels, etc.</li> <li>▪ Seat belts (frayed or damaged)</li> <li>▪ Signs of flame propagation on insulation materials</li> <li>▪ Damage resulting from the accident versus that which resulted from emergency response (e.g. emergency/RFF personnel removing slides during firefighting)</li> <li>▪ Corded devices retracted (stowed) or cords extended, as well as evidence of damage</li> <li>▪ Condition of crew rest areas, including damage</li> <li>▪ Condition of control panel(s) used by cabin crew including damage</li> </ul>

## 6 Human performance—cabin crew

Type of information	Specific information	Objective of the analysis
Pre-flight actions	<p>Review information on cabin crew performance in pre-flight activities prior to the fire/smoke/fumes:</p> <ul style="list-style-type: none"> <li>▪ Crew check-in process</li> <li>▪ Conducting or participating in crew briefings (including joint briefings, if applicable)</li> <li>▪ Conducting pre-flight check of safety and emergency equipment</li> </ul>	<p>To evaluate how cabin crew performed pre-flight duties and responsibilities. The analysis should determine:</p> <ul style="list-style-type: none"> <li>▪ Method for timely distribution of safety-related information and whether it was read/reviewed by the crew</li> <li>▪ If the crew members participated in a pre-flight briefing, and if so, what was the content, including firefighting and related cabin crew actions</li> <li>▪ If a pre-flight check of safety and emergency equipment was completed, as per operator procedures, and if any discrepancies were noted</li> </ul>

Type of information	Specific information	Objective of the analysis
Pre-fire/smoke/fumes actions	<p>Review information on cabin crew performance in pre-flight activities prior to the fire/smoke/fumes:</p> <ul style="list-style-type: none"> <li>▪ Detecting and eliminating fire hazards</li> </ul>	<p>To evaluate how the cabin crew performed in-flight duties and responsibilities. The analysis should determine:</p> <ul style="list-style-type: none"> <li>▪ If the crew members conducted cabin surveillance to identify/monitor potential sources of fire, and if so, which areas on board (e.g. lavatories, cargo areas if accessible from the cargo compartment during flight) and at what frequency</li> <li>▪ If fire hazard was suspected, actions taken by the crew: <ul style="list-style-type: none"> <li>○ investigating abnormal smells</li> <li>○ detecting smoke (e.g. coming from panels, due to electrical systems)</li> </ul> </li> </ul>

Type of information	Specific information	Objective of the analysis
<p>Actions during the fire/smoke/fumes</p>	<p>Review information on cabin crew performance in firefighting:</p> <ul style="list-style-type: none"> <li>▪ Cabin activities at the time the fire/smoke/fumes became apparent</li> <li>▪ Recognising/reacting to information regarding fire/smoke/fumes</li> <li>▪ Actions to locate source of fire/smoke/fumes and to identify type of fire/smoke/fumes</li> <li>▪ CRM among cabin crew and with flight crew</li> <li>▪ Operating systems (e.g. PA)</li> <li>▪ Operating firefighting and protective equipment</li> <li>▪ Difficulties encountered during the occurrence, including difficulties due to physical effects of fire/smoke/fumes</li> <li>▪ Providing instructions to passengers</li> <li>▪ Managing passengers and cabin</li> </ul>	<p>To evaluate how the cabin crew managed the firefighting. The analysis should determine:</p> <ul style="list-style-type: none"> <li>▪ Activities being undertaken in the cabin at the time the fire/smoke/fumes first became apparent</li> <li>▪ How the cabin crew became aware of the fire/smoke/fumes (e.g. passenger alerting crew members of unusual odour) and their response</li> <li>▪ How crew members attempted to locate the source of fire, including use of visual, audio and physical clues (e.g. using hands to feel if panels are hot) and what they saw (e.g. flames)</li> <li>▪ Actions taken if the location/source of fire could not be identified (hidden fire)</li> <li>▪ How CRM aspects were managed (communication, cooperation, coordination), including how tasks were assigned to cabin crew members and how they managed the workload and time constraints. This should include both positive and negative CRM aspects (e.g. miscommunications, delays in relaying information)</li> <li>▪ Description of equipment used or not used (e.g. Halon extinguisher, PBE, crash axe) and reasons for using or not</li> </ul>

		<p>using a specific piece of equipment</p> <ul style="list-style-type: none"> <li>▪ Number of extinguishers used during firefighting and their stowage location in the cabin</li> <li>▪ Description of firefighting technique (e.g. did the cabin crew aim for the base of the visible flames)</li> <li>▪ If the cabin crew had difficulties operating systems or equipment (e.g. PA, PBE, removing fire extinguisher from brackets), the analysis should focus on the possible reasons</li> <li>▪ If the cabin crew experienced physical effects (e.g. irritated eyes, coughing) during the occurrence and how these impacted on performance (e.g. difficulty seeing in dense smoke)</li> <li>▪ If instructions were given to passengers to minimise the effects of fire/smoke/fumes (e.g. instructing them to breathe into cloths) and by whom</li> <li>▪ If ABPs were requested by the crew and what instructions were provided</li> <li>▪ How cabin crew managed passengers and cabin (e.g. relocating passengers and flammable equipment such as oxygen bottles from the vicinity of the fire)</li> </ul>
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Type of information	Specific information	Objective of the analysis
<p>Post fire/smoke/fumes actions</p>	<p>Review information on cabin crew performance in managing the situation after the fire was extinguished or smoke/fumes dissipated:</p> <ul style="list-style-type: none"> <li>▪ Performing post-firefighting duties</li> <li>▪ Managing crew/passenger injuries</li> <li>▪ Performing landing duties, if a diversion is necessary</li> </ul>	<p>To evaluate how the cabin crew managed the post fire/smoke/fumes situation, until such time as the aircraft landed and emergency services took over. The analysis should determine:</p> <ul style="list-style-type: none"> <li>▪ If cabin crew performed post-firefighting duties, such as monitoring area for re-ignition/reappearance and maintaining continued communication with flight crew, other cabin crew members and passengers</li> <li>▪ If they applied procedures for managing on-board medical events, such as administered first-aid to injured passengers and/or seeking medical assistance from an on-board volunteer health professional</li> <li>▪ If they applied crew member incapacitation procedures (including those specific to single cabin crew member operations). The analysis should focus on actions taken to respond to incapacitated crew members who could not continue their duties (e.g. reassigning cabin crew stations so that all exits are staff for landing)</li> <li>▪ If the cabin crew had difficulties operating systems or equipment (e.g. FAK, AED) the analysis should focus on the possible reasons</li> </ul>

## 7 Human performance—passengers

Type of information	Specific information	Objective of the analysis
Pre-fire/smoke/fumes actions	Review information on passenger action/response prior to the fire/smoke/fumes: <ul style="list-style-type: none"> <li>▪ Detecting fire hazards</li> </ul>	To evaluate how passengers recognised and responded to the potential signs of fire/smoke/fumes. The analysis should determine: <ul style="list-style-type: none"> <li>▪ If passengers noticed unusual odours, other signs of a fire hazard (haze, smoke) whether this information was relayed to crew members and how (including details of information transmitted to crew members)</li> </ul>

Type of information	Specific information	Objective of the analysis
<p>Actions during the fire/smoke/fumes</p>	<p>Review information on passenger recognition and response to fire/smoke/fumes:</p> <ul style="list-style-type: none"> <li>▪ Recognising the situation</li> <li>▪ Information given to passengers</li> <li>▪ Instructions given to passengers</li> <li>▪ Reacting to the information/instructions</li> <li>▪ Other passengers' reactions</li> </ul>	<p>To evaluate how the passengers recognised and responded to the fire/smoke/fumes. The analysis should determine:</p> <ul style="list-style-type: none"> <li>▪ If/how the passengers became aware of the fire/smoke/fumes (e.g. PA from the flight crew, visible signs in the cabin), including any physical effects (e.g. irritated eyes, coughing)</li> <li>▪ How passengers understood and responded to the information given by the crew regarding the situation (e.g. breathing into a cloth)</li> <li>▪ How passengers understood and responded to the instructions given by the crew (e.g. relocating seats)</li> <li>▪ If passengers noticed other passenger reactions (e.g. passengers in panic)</li> </ul>

Type of information	Specific information	Objective of the analysis
<p>Post-fire/smoke/fumes actions</p>	<p>Review information on passenger performance after the fire/smoke/fumes:</p> <ul style="list-style-type: none"> <li>▪ Communicating with cabin crew</li> <li>▪ Interacting with other passengers/crew</li> <li>▪ Information given to passengers</li> <li>▪ Instructions given to passengers</li> <li>▪ Reacting to the information/instructions</li> </ul>	<p>To evaluate how passengers reacted following the fire/smoke/fumes. The analysis should determine:</p> <ul style="list-style-type: none"> <li>▪ If passengers requested assistance due to injuries or communicated information to cabin crew about conditions in the cabin (e.g. notifying crew of damage or reappearance of odours) and the crew's response</li> <li>▪ If other passengers or crew members were injured around them and how they reacted (e.g. assisted others)</li> <li>▪ How passengers understood and responded to the information given by the crew regarding the situation (e.g. an emergency landing was needed)</li> <li>▪ How passengers understood and responded to the instructions given by the crew (e.g. instructing passengers to prepared for an emergency landing)</li> </ul>