

# Cabin Safety Investigation Guidelines



# ISASI

"Air Safety through Investigation"

## **CABIN SAFETY INVESTIGATION GUIDELINES**

The Cabin Safety Investigation Guidelines were developed by the ISASI Cabin Safety Working Group and reviewed in collaboration with the ICAO Cabin Safety Group. The purpose of the ISASI Working Group is to promote a high standard of safety through incident and accident investigation.

The guidelines can provide Air Safety 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 flight attendant and passenger interviews. The guidelines are adaptable to any type of occurrence whether it is a turbulence incident, an evacuation with fire and smoke, or an event that involves water contact. The guidelines are easily adaptable to those operations without cabin attendants.

The information collected can be used in conjunction with information gathered by other groups (medical, human factors, operations, ARFF) to determine causes of injuries and to develop recommendations or strategies to minimize injury in future accidents or incidents. Information collected during cabin safety investigations can be used in the areas of education, research, safety promotion and accident and injury prevention. Comprehensive reports and the global exchange of cabin safety information can only enhance flight safety worldwide.

## **DOCUMENTING THE CABIN**

### **1. DOCUMENT AND REPORT THE FOLLOWING INFORMATION**

#### **1.1 General information**

- a) Name of operator and aircraft type/model.
- b) Location, date, and time, of occurrence.
- c) Weather conditions.
- d) List of cabin crewmembers.
- e) Passenger manifest with names and seat assignments of occupants [including lap-held infants].
- f) Cabin crewmember manual [used to determine emergency procedures, cabin layout, and emergency equipment location].
- g) Cabin crewmembers training records [initial, transition, and recurrent].
- h) Safety briefing card.
- i) Engineering drawing of interior that depicts seat layout, seat pitch, galleys, lavatories and emergency exits.

#### **1.2 Damage to cabin interior**

Document overall condition of cabin (e.g. intact, broken apart, fire damaged) and location of debris such as galley equipment, seats, luggage, and areas with indication of fire or smoke damage. Use photographs to supplement written report.

#### **1.3 Cabin crew and passenger seats**

- a) Manufacturer, model No., serial No., date of manufacture and rated loads.
- b) Evidence of impact/damage.
- c) Description of the integrity of tie-downs and rails.
- d) Measurements and description of the deformation/separation of seats and tie-downs.
- e) Note location and damage of child restraint systems [CRS], seat loaded cargo, stretchers, and bassinets.

#### **1.4 Seat belts and shoulder harnesses**

- a) Note seat belt manufacturer, model No., serial No., date of manufacture and rated loads.
- b) Note condition of seatbelts and seat belt extensions [e.g. damaged, detached, intact, cut].

#### **1.5 Stowage compartments**

- a) Describe damage to storage areas, such as overhead bins, closets, and compartments.
- b) Note condition of latching mechanisms for storage areas.

#### **1.6 Carry-on luggage**

- a) Note location of carry-on luggage found in cabin [e.g. overhead bins, under seat storage, closets, piled near exits].

#### **1.7 Communication**

- a) Conduct functional check of the P A system.
- b) Conduct functional check of the interphone system.
- c) Describe the positions of switches for emergency evacuation alarm systems [cockpit and cabin].

- d) Describe the positions of switches for the emergency lighting systems [cockpit and cabin].
- e) Describe the content of the pre-departure safety briefing and how the information is conveyed to passengers [P A system, recording, or video demonstration].
- f) Describe the content of the pre-departure briefing given to any special categories of passengers.
- g) In what language was the briefing conducted?
- h) Describe the airline's procedures for exit row briefing.

## 1.8 Exits

- a) Describe the location of all exits [cockpit and cabin]. Were they open or closed?
- b) Describe the location of emergency exit hatches/windows.
- c) Describe the deployment of ropes, tapes or inertia reels.
- d) Describe the damage to exit and surrounding fuselage.
- e) Describe the position of arm/disarm lever or girt bar.
- f) Describe the position of exit opening handle.
- g) Describe the condition of power-assist device [record pressure, if appropriate].
- h) Describe the assist space available at exit.
- i) Measure the height of the exit sills above the terrain if the aircraft has an unusual attitude.

## 1.9 Evacuation slides and/or slide-rafts

- a) Record the position of the device [deployed, stowed, inflated, deflated, removed from aircraft].
- b) Record the name of manufacturer, date of manufacture, model No., serial No., Technical Standard Order [TSO] No., and date of last overhaul.
- c) Describe any damage to the slide.
- d) Describe the condition of the exit stairs if no slide attached.

## 1.10 Emergency equipment

Using a cabin attendant manual as a guide, document the location and condition of emergency equipment in the cabin.

- a) Flashlights
- b) Megaphones
- c) Fire extinguishers
- d) Protective breathing equipment [PBE]
- e) Crash axe/pry bar
- f) Smoke barriers
- g) Smoke detectors
- h) Protective gloves
- i) Portable oxygen bottles
- j) First aid kits
- k) Medical kits
- l) Defibrillator
- m) Emergency locator transmitters [ELT]
- n) Lavatory waste bin automatic extinguishers
- o) Emergency lights
- p) Any other equipment installed for use in an emergency

## 1.11 Accidents involving water contact

In addition to information above, document the condition and location of:

- a) Life rafts or slide/rafts
- b) Life vests [adult and infant]
- c) Emergency locator transmitters [ELT]
- d) Water conditions at time of accident [wave height, swell height, and temperature]

- e) Survival kits

## **CABIN CREW MEMBER AND PASSENGER INTERVIEWS**

### **1. NARRATIVE**

The aim of the interview is not to apportion blame; it is to find out what happened in order to enhance cabin safety and survivability. The interviewer should give each person an opportunity to describe in his/her own words, without interruption or coercion, what happened to him/her (i.e. a narrative). After the narrative is completed, the interviewer should ask follow-up questions to determine additional information as required. An aircraft diagram (with seat rows, exits, galleys, and lavatories) is a useful tool to orient a person during an interview.

### **2. CABIN CREW MEMBER INTERVIEW**

#### **2.1 General information**

- a) Name, business address, business email and business phone number.
- b) Gender, age, height, and weight.
- d) Experience as a cabin crew member (in years) with current operator and previous operator.
- e) Work category - cabin crew member, in-charge cabin crew member [I/C], etc.
- f) Number of different aircraft models and series that the cabin crew member is qualified on.
- g) Any other special qualifications or roles [e.g. cabin crew instructor, union safety representative, etc.].
- c) Operational experience on the accident aircraft model in hours or years, including the last time that the crew member operated the accident aircraft model.
- h) Any previous accident/incident investigation experience.
- i) Nationalities of the crew members and working language amongst the crew, including mother tongue of the individual crew member.
- j) Medical history including any being taken at the time of the occurrence.
- k) Current medical condition and medication taken at time of the interview.
- l) Flight and duty schedule for the 7-day period preceding the occurrence.
- m) Sleep/wake cycle for the 7-day period preceding the occurrence.
- n) Food and beverage consumed during the 24-hour period preceding the occurrence.
- o) Commute time to airport, mode of travel, and time at base before check-in.
- p) Conditions during the commute.
- q) Any injuries sustained as a result of the occurrence. Describe the injuries. When and how were you injured? Have you received medical attention?
- r) Did you complete an occurrence report?

#### **2.2 Pre-flight / in-flight activities**

- a) Describe the pre-flight cabin crew briefing. What was covered? Was the entire crew present? Who conducted the briefing? Where was the briefing conducted? Were there any difficulties in understanding the briefing? Did you obtain the information you needed?
- b) Describe any briefing conducted by the pilot-in-command [PIC]; and to whom? If the PIC briefing was with the I/C only, was the information passed on to the rest of the cabin crew?
- c) Were you aware of any unserviceable cabin system[s] at the beginning of, or during the flight? Was that information relayed to the entire crew?
- d) Were pre-flight safety and security checks conducted and if so was a checklist or the operations manual used? Were there any abnormalities found?
- e) Describe observations of, or interaction with, passenger agents, aircraft maintenance technicians, ground service personnel, in bound crew members, other cabin crew, and/or flight crew that may be pertinent to the investigation.
- f) Describe the location of special categories of passengers, including passengers with disabilities.
- g) Describe the location of infants and how they were restrained.
- h) Describe the location and use of child restraint systems, if any.
- i) Describe the passenger safety briefing. Was it a video or a 'live' briefing? Were there any issues during the briefing? Were passengers attentive to the briefing? Were they able to understand the briefing?
- j) Describe any briefing provided to emergency exit row passengers. Were passengers attentive to the briefing?
- k) Were the passengers willing and qualified to sit in an emergency exit row? Was there a need to relocate anyone?
- l) Describe the briefing given to special categories of passengers. Were the passengers attentive to the briefing?
- m) Describe the amount and stowage of carry-on baggage. Were you able to accommodate all of the baggage that came on board in an approved stowage location?
- n) Describe your pre-departure cabin activities. Was the workload appropriate for the numbers of crew members in the cabin?
- o) Was alcohol served before/during the flight? If yes, was there anyone who appeared to be intoxicated/impaired?
- p) Did you hear the command to arm your emergency exit[s] for departure? Did you arm your own exit? Was your exit armed in accordance with the operator's procedures?
- q) Describe your final cabin safety checks. Were the passengers compliant?
- r) What was your emergency station for take-off and landing and was it in the same cabin as your work station?
- s) Were you seated for take-off and landing? If not, why not?
- t) Where were you seated for take-off and landing? Please describe your seat [e.g. cabin crew seat/jump seat, passenger seat, single or double crew station, forward or aft-facing seat].
- u) Describe the type of seat restraint system used at your cabin crew seat. How did you secure it? Was it effective?

### 2.3 Occurrence information

- a) Describe if and how you became aware or were informed of a problem. If briefed by the captain, what information were you given? If briefed by another crew member, what information were you given?
- b) Describe your location during the occurrence notification and what you were doing.
- c) Describe if and how the passengers were informed of a problem? What was their reaction?
- d) Describe the pre-occurrence preparations [i.e. type of warning, cabin preparation].
- e) Were the passengers attentive or were there any distractions?
- f) Did you use any able bodied passengers [ABPs]? Explain.
- g) Describe the occurrence.
- h) Describe the crash sequence.
- i) Did the flight crew give the “brace for impact” command and was it in accordance with the operator’s procedures? What language was it given in? Was it interpreted into other languages? Did the passengers understand the command?
- j) Describe the brace commands you used, if any.
- k) Describe the passenger reaction to the brace commands.
- l) Describe the passengers' brace position.
- m) Describe your brace position.
- n) Describe the condition of cabin furnishings in your area [e.g. curtains, bulkheads, galley compartments, overhead bins]. Did they remain secured after impact?
- o) Describe any difficulties you may have had with your seat belt/shoulder harness.
- p) Did your cabin crew seat operate as required?
- q) Describe any safety or emergency equipment you used. Why and how did you use it? Was it effective? Were you able to locate and access it easily?
- r) Describe your view of the cabin. If your view was obstructed, please explain.
- s) Describe the conditions of the cabin.
- t) Describe conditions of the galley and around the exits.

## 2.4 Training

- a) Describe your initial and recurrent safety training. Was it computer-based or in a classroom? How much time was provided for practical training?
- b) Where and when was your initial and recurrent safety training conducted?
- c) When was your last simulated exercise of an aircraft evacuation? Describe the simulated exercise. How often is the simulated exercise conducted?

- d) When was your last hands-on exercise on exit operation and assisting evacuation means for the accident aircraft model? Describe the hands-on exercise. How often is the hands-on exercise conducted?
- e) Describe your firefighting training.
- f) Describe your initial and recurrent ditching training.
- g) Did you participate in a wet drill for water survival? Describe the exercise. Do operator policies require you to know how to swim?
- h) Describe your practical training with respect to the use of safety and emergency equipment. Are the training devices representative of the actual equipment found on board the aircraft in the fleet?
- i) Describe your first-aid training or any other pertinent training?
- j) Did you participate in crew resource management {CRM} training with flight crew members or other staff from your operator? Explain.
- k) Do you have on-the-job training in your operator and was it helpful? Explain.
- l) Do you feel that your training was realistic? Explain (e.g. emergency equipment, simulated exercises).
- m) Did your training prepare you for what happened? Explain.
- n) Did you feel confident in your abilities? Explain.

## **2.5 Information to document in specific types of occurrences**

### **2.5.1 Evacuation**

- a) How did you decide to evacuate?
  - 1) Captain's order?
  - 2) Personal judgment?
  - 3) Another cabin crew member?
  - 4) Announcement made via the public address [PA] system?
  - 5) Firefighter's order?
  - 6) Passenger action?
  - 7) Was the evacuation alarm /signalling system activated? Who activated it?
- b) Did you clearly understand the order to evacuate?
- c) Describe the evacuation.
- d) Which exit[s] did you open?
- e) Were any exits opened by passengers? Explain.
- f) What was your assigned exit[s]?
- g) If you did not open an exit, explain why.
- h) Did you have a direct view of your primary/secondary exits from your cabin crew seat?



- i) Did you assess the conditions? How? Were there any difficulties assessing outside conditions?
- j) Describe opening the exit[s]. Did it remain usable throughout the evacuation? Describe any exit blocking or re-directing actions you might have taken and why.
- k) Describe the deployment and inflation of the slide[s]. Were there any difficulties? If yes, describe.
- l) Did the emergency lights operate? Which emergency lights did you observe?
- m) Describe the illumination inside and outside the aircraft.
- n) Describe the reactions of other crew members during the evacuation.
- o) Describe passenger reactions during the evacuation [calm, panic, etc.].
- p) Did the passengers attempt to take carry-on baggage during the evacuation? If yes, how did you react? Describe the effect on the evacuation.
- q) Did you have passenger assistance at your exit? How did passengers assist?
- r) Describe any problems with the passengers during the evacuation.
- s) Describe any difficulties with special categories of passengers.
- t) Approximately how long did the evacuation take? What is the estimate based on? [Note: time estimates are unreliable if the estimate cannot be verified by empirical data].
- u) Describe the cabin or flight deck search.
- v) Did you see other cabin crew members evacuate the aircraft? Which exits did they use?
- w) Did you take emergency equipment with you? Which equipment? How was it used? Was it easy to access?
- x) Describe the flight crew's activities inside and outside the aircraft.
- y) Describe the effectiveness of the rescue and firefighting activities.
- z) Describe your clothing [i.e. uniform]. Was it suitable for the evacuation? Explain.

### **2.5.2 Turbulence**

- a) Describe any information you received regarding potential weather enroute. Was it communicated to the entire crew?
- b) What are your operator's procedures in the event of anticipated and unanticipated turbulence encounters? Describe your operator's procedures for communication or established advisory signal amongst crew members and with passengers in the event of anticipated and unanticipated turbulence. Were you able to apply them and were they effective?
- c) Describe the crew communication procedure used in this occurrence. Was it in accordance with operator's procedures?

- d) Were you warned before you experienced the turbulence encounter? How?
- e) Was the seat belt sign illuminated? If yes, for how long?
- f) Were passengers seated when the seat belt sign was illuminated?
- g) Were passengers properly restrained, including infants?
- h) Were there any unrestrained personal items and did they cause a problem [e.g. portable electronic devices, cabin baggage, service items]?
- i) Were you seated at your assigned cabin crew seat? If so, were you properly restrained?
- j) If you were not in your assigned cabin crew seat, where were you? Were you able to properly restrain yourself?
- k) Where were you when the turbulence occurred? Describe what actions were taken.
- l) What announcements were made regarding turbulence? Were passengers instructed to remain seated? When were the announcements made? Were any shouted commands used?
- m) Were there any carts or other service equipment in the cabin at the time of the turbulence encounter?
- n) Describe what you did with the service equipment during or after the turbulence encounter?
- o) Were you injured? Describe your injuries.
- p) Were you able to assist others following the turbulence encounter?
- q) Describe injuries that you observed in other crew members or passengers. Did you administer first-aid?
- r) Describe the condition of the cabin and the galleys after the occurrence.
- s) Does your operator have post-turbulence procedures and if so did you use them? Explain.

### **2.5.3 Fire/smoke/fumes**

- a) When and how did you become aware of fire, smoke, and/or fumes?
- b) Where did you first observe fire, smoke, and/or fumes? Describe what you saw and/or smelled (colour, density, and odour).
- c) Where were you when you first became aware of fire, smoke, and/or fumes?
- d) What role did you play, if any, during the firefighting?
- e) Did the conditions [e.g. amount/density of smoke] increase, decrease or change during the occurrence?
- f) Did you have difficulty breathing? Did you use portable breathing equipment [PBE] or other protection?

- g) Did you have problems communicating with other crew members or passengers? If yes, describe the problems.
- h) Describe any communication with the flight crew.
- i) Which fire fighting equipment did you use, if any? Describe the actions taken to fight the fire.
- j) Describe any actions taken to assist the passengers [e.g. distribution of wet cloths, relocation of passengers, and equipment such as oxygen bottles, which may fuel the fire, etc.].
- k) Did any passengers or crew require first-aid?
- l) Did you receive training on fighting a lithium battery fire? Was it effective? Explain.
- m) Did any passengers assist in the firefighting? Explain.

#### **2.5.4 Ditching or inadvertent water contact**

- a) Were you advised to prepare for a ditching?
- b) Were there any problems deploying, inflating, boarding, or disconnecting the slide-rafts or life-rafts?
- c) Did you move a slide-raft or life-raft from one location to another? Describe any difficulties.
- d) What type of personal flotation device did you use? From where did you obtain it? Did you have any problems obtaining it or using it?
- e) What personal flotation devices did passengers use?
- f) Did passengers have any problems obtaining or donning life jackets [adults/infants/children]?
- g) Did any of the passengers inflate their life jackets inside the aircraft?
- h) Who commanded the slide-raft or life-raft that you boarded? Were there other crew members in that raft?
- i) Describe the rescue operation.
- j) Describe the sea survival procedures used.
- k) Did you retrieve any emergency equipment? If yes, from where?
- l) Was the emergency locator transmitter [ELT] used?
- m) Did you take the survival kit with you?

#### **2.6 Additional Comments**

- a) Based on your experience, can you suggest any improvements to passenger safety briefings, procedures, training, or equipment?
- b) Do you have any further information that you think may assist in the investigation of this occurrence?

### **3. PASSENGER INTERVIEW**

### **3.1 Personal data**

- a) Name, gender, age, height, and weight.
- b) Address.
- c) Phone number.
- d) Email.
- e) Occupation.
- f) Seat number and location.
- g) Travelling alone or with relatives, friends, business associates, etc.
- h) Special categories of passengers [e.g. infants, persons with mobility impairments, etc.].
- i) Any disability that could impair egress from the aircraft.
- j) Aviation experience.
- k) Any additional skills that were used during the occurrence.
- l) Previous accident experience.
- m) Languages spoken.
- n) Were you injured? Describe your injuries. When and how were you injured?
- o) Did you receive medical attention?

### **3.2 Pre-flight preparations**

- a) Describe the weight, size and stowage location of your carry-on baggage.
- b) Describe the clothing and footwear that you were wearing when the accident occurred.
- c) Was there a pre-flight safety briefing? How was it provided [i.e. pilot, cabin crew member, video or other means]? What information do you recall? Did you understand the safety briefing? Was it helpful?
- d) Did you read the passenger safety briefing card? Did you understand the information on the passenger safety briefing card? What information do you recall?
- e) Did you note the locations of more than one exit near your seat?
- f) Were you seated adjacent to an emergency exit?
- g) Were you briefed prior to departure on the operation of the emergency exit? If yes, by whom?
- h) Describe any observations of maintenance, ground service personnel [e.g. de-icing the aircraft], or flight crew that might be pertinent to the investigation.

### **3.3 Occurrence information**

- a) How and when did you first become aware of a problem? Where were you when you first became aware of a problem?
- b) How did the crew prepare you for the emergency? Were you given instructions over the PA system? By an individual crew member? Shouted instructions?
- c) Did you hear any shouted commands? If yes, what did you hear? Did the information help you?
- d) Did you brace for impact? Describe your brace position.
- e) Were you traveling with infants or other special categories of passengers? How were they restrained? Were there any problems?
- f) How tightly was your seat belt fastened? Did you have any problems releasing your seat belt? If yes, describe.
- g) Did you remove your shoes? Why? If you did not remove them, did they stay on during the impact and evacuation?
- h) Describe the impact sequence. What happened to you during the impact sequence?
- i) Did anything happen to your seat during impact?
- j) Did you remain seated until the aircraft stopped?
- k) Did you encounter any difficulties? Explain.

### **3.4 Information to document in specific types of occurrences**

#### **3.4.1 Evacuation**

- a) How did you know when to evacuate? Were any commands clear and audible?
- b) Describe the conditions in the cabin prior to and during the evacuation.
- c) Describe the actions of the cabin crew during the occurrence.
- d) Which exit did you use? Why?
- e) Did you encounter problems reaching the exit? If yes, describe.
- f) Did you attempt to take anything with you when you left the aircraft? If yes, what did you take?
- g) Did you assist anyone during the evacuation?
- h) Did anyone assist you?
- i) Were you responsible to evacuate with an infant, child, or any other passenger needing assistance?
- j) Did you open an exit? If so, which one? Did you experience difficulty operating or using the exit? If you opened an overwing exit what did you do with the hatch?
- k) What actions did you take after you opened the exit?
- l) Did you notice any lights illuminated in the cabin? Where?

- m) Approximately how long did it take you to evacuate the aircraft? What is your estimate based on?
- n) What did you see when you got out of the aircraft?
- o) Did help arrive quickly? Describe the rescue efforts.
- p) Did a rescuer assist you? How?
- q) Did you sustain an injury? If yes, please describe your injury and, if known, its cause.

#### **3.4.2 Turbulence**

- a) Where were you when the turbulence occurred?
- b) Was your seat belt fastened? If not, why not?
- c) Was the seat belt sign illuminated?
- d) Did you observe the crew checking seat belts?
- e) Did you hear any announcement regarding seat belts? If yes, describe what you heard.
- f) Who do you think made the announcement[s]? Flight crew and/or cabin crew member[s]?
- g) Were you injured? If yes, describe your injuries. Were you given first-aid by a cabin crew member or passenger?
- h) If you were traveling with an infant, child, or any other passenger needing assistance, what happened to that [those] passenger[s]? How were they restrained?

#### **3.4.3 Fire/smoke/fumes**

- a) When and how did you become aware of fire, smoke, and/or fumes?
- b) Where did you first observe fire, smoke, and/or fumes? Describe what you saw and/or smelled [colour, density, and odour].
- c) Where were you when you first became aware of fire, smoke, and/or fumes?
- d) Did the conditions [e.g. amount/density of smoke] increase, decrease or change during the occurrence?
- e) Did you have difficulty breathing? If yes, what action did you take to protect yourself?
- f) If you were traveling with an infant, child, or any other passenger needing assistance, what happened to that [those] passenger[s]? Did you do anything to protect them from smoke/fumes?
- g) Did you observe firefighting procedures? Describe.

#### **3.4.4 Ditching or inadvertent water contact**

- a) What types of flotation devices were available?
- b) Was the information contained in the passenger safety briefing card and in the safety demonstration useful? Explain.

- c) Did you obtain a life jacket?
  - 1) Where was it stored?
  - 2) Did you have a problem retrieving, opening the pouch or donning the life jacket?
  - 3) Did you put it on?
  - 4) When did you inflate it?
  - 5) Did it work properly?
  - 6) If you were travelling with an infant, was an infant life jacket/infant survival cot provided for the infant?
- d) Did you use the seat bottom cushion as a flotation device? Describe how the cushion was used and its effectiveness.
- e) Were you responsible to evacuate with an infant, child, or any other passenger needing assistance?
- f) Did you board a life-raft or slide-raft? Were there any difficulties?
- g) Describe the type of raft you boarded.
- h) What equipment in the life-raft or slide-raft was used?
- i) How many people were in the raft?
- j) Describe the water conditions.
- k) Describe the weather conditions.
- l) Describe any sea survival procedures that were used.
- m) Describe the rescue effort.

### **3.5 Additional comments**

- a) Based on your experience, can you suggest any improvements to passenger briefings, procedures, cabin crew training or equipment?
- b) Do you have any further information that you think may assist in the investigation of this occurrence?
- c) Did you fully understand information provided to you [e.g. language]? If not, describe.

— END —