

# Cabin Safety Investigation Guidelines



# ISASI

**“Air Safety through Investigation”**

International Society of Air Safety Investigators

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## CABIN SAFETY INVESTIGATION GUIDELINES

The attached Cabin Safety guideline was developed by the ISASI Cabin Safety Working Group. The purpose of the working group is to promote a high standard of safety through incident and accident investigation.

The guideline 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 guideline is 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 guideline is 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 cause 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.

DOCUMENT AND REPORT THE FOLLOWING INFORMATION:

### **GENERAL INFORMATION**

- Name of operator and aircraft type/model.
- Location, date, and time, of occurrence.
- Weather conditions.
- List of cabin crewmembers.
- Passenger manifest with names and seat assignments of occupants (including lap-held infants).
- Cabin crewmember manual (used to determine emergency procedures, cabin layout, and emergency equipment location.)
- Cabin crewmembers training records (initial, transition, and recurrent).
- Safety briefing card.
- Engineering drawing of interior that depicts seat layout, seat pitch, galleys, lavatories and emergency exit(s).

### **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.

### **CABIN ATTENDANT AND PASSENGER SEATS**

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

### **SEAT BELTS AND SHOULDER HARNESSSES**

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

### **STOWAGE COMPARTMENTS**

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

### **CARRY-ON LUGGAGE**

- Note location of carry-on luggage found in cabin (e.g. overhead bins, underseat storage, closets, piled near exits)

### **COMMUNICATION**

- Conduct functional check of the PA system
- Conduct functional check of the interphone system
- Describe the positions of switches for emergency evacuation alarm systems (cockpit and cabin)
- Describe the positions of switches for the emergency lighting systems (cockpit and cabin)
- Describe the content of the pre-departure safety briefing and how the information is conveyed to passengers (PA system, recording, or video demonstration)
  - In what language(s) was the briefing conducted?
- Describe the airline's procedures for exit row briefing.

## **EXITS**

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

## **EVACUATION SLIDES and/or SLIDE/RAFTS**

- Record the position of the device (deployed, stowed, inflated, deflated, removed from aircraft).
- Record the name of manufacturer, date of manufacture, model No., serial No., Technical Standard Order (TSO) No., and date of last overhaul.
- Describe any damage to the slide

## **EMERGENCY EQUIPMENT**

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

- Flashlights;
- Megaphones;
- Fire extinguishers;
- Protective breathing equipment (PBE);
- Crash axe/pry bar;
- Portable oxygen bottles;
- First aid kits;
- Medical kits;
- Defibrillator;
- Emergency locator transmitters (ELT);
- Protective gloves;
- Smoke barriers;
- Smoke detectors;
- Lavatory waste bin automatic extinguishers; and
- Emergency lights;

## **ACCIDENTS INVOLVING WATER CONTACT**

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

- Life rafts or slide/rafts;
- Life vests;
- ELT;
- Water conditions at time of accident (wave height, swell height, and temperature);
- Survival kits.

## **INTERVIEWS**

Each person should be given an opportunity to describe (without interruption) what happened to him or her. Follow-up questions should be asked 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.

### **CABIN CREWMEMBER**

#### **General information**

- Name, business address, and phone number.
- Gender, age, height, and weight.
- Operational experience on the accident aircraft type in hours or years.
- Work category-cabin crewmember, purser, lead crewmember, etc.
- Number of different aircraft types/models that cabin crewmember is qualified on.
- Medical history and medication taken at the time of the event.
- Current medical condition and medication taken at time of the interview
- Experience as a cabin crewmember (in years) with current carrier/previous carrier.
- Flight and duty schedule 72 hrs prior to the event.
- Food and beverages consumed during the 24-hrs period before the occurrence.
- Sleep/wake cycle for the 7 day period before the occurrence.
- Commute time to airport.
- Were you injured? Describe your injuries. When and how were you injured?

#### **Pre-flight / In-flight activities**

- Describe the pre-flight crew briefing. What was covered? Who was present? Who conducted the briefing?
- Describe any cabin system(s) that was unserviceable at the beginning of, or during, the flight?
- Describe observations of, or interaction with, maintenance, ground service personnel, and flight crew that may be pertinent to the investigation.
- Describe the location of passengers with special needs/children travelling alone.
- Describe the location of infant/child restraint system(s).
- Describe the location of passengers with disabilities.
- Describe the passenger safety briefing. Were passengers attentive to the briefing?
- Describe the amount and stowage of carry-on baggage.
- Describe your pre-departure cabin activities.
- Was alcohol served before/during the flight? If yes, approximately how many drinks did you serve?
- When did you prepare your emergency exit(s) for departure?
- Where were you seated for take-off and landing?
- Describe the type of seat restraint system used at your jumpseat.

#### **Occurrence Information**

- Describe if and how you were informed of a problem. If briefed by the captain, what information were you given? If briefed by another crewmember, what information were you given?
- Describe your location during occurrence.
- Describe if and how the passengers were informed of a problem? What was their reaction?
- Describe the pre-occurrence preparations (i.e. type of warning, cabin preparation).
- Describe the occurrence.

- Describe the impact.
- Describe the emergency commands you used, if any.
- Describe the passenger reaction to your commands.
- Describe the passengers' brace positions.
- Describe your brace position.
- Describe the security of cabin furnishings in your area.
- Describe any difficulties you may have had with your seat/seatbelt/shoulder harness.
- Describe any safety or emergency equipment you used: Why and how did you use it? Was it effective?
- Describe your view of the cabin. If your view was obstructed, please explain.

### **Evacuation**

- How did you decide to evacuate?
  - Captain's order?
  - Personal judgement?
  - Evacuation alarm?
  - PA announcement?
  - Firefighter's order?
- Describe the evacuation.
- Which exit(s) did you open?
- What was your assigned exit(s)?
- If you did not open an exit, explain why.
- Did you have a direct view of your primary/secondary exits from your jumpseat?
- Did you assess the conditions? How?
- Were there any difficulties assessing outside conditions? Opening the exit? Deploying or inflating the evacuation slide? If yes, please describe.
- Did the emergency lights operate? Which emergency lights did you observe?
- Describe the illumination inside/outside the aircraft.
- Describe passenger reactions during the evacuation (calm, panic, etc.).
- Did the passengers attempt to take carry-on baggage during the evacuation?
- Did you have passenger assistance at your exit? How did passenger assist?
- Describe any problems with the passengers during the evacuation.
- Describe any difficulties with passengers with special needs or children travelling alone.
- Approximately how long did the evacuation take? What is the estimate based on? (Note: time estimates are unreliable if the estimate can not be verified by empirical data)
- Did you see other cabin crewmembers evacuate the aircraft? Which exits did they use?
- Did you take emergency equipment with you? Which equipment? How was it used?
- Describe the flight deck crew activities outside the aircraft.
- Describe the rescue/fire fighting activities.
- Were you injured? Describe your injuries and how they were sustained.
- Were you transported to a hospital or medical facility?
- Approximately how long did the rescue efforts take?
- Describe your clothing and its suitability for the evacuation.

### **Training**

- Describe your initial and annual emergency/safety training.
- Did your training include basic instructions in aerodynamics and aircraft performance?
- When was your last evacuation drill? Describe the drill. How often is the drill conducted?
- When was your last door drill? Describe the drill. How often is the drill conducted?
- Describe your fire fighting training.
- Describe your initial and annual ditching training.
- Do you participate in a wet ditching drill? Describe the drill .

- Describe your practical training with respect to the use of emergency/safety equipment.
- Did you participate in crew resource management training with pilots or other members of your company? Explain.
- Did your training prepare you for what happened?

**Additional Comments**

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

**IF THE EVENT INVOLVED THE FOLLOWING CONDITIONS, DOCUMENT THE FOLLOWING INFORMATION:**

**Turbulence**

- Describe your company's crew communication procedures for turbulence.
- Describe the crew communication procedure used in this event.
- Were you warned before you experienced the turbulence? How?
- Was the seatbelt sign on? If yes, for how long?
- Were passengers seated when the seat belt sign was on?
- Were you seated at your cabin crewmember assigned seat? If you were not seated, why not?
- Where were you when the turbulence occurred?
- What announcements were made regarding the turbulence? Were passengers instructed to remain seated? When were the announcements made?
- Were there problems with stowing equipment before or after the turbulence event?
- Were you injured? Describe your injuries. Were you able to assist others following the turbulence?
- Describe injuries that you observed in other crewmembers or passengers.

**Smoke/Fire/Fumes**

- When did you become aware of smoke, fire, or fumes?
- Where did you first observe smoke or fire? Describe what you saw and/or smelled (color, density, and odor).
- Where were you when you first became aware of fumes?
- Did the conditions increase, decrease or change during the occurrence?
- Did you have difficulty breathing? Did you use PBE or other protection?
- Did you have problems communicating with other crewmembers or passengers? If yes, describe the problems.
- Did you use fire-fighting equipment? Describe.

**Ditching/inadvertent water landing**

- Were there any problems deploying, inflating or boarding the slide/rafts or life rafts?
- Did you move a slide/raft or life raft from one location to another? Describe any difficulties.
- 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?
- What personal flotation devices did passengers use?
- Did passengers have any problems obtaining or donning their life preservers? (adults/infants/children)
- Who commanded the life raft or slide/raft that you boarded? Were there other crewmembers in that raft?
- Describe the rescue operation.
- Describe sea survival procedures that were used.
- Did you retrieve an ELT? If yes, from where? Was the ELT used?

**PASSENGER INTERVIEW**

**Personal data**

- Name, gender, age, height, and weight.
- Address.
- Phone number.
- Occupation.
- Seat number and location.
- Aviation experience.
- Any disability that could impair egress from the aircraft.

- Languages spoken.
- Were you injured? Describe your injuries. When and how were you injured?

### **Pre-flight preparations**

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

### **Occurrence information**

- How and when did you first become aware of a problem? Where were you when you first became aware of a problem?
- How did the crew prepare you for the emergency? Were you given instructions over the PA system? By an individual crewmember? Shouted instructions?
- Did you hear any shouted commands? If yes, what did you hear? Did the information help you?
- Did you brace for impact? Describe your brace position.
- Were you traveling with infants/children? How were they restrained? Were there any problems?
- How tightly was your seatbelt fastened? Did you have any problems releasing your seatbelt? If yes, describe them.
- Did you remove your shoes? Why? If you did not remove them, did they stay on during the impact and evacuation?
- Describe the impact sequence. What happened to you during the impact sequence?
- Did anything happen to your seat during impact?
- Did you remain seated until the aircraft stopped?

### **Evacuation**

- Which exit did you use? Why?
- Did you encounter problems reaching your exit? If yes, describe.
- Did you attempt to take anything with you when you left the aircraft? If yes, what did you take?
- Did you assist anyone during the evacuation?
- Did anyone assist you?
- Did you open an exit? If so, which one? Did you experience difficulty operating or using the exit?
- Did you notice any lights on in the cabin? Where?
- Approximately how long did it take you to evacuate the aircraft? What is your estimate based on?
- What did you see when you got out of the aircraft?
- Did help arrive quickly? Describe the rescue efforts.
- Did a rescuer assist you? How?
- Did you sustain an injury? If yes, please describe your injury and, if known, its cause.

**IF THE EVENT INVOLVED THE FOLLOWING CONDITIONS, DOCUMENT THE FOLLOWING INFORMATION:**

### **Turbulence**

- Where were you when the turbulence occurred?
- Was your seatbelt fastened? If not, why not?
- Was the seatbelt sign on?
- Did you hear any announcement regarding seatbelts? If yes, describe what you heard.
- Who do you think made the announcement(s)? Flight deck crew and/or cabin crewmember(s)?
- Were you injured? Describe your injuries. Were you given first aid by a cabin crewmember or passenger?
- If you were traveling with an infant/child, what happened to the infant/child? How were they restrained?

### **Smoke/fire/fumes**

- When did you become aware of smoke, fire, or fumes?
- Where did you first observe smoke or fire? Describe what you saw and smelled. (color, density, odor)
- Where were you when you first became aware of fumes?
- Did the conditions increase, decrease or change during the occurrence?
- Did you have difficulty breathing? If yes, what action did you take to protect yourself?
- Did you observe fire-fighting procedures? Describe.

### **Ditching/inadvertent water contact**

- What types of flotation devices were available?
- Did you obtain a life preserver?
  - Where was it stored?
  - Did you have a problem retrieving it?
  - Did you put it on?
  - When did you inflate it?
  - Did it work properly?
  - If you were travelling with an infant or child, was a life preserver provided for the child?
- Did you use the seat bottom cushion as a flotation device? Describe how the cushion was used and its effectiveness.
- Did you board a life raft or slide/raft?
- Were there any difficulties?
- Describe the type of raft you boarded.
- What equipment in the life raft (slide/raft) was used?
- How many people were in the life raft?
- Describe the water conditions.
- Describe any sea survival procedures that were used.
- Describe the weather conditions.
- Describe the rescue effort.

### **Additional comments**

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

### **ATTACHMENTS**

- Reports of follow-up component tests
- Photographs
- Written statements