

Cabin Safety Bulletin No. 4 - Turbulence and seat belt policies, practices and training

Who does this bulletin apply to?

This document applies to all operators of Australian registered aircraft and should be read in conjunction with Civil Aviation Order 20.16.3.

What is the purpose of this bulletin?

The purpose of this document is to provide guidance on the use of seat belts and shoulder harnesses and remind operators of the need to continually review practices used to prevent injuries caused by turbulence. It also promotes and supports the use of the seat belt sign as a warning function and to clarify seat belt policies to ensure they are effective.

Background

The Australian Transport Safety Bureau (ATSB) releases aviation occurrence trend analysis reports each year, with the [2007-2016 information](#) recently published.

The report noted that the ATSB received 386 reports of weather-related incidents that affected safe air transport operations in 2016.

Approximately 86 per cent of all reported weather-related incidents involved windshear or turbulence. This figure has increased almost five-fold since 2009, from around 80 reported weather-related incidents per year to the 386 reported in 2016.

Impacts of turbulence on cabin crew and passengers

Cabin crew members are injured due to turbulence at a disproportionate rate compared with passengers.

Cabin crew injuries occur at a higher rate as their duties require them to be standing and moving about in the passenger cabin and/or galleys, unseated and therefore not always secured by restraint systems. During cruise, the risk of turbulence related injuries is greatest; however, cabin crew can also sustain physical harm during climb, descent and approach.

Although technology that allows aircraft to detect unexpected turbulence has improved, clear air turbulence remains difficult to distinguish with injuries resulting for both cabin crew members and passengers.

Use of seat belts and shoulder harnesses

Civil Aviation Order 20.16.3 designates that each crew member and each passenger shall occupy a seat of an approved type:

- ▶ during take-off and landing
- ▶ during an instrument approach
- ▶ when the aircraft is flying at a height less than 1000 feet above the terrain

- ▶ in turbulent conditions.

The pilot in command is responsible for all persons on board the aircraft and will require seat belts to be fastened during:

- ▶ movement of the aircraft on the ground
- ▶ take-off
- ▶ landing
- ▶ turbulence.

To provide for the safety of the user, where a shoulder harness is affixed to the aircraft, it should be worn. It is critical that all seat belts and shoulder harnesses are worn properly otherwise the full benefits may be compromised and could cause injury during serious impact. Crashworthiness tests have shown that slack in a restraint system should be minimised as much as possible whilst being worn.

The restraint should be adjusted as tightly as possible and as comfort will permit to minimise potential injury.

Cabin crew must always report any observable tearing or fraying of seat belts and safety harnesses to maintenance personnel or flight crew, as this can reduce the design protection of the entire restraint system.

Passenger seat belt use requirements

CASA encourages operators to promote passenger use of seat belts during flight and to enhance efforts aimed at encouraging passengers to remain seated with seat belts fitted at all times. The following procedures are recommended:

- ▶ An announcement should be made by a flight crew member or the senior cabin crew member explaining the hazards associated with turbulence when the seat belt sign is initially switched off during flight. The best protection against unanticipated turbulence related injuries is through the constant use of seat belts.
- ▶ Passengers should also be advised of what they are permitted and not permitted to do, when the seat belt sign is illuminated. Crew members should caution passengers to remain in their seat when the seat belt sign is on, for example, do not attempt to access an overhead locker. It is important to educate passengers that the illumination of the seat belt sign is not routine and is in fact a warning function.
- ▶ In addition to announcements, operators should consider the use of visual aids such as briefing cards and/or pointing to seat belt signs for alerting passengers during seat belt checks.
- ▶ During night sectors, crew members should instruct passengers to ensure that their seat belts are fastened securely over their blankets in order that cabin crew can verify sleeping passengers are secure.

Threat and errors management related to turbulence

The International Air Transport Association (IATA) aviation safety incident data management and analysis program recently identified the following threats and errors pertaining to turbulence related

injuries.

Threats

- ▶ Inadequate seat belt policy
- ▶ Inadequate standard operating procedures
- ▶ Anticipated and unanticipated turbulence
- ▶ Service related duties
- ▶ Operational pressure
- ▶ Service equipment and equipment restraining device
- ▶ Galley specific threats such as carts, bins, countertops, protruding latches and hot liquids
- ▶ Cabin specific threats such as overhead bins, partitions and armrests.

Errors

- ▶ Cabin crew members do not secure themselves during turbulence
- ▶ Cabin crew members standing during critical phase of flight
- ▶ Handling errors such as leaving service equipment unrestrained and handling hot liquids during turbulence.

Undesired states

- ▶ Cabin crew unsecured in turbulence
- ▶ Equipment unrestrained cabin or galley
- ▶ Hot liquids in cabin or galley during turbulence
- ▶ Passenger unrestrained in the lavatory
- ▶ Prolonged seat belt sign presentation.

Cabin crew standard operating procedures

In accordance with Regulation 215 of CAR 1988, an operator (of commercial operations) must create and provide an Operations manual for use by, and guidance of, operations personnel.

The Operations Manual must contain all necessary information, procedures and instructions to ensure the safe conduct of aircraft operations.

In order to effectively manage turbulence, standard operating procedures should include:

- ▶ the definition of turbulence intensity and types
- ▶ turbulence duration and conditions inside the aircraft
- ▶ cabin crew duties
 - ▶ take-off
 - ▶ cruise
 - ▶ anticipated turbulence
 - ▶ unanticipated turbulence
 - ▶ post turbulence management
 - ▶ descent and final approach

- ▶ procedures for turbulence management
- ▶ communication and coordination
- ▶ pre-flight Briefings
- ▶ communication amongst flight crew; senior cabin crew member; cabin crew
- ▶ communication and coordination for anticipated turbulence
- ▶ communication and coordination for unanticipated moderate turbulence
- ▶ communication and coordination for unanticipated severe turbulence
- ▶ communication and coordination for unanticipated severe turbulence post turbulence
- ▶ read back instructions
- ▶ human factors and prevention strategies
- ▶ managing complacency
- ▶ turbulence reporting
 - ▶ incidents of moderate and severe turbulence should be reported by cabin crew in order that post-incident investigations can be conducted; realising continuous safety improvements
 - ▶ incidents relating to light turbulence can also be useful in assessing routes which are more likely to encounter turbulence
 - ▶ incident reports will also provide operators with an opportunity to more accurately predict areas that encounter turbulence which can be conveyed to aircrew, service designers and passengers.

Cabin crew training

Operators are reminded of the importance of ensuring that turbulence related training scenarios are incorporated into initial intake; recurrent and requalification programming.

Designing effective training to prevent or mitigate injuries

Where training material does not contain comprehensive information pertinent to all factors that contribute to turbulence, there is a risk that the best course of action will not be initiated.

Emphasise the importance of cabin crew personal safety

Cabin crew injuries will occur at a higher rate compared with other crew members and cabin occupants as they spend more time in the cabin unseated and therefore, unrestrained.

Training programming must make cabin crew aware of their vulnerability in moderate and extreme turbulence.

Effective training can incorporate digital media; real world examples using data acquired through the Safety Management System and recorded interviews with crew members who have experienced moderate and severe turbulence.

Tools to increase personal safety and of the cabin occupants

Effective training shows cabin crew how to increase personal safety and passenger safety by identifying tools available to them in a turbulence event.

Training can include the effective use of the passenger address system and other methods of communicating with passengers; location of hand holds throughout the aircraft or equipment that

could be used as a hand hold; and how to secure a service cart or galley in minimal time.

Proactive seat belt policy

Procedures promoting voluntary seat belt use and compliance with the seat belt sign can include:

- ▶ flight crew promptly and clearly communicate turbulence advisories including direction to cabin crew and passengers. Advisories may include directions to be seated with seat belts fastened and to secure cabin service equipment, as conditions dictate
- ▶ cabin crew effectively communicate directions to passengers that they be seated with seat belts fastened.

Monitoring and improvement

It is important that operators through their SMS continually monitor and/or investigate safety related incidents which pertain to turbulence events.

Where trend analysis provides clear evidence of injuries following turbulence due to ineffective standard operating procedures; it is important that a risk assessment is undertaken and revised procedures put into place that will serve to attenuate the chance of injury.

Information that is useful when conducting trend analysis includes:

- ▶ length and route of flight
- ▶ time of year
- ▶ phase of flight
- ▶ aircraft type
- ▶ type of injuries sustained by crew members
- ▶ type of injuries sustained by passengers
- ▶ adequacy of crew member communication and coordination
- ▶ adequacy of operator procedures.

Further information

View the [cabin safety \[/aircraft/landing-page/cabin-safety\]](#) page.

If you have an inquiry please contact the cabin safety team on 131757 and ask to speak to a cabin safety inspector or email cabinsafety@casa.gov.au.

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