

***EASA REGULATORY IMPACT ASSESSMENT***

***‘RETURN TO SEAT’ SIGN AND INTELLIGIBILITY OF PUBLIC ADDRESS SYSTEM IN  
AREAS WHERE THE OCCUPANTS ARE NOT NORMALLY SEATED***

***SEPTEMBER 2009***

Issue 1

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**AMENDMENT RECORD**

ISSUE NUMBER	DATE	REMARKS
1	September 2009	Initial Issue

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## ABBREVIATIONS

AMC	Acceptable Means of Compliance
CAR	Canadian Aviation Regulations
CRI	Certification Review Item
CS	Certification Specification
EASA	European Aviation Safety Agency
FAA	Federal Aviation Administration (US)
FAR	Federal Aviation Regulations
NPA	Notice of Proposed Amendment
RIA	Regulatory Impact Assessment

## 1 PURPOSE AND INTENDED EFFECT

### 1.1 ISSUE WHICH THE NPA IS INTENDED TO ADDRESS

The NPA addresses some of the measures that can be implemented to minimise the risk of injuries due to turbulence. Advanced notification from flight crew to cabin occupants when turbulence is forecasted or expected is one of the most effective measures. It is therefore considered that the requirements of CS-25 should ensure that such notifications are provided for all occupants located throughout the cabin during all phases of the flight.

Currently, the flight crew can notify the cabin occupants of impending turbulence by activating the 'Fasten Seat Belt' signs, along with an announcement through the public address system. The relevant CS-25 Cabin Safety requirements are as follows:

- *CS 25.791(b) Signs that notify when seat belts should be fastened and that are installed to comply with the Operating Rules must be installed so as to be operable from either pilot's seat and, when illuminated, must be legible under all probable conditions of cabin illumination to each person seated in the cabin.*

OPS.CAT.518 requires 'Fasten seat belt' signs for "aircraft in which all passenger seats are not visible from the flight crew seat".

- *CS 25.1423 A public address system required by operational rules must –  
(c) Be intelligible at all passenger seats, lavatories, and cabin crew member seats and work stations.*

A public address system is required by operational rules (OPS.CAT.517) for aeroplanes with a maximum passenger seating configuration of more than 19 and is required to be audible at "all passenger seats, toilets, cabin crew seats and work stations" (AMC OPS.CAT.517).

Instead of 'Fasten Seat Belt' signs, 'Return to Seat' signs are usually installed in lavatories in most aeroplanes. However, there is no explicit requirement within CS-25 or operational rules to install 'Return to Seat' signs in lavatories or any other areas in the cabin where the occupants are not normally seated. Additionally, CS 25.1423(c) does not require the public address system to be intelligible in areas other than passenger seat areas, lavatories, and cabin crew member seats and work stations. Amendments to CS-25 may be required to ensure that 'Return to Seat' signs are installed and public address systems (if fitted) are intelligible in areas where the occupants are not normally seated (e.g. stairways, recreational areas, remote waiting areas for lavatories, showers, prayer rooms, etc). These issues may be particularly relevant to large transport aircraft.

### 1.2 SCALE OF THE ISSUE

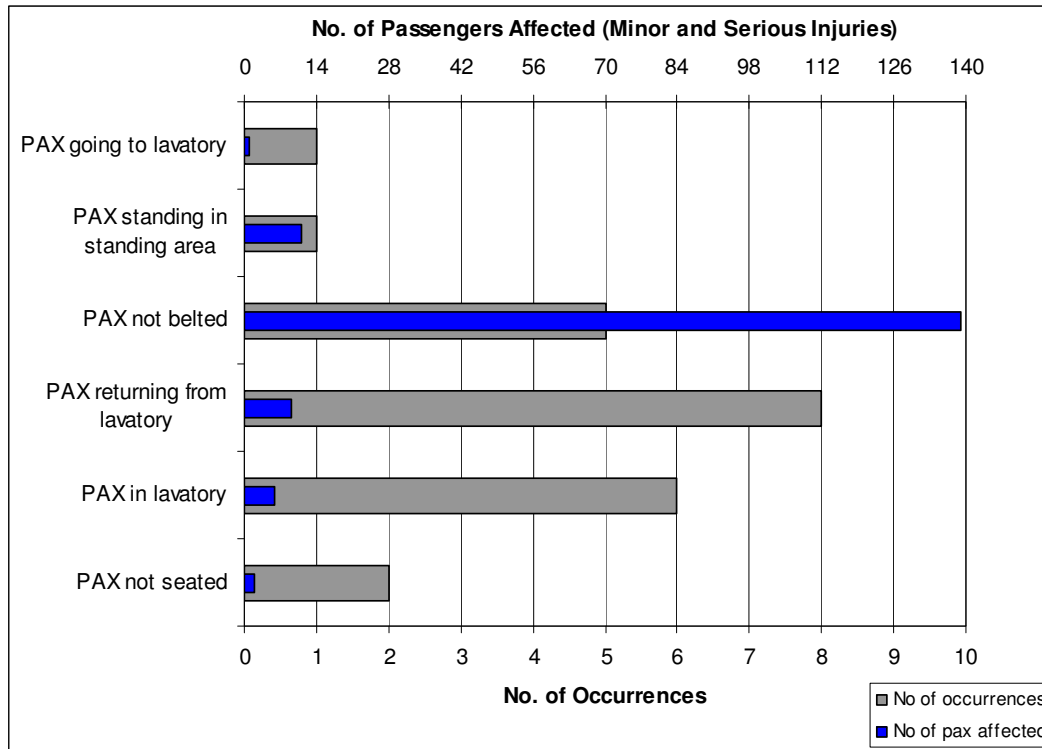
In the period 1998-2007, there were 83 accidents involving turbulence encounters which caused injuries to occupants<sup>1</sup>. The injuries consisted of 263 minor impact injuries, and 98 moderate to serious impact injuries, affecting 139 cabin crew and 222 passengers.

In the majority of those accidents, the injured cabin crew members were carrying out service duties or securing the cabin when the turbulence was encountered. The late activation of the 'Fasten Seat Belt' sign or the occurrence of an unforecasted/undetected turbulence (such as Clear Air Turbulence) were the primary factors in the large number of injured passengers; although passengers' non-compliance with the illuminated 'Fasten Seat Belt' sign (elected to leave their seats or not fastening their seat belts) were often the primary cause of

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passengers' injuries. The following chart shows the circumstances in which the passengers were affected.



Providing firm handholds (seatbacks or hand rails) as required by CS 25.785(j) may provide protection in “moderately rough air”. However, the more effective means of preventing injuries during a forecasted or expected turbulence is by ensuring that the passengers are secured in their seats. This can be achieved by timely activation of the ‘Fasten Seat Belt’ signs and announcement of the impending turbulence through the public address systems.

In some aeroplanes, typically very large transport aeroplanes, there are areas that the passengers are permitted during flight that are not fitted with seats. With regard to the safety risks discussed in this RIA, these areas are not addressed explicitly in CS-25 since CS 25.791(b) and CS 25.1423(c) refer to seated passengers. Additionally, there is no requirement for the installation of signs to prompt occupants in lavatories or other areas where the occupants are not normally seated to return to their seats.

A Certification Review Item issued by EASA for the use of the stairs between decks for the A380<sup>2</sup> requires the following special conditions:

- *Non smoking and return to seat signs should be installed and be visible in the stairway both going up and down and at the stairway entrances.*
- *The public address system should be audible in the stairway during all flight phases.*

In addition to the stairway areas, at the Very Large Transport Aeroplane Conference<sup>3</sup> a concern was raised regarding out-of-seat activities at recreational/open spaces and it was recommended that sufficient means of providing protection in these places should be considered.

### 1.3 BRIEF STATEMENT OF THE OBJECTIVES OF THE NPA

The objective of the NPA is to amend CS-25 to address the lack of an explicit requirement for 'Return to Seat' signs and the intelligibility of the public address system (if fitted to comply with the operating rules) in areas where the occupants are not normally seated. Currently, the relevant requirements only specify 'Fasten Seat Belt' signs in seated passenger compartments and for the public address system to be intelligible at all passenger seats, lavatories, and cabin crew member seats and work stations.

This issue is considered significant especially since 'out-of-seat' areas such as recreational areas, prayer rooms, bars, etc., specifically on large/very large transport aeroplanes, may be more prevalent in the future.

## 2 OPTIONS

### 2.1 THE OPTIONS IDENTIFIED

Two regulatory options are considered in this Regulatory Impact Assessment:

#### Option 1 – Do Nothing

This option means there will be no improvements to CS-25 in relation to the installation of 'Return to Seat' signs and the intelligibility of public address systems (if fitted to comply with the operating rules) in areas of aeroplanes where the occupants are not normally seated.

#### Option 2 – Rulemaking Action – Amend CS-25

This option will amend CS-25 for the following subjects:

- Add the requirement for the installation of 'Return to Seat' signs throughout the cabin where passengers or crew are permitted, excluding areas where 'Fasten Seat Belt' signs are required by CS 25.791(b).
- Amend CS 25.1423(c) to require the public address system (if fitted) to be intelligible in all areas in the cabin where passengers or crew are permitted. A draft CRI on crew rest compartments<sup>4</sup> requires that provisions must be provided so that occupants of the crew rest compartment will not be disturbed with normal, non-emergency announcements made to the passenger cabin. This will be included in the proposed amendment.

The proposed wordings of the amendments are as follows:

*CS 25.791(x)*

*Signs operable by a flight crew member that notify when the cabin occupants should return to their seats must be installed in a manner to be visible under all probable conditions of cabin illumination to all persons throughout the cabin areas where passengers or crew members are permitted; except where sub-paragraph (b) of this paragraph applies.*

*CS 25.1423 A public address system required by operational rules must –*

*(c) Be intelligible during all flight phases at all passenger seats, lavatories, cabin crew member seats and work stations, **and any other areas where passengers or crew are***

***permitted. Provisions must be provided so that occupants of crew rest areas will not be disturbed with normal, non-emergency announcements made to the passenger cabin.***

## **2.2 THE PREFERRED OPTION SELECTED**

See Section 5.3.

## **3 SECTORS CONCERNED**

The proposed regulatory change is to CS-25 and hence the aeroplanes affected will be those for which the application for a type certificate or supplemental type certificate is made after the regulatory change considered in this RIA. For the proposed amendment to CS 25.1423, only aircraft with a maximum passenger seating configuration of more than 19 will be affected (i.e. those required by the operational rule to have a public address system). The proposed amendment to CS 25.791 will primarily affect aeroplanes that feature special (standing) areas. The primary cost of the regulatory change will be borne by the aircraft manufacturers and aircraft converters. These costs will result from any increases that may be incurred in material costs, design and testing. Aircraft operators will also be affected should any of the design solutions result in significant weight increases. There will be a marginal cost to EASA in their oversight of the manufacturers/converters in showing compliance with the proposed regulatory change.

## **4 IMPACTS**

### **4.1 ALL IDENTIFIED IMPACTS**

#### **4.1.1 Safety**

##### **Option 1 – Do Nothing**

Most aeroplanes already have 'Return to Seat' signs installed in lavatories; however, manufacturers can elect to not do so since it is not mandatory. If Option 1 is selected, the installation of 'Return to Seat' signs and the audibility of the public address system in special areas (e.g. stairway areas, recreational areas, prayer rooms, etc.) are likely to be addressed by Certification Review Item/Special Conditions.

##### **Option 2 – Rulemaking Action – Amend CS-25**

This option means adopting current industry practice and Special Conditions into formal airworthiness requirements, which will standardise the requirements for the installation of 'Return to Seat' signs and the intelligibility of the public address systems in areas in the cabin where the occupants are not normally seated. Amending CS-25 to address these subjects will improve the safety level for the passengers and the cabin crew.

#### **4.1.2 Economic**

##### **Option 1 – Do Nothing**

There will be no economic impact related to Option 1, other than the costs of injuries related to turbulence accidents that could have been mitigated by the implementation of the proposed amendments to CS-25.

##### **Option 2 – Rulemaking Action – Amend CS-25**

The proposed amendments will incur costs to the aircraft manufacturers/converters for new/supplemental type certificates related to the design and installation of the signs. Operators will bear additional fuel costs should any of the design solutions result in significant weight increases. These incremental costs can be considered relatively minimal because in many cases such signs are already being, and would continue to be, installed and thus additional costs and weight increases will be small. There will be a marginal cost to EASA in their oversight of the manufacturers/converters in showing compliance with the proposed regulatory change. Overall, these costs may be offset by the time and cost savings from a simplified certification process<sup>a</sup>.

#### **4.1.3 Environmental**

No significant environmental impacts have been identified. An increase of CO<sub>2</sub> emission from each flight may occur should the design solutions result in significant additional weight. The amount of this increase will depend on the additional weight, but even at worst it is considered to be relatively small.

#### **4.1.4 Social**

No social impacts have been identified.

#### **4.1.5 Other aviation requirements outside EASA scope**

No aviation requirements outside the scope of EASA which may be affected by the contents of this NPA have been identified.

#### **4.1.6 Foreign comparable regulatory requirements**

ICAO Annex 6 and Annex 8 were reviewed and no text was found in conflict with the content or overall objectives of the NPA.

Since there are no current rulemaking activities within the FAA or Transport Canada regarding this subject, a rule change will introduce differences in the airworthiness standards.

### **4.2 ISSUES OF EQUITY AND FAIRNESS**

There are no issues of equity and fairness associated with any of the regulatory options considered in this Regulatory Impact Assessment.

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<sup>a</sup> Currently EASA raise CRIs to address "Return to Seat" signs on every project requiring such signs.

## 5 SUMMARY AND FINAL ASSESSMENT

### 5.1 COMPARISON OF THE POSITIVE AND NEGATIVE IMPACTS FOR EACH OPTION EVALUATED

#### Option 1 – Do Nothing

Currently, CS-25 does not require 'Return to Seat' signs to be installed anywhere on the aeroplane, or the public address system (if fitted) to be intelligible in areas other than at all passenger seats, toilets, cabin crew seats and work stations. The requirements on this subject are considered inadequate because out-of-seat areas are likely to be more common in the future. With this option, the level of safety with regard to the installation of 'Return to Seat' signs depends heavily on industry practice. Additionally, there could be costs of injuries related to turbulence accidents that could be averted by the implementation of the proposed amendments.

#### Option 2 – Rulemaking Action – Amend CS-25

Amending CS-25 to require 'Return to Seat' signs in areas where the occupants are not normally seated and to require the public address system (if fitted) to be intelligible in all areas in the cabin where passengers or cabin crew are permitted will increase the level of safety and standardise existing industry practice. This option would reduce the risk of injuries due to turbulence especially since out-of-seat areas are likely to be more common in the future.

There may be costs related to this option which might be offset by the reduction of costs of injuries related to turbulence accidents in the long term. However, this option would introduce differences with FAR 25/CAR 525.

### 5.2 A SUMMARY DESCRIBING WHO WOULD BE AFFECTED BY THESE IMPACTS AND ANALYSING ISSUES OF EQUITY AND FAIRNESS

Compared to Option 1, Option 2 will improve the level of safety associated with turbulence encounters for the cabin crew and passengers.

There will be cost burdens to EASA, manufacturers/converters, and operators related to Option 2. However, any costs might be offset by the cost savings from the simplified certification process and the reduction in costs of injuries related to turbulence accidents in the long term.

### 5.3 FINAL ASSESSMENT AND RECOMMENDATION OF A PREFERRED OPTION

After due consideration the Agency believes that **Option 2 – Rulemaking Action to amend CS-25** is to be preferred.

Amending CS-25 to require 'Return to Seat' signs in areas where the occupants are not normally seated and to require the public address system (if fitted) to be intelligible in all areas in the cabin where passengers or cabin crew are permitted will increase the level of safety and standardise an existing industry practice. This option would reduce the risk of injuries due to turbulence especially since out-of-seat areas are likely to be more common in the future. Any costs that may be incurred might be offset by the reduction of costs in injuries

related to turbulence accidents in the long term. It is expected that FAA and Transport Canada may consider the more stringent proposed requirements for harmonisation with their standards.

Rulemaking as described under Option 2 is therefore considered to be justified.

## 6 REFERENCES

<sup>1</sup> RGW Cherry and Associates (2009) *Study on CS-25 Cabin Safety Requirements 4208/R/000454/KK Issue 4*, prepared for the European Aviation Safety Agency

<sup>2</sup> European Aviation Safety Agency, A380 Certification Review Item, *Use of the stairs between decks – Special Condition*, Ref. D-6 Issue 3, Date 13/12/02

<sup>3</sup> *Proceedings of the Very Large Transport Aeroplane Conference*, Noordwijkerhout, The Netherlands, 13-16 October 1998.

<sup>4</sup> European Aviation Safety Agency, *Airbus A350 Certification Review Item – Special Conditions Ref. D-04*, 21.08.2008 (Draft Issue)