

UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
RENTON, WASHINGTON 98057-3356

In the matter of the petition of

**The Boeing Company**

for an exemption from § 25.853(d) of Title 14,  
Code of Federal Regulations and condition 1  
of Special Condition 25-367-SC.

**Regulatory Docket No. FAA-2010-0597**

**GRANT OF EXEMPTION**

By letter dated August 4, 2010, Jordan B Zundell, Lead Project Administrator, Production and Retrofit Projects, The Boeing Company, P.O. Box 3707, M/C 67-LR, Seattle, Washington 98124-2207, petitioned for an exemption from Title 14, Code of Federal Regulations (14 CFR) 25.853(d) and paragraph 1 of Special Condition 25-367-SC for the Boeing Model 777-300ER aircraft. Boeing intends to install energy-absorbing material, on the edges of the partition walls forward and aft of the side-facing business class seats of an Air New Zealand model 777-300ER aircraft. The energy-absorbing material is installed to mitigate occupant injury during an emergency landing and/or in the event of passenger contact with the seat during turbulence. The energy-absorbing material does not meet the flammability requirements specified in § 25.853(d) and the first condition (paragraph 1) of Special Condition 25-367-SC.

**The petitioner requests relief from the following regulation(s):**

Section 25.853(d) which requires that certain interior components of airplanes with passenger capacities of 20 or more meet the flammability test requirements of parts IV and V (heat release and smoke emission) of appendix F of 14 CFR part 25.

Paragraph 1 of Special Condition SC-367-SC which requires certain portions of the passenger seats meet the flammability test requirements of parts IV and V (heat release and smoke emission) of appendix F of 14 CFR part 25.

**The petitioner supports its request with the following information:**

This section summarizes the petitioner's request. The complete petition(s) is available at the Department of Transportation's Federal Docket Management System, on the Internet at <http://regulations.gov>, in Docket No. FAA-2010-5097.

Air New Zealand 777-300ER business class seats include partitions both forward and aft of each passenger seat place. The edges of these partition walls may be struck by persons during an emergency landing or turbulence.

During an emergency landing, for threshold loads below 6.5g, the inflatable restraints will not deploy and seated passengers may strike the top edge of the partition wall in front of them. For loads of 6.5g and above, the inflatable restraints activate to cushion forward impact. However, contact with the inflated airbag produces a rebound resulting in seated occupants contacting the vertical portion of the partition wall aft of the passenger. Although most of the energy is mitigated by the initial reaction with the airbag, the bouncing movement of the occupant must be addressed.

During turbulence, passengers may contact the partition wall edges either while seated, or in the event of a fall while navigating through the cabin. To protect passengers from injuries resulting from contact with seat partition wall edges, the business class seats incorporate energy-absorbing edge-capping material on these wall edges. The padding consists of Ensolite, an energy-absorbing foam recommended in Advisory Circular (AC) 25-17A for this express purpose, encapsulated within a leather cover.

The small concentrations of this edge-capping material compared to the total surface area of materials used in the interior (edge-capping is 0.01% of total interior surface area) have no appreciable effect on the overall fire safety of the passenger cabin. In addition, the edge-capping material itself meets the requirements of § 25.853(a) and all materials adjacent to the edge-capping will meet the requirements of § 25.853(a) and either (d) or Special Condition 25-367-SC where appropriate, reducing the possibility of propagation should the seat partition wall be involved in a fire. The use of Ensolite edge-capping on panels associated with side-facing seats goes back five years in production at Boeing and Boeing has knowledge of previous similar use of material in airplane modifications. The Ensolite padding in question, while not complying with the requirements of § 25.853(d), has been added to address delethalization requirements (per § 25.785 and AC 25-17A). The padding has been present as a means to mitigate personal injury and meet the intent of § 25.785 on airplanes since 1978.

**Public Interest**

According to the petitioner, this petition is in the public interest because it provides for the installation of an injury preventing device that will be useful during all phases of flight, including takeoff, taxi, landing, turbulence, conditions encountered during normal flight, and emergency landing events. The material fully complies with § 25.853(a) and will not propagate a fire. Additionally, it will add to the survivability of a post-crash fire due to its ability to mitigate personal injury in a crash event and aid in an occupant's ability to safely evacuate the aircraft.

In addition, due to the fact that energy-absorbing material has been accepted by the FAA for delethalization and has been in use for at least two decades for that purpose, the Boeing Company requests that the FAA find good cause under § 11.87 and waive the need for the public process described in § 11.85.

## **Federal Register publication**

A summary of the petition was published in the *Federal Register* on August 30, 2010 (75 FR 15771). No comments were received.

## **The FAA's analysis**

Section 25.785(b), "Seats, berths, safety belts, and harnesses," requires that "each seat, berth, safety belt, harness and adjacent part of the airplane at each station designated as occupiable during takeoff and landing must be designed so that a person making proper use of these facilities will not suffer serious injury in an emergency landing as a result of the inertia forces specified in §§ 25.561 and 25.562."

The Boeing Model 777-300ER offers interior arrangements which include single-occupant side-facing seat installations. These seat installations include partitions both forward and aft of each passenger seat place. The partitions are considered part of the seat installation and differ from the partitions that are installed between the seat classes such as first class and economy class. The partitions form walls to provide privacy to each individual seat place. Passengers may impact these partition edges during an emergency landing or in the event turbulence is encountered. To protect passengers from injuries the Boeing Company intends to install edge capping on the partition wall edges of each of the business class seats. The edge capping consists of Ensolite, an energy absorbing foam, encapsulated within a leather cover. Ensolite is a material recommended in AC 25-17A as a means of de-lethalizing injurious objects. Although this padding doesn't meet the smoke emission and heat release requirements required by § 25.853(d) and condition 1 of Special Condition SC-367-SC, the material fully complies with § 25.853(a) and will not propagate a fire. By separate correspondence, the Boeing Company informed the FAA that a maximum of 400 square inches of Ensolite will be installed on each individual seat. Although this exceeds the amount of material, allowed by condition 2 of Special Condition SC-367-SC, that does not have to comply with the heat release and smoke emission requirements, the FAA finds that the Ensolite will enhance passenger safety by mitigating occupant injury during an emergency landing and/or in the event of passenger contact with the seat during turbulence.

The FAA also agrees that the padding will add to the survivability of a post crash fire due to its ability to mitigate personal injury in a crash event and aid in an occupant's ability to safely evacuate the aircraft.

In consideration of the above, the FAA concludes that granting this exemption does not adversely affect safety.

## **Public interest**

Because the Ensolite foam edge capping will help prevent injury in the event turbulence is encountered or during an emergency landing, there is a public benefit in granting this exemption.

### **Conditions and limitations**

This exemption is limited to the business class seat installation on Boeing model 777-300ER airplanes.

Each individual seat place is limited to a maximum of 400 square inches of Ensolite foam. The foam installation is limited to those areas of the seat that are within the head strike zone of the seated passengers or those areas of the seat that present a potential personal injury hazard.

The Ensolite foam must meet the flammability requirements of § 25.853(a).

### **The FAA's decision**

In consideration of the foregoing, I find that a grant of exemption is in the public interest and will not adversely affect safety. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator, The Boeing Company is hereby granted an exemption from § 25.853(d) and condition 1 of Special Condition SC-367-SC for all Model 777-300ER airplanes

Issued in Renton, Washington,

**OCT 25 2010**

A handwritten signature in blue ink that reads "Michael Kaszycki". The signature is fluid and cursive, with a long horizontal stroke at the end.

Michael Kaszycki  
Acting Manager, Transport Airplane Directorate  
Aircraft Certification Service