

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

In the matter of the petition of

FedEx Express

for an exemption from §§ 25.785(j),
25.812(e), 25.857(e), and 25.1447(c)(2)(i)
of Title 14, Code of Federal Regulations

Regulatory Docket No. FAA-2014-0101

DENIAL OF EXEMPTION

By letters dated March 3, 2014, and April 23, 2014, Julio A. Berrios, Senior Aircraft Development Advisor, Aircraft Development & Acquisition Engineering, FedEx Express, 3131 Democrat Road, Memphis, TN 38118, petitioned the Federal Aviation Administration (FAA) for an exemption from the requirements of §§ 25.785(j) at Amendment 25-88; 25.812(e) at Amendment 25-128; 25.857(e) at Amendment 25-93; and 25.1447(c)(2)(i) at Amendment 25-116 of Title 14, Code of Federal Regulations (14 CFR). This exemption, if granted would permit carriage of up to two (2) supernumeraries in a crew-rest module (CRM) located in the Class E compartment of Boeing Model 767-300F/-300BCF/-300BDSF freighter airplanes.

The petitioner requests relief from the following regulations:

Section 25.785(j) at Amendment 25-88 – requires that, if the seat backs do not provide a firm handhold, a handgrip or rail must be available along each aisle to enable persons to steady themselves while using the aisles in moderately rough air.

Section 25.812(e) at Amendment 25-128 – requires that floor-proximity emergency-escape-path marking must provide emergency-evacuation guidance for passengers when all sources of illumination more than 4 feet above the cabin-aisle floor are totally obscured. In the dark of the night, the floor-proximity emergency-escape-path marking must enable each passenger to—

- After leaving the passenger seat, visually identify the emergency-escape path along the cabin-aisle floor to the first exits or pair of exits forward and aft of the seat; and
- Readily identify each exit from the emergency-escape path by reference only to markings and visual features not more than 4 feet above the cabin floor.

Section 25.857(e) at Amendment 25-93 – requires that a Class E cargo compartment is one on airplanes used only for the carriage of cargo.

Section 25.1447(c)(2)(i) at Amendment 25-116 – requires that, if certification for operation above 25,000 feet is requested, oxygen-dispensing equipment must be available.

Related sections:

Section 121.583(a) – lists categories of people who may be carried aboard an airplane in part 121 service without complying with the entire passenger-carrying airplane requirements of 14 CFR part 121.

The petitioner supports its request with the following information:

This section quotes the relevant information from the petitioner’s request, with minor edits for clarity. The complete petition is available at the Department of Transportation’s Federal Docket Management System, on the Internet at <http://regulations.gov>, in Docket No. FAA-2014-0101.

The main objectives of this request for exemption are to permit the carriage of two off-duty crewmembers on an all-freighter airplane and permit entry of qualified supernumeraries into the CRM inside the cargo compartment during flight for the purpose of resting.

Requested Regulatory Relief:

Section 25.785(j): Relief is necessary because firm handholds are not available inside the main deck cargo compartment, when access is permitted in the cargo compartment.

Section 25.812(e): Relief is necessary for floor lighting in the cargo compartment area for the door in the crew-rest module (CRM) and the rigid cargo barrier (RCB) access door are in such close proximity that floor lighting is not needed because the existing aircraft emergency lighting and the proposed CRM lighting will be sufficient. In addition, flight crews inside the CRM are required to carry flashlights.

Section 25.857(e): Relief is sought to permit carriage of up to two (2) persons in the CRM on an all freighter airplanes which have a CRM in position 1 of the Class E cargo compartment beyond the flight crew of two (2). The CRM will be occupied only in flight, not to be occupied during taxi, takeoff and landing.

Section 25.1447(c)(2)(i): Relief is sought to permit the use of portable oxygen bottles with full face mask instead of automatic dispensing units. Portable oxygen bottles will be provided in the CRM.

Description of Aircraft:

The 767-300F was manufactured under Type Certificate Data Sheet (TCDS) A1NM. The 767-300BDSF (BeDek Special Freighter) was as well manufactured under TCDS A1NM as a Passenger 767-300ER series model but later modified to a Special Freighter by Israel Aerospace Industries Bedek Aviation Group Supplemental Type Certificate (STC) ST02040SE. Boeing applied for an amended Type Certificate (TC) A1NM to derivate the 767-300ER passenger model into a freighter the 767-300BCF (Boeing Converted Freighter). All three of these models include a Class E compartment in the main deck, and a flight deck consisting of a supernumerary area, forward of the 9-g barrier RCB/smoke curtain. The flight deck area can provide a maximum of six (6) seats, of which four (4) are for the supernumeraries and two (2) are for the captain and the first officer.

The following previously granted exemptions are still applicable and are taken into consideration in this request:

- Exemption 5993A for the 767-300F.
- Exemption 9853 for the 767-300BDSF.
- Exemption 9696A for the 767-300BCF.

The flight deck of the Model 767 Freighters (-300F/-300BCF/-300BDSF) is equipped with No. 2 left and right flight-deck windows that can be opened from inside, and which were previously certified as flight crew emergency exits under TC A1NM. The right-hand window has the capability to be opened from the outside of the airplane, and its means of opening is marked on the exterior airplane fuselage.

Supernumeraries are trained persons and are briefed for duty on board the aircraft. The Airplane Flight Manual contains the definition of, and the conditions under which, the supernumerary persons may be carried, and provide specific instruction for preflight briefing. FedEx Express believes that an equivalent level of safety with the parts of the requirements from which relief is sought will be achieved by the design features of the CRM installation on the 767 Freighters (-300F/-300BCF/-300BDSF).

Crew Rest Module Configuration:

The initial type-certificate configuration addresses the access, during flight, to the cargo compartment as described per the 767-300F flight manual for only one person. The 767-300BCF and 767-300BDSF are allowed to have four persons per respective exemptions and flight-manual supplements. See Exemption 9696A for the 767-300BCF and Exemption 9853 for the 767-300BDSF.

FedEx wishes to install a CRM inside the Class E cargo compartment in position 1D/1C for the purpose of providing a compartment for no more than two off-duty crew members to rest during cruising steady flights, not to be occupied during taxi, takeoff, and landing.

The CRM will be equipped as follows:

- A smoke detector system with individual aural warning to alert the CRM occupants will be installed. The smoke detector will be connected to the Engine Indicating & Crew Alerting System (EICAS) of the aircraft so the crew on duty in the flight deck will be alerted as well. The CRM will be located inside the Class E compartment and part 25.857(e) requires smoke detection to protect the CRM occupants and the aircraft. The equipment will be similar to the 777F system currently installed on FedEx Express aircraft.
- Installation of an aural alert to alert the CRM occupants in the event of a rapid decompression or at the discretion of the flight crew on duty.
- Installation of two 4.25 cu-ft portable oxygen bottles with full face masks for the occupants to be able to walk back to their flight deck seats. This will support occupants during a decompression and/or a smoke event in the Class E compartment, which will meet 25.1439(a)(b). The portable oxygen bottles meet the performance requirements of 25.1443(a) or 25.1443(b).
- A fire extinguisher installed in the CRM. No additional portable breathing equipment (PBE) will be required since there will be two 4.25 cu-ft portable oxygen bottles with full face masks installed in the CRM. The flight deck does have fire extinguishers and PBE previously certified under the TC or STC; however they are too far to reach from the CRM. This addition will meet the requirements of § 25.851.
- Installation of emergency lighting in the event of a complete loss of power. The lighting will be inside the CRM only so occupants could find a flashlight and/or don oxygen if required inside the CRM. The CRM occupants will be required to carry their own flashlights to walk from the CRM to their seats in the flight deck. There is no emergency lighting in the Class E compartment. However, similar to the 777F and MD11F, there are two dome lights inside each CRM, one of the lights will be strategically placed inside the CRM so that when the 767 CRM door is open there is enough lighting at the floor level (8 to 10 foot candle power per SAE ARP 1283A) of the Class E compartment just between the CRM and the RCB door. The area between the CRM and RCB door would be slightly less than 22-inches long and approximately 30-inches wide. Once the RCB door is open, additional lighting will be available since there is a dome light just next to the crew entry door way.
- Installation of a two-way communication (interphone) system. The system will have a chime (aural alert) to alert the occupants and a resettable call light. The

system will have push-to-talk handsets similar to the one installed on the 777F, which is resettable once the system is in use. In addition, a Public Address (PA) will be available as a back up to the interphone system.

- The CRM will also have means to control the airflow and temperature. The CRM general design requirements will meet Class 1 Rest Facility per AC 120-31A and SAE ARP 4101/3 Crew Rest Facilities, not including the requirement to obtain Operational Specification approval A117, which is based on 14 CFR 117 that is not applicable to FedEx Cargo Operations.

FedEx Express proposes several means and limitations to address the safety of the occupants in the E-class compartment during flight:

1. Flight crew members will be trained as a part of the standard 767 crew training on the proper use and emergency procedures associated with the CRM.
2. Supernumeraries are prohibited from accessing the cargo areas during taxi, take-off and landing. A pre-flight briefing must inform the supernumeraries of this requirement.
3. Prior to each flight, a flight crew member will brief each supernumerary on the use of exits, including instructions to inspect the ground to determine whether a safe landing can be achieved before using an assist means and emergency equipment.
4. Prior to each flight, a flight crew member will brief each supernumerary on the opening and closing procedure of the RCB door.
5. A maximum of two (2) occupants will be allowed to enter the CRM during cruising flight.
6. Supernumerary Portable Oxygen
 - a. There must be at least two portable oxygen units with a full face mask connected to it provided for each supernumerary allowed to enter the main deck E-Class cargo department during flight. The units must provide an indication to the user that oxygen is flowing.
 - b. The portable oxygen units must meet the performance requirements of 25.1443(a) or 25.1443(b), or the equipment must be shown to protect the supernumerary from hypoxia at an activity level required to return to his or her seat following a rapid decompression to 25,000 feet cabin altitude.
 - c. The portable units must be located inside the CRM. Readily available to the CRM occupants within arm reach from the bunk beds.

- d. The supernumeraries must be trained in the use of the oxygen units. The supernumeraries must also be trained in making the determination whether oxygen is being delivered.
 - e. The oxygen units must be sized adequately for continuous and uninterrupted use during worst-case flight duration following smoke or decompression event, or must be of sufficient duration to allow the supernumeraries to return to their seats where additional oxygen is readily accessible for the remainder of the smoke/decompression event.
7. A placard located in the supernumerary area, in a conspicuous location either on or adjacent to the RCB smoke barrier, should indicate the following for access to the E-class cargo compartment. The pre-flight briefing should inform supernumeraries that access to the CRM is limited to two off-duty flight crew.
 8. The CRM will have a fire extinguisher that meets the requirement of 25.851.
 9. In the event of a rapid decompression an aural alert will be activated to alert the CRM occupants.
 10. No protective breathing equipment (PBE) will be provided since the CRM will have two portable oxygen bottles with full face mask.
 11. There will be an aircraft public address system capable of providing announcements from the cockpit to the courier area in addition to an interphone system.
 12. Installation of emergency lighting in the event of a complete loss of power.

Supporting Arguments:

Cargo operators need augmented flight crew onboard the aircraft for flights longer than 8 hours. Although the aircraft have three supernumerary seats, the seats are not ideal for crew rest. The installation of the CRM in the Class E compartment provides a Class 1 crew rest facility which will allow FedEx to support the flight crew rest requirements.

The proposed CRM, as described, will provide adequate level of safety and comply with all the FAR except for the sections from which FedEx seeks exemption.

Section 25.785(j):

The CRM is inside the Class E compartment and the proximity of the CRM to the RCB wall/door is slightly less than 22 inches. This distance is less than the average arm reach of the 5th percentile 40-year old Japanese female, which is 25.7 inches per NASA-STD-3000 Human Factors. FedEx believes that a firm handhold is not required to transition from the CRM to the RCB door. To transition from the CRM to the flight deck, the

supernumeraries inside the CRM must open the RCB access door, which requires the occupants to hold and turn the door-latching mechanism, thus providing a firm hold.

Section 25.812(e):

The CRM and the RCB access doors are in such close proximity that floor lighting is not needed. Once the CRM door is open, the proposed CRM emergency lighting will be sufficient to illuminate the area as described above. Once the RCB door is open additional illumination will be available from the existing aircraft emergency lighting. In addition, flight crews inside the CRM will be required to carry flashlights.

The categories of the occupants for which this exemption is sought are qualified off-duty flight crew for the type of aircraft, in this case the 767, which meet all the requirements of 121.583 as well. Furthermore, they are instructed in the autonomous use of emergency equipment and emergency exit operation.

FedEx Express will optimize their missions if they are permitted to have the CRM installed in the Class E and allow personnel aboard the CRM during cargo flights, thus ensuring availability of rested flight crew in flight.

Public Interest:

FedEx Express presents the argument that the granting of this exemption will be in the public interest by allowing FedEx Express to provide a Class 1 rest facility per AC 121-31 for extended flights, thus reducing flight-crew fatigue and improving flight safety. The granting of this exemption will allow FedEx Express to compete with international freighter operators with similar configurations. If allowed to carry supernumerary persons aboard their cargo flights, FedEx Express will be able to operate under optimal safety conditions. The reasons for these benefits are developed in the arguments above.

The current flight decks of all the 767 Cargo models (767-300F Production Freighter, 767-300BDSF BeDek Special Freighter and 767-300BCF Boeing Converted Freighter) do not have enough room to install a Class 1 Crew Rest Facility.

A Class 1 Crew Rest Facility, as defined per AC 117-1 and SAE ARP 4101/3, requires a minimum sleeping surface of 30-inches x 78-inches and a minimum volume per single occupant of 35 cu-ft. This equates to a compartment with an approximate size of 30-inches x 78-inches x 25-inches. FedEx will need two of these compartments for a total volume of 70 cu-ft. This total volume does not include any space for additional equipment that will be required.

If we could remove the three Supernumerary seats (25 inches wide each) and replace them with a single bunk compartment, that would only provide us with 75-inch bunk when we need 78-inch. In addition, the bunk cannot be used for taxi, takeoff and landing. Where will the supernumerary sit when the first observer seat is occupied? It would not be practical and it will defeat the purpose of having supernumerary seats to augment a long flight with additional flight crew.

That is why we proposed the installation of the CRM in the Class E cargo compartment. In addition, there have been several cases set forth of this request, they are 1) STC ST02372AT and 2) FAA Exemption 6656, Docket 28760.

Federal Register publication

A summary of the petition was published in the *Federal Register* on June 6, 2014 [79 FR 32806]. No comments were received.

The FAA's analysis

The FAA finds a public interest in having a Class 1 crew rest on long-haul cargo flights when those crew rests meet the guidelines of AC 121-31. Presently, a crew rest compartment located within a Class E cargo compartment does not meet the guidelines of AC 121-31. We requested that the petitioner explain the public interest of locating this crew rest inside the Class E cargo compartment and the response was that the airplane, as configured, does not have enough room in the existing supernumerary compartment.

Our review found that the smoke barrier between the cargo compartment and the supernumerary compartment could be moved to accommodate the crew rest outside the Class E cargo compartment. The petitioner confirmed that the barrier could be moved, but that doing so would increase costs. We find that the additional cost is not a valid reason for us to make a finding that it is in the public interest to install the crew rest inside the Class E cargo compartment, as FedEx Express proposes.

We acknowledge that, in 1997, the FAA had granted one exemption for a crew rest to be installed in a Class E cargo compartment. This was a special case for an airplane configuration intended for a foreign-government head-of-state operation. As the petitioner has identified, access into the Class E cargo compartments is now very tightly controlled to limit the hazard exposure to the occupants. Currently, the general access to the Class E cargo compartment is prohibited during all phases of flight. However, in certain cases, the FAA has permitted limited access to care for special types of cargo only. We have presented our analysis of this issue in several exemptions, including those that are applicable to the Boeing Model 767s operated by the petitioner.

We find that a crew rest installed in the Class E cargo compartment exposes the occupants to a risk level that is not consistent with the current limitations of our exemptions. This rationale, in addition to the fact that the smoke barrier can be relocated so that the crew rest could be installed forward of the Class E cargo compartment, contributed to our decision. We find no sufficient public interest, and that the proposed configuration would introduce unnecessary hazards to the occupants from a fire inside the Class E cargo compartment.

The FAA's decision

In consideration of the foregoing, I find that a denial of exemption is in the public interest for the reasons stated above. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator, FedEx Express is hereby denied an exemption from 14 CFR 25.785(j), 25.812(e), 25.857(e), and 25.1447(c)(2)(i) for Boeing Model 767-300F/-300BCF/-300BDSF freighter airplanes.

Issued in Renton Washington, on August 21, 2014.

/s/ Kevin Hull

Kevin Hull
Acting Manager, Transport Airplane Directorate
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