turbine blade, the proposed standard would require engine mounts and structures to support maximum torques without failure, but allows for some deformation in the structure.

The FAA concludes that modern large engines, including those on the GVI, are novel and unusual compared to those envisioned when § 25.361(b)(1) was adopted and thus warrant special conditions. The special conditions contain design criteria recommended by ARAC. The special conditions also clarify the design criteria that apply to auxiliary power units.

Discussion of Comments

Notice of proposed special conditions No. 25–11–11–SC for Gulfstream GVI airplanes was published in the **Federal Register** on May 5, 2011 (76 FR 25648). One supportive comment was received and the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the GVI. Should Gulfstream apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design features, these special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features of the GVI. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Gulfstream GVI airplanes.

The following special conditions are in lieu of § 25.361(b):

1. For turbine engine installations, the engine mounts, pylons and adjacent supporting airframe structure must be designed to withstand 1g level flight loads acting simultaneously with the maximum limit torque loads imposed by each of the following:

(a) Sudden engine deceleration due to a malfunction which could result in a temporary loss of power or thrust; and

(b) The maximum acceleration of the engine.

2. For auxiliary power unit installations, the power unit mounts and adjacent supporting airframe structure must be designed to withstand 1g level flight loads acting simultaneously with the maximum limit torque loads imposed by each of the following:

(a) Sudden auxiliary power unit deceleration due to malfunction or structural failure; and

(b) The maximum acceleration of the power unit.

3. For engine supporting structure, an ultimate loading condition must be considered that combines 1g flight loads with the transient dynamic loads resulting from:

(a) The loss of any fan, compressor, or turbine blade; and

(b) Separately, where applicable to a specific engine design, any other engine structural failure that results in higher loads.

4. The ultimate loads developed from the conditions specified in paragraphs 3(a) and 3(b) are to be multiplied by a factor of 1.0 when applied to engine mounts and pylons and multiplied by a factor of 1.25 when applied to adjacent supporting airframe structure.

5. Any permanent deformation that results from the conditions specified in paragraph 3 must not prevent continued safe flight and landing.

Issued in Renton, Washington, on July 18, 2011.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 2011–18654 Filed 7–22–11; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM456; Special Conditions No. 25–442–SC]

Special Conditions: Boeing Model 747–8 Series Airplanes; Overhead Flight Attendant Rest Compartment

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for Boeing Model 747–8 series airplanes. These airplanes will have novel or unusual design features associated with the installation of an overhead flight attendant rest compartment. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for these design features. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards. Additional special conditions will be issued for other novel or unusual design features of Boeing 747–8 airplanes.

DATES: *Effective Date:* August 24, 2011.

FOR FURTHER INFORMATION CONTACT: Jayson Claar, FAA, Airframe/Cabin Safety Branch, ANM–115, Transport Standards Staff, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington 98055–4056; telephone (425) 227–2194; facsimile (425) 227–1149.

SUPPLEMENTARY INFORMATION:

Background

On November 4, 2005, The Boeing Company, P.O. Box 3707, Seattle, WA 98124, applied for an amendment to Type Certificate Number A20WE to include the new Model 747–8 passenger airplane. Boeing later applied for, and was granted, an extension of time for the amended type certificate, which changed the effective application date to December 31, 2006. The Model 747–8 is a derivative of the 747–400. The Model 747–8 is a four-engine jet transport airplane that will have a maximum takeoff weight of 975,000 pounds and new General Electric GEnx–2B67 engines. The Model 747–8 will have two flight crew and the capacity to carry 605 passengers.

Type Certification Basis

Under the provisions of Title 14, Code of Federal Regulations (14 CFR) 21.101, Boeing must show that the Model 747–8 meets the applicable provisions of part 25, as amended by Amendments 25–1 through 25–120, plus amendment 25–127 for § 25.795(a), except for earlier amendments as agreed upon by the FAA. These regulations will be incorporated into Type Certificate No. A20WE after type certification approval of the 747–8.

In addition, the certification basis includes other regulations, special conditions and exemptions that are not relevant to these special conditions. Type Certificate No. A20WE will be updated to include a complete description of the certification basis for these airplanes. If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the 747–8 because of a novel or unusual design feature, special

conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the 747–8 must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36.

Special conditions, as defined in § 11.19, are issued under § 11.38, and become part of the type certification basis under § 21.101.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model or series that incorporates the same or similar novel or unusual design feature, or should any other model or series already included on the same type certificate be modified to incorporate the same or similar novel or unusual design feature, the special conditions would also apply to the other model or series under § 21.101.

Compliance with these special conditions does not relieve the applicant from the existing airplane certification basis requirements. One particular area of concern is that installing an overhead flight attendant rest (OFAR) compartment creates a smaller compartment volume within the overhead area of the airplane. The applicant must comply with the requirements of §§ 25.365(e), (f), and (g), for the OFAR compartment, as well as any other airplane compartments whose decompression characteristics are affected by the installation of an OFAR compartment. Compliance with the environmental regulations (§§ 25.831, 25.832, and 25.841) must be demonstrated for all phases of flight when occupants are present.

Novel or Unusual Design Features

While the installation of an OFAR compartment is not a new concept for large transport category airplanes, each compartment design has unique features by virtue of its design, location, and use on the airplane. Crew rest compartments have been installed and certified in the main passenger cabin area of Model 777–200 and –300 series airplanes and the overhead area of the passenger compartment of Model 777–200 airplanes. Other crew rest compartments have been installed below the passenger cabin area adjacent to the cargo compartment. Similar overhead crew rest compartments have also been installed on Model 747 series airplanes. The modification is evaluated with respect to the interior and assessed in accordance with the certification basis of the airplane. However, part 25 does not provide all of the requirements for crew rest compartments within the overhead area of the passenger compartment. Further, these special conditions do not negate the need to address other applicable part 25 regulations.

Due to the novel or unusual features associated with the installation of this OFAR compartment, special conditions are considered necessary to provide a level of safety equal to that established by the airworthiness regulations incorporated by reference in the type certificate.

Operational Evaluations and Approval

These special conditions outline requirements for overhead crew rest compartment design approvals, including the OFAR compartment, (i.e., type design changes and supplemental type certificates) administered by the FAA's Aircraft Certification Service.

Procedures must be developed to assure that a crewmember entering the OFAR compartment through the vestibule to fight a fire will examine the vestibule and the lavatory areas for the source of the fire prior to entering the remaining areas of the OFAR compartment. These procedures are intended to assure that the source of the fire is not between the crewmember and the primary exit. In the event a fire source is not immediately self-evident to the firefighter, the firefighter should check for potential fire sources at areas closest to the primary exit first, then proceed to check areas in such a manner that the fire source, when found, would not be between the firefighter and the primary exit. Procedures describing methods to search the overhead crew rests for fire source(s) must be transmitted to the operator for incorporation into its training programs and appropriate operational manuals.

Discussion of the Special Conditions

In general, the requirements listed in these special conditions are similar to those previously approved in earlier certification programs, such as the Model 777–200 series airplanes and Model 747 overhead crew rest compartments. These special conditions establish seating, communication, lighting, personal safety, and evacuation requirements for the OFAR compartment. In addition, passenger information signs, supplemental oxygen, and a seat or berth for each occupant of the OFAR compartment are required. These items are necessary because of turbulence and/or decompression. When applicable, the requirements parallel the existing requirements for a lower deck service compartment and provide an equivalent level of safety to that provided for main deck occupants.

On Model 777 series airplanes, crew rest compartments have been installed and certified in the main passenger cabin area, above the main passenger area, and below the passenger cabin area adjacent to the cargo compartment. Also, overhead crew rest compartments have been installed on Model 747 series airplanes.

The FAA issued special conditions that contain the additional safety standards that must be met for the OFAR compartments on Boeing Model 747 and 777 series airplanes. FAA Special Condition 25–ANM–16 was issued in 1987 to provide adequate safety standards for the 747–300 and 747–400 Door 5 Overhead Crew Rests, and amended in 1997 (25–ANM–16A) to address design changes in the 747–400 Door 5 Overhead Crew Rest. For Boeing Model 777 series airplanes, the FAA issued Special Conditions No. 25–230–SC, dated April 9, 2003, for overhead crew rest compartments allowed to be occupied during flight and Special Conditions No. 25–260–SC, dated April 14, 2004, for overhead flight crew rest (OFCR) compartments allowed to be occupied during taxi, take-off, and landing, as well as during flight.

Special Condition No. 1

This special condition requires the seats and berths to be certified to the maximum flight loads. Due to the location and configuration of the OFAR compartment, occupancy during taxi, take-off, and landing is prohibited, and occupancy is limited to crewmembers during flight. Occupancy would be limited to 12 in an OFAR compartment, or the combined total of approved seats and berths in the OFAR, whichever is less. This special condition has the requirements for:

- Door access and locking,
- Ashtray installation,
- Placards to prohibit passenger access,
- Access by crewmembers not trained in evacuation procedures,
- Smoking, and
- Hazardous quantities of flammable fluids, explosives, or other dangerous cargo.

The phrase ''hazardous quantities'' as used in this special condition permits trained crewmembers to continue to carry baggage containing minute quantities of flammable fluids (*e.g.,* finger nail polish and aerosol hairspray) that would pose no threat to the airplane or its occupants. This wording is consistent with the existing wording of §§ 25.831(d), 25.855(h)(2),

25.857(b)(2), 25.857(c)(3), and 25.1353(c)(3).

Special Condition No. 2

The purpose of this special condition is to prevent occupants from being trapped in the OFAR compartment if there is an emergency. The special condition requires at least two emergency evacuation routes that could be used by each occupant of the OFAR compartment to rapidly evacuate to the main cabin. These two routes must be sufficiently separated to minimize the possibility of an event rendering both routes inoperative. The main entry route meeting the appropriate requirements may be utilized as one of the emergency evacuation routes, or, as an alternative, two other emergency routes must be provided. The intent of Special Condition No. 2(b) is to ensure that one of the two routes would be clear of moving occupants under most foreseeable circumstances.

Special Condition No. 2(b) identifies the three issues that should be considered for egress routes. First, occupied passenger seats are not considered an impediment to the use of an egress route (for example, the egress route drops into one row of seats by means of a hatch) provided that the seated occupants do not inhibit the opening of the egress route (for example, a hatch).

Second, an egress route may utilize areas where normal movement of passengers occurs if it is demonstrated that the passengers would not impede egress to the main deck. If the egress means (a hatch in this design) opens into a main aisle, cross aisle, or galley complex to an extent that it contacts a standing ninety-fifth percentile male, then the contact should only momentarily interrupt the opening of the egress hatch. The interruption to the egress means can be considered momentary if the egress means would continue to open normally once the person has moved out of the way.

Third, the escape hatch should be provided with a means to prevent it from being inadvertently closed by a passenger on the main deck. This will ensure main deck passengers can not prevent the overhead crew rest occupants from using the escape route. The crew should be able to stow the escape hatch prior to landing.

Training requirements for the OFAR compartment occupants are included in this special condition.

To clarify how compliance can be shown to Special Condition No. 2(a) new qualitative and quantitative criteria have been added to this special condition since the issuance of Special Conditions No. 25–192–SC.

Special Condition No. 3

This special condition requires each evacuation route to be designed for and have procedures established for moving an incapacitated person from the OFAR compartment to the main deck. Additional assistants to evacuate an incapacitated person may ascend up to one half the elevation change from the main deck to the OFAR compartment, or to the first landing, whichever is lower. Where the escape route is over seats, this special condition allows for five passenger seats to be emptied when demonstrating evacuation of an incapacitated person.

Special Condition No. 4

This special condition requires exit signs; placards for evacuation routes; and illumination for signs, placards, and door handles. This special condition allows the use of exit signs with a reduced background area. The material surrounding the sign must be light in color to more closely match and enhance the illuminated background of the sign that has been reduced in area (letter size stays the same). Signs with a reduced background area have been allowed under previous equivalent level of safety findings for small transport executive jets.

Special Condition No. 5

This special condition requires an emergency lighting system to prevent the occupants from being isolated in a dark area due to loss of the normal OFAR compartment lighting. The emergency lighting must be activated under the same conditions as the main deck emergency lighting system.

Special Condition No. 6

This special condition requires a two-way voice communication and public address speaker(s) to alert the occupants of an in-flight emergency. Also required is a system to alert the OFAR compartment occupants of a decompression event and to don oxygen masks.

Special Condition No. 7

This special condition requires a means to inform occupants of the OFAR compartment of an emergency. Also, after certain failures, power must be maintained to the emergency alarm system for a specific period of time.

Special Condition No. 8

This special condition requires a means that is readily detectable by seated or standing OFAR compartment occupants to indicate when seat belts should be fastened. The requirement for visibility of the sign by standing occupants may be met by a general area sign that is visible to occupants standing in the main floor area or corridor of the OFAR compartment. It would not be essential that the sign be visible from every possible location in the OFAR compartment. However, the sign should not be remotely located or located where it may be easily obscured.

Special Condition No. 9

This special condition requires the OFAR compartment, which is remotely located from the passenger cabin, to be equipped with the following tools for firefighting: a hand-held fire extinguisher, protective breathing equipment (PBE), and a flashlight.

This requirement has been modified from previously issued Special Conditions No. 25–192–SC to clarify how it should be interpreted relative to the requirements of § 25.1439(a). Amendment 25–38 modified the requirements of § 25.1439(a) by adding, ''In addition, protective breathing equipment must be installed in each isolated separate compartment in the airplane, including upper and lower lobe galleys, in which crewmember occupancy is permitted during flight for the maximum number of crewmembers expected to be in the area during any operation.'' The requirements of § 25.1439(a) apply to the OFAR compartment, which is an isolated separate compartment. However, the PBE requirements for isolated separate compartments of § 25.1439(a) are not appropriate because the OFAR compartment is novel and unusual in terms of the number of occupants. In 1976 when Amendment 25–38 was adopted, underfloor galleys were the only isolated compartments that had been certificated with a maximum of two crewmembers expected to occupy those galleys. Special Condition No. 9 addresses OFAR compartments that can accommodate up to 12 crewmembers. This large number of occupants in an isolated compartment was not envisioned at the time Amendment 25–38 was adopted. In the event of a fire, an occupant's first action should be to leave the confined space, unless the occupant(s) is fighting the fire. It is not appropriate for all OFAR compartment occupants to don PBE. Taking the time to don the PBE would prolong the time for an occupant's emergency evacuation and possibly interfere with efforts to extinguish the fire.

Special Condition No. 10

This special condition requires a smoke detection system and appropriate warnings since the OFAR compartment is remotely located from the main passenger cabin and will not always be occupied. The smoke detection system must be capable of detecting a fire throughout the OFAR including occupiable areas of the compartment created by the installation of a curtain or door.

Special Condition No. 11

This special condition requires the OFAR compartment to be designed so fires within the compartment can be controlled without having to enter the compartment; or, the design of the access provisions must allow crew equipped for firefighting to have unrestricted access to the compartment. The time for a crewmember on the main deck to react to the fire alarm, don firefighting equipment, and gain access must not exceed the time for the OFAR compartment to become smoke filled, making it difficult to locate the fire source.

Special Condition No. 12

This special condition requirement concerning fires within the compartment was developed for, and applied to, lower lobe crew rest compartments in Model 777–200 and –300 series airplanes. It was not applied to the overhead crew rest compartment in earlier certification programs such as the Model 747 airplanes. The Model 747 special conditions were issued before the new part 25 flammability requirements were developed. This requirement originated from a concern that a fire in an unoccupied overhead crew rest compartment could spread into the passenger compartment, or affect other vital systems, before it could be extinguished. This special condition would require either the installation of a manually activated fire containment system that is accessible from outside the OFAR compartment, or a demonstration that the crew could satisfactorily perform the function of extinguishing a fire under the prescribed conditions. A manually activated built-in fire extinguishing system would be required only if a crewmember could not successfully locate and extinguish the fire during a demonstration where the crewmember is responding to the alarm.

The OFAR compartment smoke or fire detection and fire suppression systems (including airflow management features which prevent hazardous quantities of smoke or fire extinguishing agent from entering any other compartment occupied by crewmembers or passengers) is considered complex in terms of paragraph 6d of Advisory Circular (AC) 25.1309–1A, *System Design and Analysis*. In addition, the FAA considers failure of the OFAR compartment fire protection system (i.e., smoke or fire detection and fire suppression systems) in conjunction with an OFAR fire to be a catastrophic event. Based on the ''Depth of Analysis Flowchart'' shown in Figure 2 of AC 25.1309–1A, the depth of analysis should include both qualitative and quantitative assessments (reference paragraphs 8d, 9, and 10 of AC 25.1309–1A). In addition, it should be noted that hazardous quantities of flammable fluids, explosives, or other dangerous cargo are prohibited from being carried in the OFAR compartment, a prohibition addressed in Special Condition No. 1(a)(5).

The requirements to enable crewmember(s) to quickly enter the OFAR compartment and locate a fire source inherently places limits on the amount of baggage that may be carried and the size of the OFAR compartment. The OFAR compartment is limited to stowing crew personal luggage and is not intended for stowing cargo or passenger baggage. The design of such a system to include cargo or passenger baggage would require additional requirements to ensure safe operation.

During the one-minute smoke detection time, penetration of a small quantity of smoke from the OFAR compartment into an occupied area is acceptable for this airplane configuration. The FAA finds this acceptable based on the limitations placed in this and other associated special conditions. The FAA position is predicated on the fact that these special conditions place sufficient restrictions on the quantity and type of material allowed in crew carry-on bags that the threat from a fire in this remote area would be equivalent to that experienced in the main cabin.

Special Condition No. 13

This special condition requires that the oxygen equipment and a supplemental oxygen deployment warning for the OFAR compartment be equivalent to that provided for main deck passengers. Procedures must be established for OFAR compartment occupants to follow in the event of decompression.

Special Condition No. 14

This special condition has the requirements for a divided OFAR compartment to address supplemental oxygen equipment and deployment means, signs, placards, curtains, doors, emergency illumination, alarms, seat belt fasten signals, and evacuation routes.

The wording in Special Condition No. 14(a) was modified from previously issued special conditions to clarify that oxygen masks are not required in common areas where seats or berths are not installed. A visual indicator to don oxygen masks is required in these areas. The visual indicator is in addition to the aural alert for donning oxygen masks.

Special Condition No. 15

For lavatories or other small areas within an OFAR compartment, this special condition eliminates the requirements for flight deck communication as required by Special Condition No. 6, and emergency fire fighting and protective equipment as required by Special Condition No. 9.

Special Condition No. 16

This special condition requires a fitted waste disposal receptacle to be equipped with an automatic fire extinguisher.

Special Condition No. 17

This special condition requires the materials in the OFAR compartment to meet the flammability requirements of § 25.853(a), and the mattresses and seat cushions to meet the fire blocking requirements of § 25.853(c).

Special Condition No. 18

To clarify the applicability, this special condition reiterates the existing requirements for the main deck lavatory. OFAR compartment lavatories are required to comply with the existing rules on lavatories in the absence of other specific requirements. In addition, any lavatory located in the OFAR compartment must also meet the requirements of Special Condition No. 10 for smoke detection due to its placement in this remote area.

Special Condition No. 19

This special condition requires establishing fire protection procedures for the OFAR compartment based on the size of the compartment (compartment interior volume). This special condition has been revised from previously issued special conditions for other model airplanes because of the introduction of larger stowage compartments into the OFAR compartment. The fire protection requirements for stowage compartments in the OFAR compartment are more stringent than those for stowage in the main passenger cabin because the OFAR compartment is a remote area that can

remain unoccupied for long periods of time in contrast to the main cabin that is under continuous monitoring by the cabin crew and passengers. For stowage compartments less than 25 ft^3 the safety objective of these requirements is to contain the fire. FAA research indicates that properly constructed compartments meeting the material requirements will prevent burn through. For stowage compartments greater than 25 ft^3 but less than 200 ft^3 the safety objective is to detect and contain the fire for sufficient time to allow it to be extinguished by the crew. The requirements for these sizes of compartments are comparable to the requirements for Class B cargo compartments. The fire protection requirements are intended to provide a level of safety for the OFAR compartment that is equivalent to the level of safety established by the existing regulations for the main cabin.

These special conditions along with the original type certification basis provide the regulatory requirements necessary for certification of this modification. Other special conditions may be developed, as needed, based on further FAA review and discussions with the applicant, manufacturer, and civil aviation authorities.

The addition of galley equipment or a kitchenette incorporating a heat source (e.g., cook tops, microwaves, or coffee pots), other than a conventional lavatory or kitchenette hot water heater, within the OFAR compartment, may require additional special conditions. A hot water heater is acceptable and will not require issuing additional special conditions.

The OFAR compartment on the 747–8 series airplanes is located above the main passenger cabin adjacent to Door 5 and will be accessed from the main deck by stairs. The OFAR compartment will include a maximum of 10 berths and a bench style seat for a maximum occupancy of 12. An emergency hatch that opens directly into the main passenger cabin area will be provided. A smoke detection system, an oxygen system with audio warning, emergency backup lighting, information signs, and occupant amenities will also be provided. Additionally, the OFAR compartment will only be occupied by trained crew members in flight, not during taxi, take-off, or landing.

Discussion of Comments

Notice of proposed special conditions No. 25–11–13–SC for Boeing Model 747–8 airplanes was published in the **Federal Register** on May 10, 2011 (76 FR 26949). No comments were received and the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to Boeing Model 747–8 series airplanes. Should Boeing apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design features, the special conditions would apply to that model as well under the provisions of § 21.101.

Conclusion

This action affects only certain novel or unusual design features of Boeing Model 747–8 airplanes. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Boeing Model 747–8 airplanes.

1. Occupancy of the overhead flight attendant rest (OFAR) compartment is limited to the total number of bunks and seats installed in that compartment. There must be an approved seat or berth able to withstand the maximum flight loads when occupied for each occupant permitted in the OFAR compartment. The maximum occupancy is 12.

(a) Appropriate placards must be located inside and outside each entrance to the OFAR compartment to indicate:

(1) The maximum number of occupants allowed.

(2) Occupancy is restricted to crewmembers that are trained in the evacuation procedures for the overhead crew rest compartment.

(3) Occupancy is prohibited during taxi, take-off and landing.

(4) Smoking is prohibited in the OFAR compartment.

(5) Stowage in the OFAR compartment area is limited to crew personal luggage. The stowage of cargo or passenger baggage is not allowed.

(b) At least one ashtray must be located on both the inside and the outside of any entrance to the OFAR compartment.

(c) Passengers must be prevented from entering the OFAR compartment in the event of an emergency or when no flight attendant is present.

(d) Any door installed between the OFAR compartment and passenger cabin must be capable of being quickly opened from inside the compartment, even when crowding occurs at each side of the door.

(e) For all doors installed in the OFAR compartment, a means must be in place to preclude anyone from being trapped inside the OFAR compartment. If a locking mechanism is installed, it must be capable of being unlocked from the outside without the aid of special tools. The lock must not prevent opening from the inside of the OFAR compartment at any time.

2. At least two emergency evacuation routes must be available which could be used by each occupant of the OFAR compartment to rapidly evacuate to the main cabin and be able to be closed from the main passenger cabin after evacuation. In addition—

(a) The routes must be located with sufficient separation within the OFAR compartment, and between the evacuation routes, to minimize the possibility of an event rendering both routes inoperative.

Compliance with the requirements of Special Condition No. 2(a) may be shown by inspection or analysis. Regardless of which method is used, the maximum acceptable distance between exit openings is 60 feet.

Compliance by Inspection

Inspection may be used to show compliance with Special Condition No. 2(a). An inspection finding that an OFAR compartment has evacuation routes located such that each occupant of the seats and berths has an unobstructed route to at least one of the evacuation routes regardless of the location of a fire would be reason for a finding of compliance. A fire within a berth that only blocks the occupant of that berth from exiting the berth need not be considered. Therefore, exits which are located at opposite ends (i.e., adjacent to opposite end walls) of the OFAR would require no further review or analysis with regard to exit separation.

Compliance by Analysis

Analysis must show that the OFAR compartment configuration and interior features allow all occupants of the OFAR to escape the compartment in the event of a hazard inside or outside of the compartment. Elements to consider in this evaluation are:

(1) Fire inside or outside the OFAR compartment, considered separately,

and the design elements used to reduce the available fuel for the fire.

(2) Design elements to reduce the fire ignition sources in the OFAR compartment.

(3) Distribution and quantity of emergency equipment within the OFAR compartment.

(4) Structural failure or deformation of components that could block access to the available evacuation routes (e.g., seats, folding berths, and contents of stowage compartments).

(5) An incapacitated person blocking the evacuation routes.

(6) Any other foreseeable hazard not identified above that could cause the evacuation routes to be compromised.

Analysis must consider design features affecting access to the evacuation routes. The design features that should be considered include, but are not limited to,

○ Seat back break over,

○ The elimination of rigid structure that reduces access from one part of the compartment to another,

○ The elimination of items that are known to cause hazards,

○ The availability of emergency equipment to address fire hazards,

○ The availability of communications equipment,

○ Supplemental restraint devices to retain items of mass that could hinder evacuation if broken loose, and

○ Load path isolation between components that contain the evacuation routes.

Analysis of the fire threats should be used in determining the placement of required fire extinguishers and protective breathing equipment (PBE). This analysis should take into consideration the possibility of fire in any location in the OFAR compartment. The location and quantity of PBE and fire extinguishers should allow occupants located in any approved seats or berths access to the equipment necessary to fight a fire in the OFAR compartment.

The intent of this special condition is to provide sufficient exit separation. The exit separation analysis described above should not be used to approve exits which have less physical separation (measured between the centroid of each exit opening) than the minimums prescribed below, unless compensating features are identified and submitted to the FAA for evaluation and approval.

For OFAR compartments with one exit located near the forward or aft end of an OFAR compartment (as measured by having the centroid of the exit opening within 20 percent of the total OFAR compartment length from the forward or aft end of the compartment) the exit separation should not be less than 50 percent of the total OFAR compartment length.

For OFAR compartments with neither required exit located near the forward or aft end of the OFAR compartment (as measured by having the centroid of the exit opening within 20 percent of the total OFAR compartment length from the forward or aft end of the compartment) the exit separation should not be less than 30 percent of the total OFAR compartment length.

(b) The routes must be designed to minimize the possibility of blockage, which might result from fire, mechanical or structural failure, or persons standing below or against the escape route. One of the two evacuation routes should not be located where, during times when occupancy is allowed, normal movement by passengers occurs (*i.e.,* main aisle, cross aisle or galley complex) that would impede egress from the OFAR compartment. If an evacuation route is in an area where normal movement of passengers occurs, it must be demonstrated that passengers would not impede egress to the main deck. If there is low headroom at or near the evacuation route, provisions must be made to prevent or to protect occupants of the OFAR compartment from head injury. The use of evacuation routes must not depend on any powered device. If the evacuation path is over an area where there are passenger seats, a maximum of five passengers may be temporarily displaced from their seats when evacuating an incapacitated person(s). If the evacuation procedure involves the evacuee stepping on seats, the seats must not be damaged to the extent that they would not be acceptable for occupancy during an emergency landing.

(c) Emergency evacuation procedures, including procedures for emergency evacuation of an incapacitated occupant from the OFAR compartment, must be established. All of these procedures must be transmitted to the operator for incorporation into its training programs and appropriate operational manuals.

(d) A limitation must be included in the airplane flight manual or other suitable means requiring that crewmembers be trained in the use of evacuation routes.

3. There must be a means for evacuating an incapacitated person (representative of a ninety-fifth percentile male) from the OFAR compartment to the passenger cabin floor. The evacuation must be demonstrated for all evacuation routes. A crewmember (a total of one assistant within the OFAR compartment) may provide assistance in the evacuation. Additional assistance may be provided by up to three persons in the main passenger compartment. These additional assistants must be standing on the floor while providing assistance. For evacuation routes with stairways, the additional assistants may ascend up to one half the elevation change from the main deck to the OFAR compartment, or to the first landing, whichever is lower.

4. The following signs and placards must be provided in the OFAR compartment:

(a) At least one exit sign, located near each exit, meeting the emergency lighting requirements of § 25.812(b)(1)(i); however, a sign with a reduced background area of no less than 5.3 square inches (excluding the letters) may be used, provided it is installed so the material surrounding the exit sign is light in color (e.g., white, cream, light beige). If the material surrounding the exit sign is not light in color, a sign with a minimum of a one-inch wide background border around the letters is acceptable.

(b) An appropriate placard located conspicuously on or near each exit defining the location and operating instructions for each evacuation route.

(c) Placards must be readable from a distance of 30 inches under emergency lighting conditions.

(d) The evacuation path operating instruction placards required by Special Condition 4(b) of these special conditions must be illuminated to at least 160 microlamberts under emergency lighting conditions.

5. A means must be available, in the event of failure of the airplane's main power system, or of the normal OFAR compartment lighting system, for emergency illumination to be automatically provided in the OFAR compartment.

(a) This emergency illumination must be independent of the main lighting system.

(b) The sources of general cabin illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency lighting system is independent of the power supply to the main lighting system.

(c) The illumination level must be sufficient for the occupants of the OFAR compartment to locate and move to the main passenger cabin floor by means of each evacuation route.

6. A means must be available for two-way voice communications between crewmembers on the flight deck and occupants of the OFAR compartment.

Two-way voice communications must also be available between the occupants of the OFAR compartment and each flight attendant station in the passenger cabin that is required to have a public address system microphone per § 25.1423(g). In addition, the public address system must include provisions to provide only the relevant information to the flight attendants in the OFAR compartment (e.g., fire in flight, airplane depressurization, or preparation of the compartment occupants for landing).

7. A means must be available for manually activating an aural emergency alarm system, audible during normal and emergency conditions, to enable crewmembers on the flight deck and at each pair of required floor level emergency exits to alert occupants of the OFAR compartment of an emergency situation. Use of a public address or crew interphone system is acceptable, provided an adequate means of differentiating between normal and emergency communications is incorporated. The system must be powered in flight for at least 10 minutes after the shutdown or failure of all engines and auxiliary power units.

8. A means, readily detectable by seated or standing occupants of the OFAR compartment, must be in place to indicate when seat belts should be fastened. In the event there are no seats, at least one means must be provided to cover anticipated turbulence (e.g., sufficient handholds). Seat belt type restraints must be provided for berths and must be compatible with the sleeping position during cruise conditions. There must be a placard on each berth requiring seat belts to be fastened when occupied. If compliance with any of the other requirements of these special conditions is predicated on a specific head position, there must be a placard identifying that head position.

9. In lieu of the requirements specified in § 25.1439(a) pertaining to isolated compartments, and to provide a level of safety equivalent to that provided to occupants of an isolated galley, the following equipment must be provided in the OFAR compartment:

(a) At least one approved hand-held fire extinguisher appropriate for the kinds of fires likely to occur.

(b) Two PBE devices suitable for firefighting, or one PBE for each hand-held fire extinguisher, whichever is greater. All PBE devices must be approved to Technical Standard Order (TSO)-C116, *Crewmember Portable Protective Breathing Equipment,* or equivalent.

(c) One flashlight.

Note: Additional PBEs and fire extinguishers in specific locations, beyond the minimum numbers prescribed in Special Condition No. 9, may be required as a result of the egress analysis accomplished to satisfy Special Condition No. 2(a).

10. A smoke or fire detection system (or systems) must be provided that monitors each occupiable area within the OFAR compartment, including those areas partitioned by curtains. Flight tests must be conducted to show compliance with this requirement. If a fire occurs, each system (or systems) must provide:

(a) A visual indication to the flightdeck within one minute after the start of a fire.

(b) An aural warning in the OFAR compartment.

(c) A warning in the main passenger cabin. This warning must be readily detectable by a flight attendant, taking into consideration the positioning of flight attendants throughout the main passenger compartment during various phases of flight.

11. A means to fight a fire must be provided. This can be either a built-in extinguishing system or manual, hand-held bottle extinguishing system.

(a) For a built-in extinguishing system:

(1) The system must have adequate capacity to suppress a fire considering the fire threat, compartment volume, and ventilation rate. The system must have sufficient extinguishing agent to provide an initial knockdown and suppression environment per the minimum performance standards established for the agent being used.

(2) If the capacity of the extinguishing system does not provide effective fire suppression that will last for the duration of flight from the farthest point in route to the nearest suitable landing site expected in service, an additional manual firefighting procedure must be established. For a built-in extinguishing system, the time needed for effective fire suppression must be established and documented in the firefighting procedures of the airplane flight manual. If the duration of time for demonstrated effective fire suppression provided by the built-in extinguishing agent will be exceeded, the firefighting procedures must instruct the crew to:

(i) Enter the OFAR compartment at the time that demonstrated fire suppression effectiveness will be exceeded.

(ii) Check for and extinguish any residual fire.

(iii) Confirm that the fire is out.

(b) For a manual, hand-held bottle extinguishing system (designed as the sole means to fight a fire or to supplement a built-in extinguishing system of limited suppression duration) for the OFAR compartment:

(1) A limitation must be included in the airplane flight manual or other suitable means requiring that crewmembers be trained in the firefighting procedures.

(2) The compartment design must allow crewmembers equipped for firefighting to have unrestricted access to all parts of the compartment.

(3) The time for a crewmember on the main deck to react to the fire alarm, don the firefighting equipment, and gain access to the OFAR compartment must not exceed the time for the compartment to become smoke-filled, making it difficult to locate the fire source.

(4) Approved procedures describing methods for searching the OFAR compartment for fire source(s) must be established. These procedures must be transmitted to the operator for incorporation into its training programs and appropriate operational manuals.

12. A means must be provided to prevent hazardous quantities of smoke or extinguishing agent originating in the OFAR compartment from entering any other compartment occupied by crewmembers or passengers. This means must include the time periods during the evacuation of the OFAR compartment and, if applicable, accessing the OFAR compartment to manually fight a fire. When access to the OFAR compartment is open for emergency evacuation all smoke entering any other compartment occupied by crewmembers or passengers must dissipate within five minutes after access to the OFAR compartment is closed. Hazardous quantities of smoke may not enter any other compartment occupied by crewmembers or passengers during access to manually fight a fire in the OFAR compartment. The amount of smoke entrained by a firefighter exiting the OFAR compartment is not considered hazardous. During the one-minute smoke detection time, penetration of a small quantity of smoke from the OFAR into an occupied area is acceptable. Flight tests must be conducted to show compliance with this requirement.

(a) A provision in the firefighting procedures must ensure that all door(s) and hatch(es) at the OFAR compartment outlets are closed after the compartment is evacuated and during firefighting to minimize smoke and extinguishing agent from entering other occupiable compartments.

(b) If a built-in fire extinguishing system is used in lieu of manual firefighting, the fire extinguishing

system must be designed so no hazardous quantities of extinguishing agent enter other compartments occupied by passengers or crew. The system must have adequate capacity to suppress any fire occurring in the OFAR compartment, considering the fire threat, compartment volume, and ventilation rate.

13. There must be a supplemental oxygen system for each seat and berth in the OFAR compartment equivalent to that provided for main deck passengers. The system must provide an aural and visual alert to warn occupants of the OFAR compartment to don oxygen masks in the event of decompression. The aural and visual alerts must activate before the cabin pressure altitude exceeds 15,000 feet. The aural warning must sound continuously for a minimum of five minutes or until a reset push button in the OFAR compartment is depressed. Procedures must be established for instructing OFAR compartment occupants what to do in the event of decompression. These procedures must be transmitted to the operator for incorporation into its training programs and appropriate operational manuals.

14. The following requirements apply to OFAR compartments divided into several sections by installing curtains or partitions:

(a) To compensate for sleeping occupants, there must be an aural alert that can be heard in each section of the OFAR compartment that accompanies automatic presentation of supplemental oxygen masks. A visual alert that informs occupants that they must don oxygen masks is required in each section where seats or berths are not installed. Each seat or berth must have at least two supplemental oxygen masks. A means must be in place by which oxygen masks can be manually deployed from the flight deck.

(b) A placard is required adjacent to each curtain that visually divides or separates, for privacy purposes, the OFAR compartment into multiple sections. The placard must require that the curtain(s) remains open when the private section it creates is unoccupied. The vestibule section adjacent to the stairway is not considered a private section and, therefore, does not require a placard.

(c) For each section of the OFAR compartment created by the installation of a curtain, the following requirements must be met with the curtain open or closed:

(1) No smoking placard (Special Condition No. 1).

(2) Emergency illumination (Special Condition No. 5).

(3) Emergency alarm system (Special Condition No. 7).

(4) Seat belt fasten signal or return to seat signal as applicable (Special Condition No. 8).

(5) A smoke or fire detection system (Special Condition No. 10).

(d) OFAR compartments that are visually divided to the extent that evacuation could be affected must have exit signs directing occupants to the primary stairway exit. The exit signs must be provided in each separate section of the OFAR compartment, except for curtained bunks, and must meet the requirements of § 25.812(b)(1)(i).

(e) Sections within an OFAR compartment created by installing a rigid partition with a door physically separating the sections, must meet the following requirements with the door open or closed:

(1) A secondary evacuation route from each section to the main deck, or the applicant must show that any door between the sections precludes anyone from being trapped inside the compartment. Removing an incapacitated occupant from this area must be considered. A secondary evacuation route from a small room designed for only one occupant for a short period of time, such as a changing area or lavatory, is not required. However, removing an incapacitated occupant from a small room, such as a changing area or lavatory, must be considered.

(2) Any door between the sections must be shown to be openable when crowded against, even when crowding occurs at each side of the door.

(3) No more than one door may be located between any seat or berth and the primary stairway exit.

(4) Each section must have exit signs that meet the requirements of § 25.812(b)(1)(i) and direct occupants to the primary stairway exit. An exit sign with reduced background area as described in Special Condition No. 4(a) may be used to meet this requirement.

(f) For each section of the OFAR compartment created by the installation of a partition with a door, the following requirements must be met with the door open or closed:

(1) No smoking placards (Special Condition No. 1).

(2) Emergency illumination (Special Condition No. 5).

(3) Two-way voice communication (Special Condition No. 6).

(4) Emergency alarm system (Special Condition No. 7).

(5) Seat belt fasten signal or return to seat signal as applicable (Special Condition No. 8).

(6) Emergency firefighting and protective equipment (Special Condition No. 9).

(7) Smoke or fire detection system (Special Condition No. 10).

15. Special Conditions 6 (two-way voice communication with the flight deck) and 9 (emergency firefighting and protective equipment) are not applicable to lavatories or other small areas that are not intended to be occupied for extended periods of time.

16. If a waste disposal receptacle is fitted, it must be equipped with an automatic fire extinguisher that meets the performance requirements of § 25.854(b).

17. Materials (including finishes or decorative surfaces applied to the materials) must comply with the flammability requirements of § 25.853(a), as amended by Amendment 25–83. Mattresses and seat cushions must comply with the flammability requirements of § 25.853(c), as amended by Amendment 25–83.

18. The addition of a lavatory within the OFAR compartment would require the lavatory to meet the same requirements as those for a lavatory installed on the main deck except with regard to Special Condition No. 10 for smoke detection.

19. All enclosed stowage compartments within the OFAR compartment that are not limited to stowage of emergency equipment or airplane supplied equipment (e.g., bedding) must meet the design criteria given in the table below. Enclosed stowage compartments greater than 200 ft^3 in interior volume are not addressed by this special condition. The in-flight accessibility of very large, enclosed, stowage compartments and the subsequent impact on the crewmembers' ability to effectively reach any part of the compartment with the contents of a hand-held fire extinguisher will require additional fire protection considerations similar to those required for inaccessible compartments, such as Class C cargo compartments.

DESIGN CRITERIA FOR ENCLOSED STOWAGE COMPARTMENTS NOT LIMITED TO STOWAGE OF EMERGENCY OR AIRPLANE-SUPPLIED EQUIPMENT

Fire protection features	Stowage compartment interior volumes		
	Less than 25 cubic feet	25 cubic feet to 57 cubic feet	57 cubic feet to 200 cubic feet
Materials of Construction [1]	Yes	Yes	Yes.
Detectors [2]	No	Yes	Yes.
Liner [3]	No	Conditional	Yes.
Locating Device [4]	No	Yes	Yes.

[1] *Compliant Materials of Construction*
The material used in constructing each enclosed stowage compartment must at least be fire resistant and must meet the flammability standards established for interior components (i.e., 14 CFR part 25 Appendix F, parts I, IV, and V) per the requirements of § 25.853. For compartments less than 25 ft^3 in interior volume, the design must ensure the ability to contain a fire likely to occur within the compartment under normal use.

[2] *Smoke or Fire Detectors*
Enclosed stowage compartments equal to or exceeding 25 ft^3 in interior volume must be provided with a smoke or fire detection system to ensure that a fire can be detected within a one-minute detection time. Flight tests must be conducted to show compliance with this requirement. Each system (or systems) must provide:
(a) A visual indication in the flight deck within one minute after the start of a fire.
(b) An aural warning in the OFAR compartment.
(c) A warning in the main passenger cabin. This warning must be readily detectable by a flight attendant, taking into consideration the positioning of flight attendants throughout the main passenger compartment during various phases of flight.

[3] *Liner*
If material used in constructing the stowage compartment can be shown to meet the flammability requirements of a liner for a Class B cargo compartment (i.e., § 25.855 at Amendment 25–93, and Appendix F, part I, paragraph (a)(2)(ii)), then no liner would be required for enclosed stowage compartments equal to or greater than 25 ft^3 in interior volume but less than 57 ft^3 in interior volume. For all enclosed stowage compartments equal to or greater than 57 ft^3 in interior volume but less than or equal to 200 ft^3, a liner must be provided that meets the requirements of § 25.855 for a Class B cargo compartment.

[4] *Fire Location Detector*
If an OFAR compartment has enclosed stowage compartments exceeding 25 ft^3 interior volume that are located separately from the other stowage compartments (for example, away from one central location, such as the entry to the OFAR compartment or a common area within the OFAR compartment) that compartment would require additional fire protection features and/or devices to assist the firefighter in determining the location of a fire.

Issued in Renton, Washington, on July 18, 2011.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Docket No. FAA–2010–1327; Airspace Docket No. 10–ASW–19]

Amendment of Class D Airspace; Denton, TX

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This action amends Class D airspace for Denton, TX, to accommodate new Area Navigation (RNAV) Standard Instrument Approach Procedures at Denton Municipal Airport. The FAA is taking this action to enhance the safety and management of Instrument Flight Rule (IFR) operations at the airport.

DATES: Effective date: 0901 UTC, October 20, 2011. The Director of the Federal Register approves this incorporation by reference action under 1 CFR Part 51, subject to the annual revision of FAA Order 7400.9 and publication of conforming amendments.

FOR FURTHER INFORMATION CONTACT: Scott Enander, Central Service Center, Operations Support Group, Federal Aviation Administration, Southwest Region, 2601 Meacham Blvd., Fort Worth, TX 76137; telephone (817) 321–7716.

SUPPLEMENTARY INFORMATION:

History

On May 18, 2011, the FAA published in the **Federal Register** a notice of proposed rulemaking to amend Class D airspace for Denton, TX, creating additional controlled airspace at Denton Municipal Airport (76 FR 28684) Docket No. FAA–2010–1327. Interested parties were invited to participate in this rulemaking effort by submitting written comments on the proposal to the FAA. No comments were received. Class D airspace designations are published in paragraph 5000 of FAA Order 7400.9U dated August 18, 2010, and effective September 15, 2010, which is incorporated by reference in 14 CFR 71.1. The Class D airspace designations listed in this document will be published subsequently in the Order.

The Rule

This action amends Title 14 Code of Federal Regulations (14 CFR) Part 71 by creating additional Class D airspace for new standard instrument approach procedures at Denton Municipal Airport, Denton, TX. This action is necessary for the safety and management of IFR operations at the airport. The geographic coordinates of Denton Municipal Airport are also being updated to coincide with the FAA's aeronautical database. With the exception of this change, this action is the same as that published in the NPRM.

The FAA has determined that this regulation only involves an established body of technical regulations for which frequent and routine amendments are necessary to keep them operationally current. Therefore, this regulation: (1) Is not a ''significant regulatory action'' under Executive Order 12866; (2) is not a ''significant rule'' under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) does not warrant preparation of a regulatory evaluation as the anticipated impact is so minimal. Since this is a routine matter that will only affect air traffic procedures and air navigation, it is certified that this rule, when promulgated, will not have a significant economic impact on a substantial