The Special Conditions

As discussed above, these special conditions are applicable to the Airbus A380–800 airplane. Should Airbus apply at a later date for a change to the type certificate to permit installation of novel and unusual design features, these 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 the Airbus A380–800 airplane. 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(q), 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 the Airbus A380–800 airplane.

In lieu of the requirements of §25.493, the following special condition applies:

a. The airplane is assumed to execute a steady turn by steering of any steerable gear or by application of any differential power. The airplane limit vertical load factor must be 1.0, and, in the absence of a more rational analysis, the limit airplane lateral load factor must be 0.5.

b. The airplane is assumed to be in static balance, the lateral load factor being reacted by friction forces applied at the ground contact point of each tire. The lateral load must be shared between each individual tire in a rational or conservative manner. The distribution of the load among the tires must account at least for the effects of the factors specified in subparagraph c. (2) of this special condition.

c. At maximum ramp weight, a limit value of lateral center of gravity (cg) inertia load factor lower than specified in subparagraph a. but not less than 0.45g (wing axis) may be used, if it can be shown by a rational analysis that this lower value cannot be exceeded. The rational analysis must consider at least the following:

1. The maximum lateral load factor that can be reached during the full range of likely ground operations at maximum ramp weight, including ground turning, “fishtailing,” and high-speed runway exit. In each case, the full dynamic maneuver must be considered.

2. The rational analysis must include at least the following parameters:

(a) Landing gear spring curves and landing gear kinematics.

(b) Reliable tire friction characteristics.

(c) Airframe and landing gear flexibility when significant.

(d) Airframe rigid body motion.

(e) The worst combination of tire diameter, tire pressure, and runway shapes, specified in §§25.511(b)(2), 25.511(b)(3), and 25.511(b)(4).

d. The limit lateral load factor at maximum landing weight is 0.5.

e. Details of the analysis and any assumptions used must be agreed to by the FAA. Any assumptions made in the analysis must be based on the intrinsic characteristics of the airplane and must be independent of airfield geometry. Other influences that cannot be controlled by the airplane design must be conservatively assessed.

Issued in Renton, Washington, on November 9, 2006.

Ali Bahrami,
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BILLING CODE 4910–13–P
airplanes. Remote crew rest compartments have been previously 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 of the Boeing Model 777–200, and –300 series airplanes.

**Type Certification Basis**

Under the provisions of § 21.101, Boeing Commercial Airplane Group must show that the Boeing Model 777, as changed, continues to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. T00001SE or the applicable regulations or standards incorporated by reference in the applicable provisions of the regulations to which the aircraft must conform, installed and certified in the main cabins of the aircraft. Because the compartment is lowered into the main cabin, it could affect egress if it cannot be raised again. The overhead compartment may lower into a cross aisle as defined in § 25.813, but it may also lower into other potential egress paths. For the purposes of these special conditions, the same criteria apply, whether or not the egress path is required by § 25.813. Therefore, as used in these special conditions, the term “overhead cross aisle stowage compartment” addresses all such compartments.

Each stowage compartment is accessed from the main deck by a powered lift that lowers and raises the stowage compartment between the overhead and the main deck. In addition, the lift can be hand cranked down and up in the event of a power or lift motor failure. A smoke detection system will be provided in the overhead cross aisle stowage compartments.

**Discussion of the Special Conditions**

In general, the requirements listed in these special conditions for overhead cross aisle stowage compartments are similar to those previously approved for overhead crew rest compartments in earlier certification programs, such as for the Boeing Model 777 and Model 747 series airplanes. These special conditions establish compartment access, power lift, electrical power, smoke/fire detection, fire extinguisher, fire containment, smoke penetration, and compartment design criteria for the overhead cross aisle stowage compartments.

The power lift must be designed so the overhead stowage compartment will not jam in the down position, even if lowered on top of a hard structure. The lift must operate at a speed, and stop above the floor at such a height, that allows anyone underneath the compartment to move clear without injury. The lift controls must be placed clear of the compartment door and must be pressed continuously for lift operation. Training on power lift operation procedures must be added to appropriate manuals.

**Special Condition No. 3, Manual Operation**

There must be a means to manually operate the lift that is independent of the electrical drive system. The lift must be operable by a range of occupants, including a fifth percentile female. The manual means must be capable of lowering the overhead stowage compartment quickly to the main deck to fight a fire. The manual system must be capable of raising the compartment quickly so the cross aisle or other egress path (if applicable) is not blocked in an emergency. If electrical or manual power is removed, there must be a means, such as a brake, to prevent the compartment from unrestricted movement, i.e., falling. Training on
manual operation procedures must be added to appropriate manuals.

Special Condition No. 4, Handheld Fire Extinguisher

For compartments larger than 25 cubic feet, a handheld fire extinguisher appropriate to fight the kinds of fire likely to occur in the overhead stowage compartment must be provided. This handheld fire extinguisher must be adjacent to the overhead compartment. This extinguisher must be in addition to those required for the passenger cabin.

Special Condition No. 5, Fire Containment

This special condition requires either the installation of a manually activated fire extinguishing system that is accessible from outside the overhead stowage 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 get access to the fire during a demonstration where the crewmember is responding to the alarm. For the duration of the flight, the system must have adequate capacity to suppress any fire occurring in the stowage compartment considering the fire threat, volume of the compartment, and the ventilation rate.

Special Condition No. 6, Smoke Penetration

The design of the compartment must provide means to exclude hazardous quantities of smoke or extinguishing agent originating in the compartment from entering other occupied areas. The means must take into account the time period during which the compartment may be accessed to manually fight a fire, if applicable.

Smoke entering any other compartment occupied by crewmembers or passengers, when access to the stowage compartment is opened to manually fight a fire, must dissipate within five minutes after the access to the stowage compartment is closed.

During the one-minute smoke detection time (see Special Condition No. 7), penetration of a small quantity of smoke (one that would dissipate within 3 minutes under normal ventilation conditions) from this overhead stowage compartment into an occupied area on this airplane configuration would be acceptable based on the limitations placed in this and other associated special conditions. These special conditions place sufficient restrictions in the quantity and type of material allowed in the overhead stowage compartment that threat from a fire in this remote area would be equivalent to that experienced on the main cabin.

If a built-in fire extinguishing system is used in lieu of manual fire fighting, then the fire extinguishing system must be designed so that no hazardous quantities of extinguishing agent will enter other compartments occupied by passengers or crew.

Special Condition No. 7, Compartment Design Criteria

The material used to construct the overhead stowage compartment must meet the flammability requirements for compartment interiors in §25.853 and be fire resistant. Depending on the size of the compartment, certain fire protection features of Class B cargo compartments are also required.

Enclosed stowage compartments equal to or exceeding 25 ft³ 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. This is the same requirement as has been applied to remote crew rest compartments.

Enclosed stowage compartments equal to or greater than 57 ft³ in interior volume but less than or equal to 200 ft³, must have a liner that meets the requirements of §25.855 for a Class B cargo compartment. The overhead stowage compartment may not be greater than 200 ft³ in interior volume. The in-flight accessibility of very large enclosed stowage compartments and the subsequent impact on the crewmember’s ability to effectively reach any part of the compartment with the contents of a handheld fire extinguisher would require additional fire protection considerations similar to those required for inaccessible compartments such as Class C cargo compartments.

The overhead stowage 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.” The FAA considers failure of the overhead stowage compartment fire protection system (that is, smoke or fire detection and fire suppression systems) in conjunction with an overhead stowage 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 6d, 9, and 10 of AC 25.1309–1A).

The requirements to enable crewmember(s) quick access to the overhead stowage compartment and to locate a fire source inherently places limits on the amount of baggage stowed and the size of the overhead stowage compartment. The overhead stowage compartment is limited to stowage of galley type standard containers as well as coats, bags, and other items typically stowed in closets or bins. It is not intended to be used for the stowage of other items. The design of such a system to include other items may require additional special conditions to ensure safe operation.

Discussion of Comments

Notice of proposed special conditions No. 25–06–09–SC for the Boeing Model 777–200 series airplanes was published in the Federal Register on October 18, 2006 (71 FR 64432). An amended proposed notice of special conditions No. SC–06–29A–SC for the Boeing Model 777 series airplanes was published in the Federal Register on November 2, 2006 (71 FR 64478). No comments were received, and the special conditions are adopted as proposed, except for clarifying changes.

Applicability

These special conditions are applicable to the Boeing Model 777 series airplanes with overhead cross aisle stowage compartments. Should Boeing Commercial Airplane Group apply later for a change to Type Certificate No. T00001SE to include another model on the same type certificate incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Under standard practice, the effective date of final special conditions would be 30 days after the date of publication in the Federal Register, however, as the certification date for the Boeing 777 series is imminent, the FAA finds that good cause exists for make these special conditions effective upon issuance.

Conclusion

This action affects only certain novel or unusual design features on the Boeing Model 777 series airplanes. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on the airplane.
### 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 777 series airplanes. Each overhead cross aisle stowage compartment and the adjacent area, including the structural frame, mechanical system and drive motor, must meet the following requirements:

1. **Compartment Access and Placards.** There must be a means to prohibit or prevent passengers from entering or operating the overhead cross aisle stowage compartment. Placards prohibiting access are acceptable. If a compartment is large enough for a person to enter, there must be a means to preclude anyone from being trapped inside the stowage compartment. If a latching/locking mechanism is installed, the door must be capable of being opened from the outside without the aid of special tools. The mechanism must not prevent opening from the inside of the stowage at any time.

2. **Power Lift.** There must be a means such as a load or force limiter to protect the overhead cross aisle stowage compartment power lift from failure or jamming in the down position in the event it is lowered on top of a hard structure such as a galley cart.

   (a) The lift controls must be placed so the operator is clear of the lift and designed such that the controls must be pressed continuously for lift operation.

   (b) The lift must raise and lower the stowage compartment at a slow enough rate, and stop above the floor at such a height, that anyone underneath can easily move clear without injury.

   (c) Stowage compartment operation training procedures must be added to the appropriate flight attendant manuals.

3. **Manual Lift.** There must be a means in the event of failure of the aircraft’s main power system, or of the powered overhead cross aisle stowage compartment lift system, for manually activating the lift system.

   (a) This manual means must be independent of the electrical drive system.

   (b) The manual means must be accessible and operable by a range of occupants, including a fifth percentile female.

   (c) The manual means must be capable of lowering the stowage compartment to the main deck quickly enough to fight a fire in the stowage compartment before overhead cross aisle stowage compartment fire containment is compromised.

   (d) The manual means must be capable of quickly raising the stowage compartment such that the cross aisle, or other egress path is not blocked in the event of an emergency.

   (e) Stowage compartment firefighting training procedures must be added to the appropriate manuals.

   (f) The lift system must include a means, such as a brake, to retain the overhead cross aisle stowage compartment in any position of travel when the manual or electric drive force is removed.

4. **Fire Extinguisher.** The means to manually fight a fire in the overhead cross aisle stowage compartment must consider the additional stowage volume and time required to manually lower the compartment after indication. For compartments larger than 25 ft³ the following equipment must be provided directly adjacent to each overhead cross aisle stowage compartment: at least one approved handheld fire extinguisher, in addition to the fire extinguisher requirements of §25.851 and §121.309, appropriate for the kinds of fires likely to occur within the overhead stowage compartment.

5. **Fire Containment.** Fires originating within the overhead cross aisle stowage compartment must be controlled for the duration of the flight without a crewmember having to access the compartment. Alternatively, the design of the access provisions must allow crewmembers equipped for firefighting to have unrestricted access to the compartment. If the latter approach is elected it must be demonstrated that a crewmember has sufficient access to enable them to extinguish a fire. The time for a crewmember on the main deck to react to the fire alarm, (and, if applicable, to don the firefighting equipment and to open the compartment) must not exceed the flammability and fire containment capabilities of the stowage compartment.

6. **Smoke Penetration.** There must be a means provided to exclude hazardous quantities of smoke or extinguishing agent originating in the overhead cross aisle stowage compartment from entering any other compartment occupied by crewmembers or passengers. If access is required to comply with Special Condition No. 5, this means must include the time period when accessing the stowage compartment to manually fight a fire. Smoke entering any other compartment occupied by crewmembers or passengers, when access to the stowage compartment is opened to manually fight a fire, must dissipate within five minutes after the access to the stowage compartment is closed. Prior to the one minute smoke detection time (reference note 2 in paragraph (7)) penetration of a small quantity of smoke (one that would dissipate within 3 minutes under normal ventilation conditions) from the stowage compartment into an occupied area is acceptable. Flight tests must be conducted to show compliance with this requirement.

7. **Compartment Design Criteria.** The overhead cross aisle stowage compartment must be designed to minimize the hazards to the airplane in the event of a fire originating in the stowage compartment.

   (a) **Fire Extinguishing System.** If a built-in fire extinguishing system is used in lieu of manual firefighting, then the fire extinguishing system must be designed so no hazardous quantities of extinguishing agent will enter other compartments occupied by passengers or crew. The system must have adequate capacity to suppress any fire occurring in the stowage compartment, considering the fire threat, volume of the compartment, and the ventilation rate.

   (b) **Compartment Size.** All overhead cross aisle stowage compartments must meet the design criteria given in the table below. As indicated by the table below, enclosed stowage compartments greater than 200 ft³ in interior volume are not addressed by this special condition.

### Stowage Compartment Interior Volumes

<table>
<thead>
<tr>
<th>Materials of Construction</th>
<th>Less than 25 ft³</th>
<th>25 ft³ to 57 ft³</th>
<th>57 ft³ to 200 ft³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detectors</td>
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</tr>
<tr>
<td>Detectors</td>
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STOWAGE COMPARTMENT INTERIOR VOLUMES—Continued

<table>
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<tr>
<th>Fire protection features</th>
<th>Less than 25 ft³</th>
<th>25 ft³ to 57 ft³</th>
<th>57 ft³ to 200 ft³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liner (^1)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

\(^1\) Material

The material used to construct each enclosed stowage compartment must be at least fire resistant and must meet the flammability standards established for interior components (that is, 14 CFR Part 25 Appendix F, Parts I, IV, and V) per the requirements of §25.853. For compartments less than 25 ft³ in total interior volume, the design must ensure the ability to contain a fire likely to occur within the compartment under normal use.

\(^2\) Detectors

Enclosed stowage compartments equal to or exceeding 25 ft³ in total interior volume must be provided with a smoke or fire detection system to ensure that a fire can be detected within one minute. 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) 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 it can be shown the material used to construct the stowage compartment meets the flammability requirements of a liner for a Class B cargo compartment (that is, §25.855 at Amendment 25–93 and Appendix F, part I, paragraph (a)(2)(ii)), in addition to the above 1 ft³, a liner must be provided that meets the requirements of §25.855 for a Class B cargo compartment.

Issued in Renton, Washington, on November 15, 2006.

Ali Bahrami,
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