Exemption No. 10780

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

In the matter of the petition of **Greenpoint Technologies, Inc.,** for an exemption from §§ 25.785(h)(2), 25.785(j), 25.791(a), 25.813(e), and 25.853(d) of Title 14, Code of Federal Regulations	**Regulatory Docket No. FAA-2013-0245**

PARTIAL GRANT OF EXEMPTION

By letter dated March 7, 2013, Ms. Barbara Baillie, Senior Certification Engineer, Greenpoint Technologies, Inc., 4600 Carillon Pt., Kirkland, Washington, 98033, petitioned the Federal Aviation Administration (FAA) for an exemption from sections 25.785(h)(2), 25.785(j), 25.791(a), 25.813(e), and 25.853(d) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would permit relief from the requirements of flight-attendant direct view, firm handholds in the passenger compartment, no-smoking sign visibility from each seat in the passenger compartment, interior doors between passenger compartments, and maximum heat-release and smoke-emissions flammability requirements for large interior panels. The petitioner also requested an exemption from special conditions 25-368-SC, which is for seats with non-traditional, large, non-metallic panels on the airplane. These panels would need to meet the maximum heat-release and smoke-emissions flammability requirements for large interior panels. By letter dated April 9, 2013, Greenpoint Technologies, Inc., requested that the "NO SMOKING" sign requirements contained in special condition no. 25-430-SC and special condition no. 25-442-SC be included in this petition for exemption. The proposed exemption is specifically for the installation of an executive interior on Boeing Model 747-8ZV airplanes designated as "private use, not for hire, not for common carriage."

The petitioner requests relief from the following regulations:

Section 25.785(h)(2), Amendment 25-88 – Flight attendant seats must be located to provide direct view of the cabin area.

Section 25.785(j), Amendment 25-88 – Requires a firm handhold along each aisle.

Section 25.791(a), Amendment 25-72 – Requires that a no-smoking sign be visible from each seat in the passenger compartment.

Section 25.813(e), Amendment 25-46 – Requires that no door may be installed in any partition between passenger compartments.

Section 25.853(d), Amendment 25-83 – Limits maximum heat-release rates and smoke emissions for large-panel cabin interior materials.

Special Conditions no. 25-368-SC, *Seats with non-traditional large, non-metallic panels.*

The petitioner supports their request with the following information.

This section quotes, in pertinent part, 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-2013-0245.

B. Section of the Code of Federal Regulations (CFR) that are Affected

As provided for in §11.61(b), Greenpoint Technologies hereby petitions for exemption from the following 14 CFR [sections] for a Boeing Model 747-8ZV airplane, serial number 42096:

Regulation	Amendment	Requirement
25.785(h)(2) Direct View	25-88	(h) Each seat located in the passenger compartment and designated for use during takeoff and landing by a flight attendant required by the operating rules of this chapter must be: (2) To the extent possible, without compromising proximity to a required floor level emergency exit, located to provide a direct view of the cabin area for which the flight attendant is responsible.
25.785(j) Firm Handholds	25-88	(j) If the seat backs do not provide a firm handhold, there must be a handgrip or rail along each aisle to enable persons to steady themselves while using the aisles in moderately rough air.

Regulation	Amendment	Requirement
25.791(a) No Smoking Placards	25-72	(a) If smoking is to be prohibited, there must be at least one placard so stating that is legible to each person seated in the cabin. If smoking is to be allowed, and if the crew compartment is separated from the passenger compartment, there must be at least one sign notifying when smoking is prohibited. Signs which notify when smoking is prohibited must be operable by a member of the flightcrew and, when illuminated, must be legible under all probable conditions of cabin illumination to each person seated in the cabin.
25.813(e) Interior Doors	25-116	(e) No door may be installed between any passenger seat that is occupiable for takeoff and landing and any passenger emergency exit, such that the door crosses any egress path (including aisles, crossaisles and passageways).
25-853(d) Interior Materials	25-116	(d) Except as provided in paragraph (e) of this section, the following interior components of airplanes with passenger capacities of 20 or more must also meet the test requirements of parts IV and V of appendix F of this part, or other approved equivalent method, in addition to the flammability requirements prescribed in paragraph (a) of this section: (1) Interior ceiling and wall panels, other than lighting lenses and windows; (2) Partitions, other than transparent panels needed to enhance cabin safety; (3) Galley structure, including exposed surfaces of stowed carts and standard containers and the cavity walls that are exposed when a full complement of such carts or containers is not carried; and (4) Large cabinets and cabin stowage compartments, other than underseat stowage compartments for stowing small items such as magazines and maps.

C. Extent of and Reason for Relief Being Sought

Greenpoint Technologies requests an exemption from 14 CFR §§ 25.785(h)(2), Amendment 88, 25.785(j), Amendment 88, 25.791(a), Amendment 72, 25.813(e), Amendment 116, and 25.853(d), Amendment 116, on Boeing Model 747-8ZV airplane, S/N 42096, operated for “private, not-for-hire, not-for-common carriage.” Relief is requested from flight attendant direct view, firm handholds in the passenger compartment, no-smoking signs visibility from each seat in the passenger compartment, interior doors between passenger compartments, and maximum heat-release and smoke-emissions flammability requirements for interior materials. Included in the requested relief from heat-release and smoke-emissions requirements, Greenpoint also requests an exemption from special conditions 25-368-SC, which is for seats with non-traditional, large non-metallic panels.

More specifically, Greenpoint provides reasoning and requests relief for each interior requirement as listed below:

Direct View:

The proposed interior is designed to accommodate VIP/head-of State [and] includes bedrooms, dining area, meeting rooms, lounge and lavatory areas, and staff seating rather than traditional commercial type seating throughout. This type of VIP interior requires a high level of privacy and security that is normally not available in airline-style interiors. Direct compliance is not practical for the unique needs of the VIP interior given that safety may be better served by placement of the flight attendant seats in close proximity to the emergency exits with strong secondary consideration given to direct view of the occupants.

Additionally, given the small number of occupants and familiarity of the flight crew with the interior arrangement and occupants, there should be no degradation in passenger safety as a result of the requested relief. The FAA agreed, in Exemption 10686, "that the restricted nature of the operation of a private-use airplane mitigates much of the need. That is, the operator has control of, and can restrict the population of, passengers, unlike an air carrier. The risk of passengers engaging in hazardous or malicious activity is essentially eliminated, and the need for direct view is limited to those cases where a passenger might need assistance." Therefore, an exemption to the flight attendant direct view requirement, similar to that granted in Exemption 10686, is needed to allow the interior to meet the needs [of the]end customer.

In lieu of 14 CFR § 25.785(h) (2): *As practical, the majority of the flight-attendant seats must be oriented to face the passenger cabin.*

Firm Handholds:

The proposed interior is designed to accommodate VIP/head-of State [and] includes bedrooms, dining area, meeting rooms, lounge and lavatory areas, and staff seating rather than traditional commercial type seating throughout and is quite different than that envisioned by the original rule. The interior includes large rooms with limited seating and executive furnishings where the original requirement for firm handhold along aisles cannot be met.

The risk to occupants due to the reduced number of direct handholds in certain areas of the airplane should be considered acceptable for the following reasons:

- All furniture in the passenger cabin will not have sharp corners and edges in order to avoid serious injury in case of contact during turbulence;

- In general, seat backs, divan arms, tables, and furniture are readily within reach in a few steps;

- The installed seats and divans are heavily upholstered and will not cause injuries when contacted;

- Occupants are experienced travelers and are familiar with the airplane's interior.

The FAA, in granting Exemption 10686 agreed: "We have considered the requirement for firm handholds in the context of private-use airplanes and have determined that it would be impractical for this type of operation and interior configuration with meeting rooms, offices, bedrooms, lavatories, and lounges rather than traditional airline-type seating." Therefore, an exemption to the firm handholds requirement, similar to that granted in Exemption 10686, is needed to allow the interior to meet these needs.

In lieu of 14 CFR §25.785(j): *In areas of the airplane where traditional seating arrangements are used, firm handholds should be provided.*

No Smoking Placards:

The proposed VIP airplane is intended to be a No Smoking airplane. Placards will be displayed at each entry door indicating such and passengers are familiar with this designation of the airplane. An acceptable level of safety will be maintained with placement of placards different than required in the applicable rule but equally visible to all occupants upon boarding. Therefore, an exemption to the No Smoking Placards requirement, similar to that granted in Exemption 10686, is needed to meet the needs of the end customer.

In lieu of 14 CFR §25.791(a): *There must be a single placard, indicating that smoking is prohibited, conspicuously located inside the passenger compartment, easily visible to all persons entering the cabin in the immediate vicinity of each passenger-entry door.*

Interior Doors:

The proposed interior includes doors to separate the passenger compartment into bedroom, dining room, medical, and lounge areas typical of VIP interior configurations. Interior doors to partition the airplane into individual rooms is paramount to an acceptable interior for the end customer. The FAA acknowledged, in Exemption 10686, "the desirability of these features from the operator's point of view," and further acknowledged that when the regulations pertaining to interior doors were adopted, they did not consider "rooms." The FAA defined five categories of doors in their analysis in Exemption 10686. The five categories are restated below:

Category 1: A door in a room and the room is less than the full width of the airplane. An aisle is outside the room. This type of room may be occupied during takeoff and landing, and only the occupants of the room must use the door to reach an exit.

Category 2: A door in a room and that is the same as Category 1, except a single emergency exit or pair of emergency exits is within the room.

Category 3: A door or doors in a compartment and the compartment is the full width of the airplane. Passengers are seated on both sides (fore and aft) of the door(s), and the main aisle leads out of, or passes through, the compartment. The compartment does not have emergency exits. This type of compartment may be occupied during takeoff and landing.

Category 4: A door in a room and the room is the full width of the airplane. Passengers are seated on both sides (fore and aft) of the door, and a pair of emergency exits is at one end of the room. This type of room may be occupied during takeoff and landing.

Category 5: A door in a room that may be the full width of the airplane. This type of room is not occupied during takeoff and landing. This room is only occupied during flight. Passengers are not seated on both sides of the door during taxi, takeoff, and landing. Passengers seated in taxi, takeoff, and landing seats must not need to pass through this door to get to any emergency exits.

The proposed VIP interior utilizes 6 interior doors that fall into the categories defined by the FAA. The interior doors are not electrically powered and will incorporate the following design features as mitigation for the relief requested:

- Dual latches to secure them in the open position;
- Doors will be frangible to allow egress in the event they become stuck in the closed position;
- Interior doors that are between seats occupiable for takeoff and landing and any passenger exit such that the door crosses the egress path will have cockpit annunciation of the door position for taxi, take-off and landing;
- Doors to rooms that are not occupied for taxi, takeoff and landing will have placards installed on or near the door indicating that the door must be closed for taxi, takeoff and landing.

These design features will provide an acceptable level of safety for this VIP interior configuration. Therefore, an exemption to the Interior Doors requirement, similar to that granted in Exemption 10686, is needed to meet the needs of the end customer.

In lieu of 14 CFR §25.813(e):

a. Each door between passenger compartments must be frangible.

b. Doors that fall into Category 1 must be in the open position during taxi, takeoff, and landing when the room is occupied.

c. Doors that fall into Category 2, 3, and 4 must be in the open position during taxi, takeoff, and landing, regardless of occupancy of the room.

d. Doors that fall into Category 5 must be in the closed position during taxi, takeoff, and landing.

e. Appropriate procedures must be established to both signal the flight crew in the event a door between passenger compartments is not in the proper position, and prohibit TT&L. Doors in Category 5 do not need to comply with this requirements. For Category 5 doors, installing placards located on or near the door, and indicating that the door must be closed for TT&L, is acceptable.

f . Doors between passenger compartments must have dual means to retain them in the open position. Each means must be capable of withstanding the inertia loads specified in§ 25.561. Doors in Category 5 do not need to comply with this requirement because they are required to be closed for TT&L.

Interior Materials:

The proposed interior is designed to incorporate executive furnishings and materials to satisfy the design requirements of the VIP end customer. STC applicants for these VIP interiors have been able to simultaneously satisfy both these styling requirements of end user and the interior material flammability requirements of § 25.853(a) and (c); however, many of the materials required in these aircraft interiors do not comply with the heat release and smoke emission requirements of § 25.853(d).

The majority of the heat release and smoke portion of the rule was driven by post-crash fire experiences in airline operations. The 65/65 heat release regulation was specifically developed to reduce the likelihood of the flash-over phenomenon which was proven by tests to be a prime contributor to the rapid propagation of post-crash cabin interior fires and the generation of blinding smoke. Rapid fire propagation combined with the relatively slow rate of passenger evacuation from densely packed air carrier airplanes has proven to be a deadly combination during actual airline accidents. Special conditions 25-368- SC address seats with non-traditional, large, non-metallic panels on the airplane and incorporate the same heat release and smoke emissions flammability requirements. Since it is clear that material selection is being controlled by aesthetics in this application, we cannot exercise any real control over the actual heat release but the exposure time to this heat release is still within our control.

Per the FAA analysis in Exemption 10686, “The airplane type discussed in the petition was not envisioned by the rulemaking, insofar as the large size with low

passenger count is concerned. We have considered the issue of the evacuation capability of the airplane relative to the flammability of the materials, and find that some relief may be possible." As a means to provide an acceptable level of safety for post-crash fire scenarios in lieu of the heat release and smoke emissions flammability requirements, it is proposed that an evacuation analysis be performed to show that all occupants can be safely evacuated in less than 45 seconds. Precedent for this relief, which includes § 25.853(d) and the requirements of special conditions 25-368-SC, have been set, including in Partial Grant of Exemption 10686, issued January 8, 2013.

In order to address the in-flight fire threat, installing a smoke detector in isolated areas is proposed as compensation. As stated in Exemption 10686, "an isolated passenger compartment is defined as a room that does not contain an egress path (e.g., main cabin aisle, cross aisle, or passageway), or is isolated by a door." This requirement, in addition to the 45 second evacuation requirement discussed above, provides dual criteria to effectively satisfy the FAA flammability concerns covered by § 25.853(d) for commercial transport airplane operations and allows a path to certification for the VIP customers of transport airplanes in private use. An exemption to the Interior Materials requirement, similar to that granted in Exemption 10686, is needed to meet the needs of the end customer.

In lieu of 14 CFR § 25.853(d):

a. When materials are installed that do not comply with the requirements of appendix F, parts IV and V, it must be shown that the passengers and crewmembers can be evacuated in 45 seconds or less, under the conditions described in part 25, appendix J. This condition also includes the requirements of special conditions 25-368-SC, which addresses seats with non-traditional, large, non-metallic panels on the airplane.

b. A means to signal the flight crew must be in place in the event of fire in an isolated passenger compartment, and the detection system must meet the requirements of § 25.858(a) through (d).

D. Statement of Public Interest

Granting this exemption would be in the public interest for the following reasons:

VIP aircraft are used by Heads-of-State and Diplomatic Persons. Developing and maintaining positive relations with the operators of these aircraft benefits the US economy in terms of trade and balance of power;

The use of US design and manufacture of aircraft and interiors such as this one develops and maintains the worldwide positive image and influence currently enjoyed by the US Aerospace Industry. Consistency in regulations and design requirements at and after contract award affects competitiveness and significant changes after the time of contract

places the US industry in a significantly lowered position to foreign industry. Future sales depend on potential customers worldwide finding the US certification process dependable and reasonable, so standardizing requirements for modifiers of transport airplanes is both acceptable and productive, and in line with the FAA's usual business practice of standardization of the regulatory requirements for commercial transport airplanes.

Granting of exemptions that are identical to others issued for the same airplane model and in the same time frame serves to level the playing field so as not to create an unfair advantage for one US modifier.

E. Statement of No Adverse Effect on Safety

The FAA has made adjustments to regulatory requirements based on specific design and operational factors numerous times in the past. This exemption will have no adverse impact on safety for the following reasons:

The operation of this aircraft is limited to private use by an individual or a company and does not include scheduled flights, fare-paying public passengers or cargo-for- hire commercial service;

The proposed interior configuration is designed for very small and highly controlled passenger population;

The mitigating design requirements proposed will establish an acceptable level of safety for the occupants consistent with previous grants of exemption;

The relief requested is identical to that previously granted in Exemption No. 10686, Regulatory Docket No. FAA-2012-0707, dated January 8, 2013 for relief from §§25.785(h)(2), 25.785(j), 25.791(a), 25.813(e), and 25.853(d) for two Boeing Model 747-8 airplanes with similar VIP applications.

F. Public Summary

Greenpoint Technologies requests exemption from 14 CFR §§ 25.785(h)(2), 25.785(j), 25.791(a), 25.813(e), and 25.853(d) for a Boeing model 747-8ZV airplane, S/N 42096. The 747-8 aircraft is intended to be a VIP executive airplane that includes bedrooms, dining and meeting rooms, lounge and lavatory areas rather than traditional commercial type seating and incorporates executive furnishings and materials. This request is necessary in order to certify the desired aircraft configuration for the end customer.

G. Background and Supportive Information

The Boeing Model 747-8ZV project airplane is intended to be a VIP executive aircraft; modified under Bahamian registration. Greenpoint is contracted to design, install and certify an executive interior in a Boeing Model 747-8ZV per customer specifications.

STC certification is sought under FAA project no. ST11824SE-T. The certification basis for the project is defined in Type Certificate Data Sheet A20WE and includes 14 CFR 25 through Amendment 25-120 and Special Conditions for the Model Boeing 747-8 aircraft. The Project Specific Certification Plan, Greenpoint Document G1265-CP-01, Revision D, dated February 1, 2013, was accepted by FAA Letter 150S-13-45, dated February 18, 2013. The proposed interior installation includes bedrooms, dining and meeting rooms, lounge and lavatory areas rather than traditional commercial type seating. Maximum passenger count will be limited to 76 occupants which represents only a fraction of the usual commercial configuration certificated for a Boeing 747-8 airplane. These types of VIP interiors require a high level of privacy and security that is normally not available in airline-style interiors. This results in increased focus on maintaining control and safety of the occupants as well as greater understanding and general awareness by the occupants of the safety risks and existing design features in the interior that mitigate these.

14 CFR part 25 governs type design certification requirements for transport category airplanes. The FAA has stated that to the extent considered appropriate for safety, part 25 requirements contain different provisions based on passenger capacity discriminants. These requirements do not distinguish between airplanes operated in air carrier service and airplanes operated for private use. Aviation industry representatives have stated that the part 25 standards are written with only air carrier operation in mind, and the FAA has issued alternative standards related to cabin interiors for private use airplanes based on these alternate standards providing an acceptable level of safety. The relief requested is in line with these prior issued alternative standards and will have no adverse impact on safety given the operation of the aircraft is limited to private use by an individual or a company and does not include scheduled flights, fare-paying public passengers or cargo-for-hire commercial service. Additionally, the occupants are a small, highly controlled passenger population.

H. Privilege of this Exemption Outside the United States

In accordance with § 11.81(h), Greenpoint Technologies requests that the privileges of this exemption be extended outside of the United States. This extension of privileges is necessary because the end user of the Boeing Model 747-8 airplane being modified is a foreign national and the airplane will be operated the majority of time outside the US.

Federal Register publication

The FAA has determined that good cause exists for waiving the requirement for *Federal Register* publication for public comment because the request is identical in all material respects to previously granted exemptions, including, in pertinent part, those exemptions the petitioner lists in their petition; and the exemption, if granted, would not set a precedent.

The FAA's analysis

The FAA considers that granting this petition is in the public interest for the reasons stated by the petitioner and because the FAA is directed to take into account the type of operation when establishing standards under Title 49 of the United States Code (49 U.S.C. 44701(d)).

As more transport-category airplanes have been configured (or re-configured) for private use, the FAA has given considerable attention to the issue of appropriate regulation of such airplanes. Some of the current regulations governing design certification of transport-category airplanes are not compatible with private use of such airplanes. Because of this, we have received a number of petitions for exemption from certain regulations. We have granted such exemptions when we find that to do so is in the public interest and does not adversely affect the level of safety provided by the regulations. We published Special Requirements for Private Use Transport Category Airplanes (SFAR) 109, which significantly reduces the need for case-by-case review of individual petitions for exemption for private-use airplanes within the limitation of SFAR 109. The 747-8 airplanes under consideration have a passenger-seating capacity greater than the 60-passenger seating limitation in SFAR 109, therefore, the SFAR is not applicable to these airplanes.

Our analysis of this petition considered each of the following design features the petitioner proposes:

1. Direct View

The petitioner has identified the requirement for flight-attendant seats to be located to provide a direct view of the passenger cabin, as not being practical for compliance with the executive-type interior to be used on the Boeing 747-8 airplanes. The complexity of the interior arrangement, coupled with the need to retain proximity to emergency exits, is cited as the primary reason that compliance is impractical.

The FAA has considered the requirement for direct view in the context of private-use airplanes and agrees that much of the justification for the requirement is based on air-carrier-type operations. The practicality of locating flight-attendant seats near emergency exits so that there is a direct view of occupants inside the rooms is questionable, at best. In this regard, we believe that some relief may be appropriate for airplanes intended for private use. However, we note that the justification for the requirement for direct view is not limited to observation of passengers that are not familiar with the interior. Flight-attendant seats should be located so that a direct view is provided for the cabin area whenever practical. For example, flight-attendant seats should not face away from the cabin. In those areas of the airplane where traditional seating arrangements are used, the FAA believes that a direct view should be provided.

In considering the need for direct view, the FAA agrees that the restricted nature of the operation of a private-use airplane mitigates much of the need. That is, the operator has control of, and can restrict the population of, passengers, unlike an air carrier. The risk of passengers engaging in hazardous or malicious activity is essentially eliminated, and the need for direct view is limited to those cases where a passenger might need assistance. We consider that this objective is met by requiring that a majority of flight-attendant seats face the cabin.

2. Firm Handholds

We have considered the requirement for firm handholds in the context of private-use airplanes and have determined that it would be impractical for this type of operation and interior

configuration with meeting rooms, offices, bedrooms, lavatories, and lounges rather than traditional airline-type seating. In those areas of the airplane where traditional seating arrangements are used, the FAA believes that firm handholds should be provided.

3. No-Smoking Placards

We have considered the requirement for having no-smoking placard(s), visible from each seat in the passenger compartment, in the context of private-use airplanes where smoking is prohibited by the owner/operator of the airplane. We have determined that a single placard, indicating that smoking is prohibited, would be acceptable notification to the passengers, whereby the placard is conspicuously located inside the passenger compartment and is easily visible to all persons entering the cabin in the immediate vicinity of each passenger-entry door. We have determined that this proposed placarding would be acceptable for addressing the requirements of "NO SMOKING" signs, as described in special conditions no. 25-430-SC condition number 14, and addressing the "NO SMOKING" placard requirements in special conditions no. 25-442-SC condition number 1(a)(4).

4. Interior Doors

The placement of interior doors is clearly quite significant to the owner/operator of the airplane. The flexibility to partition the airplane into individual rooms, such as private meeting rooms or bedrooms, is paramount to an acceptable interior. The FAA acknowledges the desirability of these features from the operators point of view.

When the regulations pertaining to interior doors were adopted, they did not consider "rooms." They considered two possible types of interior doors in a passenger compartment. The first type is an interior door between passenger compartments. The second type is an interior door between an exit and the passenger compartment.

Until recently, only the first type of door was prohibited by § 25.813(e). However, part 25, as amended by Amendment 25-116, prohibits interior doors between the exit and the passenger compartment. In addition, Amendment 121-306 prohibits these doors in airplanes manufactured after November 27, 2006, operated under 14 CFR part 121. Amendments 25-116 and 121-306, titled Miscellaneous Cabin Safety Changes, were published in the Federal Register on October 27, 2004. Because amendment 25-116 is not in the certification basis for the 747-8 airplane and the airplane is not operated under 14 CFR part 121, the swing door located between the forward exits and the passenger compartment is not subject to this exemption.

Airplanes configured for private-use, not-for-hire, and not-for-common carriage typically use any of five different categories of door in the passenger cabins:

> **Category 1:** A door in a room and the room is less than the full width of the airplane. An aisle is outside the room. This type of room may be occupied during takeoff and landing, and only the occupants of the room must use the door to reach an exit.

Category 2: A door in a room and that is the same as Category 1, except a single emergency exit or pair of emergency exits is within the room.

Category 3: A door or doors in a compartment and the compartment is the full width of the airplane. Passengers are seated on both sides (fore and aft) of the door(s), and the main aisle leads out of, or passes through, the compartment. The compartment does not have emergency exits. This type of compartment may be occupied during takeoff and landing.

Category 4: A door in a room and the room is the full width of the airplane. Passengers are seated on both sides (fore and aft) of the door, and a pair of emergency exits is at one end of the room. This type of room may be occupied during takeoff and landing.

Category 5: A door in a room that may be the full width of the airplane. This type of room is not occupied during takeoff and landing. This room is only occupied during flight. Passengers are not seated on both sides of the door during taxi, takeoff, and landing (TT&L). Passengers seated in TT&L seats must not need to pass through this door to get to any emergency exits.

Because not all interior doors between passenger compartments are equivalent, the FAA has determined that the following requirements will produce an adequate level of safety:

1. To maximize the level of safety, doors in Category 2, 3, or 4 installed across the main cabin aisle must open and close in a transverse direction. That is, the direction of motion of the door must be at a right angle to the longitudinal axis of the airplane. A "pocket door" is one example of such a design. This will tend to minimize the chance that the inertia forces of an accident could force the door closed.

2. Redundant means are necessary to latch doors open for takeoff and landing. Each latching means must have the capability of retaining the door in the takeoff and landing position under the inertia forces of § 25.561.

3. Each interior door must be frangible, in the event that it is jammed in the closed position in flight or during TT&L. Frangibility is intended to ensure that if a door is jammed closed, occupants can escape in either direction and emergency equipment can be moved. Frangibility may be demonstrated in either of the following ways:

    - A 5th percentile female can break through the door, creating a large enough opening that a 95th percentile (or larger) male can pass through. (See Advisory Circular 25-17A, Transport Airplane Cabin Interiors Crashworthiness Handbook, paragraph 43b(2)).

    - A 5th percentile female can break a hinge on the door or a hinge on a smaller door within the door such that the door can swing, so as to allow a 95th percentile (or

larger) male to pass through the opening with the door swung open. This evaluation must be made with any cabin furnishing or equipment installed that could limit the swing arc of the door and placed in the most adverse position. In using this approach, one must consider the possibility that the door is physically jammed in the closed position by distortion of the fuselage or furnishings. This possibility must be considered even if the door normally translates into the open and closed positions.

4. Doors that fall into Category 1 must be in the open position during TT&L only when the room is occupied.

5. Doors that fall into Categories 2, 3, or 4 must be in the open position during TT&L, regardless of occupancy.

6. Doors that fall into Category 5 must be in the closed position during TT&L.

With respect to the possibility that a door remains closed when it should not be, we have determined that a higher level of awareness is required to address this issue. Due to the relative complexity of the cabin interior, we have determined that inspection by flight attendants prior to takeoff and landing is not sufficient to verify that interior doors are in a required open position. Consequently, some type of remote indication is considered necessary. The petitioner's proposal to provide remote indication to the flight crew that these doors are in the open position during TT&L is considered adequate for doors that fall into Categories 1, 2, 3, and 4. Doors in Category 5 do not need to comply with this requirement. For Category 5 doors, placards located on or near the door, and indicating that the door must be closed for TT&L, is acceptable.

Recently, the FAA has been made aware that some of these interior doors are power-operated. The applicant has confirmed that all of the interior doors on this airplane are manually operated. There are no powered interior doors installed on this airplane.

5. Interior Materials

With respect to the flammability of interior materials, the petitioner has accurately summarized the requirements. The petitioner correctly notes that the requirements are related to prolonging the time available for evacuation from the airplane. This also includes the requirements of special conditions 25-368-SC, which addresses seats with non-traditional, large, non-metallic panels on the airplane. The panels on the subject airplane seats would need to meet the maximum heat-release and smoke-emissions flammability requirements for large interior panels.

When the standards for heat release and smoke emissions of interior materials were developed, the FAA incorporated a discriminant based on passenger capacity. This approach was intended to address smaller airplanes where the ratio of exits to passengers is typically quite good and the evacuation times are expected to be quite low. Under these conditions, the benefits of improved materials were expected to be negligible. The airplane type discussed in the petition was not envisioned by the rulemaking, insofar as the large size with low passenger count is concerned.

We have considered the issue of the evacuation capability of the airplane relative to the flammability of the materials, and find that some relief may be possible. However, the issue of flammability is not limited to post-crash scenarios; the in-flight fire threat must also be addressed. We note that the petitioner has not proposed an alternative to the heat-release and smoke-emissions standards, but rather an exemption from the requirement to assess the heat release and smoke emissions of certain materials.

Because the main benefit of improved interior materials is to lengthen the time available for evacuation, an arrangement that effectively provides the same evacuation capability would satisfy many of the concerns addressed by the requirement, albeit indirectly. The FAA has reviewed the full-scale, fire-test data used in developing the heat-release and smoke-emissions requirements, and also considered accident data relevant to this issue. This review is not complete, but it does suggest that a quantifiable improvement in evacuation capability could warrant a relaxation of the heat-release and smoke-emissions requirements.

The petitioner has proposed that an evacuation analysis be performed to show that all occupants, including crew, can be safely evacuated in less than 45 seconds. The FAA has determined that a 45-second evacuation time would provide an acceptable level of safety over that allowed by the regulation, and would allow a relaxation of the heat-release and smoke-emissions requirements. Precedents have been set for this decision and apply to other private-use airplanes. This also includes the requirements of special conditions 25-368-SC, which addresses seats with non-traditional, large, non-metallic panels on the airplane. The panels on the subject airplane seats would not need to meet the maximum heat-release and smoke-emissions flammability requirements for large interior panels as part of this exemption.

The remaining issue of the in-flight fire scenario needs to be addressed as well. The major issue with respect to in-flight fires is timely recognition. On some airplanes, the interior includes isolated areas that do not lend themselves to timely detection of a fire. For the purposes of this exemption, an isolated passenger compartment is defined as a room that does not contain an egress path (e.g., main cabin aisle, cross aisle, or passageway), or is isolated by a door. To address the in-flight case, the FAA believes that installing a smoke detector in such areas would compensate for the potential for an increased in-flight fire threat. Therefore, each isolated passenger compartment must incorporate a fire-detection system that meets the requirements of § 25.858. While this section is written for cargo-compartment fire-detection systems, the criteria contained therein are considered appropriate to this application.

The FAA's decision

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator, I grant the petition of Greenpoint Technolgies, Inc., for an exemption from 14 CFR 25.785(h)(2), 25.785(j), 25.791(a), 25.813(e), and 25.853(d) and special conditions 25-368-SC, 25-430-SC for "NO SMOKING" signs, and, 25-442-SC for "NO SMOKING" placards to the extent necessary to allow installation of an executive interior on private, not-for-hire, not-for-common-carriage Boeing 747-8 airplanes. Specifically, the exemption allows relief from the requirements for:

- Flight attendant direct view in meeting rooms, offices, bedrooms, lavatories, lounges etc. areas of the passenger compartment are exempted. In those areas of the airplane where traditional seating arrangements are used, direct view must be provided.

- Firm handholds in meeting rooms, offices, bedrooms, lavatories, lounges etc. areas of the passenger compartment are exempted. However, firm handholds are required in hallways and areas of the airplane where traditional airline seating are installed.

- No-smoking placards.

- Flight-deck security considerations.

- Interior doors between passenger compartments.

- Maximum heat-release and smoke-emissions flammability requirements for large interior panels. This also includes the requirements of special conditions 25-368-SC, which addresses seats with non-traditional, large, non-metallic panels on the airplane. The panels on the subject airplane seats would need to meet the maximum heat-release and smoke-emissions flammability requirements for large interior panels.

This exemption is subject to the following conditions, and limitation numbers 1, 4, 5, and 6 must be documented in the Limitations Section of the Airplane Flight Manual:

1. The airplane must not be operated for hire or offered for common carriage. This provision does not preclude the operator from receiving remuneration to the extent consistent with 14 CFR parts 125 and 91, subpart F, as applicable.

2. A majority of flight-attendant seats must be oriented to face the passenger cabin.

3. Each door between passenger compartments must be frangible.

4. Doors that fall into Category 1 must be in the open position during TT&L when the room is occupied.

5. Doors that fall into Categories 2, 3, or 4 must be in the open position during TT&L, regardless of occupancy of the room.

6. Doors that fall into Category 5 must be in the closed position during TT&L.

7. Appropriate procedures must be established to both signal the flight crew in the event a door between passenger compartments is not in the proper position, and prohibit TT&L. Doors in Category 5 do not need to comply with this requirement. For Category 5 doors, installing placards located on or near the door, and indicating that the door must be closed for TT&L, is acceptable.

8. Doors between passenger compartments must have dual means to retain them in the open position. Each means must be capable of withstanding the inertia loads specified in § 25.561. Doors in Category 5 do not need to comply with this requirement because they are required to be closed for TT&L.

9. When materials are installed that do not comply with the requirements of appendix F, parts IV and V, it must be shown that the passengers and crewmembers can be evacuated in 45 seconds or less, under the conditions described in part 25, appendix J. This also includes the requirements of special conditions 25-368-SC, which addresses seats with non-traditional, large, non-metallic panels on the airplane. The panels on the subject airplane seats would not need to meet the maximum heat-release and smoke-emissions flammability requirements for large interior panels.

10. A means to signal the flight crew must be in place in the event of a fire in an isolated passenger compartment, and the detection system must meet the requirements of § 25.858(a) through (d).

Issued in Renton, Washington, on May 29, 2013.

/s/ Jeffrey E. Duven

Jeffrey E. Duven
Acting Manager, Transport Airplane Directorate
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