Exemption No. 11050

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

In the matter of the petition of **Learjet Inc.** for an exemption from § 25.813(e) of Title 14, Code of Federal Regulations	**Regulatory Docket No. FAA-2013-0800**

DENIAL OF EXEMPTION

By letter dated September 3, 2013, Mr. Robert Cahn, of Learjet Inc., One Learjet Way, Wichita, KS 67209-2942, petitioned the Federal Aviation Administration (FAA) for an exemption from the requirements of § 25.813(e) of Title 14, Code of Federal Regulations (14 CFR). This exemption, if granted, would permit the installation of doors in the passenger compartment on Learjet Model LJ-200-1A10. The requested exemption is specifically for the installation of a door between the main passenger compartment and the emergency exit in the lavatory on Learjet Model LJ-200-1A10 airplanes, which would be operated for both private use only (14 CFR part 91 operations) and for hire (14 CFR part 135 operations).

The petitioner requests relief from the following regulations:

> **Section 25.813(e), Amendment 25-116** – No door may be 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).

The petitioner supports its request with the following information:

This section quotes the relevant information from the petitioner's request, with minor edits for clarity. The complete petition is available at the Department of Transportation's Federal Docket Management System, on the Internet at regulations.gov, in docket no. FAA 2013-0800.

> **Discussion**
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> When 14 CFR Part 25, Section 25.813(e) Amdt. 25-1 was issued to restrict installation of doors between passenger compartments it did not restrict the installation of doors forward or aft of passenger compartments. As such it continued to be common practice for

business class aircraft to install doors which isolated the passenger seating areas from crew work areas. These doors lowered noise levels in the passenger cabin and created effective work environments on these business aircraft. On October 27, 2004, Amendments 25-116 and 121-306, titled "Miscellaneous Cabin Safety Changes," were published in the Federal Register. This revised 14 CFR 25.813(e) to restrict the installation of any interior door between a passenger seat and any emergency exit, effectively restricting the use of all interior doors. In addition, the FAA revised 14 CFR 121.310(f)(6), to prohibit these doors in airplanes manufactured after November 27, 2006, and operated under 14 CFR part 121. However, at that time the FAA chose not to amend 14 CFR Part 135 or 14 CFR Part 91. As a result, aircraft certified prior to Amendment 25-116, and operating under other than 14 CFR Part 121, are permitted to incorporate these types of door installations.

When Amendment 25-116 was issued, the FAA noted that this change was incorporated due to concerns over passengers' ability to recognize that an exit exists beyond an interior door forward or aft of the passenger compartment; and reach the exit beyond the door in the event of failure of the interior door to open or being jammed.

For the Learjet Model LJ-200-1A10 executive business aircraft, Learjet Inc. believes that it is possible to provide a level of safety consistent with the intent of the 14 CFR Part 25 regulations while allowing for installation of certain interior pocket doors. This will be accomplished by incorporating specific design features to ensure the passengers' ability to effectively identify the exit and egress [from] the aircraft is not diminished.

Learjet Inc. is proposing specific design requirements to provide this level of safety appropriate to the operations of executive business aircraft, both private (14 CFR Part 91) and for hire (common carriage) (14 CFR Part 135) equipped with partitions and doors.

The Learjet Model LJ-200-1A10 executive business aircraft will be designed to the requirements of 14 CFR Part 25, Transport category. These rules basically address airplanes that are used for the carriage of fare paying passengers or the general public. Additionally, the rules consider aircraft with a passenger seating of up to 500. The new Learjet Model LJ-200-1A10 will have a maximum seating capacity of ten (10) passengers, and will be equipped exclusively for executive business aircraft use. The difference between the commercial transport category aircraft used in airline operation and aircraft specifically used for executive business operations are not segregated in the 14 CFR Part 25 rules. Learjet contends that airplanes specifically designed for executive business operations, whether private or for hire (common carriage) should be eligible for the acceptance by exemption of cabin features which do not comply with the full requirements of 14 CFR Part 25 provided that they demonstrate and provide similar levels of safety.

Aircraft specifically designed for executive business aircraft operation contain features designed to support passengers who fly frequently and are very familiar with the executive business aircraft in which they are traveling. The crew of an executive business aircraft is intimately in contact with the passengers thus the communications are first

hand which ensures safety and understanding of operation. Furthermore, passengers will be briefed as to the proper use and safety features of the doors enhancing safety and ensuring rapid egress from the aircraft in an emergency situation. This is typically addressed in the pre-flight briefings from the pilots prior to take off for 14 CFR Part 91/135 operations and additionally in the passenger briefing cards for 14 CFR Part 135 operations.

The new Learjet Model LJ-200-1A10 will have a maximum seating capacity of ten (10) passengers and two (2) crew members. The standard floor plan arrangement will consist of four (4) club seating arrangement in the main passenger cabin.

Optional floor plan arrangements will also be available, they will consist of a three (3) club seating arrangements and a three (3) place side-facing divan (See Figure 2). Installed in the aft section of the main passenger cabin, as part of both the standard and optional seating arrangements, will be a manually operated single "pocket" door stowed in the LH Aft Lavatory Partition that will separate the main passenger cabin from the aft lavatory. The aft lavatory area will consist of a vanity cabinet on the LH side and a toilet enclosure on the RH side with provisions for an optional belted seat.

As a customer selected option, a manually operated single mid-cabin “pocket” door will be installed just aft of the RH forward galley. The optional mid-cabin door will only be available for use if the aircraft is operating under Part 91 operations. When the aircraft operates under Part 135 operations (for hire or for common-carriage), this door will be required to be removed or mechanically disabled in the stowed position.

The main entry door, a Type I exit, will be located on the LH side of the aircraft, approximately three feet aft of the cockpit. From inside the aircraft, a single handle, located on the forward side of the door, is rotated upward releasing the locking mechanism allowing the door to open outward. A set of stairs are integrated into the door along with hand rails on the aft side to assist occupants in entering and exiting the aircraft.

Installed on the RH side, just outboard of the toilet enclosure in the aft lavatory, will be a Type III emergency exit. Opening of the Type III emergency exit from inside the aircraft will consist of rotating a handle up and forward which will allow the door to move upward to clear the lower latches and thus swing outward and forward along the fuselage. The door will remain attached to the door opening structure and will not be a removable plug-style door like other aircraft in its class. Additionally, the Type III emergency exit door will have a latching mechanism to retain it in the open position.

There are several technical arguments to support special consideration for this size of aircraft with a passenger count of ten (10) or less; which is significantly less than the amount carried in airline service. One of which is the distance between the Type I and Type III emergency exits of approximately 18.5 feet and separated by one single aisle. Passengers leaving their seats will either move forward or aft to reach an emergency exit. Bulkhead Exit signs will be installed on both the forward LH partition and the RH aft

partition, providing occupants awareness that the exits are located beyond the bulkheads. In addition, opening of the Type III emergency exit from inside the aircraft will be much easier in that, in the event of an emergency, an occupant will not have to decide what to do with a door that is at least 20 inches wide by 36 inches high weighing between 45 to 50 lbs. All they will have to do is rotate the handle up and forward, push the door outward and forward along the fuselage where it will lock into the open position. The opening of the Type I door from inside the aircraft will only require the rotation of the handle upward and pushing the door open. Furthermore, the proposed design features of the partitions with pocket doors will have safety features that will be equal to what is required by the rule and is further described in the Occupant Safety Considerations below.

Occupant Safety Considerations

For Part 91 Operations, the aft lavatory door and the mid-cabin door will incorporate the following design features. When the mid-cabin door is installed, the airplane will 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. These design features are similar to exemptions previously granted for private aircraft operations and the limitations will be documented in the limitations section of the AFM:

- The door will open and close in a transverse direction. That is, the direction of motion of the door will 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.

- The door will have a redundant means to latch the door open (stowed) position for taxi, take-off and landing. Each latching means will be shown to retain the door in the open (stowed) position under all emergency landing loads specified under 14 CFR 25.561(b).

- The doors between the passenger compartments and emergency exits will be frangible. Frangibility is intended to ensure that if a door is jammed closed, occupants can escape in either direction and emergency equipment can be moved. Two (2) tests will be conducted to show the effectiveness of the frangible door. One will show that a 5th percentile female will be able to egress forward out of the lavatory. A second test will show that a 5th percentile female will be able to egress aft towards the Type III over-wing exit. Both tests will show that a 95th percentile male will be able to follow through the opening that the 5th percentile female had created. Guidance from Advisory Circular 25-17 A, *Transport Airplane Cabin Interiors Crashworthiness Handbook*, paragraph 43b(2) will be followed.

- No hazards will be present after breaking through frangible door.

- A placard describing the frangibility procedure will be installed in a conspicuous location on both sides of the door.

- A placard requiring the door to be in the open position will be installed in a conspicuous position on both sides of the door

- An Amber CAS message will alert the pilots if either of the interior doors are not in the properly open (stowed) position when the landing gear is down or the flaps are not fully retracted for taxi, takeoff, and landing.

- The doors will be equipped with an override function allowing an occupant to open either door from the cabin side.

For Part 135 operations, only the aft lavatory door will be a functional door. The mid-cabin door will either be removed or mechanically locked in the stowed position, preventing it from being used. In addition to the requirements listed above, the following design features will be included in the lavatory door and the limitations will be documented in the *Limitations* section of the *Airplane Flight Manual* (AFM):

- Operation will be limited to Part 135 operations and below. No Part 121 operations will be permitted

- The installation will be limited to the lavatory door.

- A minimum 15-in.-width passageway with no encroachment will be maintained from the lavatory door to the Type III exit opening.

- The airplane's maximum passenger capacity will be limited to 10 and the type-certificate data sheet (TCDS) will reflect this maximum passenger capacity.

- The frangible features of the door will be demonstrated by test. Both tests listed above will demonstrate the frangible features of the door. Additional criteria will be shown during the test where the evacuees are moving aft through the lavatory compartment:

    - The test will include the 5th percentile female passing through the lavatory door utilizing its frangibility features and opening the Type III exit; all within 10 seconds.

    - The Type III exit is defined as open when it meets the requirements defined in§ 25.809(i).

    - The resultant opening that the female makes will be shown to be big enough at a minimum for the 95th percentile male to evacuate. Guidance from Advisory Circular 25-17A, *Transport Airplane Cabin Interiors Crashworthiness Handbook*, paragraph 43b(2) will be followed.

- The pre-flight video briefing will be provided to the test subjects prior to running test.

- The test will be conducted under emergency lighting conditions and normal airplane attitude.

- A self-stowing Type III exit (or larger) will be installed in the aft lavatory compartment. The Type III exit will be designed such that when operated to the fully open position, the hatch/door is automatically disposed so that it neither reduces the size of the exit opening, the passageway leading to the exit, nor the unobstructed space specified in the regulations to below the required minimum dimensions. In the fully open position it will not obstruct egress from the exit via the escape route specified in § 25.810(c).

- A video briefing will demonstrate to the passengers the use of the door including its frangible features. The AFM will require that the video is shown each flight.

- The door will be designed to be automatically open (stowed) when the landing gear is down or the flaps are not fully retracted. It will be designed so that it can only be closed (deployed) when the gear and flaps are fully retracted (airborne configuration), or when the parking brake is engaged.

- The latches will be cycle tested to a minimum of 100,000 cycles to account for wear and tear in service.

- In accordance with Learjet's approach to compliance with 14 CFR 25.1309, the failure to egress through any individual emergency exit is classified as Major. Learjet will demonstrate that the probability of failure to egress through the Type III emergency exits will meet the criteria for a failure scenario classified as Major. This will include conducting a quantitative analysis that shows the probability of this scenario to be less than 10^{-5} per flight hour. This hazard criticality is based on 14 CFR 25.783(b)(2).

Effect of the Exemption on Safety

Acceptance of the proposed design on the Learjet Model LJ-200-1A10 will ensure that a level of safety consistent with the intent of the regulation has been provided. The design of the proposed interior doors will ensure the same level of safety for cabin egress as is required for any emergency exit and will provide a clear egress path. This combined with other characteristics of the LJ-200-1A10 such as the self-stowing Type III exit door will provide a level of safety exceeding that currently prescribed under 14 CFR Part 25.

Learjet recognizes that the exemptions previously granted have a stipulation that the aircraft must not be operated for hire or offered for common carriage. However, Learjet has proposed a number of additional safety features for the lavatory door so that occupants with limited knowledge of the aircraft will clearly be able to deal with safety

situations similar to occupants with intimate knowledge. These safety features will ensure the same level of safety for passenger egress as is required for any emergency exit and will provide a clear egress path.

Although the current operational requirements under Part 91 and Part 135 for this type of aircraft have not been amended to correspond to Part 25 restriction, Learjet acknowledges that the Part 25 change is an important enhancement to the level of safety offered by newly manufactured aircraft. The design criteria proposed by Learjet raises the current level of safety to that envisioned by Amendment 25-116 to Part 25.

Issue of Public Interest

Learjet Inc. has been manufacturing executive business aircraft for a wide variety of customers, worldwide for more than fifty (50) years. Its leadership in the business aviation is due in a large part to its innovative design and advanced technologies, providing customers with efficient, safe and economical executive aircraft. Customer expectation and satisfaction is a cornerstone in the sale of business aircraft. Customers in this market segment have come to expect the ability to segregate their cabin into private areas to conduct their business transactions. Lavatory areas have an additional expectation of privacy that simple curtains do not provide. Limiting the use of doors on the Learjet LJ-200-1A10 would negatively affect the marketability and sale of the aircraft. This effect would be even greater if the lavatory door were not available for all requested flight operations. Learjet provides thousands of jobs to the region. In addition, the program utilizes numerous supplies from all over the United States, providing economic growth and stabilization of the American job market. The loss of sales would impact not only Learjet, but its entire supply chain. Additionally, since customers desire these doors and expect a level of privacy in lavatory compartments, they may opt for aircraft designed to an earlier certification basis, in lieu of the LJ-200-1A10. This will restrict the advancements in safety introduced by the LJ-200-1A10 airplane, not only in the areas of cabin safety, but thorough out the airplane. This is counter to both Learjet's and the FAA’s goal of continuous improvement in overall aircraft safety. The advancement of aircraft safety is in the interest of the public.

Operation Outside of the United States

The European Aviation Safety Administration (EASA) Certification Standard (CS) 25.813 regulation is not currently harmonized with 14 CFR 25.813 and does not restrict these types of door installations.

Regardless of EASA requirements, per 14 CFR 11.81(h) Learjet requests consideration be given to extending this exemption for operation outside of the United States. Learjet aircraft are routinely registered and operated outside of the United States and projections are the same for the Learjet Model LJ-200-1A10. Granting this extension of privileges will allow for operations based within foreign countries, including EU member countries, having bilateral agreements with the United States accepting FAA 14 CFR part 25 as their airworthiness standards for transport category aircraft. Learjet believes that limiting

this exemption to use within the U.S. would put unfair restrictions on the marketability of this aircraft.

Conclusion

Based on the above information, Learjet Inc. believes that an exemption to 25.813(e) is in the public interest and would not adversely affect safety of the passenger traveling aboard the Learjet Model LJ-200-1A10.

***Federal Register* publication**

A summary of the petition was published in the Federal Register on October 2, 2013 (76 FR 60995). No comments were received.

The FAA's analysis

Explanation of "executive use" aircraft

Over the last 40 to 50 years, the term "executive use" typically has been associated with airplanes that have been limited, by the exit configuration of the airplane, to 19 or fewer passengers. These include airplanes similar in size to the LJ-200-1A10, such as the Embraer EMB-550, Gulfstream GIII/GIV/GV, Canadair Challengers, Dassault Falconjets, and Hawker Model 4000s. The types of operations conducted by operators of the smaller transport airplanes have grown significantly in the past 15 to 20 years. These airplanes, with 19 or fewer passengers, typically are not used in part 121 operations but they are very frequently used in part 135 operations. The term "air carrier" is defined as any person who undertakes directly, by lease or other arrangement, to engage in air transportation. This term applies to on-demand operations for hire conducted under part 135.

The development of cabin safety standards for private-use aircraft

The FAA adopted Special Federal Aviation Regulation (SFAR) 109 to define an alternative set of cabin-safety standards for transport-category airplanes in private use (i.e., not for hire, not for common carriage) airplanes. The intent of this activity was to recognize that private owners, who made no pretense of providing commercial passenger service, were entitled to certain considerations with respect to the regulatory requirements. Specifically, the FAA is required, by § 44701(d) of Title 49, United States Code (49 U.S.C.), to consider differences between air transportation and other air commerce.

SFAR 109 applies to operations that are not for hire and "not for common carriage." It contains a provision to preclude operation of any sort in part 135. Operation in accordance with SFAR 109, paragraph 10, "Interior," does permit installation of interior doors. However, SFAR 109 is a separate rule with its own criteria. In particular, SFAR 109 is limited to private-use operations and addresses several different regulatory issues, including interior doors.

With regard to operation under part 91, we consider the petitioner's proposal to be in the public interest for the reasons the petitioner stated previously. However, considering that Learjet

previously applied for, and was granted, a partial exemption (exemption no. 10670) from § 25.813(e) for the Model LJ-200-1A10 airplane, the FAA sees no reason to issue another exemption that is identical to the previously issued partial grant of exemption. That partial grant of exemption is limited to "private, not for hire, not for common carriage" operations.

Operation for hire (part 135 operations)

Amendment 25-116 to § 25.813 was adopted to address the hazard presented by a door located between passengers and an emergency exit. Should such a door (either through omission or mechanical failure) become jammed in the event of an emergency evacuation, persons could be prevented from, or delayed in, evacuating, which could result in fatalities or injuries that would not otherwise have occurred. Also, it was determined in the course of accident investigations in the 1960s that an interior door could be detrimental in evacuation of passengers, who tended not to recognize that an exit was beyond the door, even if it was the closest available exit. Either could result in the same consequences – failure of some passengers to evacuate the airplane. In the case of the LJ-200-1A10, the airplane has only two emergency exits, so any hazard presented by a lavatory door could significantly affect evacuation.

The FAA considers the petitioner's proposal not to be in the public interest when the airplane is operated for hire (14 CFR part 135 operations) for the following reasons.

The petitioner's argument that it is more in the public interest to have the privacy of a pocket door on the lavatory, in lieu of a curtain, than not having a door between passenger seats and one of the two emergency exits on the airplane, is not supported for a for-hire airplane. The interest of the public in safe evacuation from a for-hire carrier is not outweighed by an interest in additional privacy.

For commercial-carriage and for-hire operations, we have consistently denied petitions for interior doors except for the Gulfstream GVI. That airplane has two pair of overwing exits which provide a total of four exits available to passengers should the interior door become unopenable, thus ensuring the availability to evacuate safely (refer to exemption number 10188). For airplanes that are operated for hire, the passenger has a high expectation of the level of safety when they purchase the ticket. The typical paying passenger has the same expectation of safety regardless of whether the operation is part 135 or part 121.

The FAA's decision

In consideration of the foregoing, I find that a grant of exemption is not 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 deny Learjet's petition for an exemption from § 25.813(e) that would have allowed installation of an interior door on LJ-200-1A10 airplanes operating under part 135.

Issued in Renton Washington, on September 5, 2014.

/s/ Jeffrey E. Duven

Jeffrey E. Duven
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