Exemption No. 10634

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

In the matter of the petition of **Learjet Incorporated** for an exemption from § 25.785(b) of Title 14, Code of Federal Regulations	**Regulatory Docket No. FAA-2012-0646**

GRANT OF EXEMPTION

By letter dated July 10, 2012, Ms. Victoria Goff, ODA Administrator, Learjet Inc., One Lear Way, Wichita, KS 67209-2942 petitioned the Federal Aviation Administration (FAA) for an exemption from the requirements of § 25.785(b) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would permit relief from the general occupant protection requirements for single-place side-facing seats in the passenger compartment on Learjet Model 45 airplanes.

The petitioner requests relief from the following regulations:

> **Section 25.785(b), Amendment 25-72 –** Each seat, berth, safety belt, harness, and adjacent part of the airplane at each station designed as occupiable during takeoff and landing must be designed so that a person making proper use of these facilities will not suffer serious injury in an emergency landing as a result of the inertia forces specified in §§ 25.561 and 25.562.

The petitioner supports its request with the following information:

This section quotes the relevant information from the petitioner's request. Their 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-2012-0646.

Learjet requests relief from the following regulation:

14 CFR Part 25, Section 25.785(b) Amendment 25-72. Seats, Berths, Safety Belts, and Harnesses. The proposed exemption. if granted, would permit relief from the requirement of general occupant protection for a single side-facing seat.

Affected Model and Serial Numbers:

Learjet Model 45
Serial Numbers 45-368,45-446, 45-456—45-2000, 45-2129, 45-2134—45-4000

The request is supported by the following information:

The primary reason for this exemption request is because the previously FAA approved performance standards for the installation of a single side-facing seat on the Learjet Model 45 provided by the Transport Airplane Directorate (TAD) on March 7, 1997 were not appropriately documented as required by FAA Order 8110.4. The performance standards were in a form of a facsimile from Jeff Gardlin at TAD to Dale Bleakney, ACE-115W of the Wichita ACO and should have been in the form of a Special Condition and subsequently added to the Type Certificate Data Sheet (TCDS) at the time of initial issuance of the Type Certificate for the Learjet Model 45. If this had been the case, Learjet would not have received a new Proposed Special Condition Issue Paper outlining a new set of performance standards for the certification of a side-facing seat that is similar to one previously approved by Type Design.

On February 17, 2012, Learjet received a Proposed Special Condition Issue Paper outlining a new set of performance standards for the installation of a side-facing seat. This Issue Paper was based on an application for a new STC consisting of an interior upgrade to the Learjet Model 45. However in the certification plan, Learjet indicated that the proposed side-facing seat was similar to ones previously approved by Type Design utilizing the set of performance standards outlined in a facsimile provided by TAD in 1997. The FAA indicated that they could not find any record of this correspondence. In addition, the FAA indicated that Learjet is not technically in compliance with their Type Certificate Data Sheet (TCDS) since the installation of side-facing seats are considered new and novel and requires a Special Condition or Exemption depending on the configuration. The following paragraphs provide a detailed history of the events leading up to this exemption request. In addition, the following paragraphs will provide a justification as to why a new Proposed Special Condition Issue Paper is not required for this installation.

On February 2, 1996 (ref. Learjet letter L706-02-96-80), Learjet submitted a proposal for the approval method and definition of the optional installations and equipment for the Learjet Model 45. One of the optional installations included in this letter was a side-facing belted toilet. The descriptive details and method of compliance were outlined in this letter. On August 27, 1996, (ref. Learjet letter L706-08-96-605), Learjet submitted

the proposed Aft Lavatory Belted Toilet Compliance Plan for the installation of a belted toilet on the Learjet Model 45 (ref ER-243, Revision A). Included in this plan was the proposed testing approach for the side-facing lavatory seat. The testing approach consisted of one vertical and one longitudinal test using a Hybrid II Anthropomorphic Dummy (ATD). Both tests included an aft lavatory arrangement consisting of a toilet, toilet enclosure, lap belts, an aft partition, and a full length contact pad installed on the aft side of the aft partition. The lap belts and aft partition with contact pad were considered the restraint system for the occupant. The performance standards contained in this compliance plan consisted of the standard structural requirements of 14 CFR Part 25, Section 25.561 Amdt 25- 64 and 25.562 Amdt 25-64 along with the applicable occupant protection requirements of 14 CFR Part 25, Section 25.785 Amdt 25-72 and 25.562 Amdt 25-64. Enclosed with the submittal of this compliance plan were two 8110-3s recommending approval. The FAA approved the recommendation on September 3, 1996. On March 7, 1997, Jeff Gardlin from the Transport Airplane Directorate sent a facsimile to Dale Bleakney that outlined a set of performance standards to certify the side-facing seat. These performance standards consisted of the following:

1. All of the existing paragraphs of § 25.562 Apply.
2. The seat should be installed aft of structure such as an interior wall or furnishing that support the pelvis, upper arm, chest, and head of an occupant seated next to the structure. A conservative representation of the structure and its stiffness must be included in the tests. During the 16g forward dynamic test, if contact occurs between the structure and one of these body segments of the test dummy seated next to the wall or furnishing, one of the following methods for providing impact protection must be used:
    a. The contact surface must be covered with at least two inches of energy absorbing protective foam, such as ensolite; or
    b. Alternatively, for the pelvis, upper arms, and chest, testing with a Side Impact Dummy (SID), as defined by 49 CFR Part 572, Subpart F, or its equivalent, must be conducted and Thoracic Trauma Index injury criteria acquired with the SID must be less than 85, as defined in 49 CFR Part 572, Subpart F. Any head contact surface must be covered with at least two inches of energy absorbing protective foam, such as ensolite.
3. Pelvic lateral acceleration must not exceed 130g.
4. The lower limbs should be prevented from flailing. In the absence of a means to prevent the lower limbs from flailing, the torsion in the femur should not exceed 1200 in-lbs.
5. Where upper torso straps (shoulder straps) are used for the occupant, tension loads in individual straps must not exceed 1,750 pounds. If dual straps are used for restraining the upper torso, the total strap tension loads must not exceed 2,000 pounds.

These performance standards were reviewed against the FAA approved compliance plan (ref. ER-243 Rev A) to ensure the testing would satisfy all the requirements. Based on that review, testing was conducted from March 12, 1997 through May 29, 1997. Five tests were conducted; One 14g vertical test and four 16g longitudinal tests. Two of the longitudinal tests were considered invalid due to incorrect crash sled parameters. The third or additional longitudinal test was conducted to investigate occupant leg flail

without the use of a leg attenuating device. This additional test demonstrated that there wasn't any unnatural leg flail; therefore the leg flail attenuating device was not required. On October 21, 1997 the results of the testing was compiled into a report (ref. ER-244 Rev B). On November 7, 1997 (ref. Learjet letter L706-11- 97-1878), Learjet submitted the test report with the appropriate approvals. The FAA accepted the approval on March 13, 1998. For formality purposes, the Aft Lavatory Belted Toilet Compliance Plan was revised (ref. ER-243 Rev B) to include the performance standards provided by the Transport Airplane Directorate. On November 7, 1997, the revised compliance plan was submitted to the FAA. The history of events described above became the certification basis for the Side-facing seat on the Learjet Model 45.

Over the last fifteen (15) years, there have been a few changes to the side-facing seat configuration. Each of these changes was retested to satisfy the requirements. The changes were primarily related to material and processes from one manufacturer to another along with some structural attachment improvements. The performance standards used for the testing were from the original certification in 1997. On both occasions, the FAA was involved in the certification testing (ref. 45-TR11-1, Learjet Model 45XR RH Lavatory Seating System Test Results and 04/0103, Learjet Model 45XR RH Lavatory Seating System Testing) including the approval of the test plans.

As stated earlier, on February 17, 2012 Learjet received a new Proposed Special Condition Issue Paper outlining a new set of performance standards for the installation of a single side facing seat. This Issue Paper is based on draft policy PS-ANM-25-03 that the FAA sent out for review and comment in August 2011. This policy discusses compliance methods that should be applied to type certificate, amended type certificate, supplemental type certificate, and amended supplemental type certification programs. The compliance methods in this policy apply to those programs with an approval date that is on or after the effective date of the final policy. Since the final policy has not been released, Learjet believes that it does not apply. Additionally, if Learjet would have received a Special Condition in 1997 that included the performance standards outlined on pages 2 and 3 then this would have been part of the aircraft certification basis. With the Special Condition listed in the TCDS, there would not have been a need to issue another one for the same subject matter. If we were to consider the statement from the implementation section of the draft policy that states, "For projects for which the methods of compliance already have been coordinated with and approved by the FAA, those compliance methods may be used"; Learjet contends that the performance standards provided by the FAA in 1997 along with their use on two (2) other certification projects over the last fifteen (15) years are considered the "methods of compliance already approved by the FAA." Therefore, these performance standards should be allowed for use on all active and future Learjet Model 45 projects.

Public Interest:

Learjet Inc. has been manufacturing executive business aircraft for a wide variety of customers, worldwide for more than forty-seven (47) years. In 1998, the Learjet Model

45 was introduced into the market where the first side-facing seat was certified to the performance standards outlined on pages 2 and 3. These performance standards are very similar to the performance standards outlined in the current FAA Policy ANM-03-115-30 dated May 6, 2005.

Granting this petition for exemption would clearly be in the public interest because of the importance of business aviation to the United States economy. Business aircraft reduces business travel time, reduces flight time, and allows for greater productivity by allowing executives to take their business to the customer. It also allows the executives to make commitments to varied locations on short schedules. Failure to grant the exemption will result in a significant loss of income for both Learjet and its potential customers; loss of domestic and foreign trade for the U.S. which leads to loss of employment and slower economic growth.

Effect on Safety:

There are over five hundred (500) Learjet Model 45 aircraft in service. Many of these aircraft are equipped with a single side-facing seat. Learjet has no record of any safety incidents related to the installation of this seat. Learjet contends that the side-facing seat on the Learjet Model 45, when tested to the performance standards outlined on pages 2 and 3, provides a level of safety equal to the performance standards outlined in FAA Policy ANM-03-115-30. Safety is not diminished by this request and there is no detrimental effect on the public at large.

Public Comment:

In accordance with 14 CFR 11.87, Learjet requests that the FAA not publish a summary of this petition for exemption in the Federal Register allowing for public comment as the performance standards outlined on pages 2 and 3 are not considered precedent setting and are very similar to performance standards outlined in FAA Policy ANM-03-115-30 which are considered the industry standard requirements. Publishing this exemption request in the Federal Register would cause further delay to the certification of the interior upgrade thus causing Learjet to have to remove the side-facing seat option from the aircraft. This would adversely affect the continued marketability of the aircraft. The performance standards outlined on pages 2 and 3 have been in effect for the last fifteen (15) years. Since the purpose of this exemption is to appropriately document the continued use of the performance standards approved in 1997, then there is no reason or value added for requiring public comment.

Operation Outside of the United States

In accordance with 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. 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 continued marketability of this aircraft.

Summary

In summary, Learjet Inc. is requesting exemption from 25.785(b), Amendment 25-72, Seats, Berths, Safety Belts and Harnesses for the Learjet Model 45 single side-facing seat. Based on the above information, Learjet Inc. believes that an exemption to allow the use of the performance standards listed on pages 2 and 3, previously approved in 1997, would be in the public interest and would not adversely affect safety of the passenger traveling aboard the Lear Model 45.

***Federal Register* publication**

The FAA has determined that good cause exists for waiving the requirement for *Federal Register* publication because the exemption, if granted, would not set a precedent, and any delay in acting on this petition would be detrimental to Learjet.

The FAA's analysis

The FAA considers the petitioner's proposal to be in the public interest for the same reasons as those previously stated by the petitioner.

Amendment 25-64 to 14 CFR part 25 was issued June 16, 1988, to revise the emergency-landing conditions that must be considered in the design of an airplane. Amendment 25-64 revised the static-load conditions in § 25.561, and added a new § 25.562 that required dynamic testing of all seats approved for occupancy during takeoff and landing. The intent of Amendment 25-64 was to provide an improved level of safety for occupants on transport-category airplanes. Because most seating is forward/aft facing on transport-category airplanes, the pass/fail criteria developed in Amendment 25-64 focused primarily on these seats. Side-facing seat installations were not adequately taken into account for transport-category airplanes when this amendment was issued. Therefore, in November of 1997, the FAA issued Memorandum "Side-Facing Seats on Transport Category Airplanes" and draft Issue Paper "Dynamic Test Requirements for Single Place Side-Facing Seats" to address the dynamic certification of side-facing seats. The memorandum and the issue paper introduced requirements for Thoracic Trauma Index (TTI) and lateral pelvic acceleration, which were in addition to the existing injury criteria requirements of § 25.562(c). The specified conditions are required to be measured during dynamic testing of the side-facing seats and in compliance with the limitations to be demonstrated.

Side-facing seats are considered a novel design for transport-category airplanes that include Amendment 25-64 in their certification bases and were not anticipated when those airworthiness standards were issued. Therefore, the existing regulations do not provide adequate or appropriate safety standards for occupants of multiple-place side-facing seats. The FAA has conducted

research to develop an acceptable method of compliance with § 25.785(b) for multiple-place side-facing seat installations and had published policy statement PS-ANM-25-03 dated June 8, 2012. Based on the past history of this particular case and the application date for this specific project, the FAA finds that it is in the public interest to grant an exemption to the petitioner for Learjet 45 airplanes.

The FAA's decision

In consideration of the foregoing, I find that a 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, Learjet Incorporated is hereby granted an exemption from 14 CFR §§ 25.562(a) at Amendment 25-64 and 25.785(b) at Amendment 25-72. The petition is granted to the extent necessary to allow Learjet to install single-place side-facing seats in the passenger compartment on Learjet 45 airplanes. This exemption is subject to the following conditions:

1) Dynamic Test Requirements for Side-facing, Single-occupant Seats

In addition to the airworthiness standards in §§ 25.562 and 25.785, the following limitations provide injury criteria and installation/testing guidelines that represent the minimum acceptable airworthiness standard for side-facing, single-occupant seats:

2) The Injury Criteria

a) Existing Criteria: All injury-protection criteria of § 25.562(c)(1) through (c)(6) apply to the occupant of a side-facing seat. Head-injury criterion (HIC) assessments are only required for head contact with the seat and/or adjacent structures.

b) Body-to-Wall/Furnishing Contact: The seat must be installed aft of a structure, such as an interior wall or furnishing, that will support the pelvis, upper arm, chest, and head of an occupant seated next to the structure. A conservative representation of the structure and its stiffness must be included in the tests. It is recommended, but not required, that the contact surface of this structure be covered with at least two inches of energy-absorbing protective padding (foam or equivalent) such as Ensolite®.

c) Thoracic Trauma: TTI injury criterion must be substantiated by dynamic test or by rational analysis based on previous test(s) of a similar seat installation. Testing must be conducted with a Side Impact Dummy (SID) Anthropomorphic Test Device (ATD), as defined by 49 CFR part 572, subpart F, or its equivalent. TTI must be less than 85, as defined in 49 CFR part 572, subpart F. SID TTI data must be processed as defined in Federal Motor Vehicle Safety Standard (FMVSS) part 571.214, section S6.13.5.

d) Pelvis: Lateral pelvic acceleration must be shown by dynamic test or by rational analysis, based on previous test(s) of a similar seat installation, to not exceed 130g. Pelvic acceleration data must be processed as defined in FMVSS part 571.214, section S6.13.5.

e) Shoulder-Strap Loads: Where upper-torso straps (shoulder straps) are used for occupants, tension loads in individual straps must not exceed 1,750 pounds. If dual straps are used for restraining the upper torso, the total strap-tension loads must not exceed 2,000 pounds.

f) Lower limbs: The lower limbs should be prevented from flailing. In the absence of a means to prevent the lower limbs from flailing, the torsion in the femur must not exceed 1200 in-lbs.

3) General Test Guidelines

a) One longitudinal test with the SID ATD or its equivalent, undeformed floor, no yaw, and with all lateral structural supports (armrests/walls). Pass/fail injury assessments: TTI and pelvic acceleration.

b) One longitudinal test with the Hybrid II ATD, deformed floor, with 10 degrees yaw, and with all lateral structural supports (armrests/walls). Pass/fail injury assessments: HIC; and upper-torso-restraint load, restraint-system retention, and pelvic acceleration.

c) A vertical (14g) test is to be conducted with modified Hybrid II ATDs with existing pass/fail criteria.

Issued in Renton Washington, on September 26, 2012.

/s/ Ali Bahrami

Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service