U.S. Department
of Transportation
**Federal Aviation
Administration**

Transport Airplane Directorate
1601 Lind Avenue, S.W.
Renton, Washington 98057-3356

June 30, 2014

Exemption No. 10268B
Regulatory Docket No. FAA-2010-1284

Mr. Douglas M. Lane
ODA Deputy Lead Administrator
The Boeing Company
P.O. Box 3707 MC 03-56
Seattle, WA 98124-2207

Dear Mr. Lane:

This letter is to inform you that we have granted your petition for time-limited extension to exemption no. 10268. It explains the basis for our decision and describes its effect.

The Basis for Our Decision

By letter dated April 9, 2014, you petitioned the Federal Aviation Administration (FAA) on behalf of The Boeing Company for an amendment to exemption no. 10268. That exemption from §§ 25.1305(c)(6) and 25.1309(c), Amendment 25-116, of Title 14, Code of Federal Regulations, provides The Boeing Company temporary relief from the cockpit indication requirements for indicating fuel-system contamination on Boeing Model 787-8 airplanes powered by General Electric GEnx-1B engines. Your request would add 4 months to the original exemption time limit for the 787-8 to allow relief for airplanes delivered prior to October 31, 2014, and for retrofit incorporation until April 30, 2017.

For the 787-8 fuel systems to comply with § 25.1309(c), an unambiguous and timely indication to the flightcrew is required in the event that both engines on the same flight are subjected to a fuel filter impending bypass condition. Further, to comply with § 25.1309(c), the flightcrew must be alerted of anticipated fuel-system contamination that could clog the fuel system ahead of the engine fuel filter. The purpose of this indication is to enable the flightcrew to take appropriate corrective action.

Boeing originally requested relief for a limited number of 787- 8 airplanes to allow sufficient time to develop, validate, certify, and incorporate into production a new, compliant, gross-fuel-system contamination indication. Following incorporation of the compliant indication into production airplanes, Boeing will issue a service bulletin that requires all airplanes delivered under this time-limited exemption to be retrofitted. Boeing has completed the design development for the impending bypass indication. They met the compliance-planning conditions of the exemption, submitted draft service instructions to the FAA, and are on schedule to receive FAA approval of the final service instructions as required by the original exemption. However, incorporation of the gross-fuel-system

contamination indication into production airplanes requires modifying the electronic engine controls (EEC) that provide information to the airplane's cockpit display system. Modification of the EEC to include the following safety improvements has resulted in the need to extend the compliance time for the original exemption:

- Allows the engine to continue safe function in ice-crystal icing conditions
- Ensures engine stability throughout the operating envelope
- Provides clearer fuel-shutoff-valve position indication.

According to Boeing, the extraordinary procedures included in the amendment to the original exemption compensate for the non-compliant features. This includes specific post-maintenance procedures that are intended to detect debris that may be introduced into the airplane fuel system during fuel-tank entries. The Airworthiness Limitations section of the *Instructions for Continued Airworthiness* include procedures for inspecting the engine fuel strainer for contaminants after the first flight following maintenance actions where personnel enter into the center wing fuel tank. The amended provisions require inspection of the engine fuel-strainer maintenance indicators after the first flight, and inspection of engines at specified flight-hour intervals instead of after a single flight.

The FAA understands that your petition makes no change in the intent of the conditions and reasons relative to public interest and safety that were the basis for granting the original exemption.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested time-limited extension to the exemption would not set a precedent, and any delay in acting on this petition would be detrimental to The Boeing Company.

The Effect of Our Decision

Our decision extends the time limit of exemption no. 10268, for airplanes for which an application for an airworthiness certificate is made, from prior to June 30, 2014, to prior to October 31, 2014. The time limit for retrofit of in-service airplanes is extended from December 31, 2016, to April 30, 2017. Boeing has met the requirements of conditions number 2 and 5 of the original exemption. These conditions are included in this amendment of the original exemption for completeness. The Grant of Amended Exemption provides specific compliance dates for the exemption extended time limits.

The Grant of Amended Exemption

In consideration of the foregoing, I find that extending the time-limited grant of exemption no. 10268 is in the public interest regarding 14 CFR 25.1305(c)(6) and 25.1309(c), at Amendment 25-116. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator, The Boeing Company is granted an exemption until April 30, 2017, from the requirements of §§ 25.1305(c)(6) and 25.1309(c), at Amendment 25-116, as they pertain to indication of impending bypass of the engine oil fuel-cooled oiler coolers, and indication of impending bypass on the main fuel filters of multiple engines, for the Boeing Model 787-8 airplanes powered by General Electric GEnx-1B and subsequent variants of the engine.

The following amended conditions and limitations, except numbers 2 and 5, supersede the conditions and limitations of exemption no. 10268:

1. For Model 787-8 airplanes granted a certificate of airworthiness before October 31, 2014, the Airworthiness Limitations section of the *Instructions for Continued Airworthiness* must include a limitation that requires operators to verify contaminants have not accumulated on the fuel strainer located upstream of the engine-driven fuel pump. The limitation must also require an inspection of the fuel-cooled oil cooler if the fuel strainer has bypassed fuel. The airworthiness limitation must require these actions following any maintenance action that resulted in personnel entry into the center wing fuel tank:

    a. After the first flight following tank entry, access and analyze the messages from the engine-indication and crew-alerting system, and operational-health monitoring system, to detect any bypass or impending bypass of any of the engine-fuel strainers.

    b. Perform a physical inspection of the engine-fuel strainer from one engine within 20 flight hours.

    c. Perform a second physical inspection of the engine-fuel strainer from the second engine within 40 flight hours.

2. Boeing must develop and implement procedures that include appropriate pass/fail criteria acceptable to the FAA for determining if contamination is present on the fuel strainer located upstream of the engine-driven fuel pump. If the upstream strainer has bypassed fuel, inspection of the face of the fuel-cooled oil cooler, and removal of any unacceptable contaminants, is required. This inspection must be accomplished following completion of production flight tests, and prior to issuance of the standard certificate of airworthiness or export certificate of airworthiness (as applicable in support of customer delivery),

3. Prior to October 31, 2014, Boeing must complete the design and show compliance to §§ 25.1305(c)(6) and 25.1309(c), at Amendment 25-116, for design improvements and flightcrew procedures to allow timely flightcrew awareness and response to hazardous fuel contamination.

4. Prior to July 31, 2014, Boeing must develop and submit for FAA approval service information to incorporate any design changes and/or operating and maintenance limitations developed to meet the provision of §§ 25.1305(c)(6) and 25.1309(c), as identified in condition 3 (above).

5. By July 1, 2011, Boeing must present to the FAA a comprehensive compliance plan and schedule, supporting the deliverables outlined in conditions 3 and 4 (above). Thereafter, Boeing must submit a status report every three months to the Seattle Aircraft Certification Office identifying all actions completed to date, as well as those that remain outstanding. The report must demonstrate Boeing's progressive performance and accomplishments indicating its projected success in meeting the schedule and conditions of the exemption. Boeing must also submit drafts of the service information required by condition 4 (above) to the FAA by April 30, 2014.

6. For Model 787-8 airplanes granted a certificate of airworthiness prior to October 31, 2014, that do not have the design changes incorporated as identified by condition 3 (above), the Airworthiness Limitations section of the Model 787-8 airplane *Instructions for Continued Airworthiness* must state that delivered airplanes cannot be operated after April 30, 2017, unless the design changes submitted in accordance with condition 4 (above) are incorporated by the owner or operator.

7. If an application for an airworthiness certificate is made on or after October 31, 2014, the affected airplanes must incorporate the indication of impending bypass of the fuel-cooled oil cooler in compliance with §§ 25.1305(c)(6) and 25.1309(c).

8. The FAA will not issue original airworthiness-certificate approvals for Boeing Model 787-8 airplanes on or after October 31, 2014, unless that airplane has incorporated the design changes that Boeing has shown to be fully compliant with §§ 25.1305(c)(6) and 25.1309, and the conditions and limitations of this exemption have been met.

All conditions and limitations of exemption no. 10268 remain the same. This letter must be attached to, and is a part of, exemption no. 10268.

Sincerely,

/s/ John P. Piccola, Jr.

John P. Piccola, Jr.
Acting Manager, Transport Airplane Directorate
Aircraft Certification Service