Exemption No. 10267B

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

In the matter of the petition of **The Boeing Company** for exemption from §§ 25.1305(c)(6) and 25.1309(c) of Title 14, Code of Federal Regulations	**Regulatory Docket No. FAA-2010-1268**

PARTIAL GRANT OF EXEMPTION

By letter dated November 2, 2012, Virinder Duggal, The Boeing Company, P.O. Box 3707 MC 03-56, Seattle, WA 98124-2207, petitioned the Federal Aviation Administration (FAA), on behalf of The Boeing Company, for an amendment to Exemption No. 10267A. That exemption, from §§ 25.1305(c)(6) and 25.1309(c), at Amendment 25-120 of Title 14, Code of Federal Regulations (14 CFR), provides The Boeing Company temporary relief from the cockpit-indication requirements for indicating fuel-system contamination on Boeing Model 747-8 and 747-8F airplanes. The petition request seeks to amend provision 1 of Exemption No. 10267 to allow for 20 flight hours or 4 flight cycles (whichever comes later) between fuel-tank maintenance events and the first physical engine-fuel strainer inspection, and 40 flight hours or 8 flight cycles (whichever comes later) to accrue between fuel-tank maintenance events and the second physical engine-fuel strainer inspection.

The petitioner requests relief from the following regulations:

Section 25.1305(c)(6) at Amendment 25-120, requires that:

(c) For turbine engine-powered airplanes. In addition to the powerplant instruments required by paragraph (a) of this section, the following powerplant instruments are required:

(6) An indicator for the fuel strainer or filter required by § 25.997 to indicate the occurrence of contamination of the strainer or filter before it reaches the capacity established in accordance with § 25.997(d).

Section 25.1309(c) at Amendment 25-120, requires that warning information must be provided to alert the crew to unsafe system operating conditions, and to enable them to take appropriate corrective action. Systems, controls, and associated monitoring and warning means must be designed to minimize crew errors which could create additional hazards.

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 http://regulations.gov, in docket no. FAA-2010-1268.

> The Boeing Company respectfully requests an amendment to provision #1 of Exemption 10267A. The FAA decision included the following provision in granting the Exemption:
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> "For Model 747-8/8F airplanes granted a certificate of airworthiness before June 30, 2014, the Airworthiness Limitations section of the Instructions for Continued Airworthiness must include a limitation that requires operators to verify that 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 central maintenance computer 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 a second engine within 40 flight hours."
>
> The current provision only allows 20 flight hours between fuel tank maintenance and engine fuel strainer inspection events. The amendment Boeing requests to this provision would allow for 20 flight hours or 4 flight cycles (whichever comes later) between fuel tank maintenance events and the first physical engine fuel strainer inspection, and 40 flight hours or 8 flight cycles (whichever comes later) to accrue between fuel tank maintenance events and the second physical engine fuel strainer inspection.
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> This amended provision would be met by three separate inspections:
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> - Inspection of the Engine Indication and Crew Alerting System (EICAS) and Central Maintenance Computer (CMC) messages to detect any bypass or impending bypass at the fuel strainers after the first flight.
>
> - Physical inspection of the engine fuel strainer for the first engine after 20 flight hours or 4 flight cycles, whichever comes later.

- Physical inspection of the engine fuel strainer for the second engine after 40 hours or 8 flight cycles, whichever comes later.

The two engines selected will be those determined by analysis to be fed primarily from the center fuel tank; no inspection would be required for the other two engines after center tank maintenance activity. Additionally, Boeing is committing to similar inspections following inboard main fuel tank entry by maintenance personnel.

The rationale for requesting this amendment to add a flight cycles condition to 10267A Provision No. 1 is to ensure the engines are operated on center tank fuel for sufficient time for any maintenance related contaminants to be captured by the engine fuel strainers, while allowing adherence to the best practices of avoiding maintenance on multiple common engine fuel systems at the same maintenance opportunity. The addition of flight cycles in combination with the existing flight hour requirement is an effective common mode threat mitigation strategy and provides an allowance for one round trip flight in combination with an unplanned in-flight diversion between maintenance events.

This petition reflects coordination between 747-8/8F air carriers and Boeing in the accumulation of more than 10,000 flight cycles of service. Therefore, Boeing respectfully requests waiving the [public] comment period so the public can benefit from the effects of this amendment as soon as possible.

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 a previously issued exemption; and the exemption, if issued, would not set a precedent.

The FAA's analysis

The FAA has reviewed the information The Boeing Company provided and has concluded that granting the changes to the exemption as proposed by Boeing is not in the public interest for the reasons described here. However, granting changes to the exemption to address operational concerns Boeing presented are in the public interest. The original intent of the inspection requirements defined in the exemption was to limit the exposure to contaminants that could be introduced into the fuel tanks during maintenance. The FAA had originally required inspection of the fuel-cooled oil coolers of both engines after the first flight, following maintenance, in a fuel tank feeding multiple engines. Boeing requested that the exemption be modified to allow up to 20- and 40-hour inspection intervals for inspecting the first and second engines respectively. This was based upon operational limitations of maintenance facilities and a goal of allowing two flight legs so the airplane could return to the originating maintenance base. The maintenance actions were also separated to avoid the potential of a common cause maintenance error affecting multiple engines.

The latest Boeing request to extend the 20- and 40-hour intervals, to include 4 and 8 flights, respectively, could significantly increase the engine fuel system's overall exposure to contamination. Boeing 747-8 airplanes are operated on long flights that could exceed 15 hours'

duration. Adding the provision to allow 4 and 8 flights, respectively, could result in a significant increase in exposure to contamination given that hours of operation may add up considerably within very few flights, which could result in engine-thrust loss in-flight.

The intent of the requested relief was stated as follows: "The addition of flight cycles in combination with the existing flight hour requirement is an effective common mode threat mitigation strategy and provides an allowance for one round trip flight in combination with an unplanned in-flight diversion between maintenance events."

The desired operational flexibility requested by Boeing for a round-trip flight can be achieved without the allowance for the 4- and 8-flight requirements. Allowing 2 and 4 flights for the 20- and 40-hour intervals, respectively, provides the operators the ability to conduct a round-trip flight, including a provision that would allow an additional flight following an unscheduled landing. Therefore, a partial grant of exemption that allows 2 and 4 flights for the 20- and 40-hour intervals, respectively, as well as one flight following an unscheduled landing, should provide operational flexibility while still limiting overall flight-time exposure of the engine fuel system to fuel-tank contamination.

The FAA's decision

Our decision amends provision number 1 of Exemption No. 10267.

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, Boeing Company is hereby granted a partial exemption from §§ 25.1305(c)(6) and 25.1309(c) of Title 14, Code of Federal Regulations as follows:

1. This amended provision would be met by three separate inspections:

    a. Inspection of the Engine Indication and Crew Alerting System (EICAS) and Central Maintenance Computer (CMC) messages to detect any bypass or impending bypass at the fuel strainers after the first flight.

    b. Physical inspection of the engine fuel strainer for the first engine after 20 flight hours or 2 flight cycles, whichever comes later. One additional flight is allowed following an unscheduled landing.

    c. Physical inspection of the engine fuel strainer for the second engine after 40 hours or 4 flight cycles, whichever comes later. One additional flight is allowed following an unscheduled landing.

    d. The two engines selected will be those determined by analysis to be fed primarily from the center fuel tank; no inspection would be required for the other two engines after center-tank maintenance activity. Additionally, inspections of engines fed by the inboard main fuel tanks, following inboard main-fuel-tank entry by maintenance personnel, is required.

All other conditions and limitations of Exemption No. 10267 remain the same.

Issued in Renton, Washington, on June 7, 2013.

/s/ Jeffrey E. Duven

Jeffrey E. Duven
Acting Manager, Transport Airplane Directorate
Aircraft Certification Service