

Dated at Rockville, Maryland, this 2nd day of December, 2003.

For the Nuclear Regulatory Commission.

Annette Vietti-Cook,

Secretary of the Commission.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM270; Notice No. 25-03-08-SC]

Special Conditions: Boeing Model 747-100/200B/200F/200C/SR/SP/100B SUD/400/400D/400F Airplanes; Flammability Reduction System (Fuel Tank Inerting)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed special conditions.

SUMMARY: This notice proposes special conditions for the Boeing Model 747-100/200B/200F/200C/SR/SP/100B SUD/400/400D/400F series airplanes. These airplanes, as modified by Boeing Commercial Airplanes, will incorporate a new flammability reduction system that uses a nitrogen generation system to reduce the oxygen content in the center wing fuel tank so that exposure to a combustible mixture of fuel and air is substantially minimized. This system is intended to reduce the average flammability exposure of the fleet of airplanes with the system installed to a level equivalent to 3 percent of the airplane operating time. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for the design and installation of this system. These proposed special conditions contain the additional safety standards that the Administrator considers necessary to ensure an acceptable level of safety for the installation of the system and to define performance objectives that the system must achieve to be considered an acceptable means for minimizing the development of flammable vapors in the fuel tank installation.

DATES: Comments must be received on or before January 23, 2004.

ADDRESSES: Comments on this proposal may be mailed in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attn: Rules Docket (ANM-113), Docket No. NM270, 1601 Lind Avenue SW., Renton, Washington, 98055-4056; or delivered in duplicate to the Transport Airplane Directorate at

the above address. Comments must be marked: Docket No. NM270. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT:

Mike Dostert, Propulsion and Mechanical Systems Branch, FAA, ANM-112, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington, 98055-4056; telephone (425) 227-2132, facsimile (425) 227-1320, e-mail mike.dostert@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. The most helpful comments reference a specific portion of the proposed special conditions, explain the reason for any recommended change, and include supporting data. We ask that you send us two copies of written comments.

All comments received will be filed in the docket, as well as a report summarizing each substantive public contact with FAA personnel concerning these proposed special conditions. The docket is available for public inspection before and after the comment closing date. If you wish to review the docket in person, go to the address in the **ADDRESSES** section of this preamble between 7:30 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

We will consider all comments we receive on or before the closing date for comments. We will consider comments filed late if it is possible to do so without incurring expense or delay. We may change these proposed special conditions based on the comments we receive.

If you want the FAA to acknowledge receipt of your comments on these proposed special conditions, include with your comments a pre-addressed, stamped postcard on which the docket number appears. We will stamp the date on the postcard and mail it back to you.

Background

Boeing Commercial Airplanes intends to modify Model 747 series airplanes to incorporate a new flammability reduction system that will inert the center fuel tanks with nitrogen-enriched air. Though the provisions of § 25.981, as amended by Amendment 25-102, will apply to this design change, these special conditions are being proposed to address novel design features.

Regulations used as the standard for certification of transport category

airplanes prior to Amendment 25-102, effective June 6, 2001, were intended to prevent fuel tank explosions by eliminating possible ignition sources from inside the airplane fuel tanks. Service experience of airplanes certificated to the earlier standards shows that ignition source prevention alone has not been totally effective at preventing accidents. Commercial transport airplane fuel tank safety requirements have remained relatively unchanged throughout the evolution of piston-powered aircraft and later into the jet age. The fundamental premise for precluding fuel tank explosions has involved establishing that the design does not result in a condition that would cause an ignition source within the fuel tank ullage (tank vapor space). A basic assumption in this approach has been that the fuel tank could contain flammable vapors under a wide range of airplane operating conditions even though there were periods of time in which the vapor space would not support combustion.

Fuel Properties

The flammability temperature range of jet engine fuel vapors varies with the type of jet fuel, the ambient pressure in the tank, and the amount of dissolved oxygen that may be present in the tank due to vibration and sloshing of the fuel that occurs within the tank.

At sea level pressures and with no sloshing or vibration present, Jet A fuel, the most common commercial jet fuel in the United States, and Jet A1 used in most portions of the world, have flammability characteristics that tend to make the fuel vapor-air mixture too "lean" to ignite at temperatures below approximately 100°F, and too "rich" to ignite at temperatures above 175°F. This range of flammability (100°F to 175°F) is reduced to cooler temperatures as the airplane gains altitude due to the corresponding reduction of pressure. For example, at an altitude of 30,000 feet the flammability temperature range is approximately 60°F to 120°F.

The flammability range of Jet B (JP-4), another fuel approved for use on most commercial transport airplanes but not used as a primary fuel, is approximately 15°F to 75°F at sea level, and -20°F to 35°F at 30,000 feet. Because Jet B fuel flammable temperature ranges as a function of pressure altitude are more within normal temperatures at altitudes, airplane fuel tanks are flammable for a much larger portion of the flight.

Most commercial transports are approved for operation at altitudes in the range of 30,000 to 45,000 feet. The FAA has always assumed that airplanes