



# Regulatory Announcement

---

## Proposed Aircraft Engine Emission Standards

*The U.S. Environmental Protection Agency (EPA) is proposing to amend the existing emission standards for oxides of nitrogen (NO<sub>x</sub>) for new commercial aircraft engines. These new standards are equivalent to the latest NO<sub>x</sub> emission standards of the United Nations International Civil Aviation Organization (ICAO), and thereby would bring the United States aircraft standards into alignment with the international standards.*

*These standards would go into effect in 2004 and would apply to new aircraft engines utilized on commercial aircraft that include small regional jets, single-aisle aircraft, twin-aisle aircraft, and 747s and larger aircraft. General aviation and military aircraft can use commercial aircraft engines subject to this proposal (e.g., small regional jet engines are also utilized in executive general aviation aircraft and larger commercial aircraft engines may also be used in military transport aircraft).*

### **Emissions From Aircraft Engines**

Aircraft engines contribute about 1 percent of the total U.S. mobile source NO<sub>x</sub> emissions. However, in some U.S. airport areas, aircraft currently can contribute up to 4 percent of mobile source NO<sub>x</sub> emissions. Commercial aircraft emissions are a growing segment of the transportation emissions inventory. This growth is occurring at a time when other significant mobile and stationary sources are drastically reducing emissions, thereby accentuating the growth in aircraft emis-

sions. In the Atlanta area for example, NOx emissions from commercial aircraft are expected to more than double by 2010 and contribute as much as 10 percent of mobile source NOx emissions. (These growth projections do not include the impact of the September 11 terrorists' attacks and the subsequent economic downturn. However, the Federal Aviation Administration (FAA) expects the demand for air travel to recover, and then continue a long-term trend of annual growth in the United States. Recently, FAA reported that flights of commercial air carriers will increase by 18 percent from 2002 to 2010 and 45 percent from 2002 to 2020.)

### **Health and Environmental Concerns**

The emissions from aircraft engines that are being directly controlled by the standards proposed in this rulemaking are NOx emissions. NOx emissions are a precursor to the formation of ground-level ozone, also called smog. Ozone affects human pulmonary and respiratory health. Also, NOx reacts in the atmosphere to form secondary particulate matter (PM<sub>2.5</sub>), which causes detrimental health effects. In addition, NOx, ozone, and PM adversely affect the environment in various ways including visibility impairment, crop damage, and acid rain.

To protect public health and the environment, EPA has established National Ambient Air Quality Standards (NAAQS) for several air pollutants, which includes ozone and PM. Recent air quality data show that about 111 million people live in areas that violate air quality standards for ground-level ozone. About 70 million people live in areas that violate air quality standards for PM. Because aircraft emissions contribute to increases in these air pollutants, the proposed aircraft engine standards would help states achieve and/or maintain compliance with the NAAQS.

### **History of EPA's Regulation of Aircraft Engine Emissions**

The aircraft emission standards for gas turbine (jet) engine have been in place for about thirty years. Emission standards apply to essentially all commercial aircraft, comprising scheduled and freight airlines. Two classes of aircraft, military and general aviation, are presently not covered. Emission controls on engine smoke and prohibitions on fuel venting were instituted in 1974 and have been revised several times

since then. EPA standards for unburned hydrocarbon emissions (HCs), which align with ICAO HC standards, have been in effect since 1984 (including separate HC standards for gas turbine engines employed in supersonic aircraft). Also, in May 1997, EPA adopted standards equivalent to the existing ICAO NO<sub>x</sub> and carbon monoxide (CO) standards.

### **EPA's Participation in ICAO**

EPA has worked with the FAA and ICAO in the development of international aircraft emission standards. FAA is responsible for enforcing the aircraft emissions standards established by EPA. ICAO was established by the United Nations to ensure safety, equality, and consistency among international air transport services. One of ICAO's objectives is to lead international bodies in the development of standards and procedures for aircraft engines. The United States is one of 188 participating member States of ICAO. Under the basic ICAO treaty established in 1944, a participating nation which elects not to adopt the ICAO standards must provide a written explanation to ICAO describing why a given standard is impractical to comply with or not in their national interest. In this rulemaking, EPA proposes to adopt standards equivalent to the latest ICAO standards.

### **Main Components of the Rule**

This rulemaking proposes to codify into United States law requirements equivalent to ICAO's February 1999 NO<sub>x</sub> emission standards and March 1997 test procedure amendments, thereby bringing the United States emission standards and test procedures into alignment with the internationally adopted standards and test procedures. The proposed NO<sub>x</sub> emission standards would become effective in the year 2004, and these standards generally represent about a 16 percent reduction (or increase in stringency) from the existing NO<sub>x</sub> standards. These proposed emission standards would apply to commercial aircraft engines with rated thrust greater than 26.7 kilonewtons (kN) that are newly certified (and designed) after the effective date of the regulations. General aviation and military aircraft can use commercial engines subject to this proposal, and thus, emission benefits would be realized from these type of aircraft.

### **Benefits of Adopting ICAO Standards**

This proposed rule would establish consistency between U.S. and international emission standards and test procedures. Since aircraft engines

are international commodities, there is a commercial benefit to consistency between U.S. and international emission standards and control program requirements. It would be easier for manufacturers to certify products for international markets since the U.S. can certify engines for ICAO compliance. Emission certification tests meeting U.S. requirements will also be applicable to all ICAO requirements. In addition to the economic benefit, this proposed rule would ensure that domestic commercial aircraft will meet the current ICAO standards, and thus, the public would be assured they are receiving the air quality benefits of the international standards.

Nearly all (94 percent) already certified or in-production engine models currently meet or perform better than the standards we are proposing to adopt in this proposed rulemaking. In addition, manufacturers have already been developing improved technology in response to the ICAO standards. Therefore, there are no additional costs that would be incurred by the aircraft industry as a result of this proposed rule. In addition, the test procedures necessary to determine compliance are already being adhered to by manufacturers during current engine certification tests. Thus, the regulations will impose no additional burden on manufacturers.

### **Public Participation Opportunities**

The proposal and related documents are available on the Office of Transportation and Air Quality (OTAQ) Web site at: [www.epa.gov/otaq/aviation.htm](http://www.epa.gov/otaq/aviation.htm). We welcome your comments on this proposal. You can comment via email by sending a message to [aircraft@epa.gov](mailto:aircraft@epa.gov). For instructions on additional ways to send comments, please see the *Federal Register* notice. It is available on the Web site above or by calling the EPA Air Docket at (202) 566-1742; please refer to Docket No. OAR-2002-0030. You may submit written comments until December 15, 2003.

We will also hold a public hearing in Washington, DC, on November 13, 2003, at:

U.S. Environmental Protection Agency  
EPA East Building  
Room Number 1153  
1201 Constitution Avenue, N.W.  
Washington, DC 20004  
Telephone: (202) 564-1682

Detailed information about the hearings will be published in the *Federal Register* and at [www.epa.gov/otaq/aviation.htm](http://www.epa.gov/otaq/aviation.htm).

### **For More Information**

You can access documents on aircraft emissions electronically on the OTAQ Web site given above, or by contacting the OTAQ library at:

U.S. Environmental Protection Agency  
Office of Transportation and Air Quality Library  
2000 Traverwood Drive  
Ann Arbor, MI 48105  
(734) 214-4311 & 214-4434  
E-mail: [Group\\_AALibrary@epa.gov](mailto:Group_AALibrary@epa.gov)