

adding a new Subpart E entitled "Operating Noise Limits." The regulation established a phased compliance program for U.S. domestic operators that required them to achieve compliance with Stage 2 or Stage 3 certification standards for all four-engine jet airplanes by January 1, 1985.

In 1980, Congress enacted the Aviation Safety and Noise Abatement Act of 1979 (ASNA). The ASNA required the FAA to promulgate regulations that extended the application of the January 1, 1985, cut-off date for four-engine jet Stage 1 airplanes to apply to both the U.S. and foreign operators. The FAA amended part 91 in 1980 to apply the 1985 operation deadline to all operators. Subpart E was recodified as Subpart I of part 91 in August 1989.

Recognizing the need to both expand airport capacity and provide relief from aviation noise, Congress passed the Airport Noise and Capacity Act of 1990 (ANCA) on November 5, 1990 (now codified at 49 U.S.C. 47521–47533). The regulations implementing the part of ANCA known as the Stage 3 transition rule were effective on September 25, 1991, and are codified at part 91, Subpart I, Operating Noise Limits. The regulations provided two options to meet the schedule for the transition to 100 percent Stage 3 operations in the contiguous United States by December 31, 1999. One option allowed an operator to meet the compliance schedule by phasing out Stage 2 airplanes. Under this option, an operator could operate no more than 75 percent of its Stage 2 base level after December 31, 1994, 50 percent after December 31, 1996, and 25 percent after December 31, 1998. The second option allowed an operator to meet the compliance schedule by attaining a fleet composition of not less than 55 percent Stage 3 airplanes after December 31, 1994, 65 percent after December 31, 1996, and 75 percent after December 31, 1998. New entrant operators (those that did not conduct operations on or before November 5, 1990) had to operate a fleet composed of at least 25 percent Stage 3 airplanes after December 31, 1994, 50 percent after December 31, 1996, and 75 percent after December 31, 1998. All operators were required to operate 100 percent Stage 3 fleets after December 31, 1999. In October 1991, Public Law 102–143 added a separate Stage 2 restriction for operations in Hawaii.

The FAA is now proposing to establish a new quieter noise standard to be known as Stage 4. This new noise standard would apply to any person filing an application for a new airplane type design on and after January 1,

2006. However, the adoption of a new noise standard for new aircraft designs is not intended to signal the start of any rulemaking or other proceeding aimed at phasing out the production or operation of current aircraft models. Currently, the FAA has no operational restrictions on Stage 3 airplanes, and the FAA has no plan to impose such restrictions.

Moreover, in the event that there is a decision at some future date to begin a transition from one noise standard to another, history has shown that phasing out the production of noisier airplanes, and eventually phasing out their operation, is a long process. As an example, the FAA established the Stage 3 noise standard in 1975, but it was not until the end of 1999 that the contiguous United States had an all Stage 3 fleet in operation. Stage 2 airplanes were last produced in 1988, but their operation was permitted for another 12 years. From the time the Stage 3 noise standard was adopted in 1975 until the contiguous United States had an all Stage 3 operational fleet, approximately 25 years had elapsed. As noted above, however, the FAA has no current plan to begin a phaseout of Stage 3 airplanes.

#### *Development of ICAO Chapter 4 Noise Standard*

Much of the background for the development of a Stage 4 noise standard has taken place in the international arena and the work of International Civil Aviation Organization (ICAO).

The environmental activities of the ICAO are largely undertaken through the Committee on Aviation Environmental Protection (CAEP), which was established by the ICAO in 1983, and which superseded the Committee on Aircraft Noise and the Committee on Aircraft Engine Emissions. The CAEP assists the ICAO in formulating new policies and adopting new standards on aircraft noise and aircraft engine emissions. The United States is an active member in the CAEP activities. There is at least one U.S. representative participating on each of the five working groups under CAEP.

In 1998, the CAEP Working Group for Noise (WG1) was tasked to develop options to further reduce airplane noise levels. The Working Group met several times over the two years to accomplish the task. Representatives of Working Group 2 for Airports and Operations, and the Forecast Economic Analysis Support Group, participated in the WG1 meetings to acquaint themselves with noise stringency options and to help WG1 define noise data requirements.

The working group considered several new, more stringent noise certification options for analysis. They include a "traditional" option with specified reductions at each noise certification measurement point (flyover, lateral, and approach), and three "cumulative" options that combine the three traditional measurement points allowing a total cumulative reduction without specifying reductions at any one measurement point. The three cumulative options were 8, 11, and 14 decibel reductions from Chapter 3/Stage 3 levels respectively.

In reaching a recommendation for a new ICAO noise standard for subsonic jet and large transport airplanes, the CAEP considered estimates of comprehensive costs and benefits associated with the various noise stringency and phaseout options. The technical working group charged by the CAEP to conduct the costs and benefits analysis made several key assumptions. These assumptions together with the issues arising from some of these are set out below:

*New Production Assumption.* It was assumed that airlines would require all new production aircraft to meet the new standard once it has been announced regardless of the application date. Within the ICAO working group, they used the term Non-Production for this assumption. The CAEP deliberations identified such possible commercial reasons as more stringent local noise restrictions, especially at some European airports, and the potential for future regional phaseout of noncompliant airplanes.

*Recertification.* The technical working group defines recertification as the certification of an in-service aircraft to comply with a more stringent noise certification standard. Recertification potentially includes options such as re-analysis of existing noise certification and performance databases, weight and/or flap limitations, and engine or airframe modifications. The cost or penalty incurred to recertify aircraft to the proposed new stringency levels is based on the relationships between noise reduction, the capital investment required, and operating costs. Under the recertification case analyzed by CAEP, noncompliant aircraft are either replaced or modified to comply with the new noise standard. An estimate was made of the cost to modify the airframe and/or engine to comply with the new noise standard. Aircraft affected by a phaseout scheme were screened to identify candidates eligible for recertification. These aircraft were assumed to be recertified (modified) to