

build standard) or replacement/alternative engines that perform better than the proposed NO<sub>x</sub> standards and that are also similar in size and aircraft application.<sup>106</sup> For example, the PW 4098 engine would achieve the NO<sub>x</sub> levels of the proposed standards, and similar to the PW4090 it is utilized on the Boeing 777–200 and 777–300. Due to the 1998 CAEP/4 NO<sub>x</sub> standards, Pratt and Whitney has recently certified and manufactured these other or replacement engines. Also, based upon the CAEP/4 standards, they have already targeted future (after 2003) engine designs for modification so that newly certified or designed engines would meet today's proposed NO<sub>x</sub> standards. Therefore, it appears unlikely that a substantial number of the 4 remaining engines would be built or sold in the future, unless they were produced as spare engines (replacement engines for existing aircraft instead of newly manufactured aircraft).

#### 1. Effect of Market Forces

In 1998, FESG indicated at CAEP/4 that “\* \* \* market forces and potential local/regional operating restrictions might encourage the manufacturers to modify their existing products, so that they, too, comply with the proposed stringency.”<sup>107</sup> These modifications to in-production engines would be considered “voluntary environmental enhancement.”<sup>108</sup> Thus, there was significant consideration at CAEP/4 given to the effect that new NO<sub>x</sub> standards for newly certified engines would potentially have on in-production or already certified engines. Many parties within CAEP and its working groups consider market forces to have a real and tangible effect on newly manufactured or already certified engines, even though such engines are

not required to comply with the new standards. We are unaware of any new local/regional operating restrictions being implemented throughout the world due to the CAEP/4 NO<sub>x</sub> standards. However, it seems some market forces from the CAEP/4 newly certified engine standards have affected production engines since there are now only four in-production engine models remaining from 1998 that would not meet the CAEP/4 standards. The Agency solicits comment on the effect market forces and potential local/regional operating restrictions might have on manufacturers to modify in-production or already certified engines.

#### 2. Impact of Existing Fleet Aircraft

An element of the emissions proposals made at CAEP/4 was to increase NO<sub>x</sub> stringency as far as possible without affecting the existing fleet aircraft asset values, and this was proposed to be achieved by applying the new stringency to new engine designs only (newly certified engines).<sup>109</sup> Two studies on whether the financial value of existing aircraft assets were affected by the CAEP/2 NO<sub>x</sub> standards were reviewed for CAEP/4, and the studies did not reveal any correlation between approval of the CAEP/2 emissions standards and aircraft values. Thus, FESG was unable to definitively assess the effect CAEP/4 NO<sub>x</sub> standards would have on fleet aircraft values.<sup>110</sup> (The scope of the two studies and their ground rules were set by FESG.) These studies showed that a large number of factors impact aircraft asset values.

#### 3. Request for Comment on Applying the Proposed NO<sub>x</sub> standards to Already Certified Engines

As discussed earlier, FESG and CAEP working groups (specifically, Working Group 3—Emissions Technical Issues Working Group) are currently considering applying the 1998 CAEP/4 NO<sub>x</sub> standards to engines built to already certified engine designs. Today, we are requesting comment on whether to apply the proposed NO<sub>x</sub> standards, which are equivalent to the CAEP/4 NO<sub>x</sub> standards, to already certified

engines.<sup>111</sup> Historically, EPA and ICAO have applied aircraft engine emission standards to already certified engines (or newly manufactured engines).<sup>112</sup> Although there is expected to be minimal environmental benefits (as well as relatively small costs) from such a requirement, it would ensure that manufacturers could not indefinitely produce existing engines that do not meet these standards (four such in-production or already certified engines models exist today).<sup>113</sup>

The implementation dates being analyzed by FESG and Working Group 3 for applying CAEP/4 standards to already certified engines are 2, 4, and 6 years after December 31, 2003 (the implementation date for newly certified engines). Based on the results of the complete assessment (which are not yet available), FESG and Working Group 3 are expected to recommend an implementation date for applying the CAEP/4 standards to already certified engines at CAEP/6 in February 2004 (a decision on this date is also expected at CAEP/6).<sup>114</sup> If this requirement and date is accepted at CAEP/6, EPA would plan to propose the new requirement soon thereafter (see section IV.B. above for a discussion of the emission benefit of applying the proposed standards to already certified engines). We request comment on applying standards for already certified engines at a date 2, 4, and 6 years after the implementation date for new designs (2006, 2008, and 2010). Commenters suggesting different dates should specify the date(s) they prefer and, to the extent possible,

<sup>111</sup> Spare engines for existing aircraft would not be covered by such a requirement.

<sup>112</sup> EPA promulgated a HC standard in 1982 that applied to newly manufactured engines beginning in 1984. Also, the original ICAO NO<sub>x</sub>, HC, and CO standards approved in 1981 applied to newly manufactured engines starting in 1986. In 1997, EPA adopted this CO standard, which was to be implemented later that same year for newly manufactured engines. In addition, the March 24, 1993 ICAO amendment to tighten the original NO<sub>x</sub> standard by 20 percent (CAEP/2 standards), which EPA adopted in 1997, applied to newly certified engines beginning in 1996 and newly manufactured engines in 2000.

<sup>113</sup> Nearly all engines built to already certified engine designs are likely to be in compliance with the proposed NO<sub>x</sub> standards.

<sup>114</sup> The FESG analysis mentioned earlier (CAEP–SG20022–WP/20, September 12, 2002) addresses the impact of applying the CAEP/4 NO<sub>x</sub> standards to already certified engines at 2, 4, and 6 years after the implementation date of the CAEP/4 standards for newly certified engines. Yet, further assessment of the NO<sub>x</sub> emission reductions was requested by the Steering Group for the next meeting in mid-2003. (ICAO, CAEP, Steering Group Meeting, Paris, France, September 10–13, 2002, “Summary of Discussions and Decisions of the First Meeting of the Steering Group,” September 10, 2002, CAEP–SG20022–SD/1. See page 3. A copy of this paper can be found in Docket OAR–2002–0030.

<sup>106</sup> Although the remaining 4 engines (or two engine families) currently being built are expected to still be in production in year 2004, they would not be required to meet the proposed standards.

<sup>107</sup> ICAO, CAEP/4, Working Paper 4, “Economic Assessment of the EPG NO<sub>x</sub> Stringency Proposal,” March 12, 1998, Presented by the Chairman of FESG, Agenda Item 1: Review of proposals relating to NO<sub>x</sub> emissions, including the amendment of Annex 16, Volume II, section 3.3.2 of the paper. A copy of this paper can be found in Docket OAR–2002–0030.

<sup>108</sup> However, FESG indicated that the “\* \* \* the development of production engine emissions enhancements would only occur if the market place showed enough interest in the enhancements or if the failure to meet the proposed stringency became a competitive disadvantage.” (ICAO, CAEP/4, Working Paper 4, “Economic Assessment of the EPG NO<sub>x</sub> Stringency Proposal,” March 12, 1998, Presented by the Chairman of FESG, Agenda Item 1: Review of proposals relating to NO<sub>x</sub> emissions, including the amendment of Annex 16, Volume II, section 5.6.2 of the paper. A copy of this paper can be found in Docket OAR–2002–0030.

<sup>109</sup> ICAO, CAEP, Fourth Meeting, Montreal, Quebec, April 6–8, 1998, Report, Document 9720, CAEP/4. Copies of this document can be obtained from ICAO (<http://www.icao.int>).

<sup>110</sup> ICAO, CAEP/4, Working Paper 4, “Economic Assessment of the EPG NO<sub>x</sub> Stringency Proposal,” March 12, 1998, Presented by the Chairman of FESG, Agenda Item 1: Review of proposals relating to NO<sub>x</sub> emissions, including the amendment of Annex 16, Volume II, section 4 of the paper. A copy of this paper can be found in Docket OAR–2002–0030.