

KEY FACTS ASSOCIATED WITH COMMERCIAL JET AIRCRAFT NOX EMISSIONS STANDARDS

- International Civil Aviation Organization (ICAO) established by Chicago Treaty of 1944 regulates commercial aircraft emissions and member states adopt these regulations
- ICAO Committee on Aircraft Environmental Protection (CAEP) adopted CAEP/1 NOx standard in 1981 which applied to newly manufactured engines starting in 1986
- CAEP/1 established a ceiling on NOx emissions at 100 grams per kilo Newton (g/kN) of rated engine thrust for Engine Pressure Ratio (EPR) 30
- EPR, or the ratio between maximum internal pressure in the engine and the ambient atmospheric pressure, is a key parameter governing NOx emissions
- ICAO adopted CAEP/2 NOx standard in 1993 that reduced emission limits by 20% to 80 g/kN for EPR 30. This standard applied to newly certified engines starting in 1996 and to already-certified newly manufactured engines starting in 2000.
- In 1997 U.S. EPA adopted ICAO CAEP/2 NOx standard that harmonized US aircraft emission standards with ICAO
- In 1999 ICAO adopted CAEP/4 NOx standard for newly certified engines that will reduce emission limits by an additional 16% to 67 g/kN for EPR 30 and smaller percentage reductions for EPR greater than 30 beginning in 2004. This standard is the subject of the current rulemaking.
- ICAO standards are “technology following” since by the date the standards *are adopted*, most engines in production already meet the standard by various margins
- A primary consideration in standard setting by ICAO is the number of in-production already-certified engines that would not meet the proposed standard. The CAEP/4 standard impacted only a small fraction of the fleet. In fact, if CAEP/4 had been set at a level 10% below the adopted level, only 35 out of 124 (28%) of the in-production engines would emit at levels above the standard
- CAEP/4 responded to the concern about the potential impact of new standards on the asset values of existing fleet aircraft by only applying the new stringency level to newly certified engines. The CAEP/4 standard therefore does not apply to newly-manufactured engines from old designs.

- Two ICAO studies of the impact of CAEP/2 NOx standards on the financial value of existing aircraft assets did not reveal any correlation between approval of CAEP/2 NOx emission standards and aircraft values. ICAO was unable to definitively assess the effect CAEP/4 NOx standards would have on fleet aircraft values
- In 2004 ICAO will consider making the CAEP/4 standards applicable to already-certified newly manufactured engines starting in either 2006, 2008, or 2012
- A production cut-off date for already-certified engines would prevent manufacturers from offering these engines for sale unless the engines were redesigned to meet the standard and recertified
- Nearly all (94%) already-certified engines currently meet or perform better than the CAEP/4 NOx standard
- Only two engine families with 4 currently certified engines do not meet the CAEP/4 NOx standard and would not be required to meet the standard
- The NOx benefit associated with application of the proposed standard, through a production cut-off, to these 4 engines is estimated to be negligible
- There is only one remaining newly-designed growth engine being developed by Pratt & Whitney Canada expected to be certified in 2004 or 2005 that would need to meet the CAEP/4 NOx standard

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