

engine configuration which is expected to be worst-case for exhaust emission compliance on in-use engines, considering all exhaust emission constituents and the range of installation options available to vessel builders. The engines selected for testing are collectively described as the test fleet.

(b) Each engine in the test fleet must be constructed to be representative of production engines.

(c) After review of the manufacturer's test fleet, the Administrator may select from the available fleet one additional test engine from each engine family.

(d) Each engine selected shall be tested according to the provisions of Subpart B of this part.

(e) In lieu of testing an emission data engine selected under paragraph (a) of this section and submitting the resulting data, a manufacturer may, with Administrator approval, use emission data on a similar engine for which certification has previously been obtained or for which all applicable data required under this subpart have previously been submitted. These data must be submitted in the application for certification.

(f) A single cylinder test engine may be used for certification of Tier 1 Category 3 engine families. If you use test data from a single cylinder test engine for certification, explain in your application how you have determined that such data show that the multiple cylinder production engines will comply with the applicable emission standards.

[64 FR 73331, Dec. 29, 1999, as amended at 68 FR 9786, Feb. 28, 2003]

**§94.218 Deterioration factor determination.**

Manufacturers shall determine exhaust emission deterioration factors using good engineering judgement according to the provisions of this section. Every deterioration factor must be, in the Administrator's judgment, consistent with emissions increases observed in-use based on emission testing of similar engines. Deterioration factors that predict emission increases over the useful life of an engine that are significantly less than the emission increases over the useful life observed

from in-use testing of similar engines shall not be used.

(a) A separate exhaust emission deterioration factor shall be established for each engine family and for each emission constituent applicable to that family.

(b) *Calculation procedures*—(1) *For engines not utilizing aftertreatment technology (e.g., catalyst).* For each applicable emission constituent, an additive deterioration factor shall be used; that is, a deterioration factor that when added to the low mileage emission rate equals the emission rate at the end of useful life. However, if the deterioration factor supplied by the manufacturer is less than zero, it shall be zero for the purposes of this section.

(2) *For engines utilizing aftertreatment technology (e.g., catalyst).* For each applicable emission constituent, a multiplicative deterioration factor shall be used; that is deterioration factors that when multiplied by the low mileage emission rate equal the emission rate at the end of useful life. However, if the deterioration factor supplied by the manufacturer is less than one, it shall be one for the purposes of this section.

(c) *Rounding.* (1) In the case of a multiplicative exhaust emission deterioration factor, round the factor to three places to the right of the decimal point.

(2) In the case of an additive exhaust emission deterioration factor, round the factor shall to at least two places to the right of the decimal point.

(d)(1) Except as allowed by paragraph (d)(2) of this section, the manufacturer shall determine the deterioration factors for Category 1 and Category 2 engines based on service accumulation and related testing, according to the manufacturer's procedures, and the provisions of §§94.219 and 94.220. The manufacturer shall determine the form and extent of this service accumulation, consistent with good engineering practice, and shall describe this process in the application for certification.

(2) *Alternatives to service accumulation and testing for the determination of a deterioration factor.* A written explanation of the appropriateness of using an alternative must be included in the application for certification.

## Environmental Protection Agency

## § 94.220

(i) *Carryover and carryacross of durability emission data.* In lieu of testing an emission data or durability data engine selected under §94.217 or §94.219, and submitting the resulting data, a manufacturer may, with Administrator approval, use exhaust emission deterioration data on a similar engine for which certification to the same standard has previously been obtained or for which all applicable data required under this subpart have previously been submitted. These data must be submitted in the application for certification.

(ii) *Use of non-marine deterioration data.* In the case where a manufacturer produces a certified motor vehicle engine, locomotive engine, or other nonroad engine that is similar to the marine engine to be certified, deterioration data from the non-marine engine may be applied to the marine engine. This application of deterioration data from such an engine to a marine engine is subject to Administrator approval, and the determination of whether the engines are similar shall be based on good engineering judgment.

(iii) *Engineering analysis for established technologies.* In the case where an engine family uses technology which is well established, an analysis based on good engineering practices may be used in lieu of testing to determine a deterioration factor for that engine family. Engines using exhaust gas recirculation or aftertreatment are excluded from this provision. The manufacturer shall provide a written statement to the Administrator that all data, analyses, test procedures, evaluations, and other documents, on which the deterioration factor is based, are available to the Administrator upon request.

(iv) *Assigned deterioration factors.* Small-volume manufacturers may use deterioration factors established by EPA.

[64 FR 73331, Dec. 29, 1999, as amended at 67 FR 68346, Nov. 8, 2002; 68 FR 9786, Feb. 28, 2003]

### § 94.219 Durability data engine selection.

(a) For Category 1 and Category 2 engines, the manufacturer shall select for durability testing, from each engine family, the engine configuration which

is expected to generate the highest level of exhaust emission deterioration on engines in use, considering all exhaust emission constituents and the range of installation options available to vessel builders. The manufacturer shall use good engineering judgment in making this selection.

(b) Carryover data satisfying the provisions of §94.220 may also be used in lieu of testing the configuration selected in paragraph (a) of this section.

(c) Durability data engines shall be built from subsystems and components that are representative of actual production engines.

[64 FR 73331, Dec. 29, 1999, as amended at 68 FR 9786, Feb. 28, 2003]

### § 94.220 Service accumulation.

(a) Each test emission data engine in the test fleet may be operated with all emission control systems operating properly for a period, up to 125 hours of operation, that is sufficient to stabilize emissions.

(b) Durability data engines shall accumulate service in a manner which will represent the emission levels from in-use engines over their full useful life, consistent with good engineering judgement.

(1) Components may be removed from the engine and aged separately.

(2) End of useful life emission levels and deterioration factors may be projected from durability data engines which have completed less than full useful life service accumulation, provided that the amount of service accumulation completed and projection procedures are determined using good engineering judgement.

(c) No maintenance, other than recommended lubrication and filter changes or maintenance otherwise allowed by this part, may be performed during service accumulation without the Administrator's approval.

(d) The manufacturer must maintain, and provide to the Administrator if requested, records stating the rationale for selecting the service accumulation period and records describing the method used to accumulate service hours on the test engine(s).