Marine Spark Ignition Engines

Overview

- Sector description and who must certify
- Requirements
- Reporting
- Special provisions
- Important areas of concentration
- On-board diagnostics
- Compliance assistance
- Your team

Sector Description

- Governed by 40 CFR 1045
  - Outboard engines
  - Inboard/Stern Drive
  - Personal Watercraft
- Part 1065 testing requirements apply
- Part 1068 applies

Who Must Certify

- Manufacturers of Spark Ignition engines used in marine vessels
  - (Includes Outboards, Inboard/Sterndrive, Personal Watercraft, Airboats, Mini-jet boats, Motorized Surf Boards)
- Exemptions
  - Competition 40 CFR 1045.620 also in 40 CFR 1068
  - Exemptions under 40 CFR 1068
- Includes evaporative systems used in SI vessels

Requirements

- Tests
  - E4 Certification Test
  - NTE Test Points
- Standards 40 CFR 1045
  - Outboards and PWCs: 1045.103
  - Sterndrive/Inboard: 1045.105
  - High Performance (>373 kw) Sterndrive/Inboard engines: 1045.105
- Evaporative
  - Installed fuel lines and tanks must be covered by a CoC from 40 CFR 1060
  - Engine installers must follow the instructions of the engine manufacturer with regards to evaporative components

Reporting – Production Line Testing

- Reporting periods – there has been some confusion
  - If reporting PLT for more than a year break that period of time into 4 even increments
  - Never break the reporting into more than 4 periods
- Exemptions
  - Small-volume manufacturers – Engine manufacturer with 250 or less employees do not have to perform PLT
  - Engine families with U.S. directed production below 150 must request an exemption. If you go above this level during the year - notify EPA
  - Sterndrive/inboards are exempt
  - Alternative testing programs can be proposed and EPA will consider them
- Template
  - EPA template should be filled out and sent to EV-CIS
  - One engine family per template

Reporting – In-Use Testing

- Applicable to outboard and personal watercraft
- EPA selects up to 25% of engine families for in-use testing for applications submitted by December 31st and selects in-use engines for early selection by February 28th of the following year
- If the manufacturer does not receive a notice by February 28th then the manufacturer may make their own selections
  - Notify EPA of these selections by March 31st of that year
  - Consider the selection criteria of 40 CFR 1045.405(b)(1)
  - If the manufacturer does not make selections or if the manufacturer does not select 25% of its engine families then EPA can make further selections at a later date
- Test plans are due
  - Within 6 month of an EPA directed selection
- All applicable families that are submitted to EPA after December 31st of the previous calendar year that engine family is automatically selected for in-use testing

Reporting - Averaging Banking and Trading

- Averaging Sets
  - SD/I
  - Outboard and PWC
  - Evaporative may be used for any vessel

- ABT templates should be downloaded to EV-CIS

Reporting - Templates

- EPA has specific templates for reporting
- Manufacturers should use these templates
- If there are problems – Notify EPA
- Do not alter the templates
  - EPA uses these for a certification streamlining process
  - Altering template will slow your certification process

Special Provisions – Engines Certified for Other Purposes

- 40 CFR 1045.605 and 610
- Allow LSI, Motor Vehicle and Small SI engines to be used for marine purposes – with special considerations
  - Engine must not be altered from certified condition
  - Percentage limits
    - LSI and motor vehicle < 10% of total sales in the United States
    - Small SI < 5% of total sales in the United States
  - Labeling requirements

Important Areas of Concentration

- EPA continues to request engine maps and calculations per 40 CFR 1065.510
  - Most manufacturers have complied with this request
- EPA concentrating on pre-catalyst exhaust leaks
  - 40 CFR 1060.130(e)
    - Recommends that a chemical balance be performed
    - EPA will ask for the results of that chemical balance or other proof that leaks are minimized
  - Exploring methods of characterizing the volume of leaks
  - Testing for leaks during compliance tests and in-use testing
  - Marine manufacturers following ABYC standards for exhaust installation present a compelling case for compliance

Important Areas of Concentration

Specialty Applications

- Some boats/engines are non-compliant
  - Airboats
  - Mini Jet Boats
  - Uncertified outboards sold online
- Reaching out to manufacturers in an attempt to guide them to a process of compliance
- This is complicated by a number of factors
  - There are many small manufacturers
  - If one manufacturer is targeted others take up the lost sales

Important Areas of Concentration

Specialty Applications

- EPA is seeking to educate manufacturers and enlist the assistance of EPA regions
- Also reaching out to online sales companies to make them aware of the issue and to curtail the sales
- This insures compliance with standards helping to contribute to better air quality and
- Creates a level playing field so one manufacturer does not have a competitive advantage over another

On-Board Diagnostics

- EPA is developing a greater capability to test the OBD system in marine engines that are subject to these requirements
- Manufacturers of engines with three-way catalysts and closed-loop control of air-fuel ratios can expect a greater level of scrutiny
  - Test in-use engines
  - Visits to manufacturer's facilities

Compliance Assistance – Online Resources

- Support documents for Marine SI:
  - Templates
  - Verify Users Manual
  - https://www.epa.gov/vehicle-and-engine-certification/support-files-all-nonroad-spark-ignition-si-engines
- Certification tutorials for Marine SI:
  - https://www.epa.gov/vehicle-and-engine-certification/certification-materials-marine-si-enginesequipment
- Guidance Letters Library
  - https://iaspub.epa.gov/otaqpub/

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