Supporting Statement

for

Information Collection Request

Emissions Certification and Compliance Requirements for Nonroad Compression-ignition Engines and On-highway Heavy Duty Engines (Revision)

EPA ICR Number 1684.18 OMB Control Number 2060-0287

42 USC 7521 § 206 (b)(1) 42 USC 7521 § 207(b) 42 USC 7521 § 213(d) 42 USC 7521 § 217

> 40 CFR Part 85 40 CFR Part 86 40 CFR Part 89 40 CFR Part 94 40 CFR Part 1027 40 CFR Part 1039 40 CFR Part 1042 40 CFR Part 1045 40 CFR Part 1060 40 CFR Part 1065 40 CFR Part 1068

> > July 2014

Certification and Compliance Division
Office of Transportation and Air Quality
Office of Air and Radiation
U.S. Environmental Protection Agency

1. Identification of the Information Collection

1(a) Title and Number of the Information Collection

Emissions Certification and Compliance Requirements for Nonroad Compression-ignition Engines and On-highway Heavy Duty Engines (Revision); EPA ICR Number 1684.18 OMB Control Number 2060-0287.

1(b) Short Characterization

- With this supporting statement, EPA requests the **revision with a three year extension** of an existing ICR. The requirements described in this statement apply to emissions certification and compliance programs for:
 - Nonroad (NR) compression-ignition (CI) engines, e.g. diesel, used primarily for agriculture and construction equipment and as auxiliary engines on marine vessels;
 - Category 1 and Category 2 marine CI engines which provide propulsion power on marine vessels. (Category 3 marine CI engines, which are used primarily for propulsion power on oceangoing vessels, are covered under ICR 2345.03); and,
 - On-highway heavy-duty (HD) vehicles/trucks and engines, both gasoline and diesel. This includes HD alternative fuel conversions as discussed in the previous revision of this ICR.

This supporting statement also consolidates a previously existing ICR (EPA Number 1826.05). This action is undertaken to consolidate information requirements for the NRCI engine and equipment industries into one ICR for simplification and to eliminate duplicity. Both ICRs address related sets of respondents.

This collection series, ICR 1684, covers emissions certification and compliance programs for nonroad CI engine manufacturers. ICR series 1826 covered the Transition Program for Equipment Manufacturers (TPEM), a collection responded to by NRCI engine and equipment manufacturers. We should note that the engine manufacturers who responded to 1826.05 must also respond to 1684.18.

In this document we refer to all three industries covered by this ICR (nonroad CI engines, marine CI engines and heavy-duty engines and vehicles) collectively as 'CI engines,' for simplicity. When a requirement applies to only one or two of those industries, we will refer to them by name. The term 'manufacturer' generally refers to engine manufacturers as opposed to equipment manufacturers. We will refer to equipment manufacturers only when discussing TPEM.

Under Title II of the Clean Air Act (42 U.S.C. 7521 et seq.; CAA), EPA is charged with issuing certificates of conformity for engine prototypes that comply with applicable emission standards. Such a certificate must be issued before engines produced after these prototypes may be legally introduced into commerce. Table 1 below lists EPA regulations pertaining to the industries covered by this ICR.

Table 1 Nonroad CI and Heavy-duty Emissions Regulations

Industry	40 CFR ¹
	Part
Heavy-Duty Engines (HD)	85*², 86*
Nonroad Compression-Ignition Engines	89*,
(NRCI)	1039*
Marine Compression-Ignition Engines	94*,
(Marine CI)	1042*
Evaporative Requirements	1060
Testing Provisions	1065
General Provisions - apply to most nonroad	1068
categories	
Fees	1027

Each model year, engine manufacturers wishing to sell their products in the US must obtain a certificate of conformity. To apply, manufacturers submit descriptions of their planned production engines, detailed descriptions of emission control systems and test data. This information is organized by "engine family" groups expected to have similar emission characteristics. There are also recordkeeping requirements.

Engine manufacturers electing to participate in the Average, Banking and Trading (AB&T) Program must submit information regarding the calculation, actual generation and usage of credits in an initial report, end-of-the-year report and final report. These reports are used for certification and enforcement purposes. Manufacturers must also maintain records for eight years on the engine families included in the program.

¹ Code of Federal Regulations (CFR)

² Each Part marked with an asterisk (*) is a standard setting part, or a part in the CFR that defines emission standards for a particular engine and/or piece of equipment (as defined in 1068.30).

The Act also mandates EPA to verify that engine manufacturers have successfully translated their certified prototypes into mass produced engines, and that these engines comply with emission standards throughout their useful lives. Some respondents are required to test a sample of engines as they leave the assembly line. This self-audit program is referred to as the Production Line Testing (PLT) Program and allows manufacturers to monitor compliance with statistical certainty while minimizing the cost of correcting errors through early detection. Through Selective Enforcement Audits (SEAs), EPA verifies that test data submitted by manufacturers is reliable and that testing is performed according to EPA regulations. Compliance with emission regulations throughout the useful life of an engine is verified through the In-use Testing (In-use) Programs under which engines are tested after they have served a portion of their useful lives. Not all programs apply to all industries included in this collection.

Engine and equipment manufacturers who chose to participate in the TPEM must submit annual reports and keep records. Equipment manufacturers must also notify EPA of their intent to participate prior to introducing any TPEM engines/equipment into the US market.

This information is collected by the Diesel Engine Compliance Center (DECC), Compliance Division (CD), Office of Transportation and Air Quality, Office of Air and Radiation, U.S. Environmental Protection Agency (EPA). Besides DECC, this information could be used by the Office of Enforcement and Compliance Assurance (OECA) and the Department of Justice for enforcement purposes. Non-confidential portions of the applications are also disclosed in EPA's website. This information is used by trade associations, environmental groups, and the public. The information is usually submitted in an electronic format, and it is stored in CD's databases.

It has been estimated that a total of 2,528 engine and equipment manufacturers will respond to this collection with an approximate cost of \$33,457,421. Please note that the burden and cost tables referenced in this document are found in the accompanying Excel file.

2. Need for and Use of the Collection

2(a) Need/Authority for the Collection

EPA's emission certification programs are statutorily mandated; the agency does not have discretion to cease these functions. Under Section 206(a) of the CAA (42 USC 7521):

"The Administrator shall test, or require to be tested in such manner as he deems appropriate, any new motor vehicle or new motor vehicle engine submitted by a manufacturer to determine whether such vehicle or engine conforms with the regulations

prescribed under §202 of this Act. If such vehicle or engine conforms to such regulations, the Administrator shall issue a certificate of conformity upon such terms, and for such period (not in excess of one year) as he may prescribe."

This provision also applies to nonroad engines, pursuant to §213(d) of the CAA. Therefore, vehicle and engine manufacturers may not legally introduce their product into U.S. commerce unless EPA has certified that their vehicles and engines comply with applicable emission standards. To ensure compliance with the CAA, EPA reviews product information and manufacturers' test results. The agency may also test some vehicles and engines to verify data provided by manufacturers at certification

Section 206(b)(1) of the Act authorizes EPA to inspect and require testing of new vehicles and engines to: (1) verify that manufacturer's final product actually complies with EPA standards; (2) assure that the correct parts are installed correctly in each engine; and (3) audit the manufacturer's testing process to ensure testing is being done correctly. The PLT, In-Use, and SEA Programs fulfill these requirements by inspecting and testing engines taken directly from the assembly line and/or existing fleets, and by auditing the engine manufacturer's testing procedures and facilities. Section 207(b) of the CAA mandates the establishment of methods and testing procedures to ascertain whether certified engines in actual use in fact comply with applicable emission standards throughout their useful lives.

2(b) Practical Utility/Users of the Data

EPA uses the information requested under this collection to verify and support a three stage compliance assurance system envisioned in the CAA and for enforcement purposes. First, certification information is needed to verify that engine designs comply with emission standards and that the necessary testing has been performed. Based on this information, EPA issues a certificate of conformity. Information collected under the PLT program is used to verify that manufacturers have successfully translated their prototypes into mass-produced engines. Engines are taken directly from the assembly line and tested. Lastly, in-use testing is designed to determine if CI engines, when maintained in accordance with the manufacturer's instructions, continue to comply with emission standards throughout their useful lives

Flexibility programs such as AB&T and TPEM ease the burden of EPA regulations on regulated parties who choose to participate.

The information will be received and used by DECC. In instances of noncompliance, the information may be used by EPA's enforcement office and the Department of Justice. Non-confidential portions of the information submitted to DECC are available to and used by importers, environmental groups, members of the public and state and local government organizations.

3. Nonduplication, Consultations and Other Collection Criteria

3(a) Nonduplication

The information requested under this ICR is required by statute. Because of its specialized nature, and the fact that most of it must be submitted to EPA before marine CI engines can be sold, the information collected is not available from any other source. Furthermore, some of the data requested, such as sales volumes or certain engine designs, may be proprietary in nature, and thus claimed as confidential business information (CBI) by manufacturers. Therefore, EPA can only obtain the information if it is submitted by its owners.

3(b) Public Notice Required Prior to ICR Submission to OMB

An announcement of the public comment period for this ICR revision was published in the <u>Federal Register</u> (79 FR 21916) on April 18, 2014. This document may be accessed through the Federal Register's website at http://www.gpoaccess.gov/fr/index.html.

No comments were received in response to this ICR revision.

3(c) Consultations

EPA consulted less than ten past respondents regarding this information collection burden.

Contact: Dave Gardner Company: Navistar

Phone: 331-332-4269

Contact: Members of EMA

Company: Engine Manufacturers Association (EMA)
Phone: (312) 929-1974 – contact Roger Gault

Mr Gardner provided estimates on the cost of HD In-use testing. His estimates were fully integrated into Section 6. Mr. Gault represents EMA, an industry association with which EPA consults routinely.

Mr Gault coordinates with a group of manufacturers to review and comment on many, if not all, of the forms included in this ICR. His and his associates' have commented on the type of data collected and the way we collect it. Most recently, Mr Gault has provided input on the NRCI ABT template and all of the TPEM templates. Their comments have been addressed and adopted as appropriate.

Data generated during other recent ICR revisions/renewals, such as that of ICR 2345.03, which covers marine Category 3 engines and vessels, was also used to support estimates in this ICR.

3(d) Effects of Less Frequent Collection

The CAA states that emission certification must be done on a yearly basis (CAA 206(a)(1)), coinciding with the industry's 'model year.' Major product changes typically occur at the start of a model year. For these reasons, a collection frequency of less than a model year is not possible. However, when an engine design is "carried over" to a subsequent model year, the amount of new information required is substantially reduced.

For practical reasons, PLT reports are submitted on a quarterly basis. Manufacturers are required to test up to one percent of their production at random to ensure that mass produced engines comply with emission requirements. If a problem is found, manufacturers must correct it and might need to recall engines that have already been sold. Engine manufacturing companies update their internal production volume reports every quarter. By conducting this quality control testing also on a quarterly basis, manufacturers are able to learn about and address any problems early, before the start of the next quarter's production, thus minimizing costs.

In-use testing and SEA information is collected on occasion, when EPA orders testing of a particular engine or audits a particular manufacturer.

AB&T and TPEM data is collected annually, once manufacturers elect to participate in those programs, also to correspond with manufacturing cycles and to make data collection and compliance verification more manageable for both EPA and respondents.

3(e) General Guidelines

Certification, ABT, and end-of-the-year report related records must be maintained for eight years. Note that respondents may "store these records in any format and on any media, as long as

[respondents] can promptly send us organized, written records in English if we ask for them"[1039.250(d), 1042.250(d)]. For HD engines, "records may be retained as hard copy or reduced to microfilm, ADP film, etc., depending on the manufacturer's record retention procedure, provided that in every case all the information contained in the hard copy is retained" [(86.000-7(a)(3)]. These recordkeeping requirements stem, in large part, from the statutory requirement to warrant some items for long periods of time. In addition, the manufacturers must comply with requirements to recall vehicles and engines failing to meet emission standards during their useful lives.

Manufacturers are required to submit confidential business information such as sales projections and certain sensitive technical descriptions (Please see section 4(b)(i) for reference). This information is kept confidential in accordance with the Freedom of Information Act, EPA regulations at 40 CFR Part 2, and class determinations issued by EPA's Office of General Counsel. Also, non-proprietary information submitted by manufacturers is held as confidential until the specific vehicle or engine to which it pertains is available for purchase.

For practical reasons, PLT reports are submitted on a quarterly basis. Manufacturers are required to test a certain amount of engines at random to ensure that mass produced engines comply with emission requirements. If a problem is found, manufacturers must correct it and might need to recall engines that have already been sold. Engine manufacturing companies update their internal production volume reports every quarter. By conducting this quality control testing also on a quarterly basis, manufacturers are able to learn about and address any problems early, before the start of the next quarter's production, thus minimizing costs.

Under an SEA, manufacturers are required to submit test results and information within five working days after all engines ordered to be tested have been tested. The items requested are all readily available or generated during the SEA. For nonroad engines, a report on the test results must be submitted within 30 days (see Section 1068.450). The information is requested in less than thirty days so that EPA can verify the accuracy and validity of the emission data and expeditiously reach a conclusive audit decision. An expeditious audit decision allows the manufacturer to quickly release the tested vehicles or engines for introduction into commerce.

No other general guideline is exceeded by this information collection.

3(f) Confidentiality

Manufacturers are allowed to assert a claim of confidentiality over information provided to EPA. Confidentiality is provided in accordance with the Freedom of Information Act and EPA regulations at 40 CFR Part 2. For further detail, refer to section 3(e).

3(g) Sensitive Questions

No sensitive questions are asked in this information collection.

4. Respondents and Information Requested

4(a) Respondents/SIC Codes

Respondents are manufacturers of non-road engines within the following North American Industry Classification System (NAICS) codes:

333618	Other Engine Equipment Manufacturing
333111	Farm Machinery and Equipment Manufacturing
333112	Lawn and Garden Tractor Manufacturing
333120	Construction Machinery Manufacturing
336312	Gasoline Engine and Engine Parts Manufacturing
336611	Manufacturers of Marine Vessels;
811310	Engine Repair and Maintenance

4(b) Information Requested

EPA has developed electronic tools that respondents use to submit most of the information requested. Section 4(b)(i) below summarizes the data requested under each program and the tools used to collect it, if applicable.

All manufacturers must describe their products and supply test data to verify compliance with various emissions requirements and programs described in this section. This information is organized by "engine family." An engine family is a group of engines expected to have similar emission characteristics. Most programs run on a "model year" (MY) basis. A model year refers to the manufacturers' annual new model production period, or a calendar year if the manufacturer does not have a model year.

Reporting and recordkeeping requirements may vary according to the characteristics of the engine/vehicle being certified and the programs manufacturers elect to participate in. However, the data requested is similar for all three engine categories included in this ICR (nonroad CI, marine CI and on-

highway heavy-duty). Some of the data items are only required to be kept in records and submitted upon request.

Per 1039.255(c) and 1042.255(c), EPA may deny an application, revoke, suspend or void a certificate for an engine family for which the manufacturer:

- Refuses to comply with any testing or reporting requirement
- Submits false or incomplete information
- Submits inaccurate test data
- Fails to update an application to include all engine models being produced,
- Fails to supply information requested by the agency
- Fails to keep records or does not produce them when asked by EPA

Should EPA deny or revoke a certificate, the affected manufacturer may request a hearing within 30 days of the EPA's decision. The request must be in writing, include a description of the manufacturer's objections and data to support the objections. Hearings will be conducted using the procedures specified in 40 CFR Part 1068, Subpart G.

(i) Data Items

(4)(b)(i)(1) Certification

Engine families need to be certified for each model year. Most engine families are certified for exhaust emissions only. However, nonroad CI and marine CI engine families that will be fueled with volatile liquid fuels other than conventional diesel must obtain two certificates of conformity: (1) Exhaust Emissions Certificate under the applicable standard setting part [see Table 1 and footnote 1 under section 1(b)]; and (2) Evaporative Certificate under Part 1060. Manufacturers must also obtain a "California-only" certificate for engine families that are to be sold only in the State of California.

Applications for exhaust certificates for nonroad CI and HD engines as well as evaporative certificates are collected via webforms through VERIFY, EPA's online vehicle and engine compliance information system. More information about VERIFY can be found at http://epa.gov/otaq/verify/index.htm. Currently, exhaust certificate applications for Marine CI engines are submitted using EPA form 590-124. The form is submitted electronically. However, EPA expects to complete a marine CI certification module in VERIFY by the fall of 2014 so those applications can be collected in the same manner as NRCI and HD applications.

An application for certification contains a description of the engine models grouped within the family and test data. After the first model year a given engine family is certified, the certification burden

for that family may be significantly reduced, because data and information from previous years can be "carried over" when no significant changes have occurred. For instance, an engine family certified in model year 2014 can be certified in the 2015 model year by "carry over" of data and paperwork from the 20014 model year if no significant changes have occurred to the engine family between model years. EPA may also allow manufacturers to "carry across" data from HD certification to NRCI certification and vice-versa for engine families they produce for both markets if there are no significant differences between the HD and NRCI versions of the engine family. Allowing manufacturers to "carry over" and "carry across" data saves manufacturers the cost of testing both families. Manufacturers may submit changes to the certification application ('running changes').

Engine manufacturers must label all engines. The label must identify each engine and state the engine family name, the fuels the engine is certified to run on, the engine useful life and category, if applicable. Other language applies if the engine is being certified under a special provision or exempted under any of the programs discussed here. Under certain circumstances, the equipment or vessel must also be labeled. Manufacturers are also required to provide warranties and owner's manuals to consumers.

An application fee must be paid per engine family per model year. This fee, which is recalculated every year, is requested under the authority of Section 217 of the CAA and the Independent Offices Appropriation Act (31 U.S.C. 9701) to ensure that the motor vehicle emissions compliance program is self-sustaining to the extent possible. Fees are collected electronically at www.pay.gov or by mail using the Nonroad Fee Filing Form, Form 3520-29. The fee filing form is covered under ICR 2080.05, OMB Control Number 2060-0545. Additional information is available at http://www.epa.gov/otaq/fees.htm and in section 6(b)(ii) of this supporting statement.

The following are lists of data items requested for certification-related activities and recordkeeping. Other data items may be listed in the regulations. EPA Regulations provide that the Agency may also require additional information as needed to evaluate the application for certification and compliance with requirements.

Summary of certification data items:

- Statement of compliance
- Identification and description of the basic engine design including, but not limited to, the engine family specifications (fuel, cooling medium, etc.)
- Explanation of how the emission control system operates
- Fuel System Type and Components
- Useful Life Period

- Deterioration Factors
- Intended Service Class
- Projected Sales
- Estimated Production Period
- Sales Area
- Plant Contact and Location
- Program Information
- Family Emission Limits
- Nonroad Engine Equipment Types
- Detailed description and justification of each auxiliary emission control device (AECD), and how they affect emissions
- Description of all adjustable parameters, their adjustable ranges and methods employed to prevent tampering, etc.
- Detailed drawings and descriptions of the various emissions-related components
- Description of the test equipment and fuel to be used
- Description of the test procedures to be used to establish the durability data or the exhaust emission deterioration factors
- All test data obtained by the manufacturer on each test engine
- Statement of the useful life
- Statement of the alternative useful-life period and a brief synopsis of the justification, if applicable
- Maintenance information
- Description of the provisions taken to prevent tampering with emission control computer instructions
- Proposed test fleet selection and the rationale for the test fleet selection
- Special or alternate test procedures, if applicable
- Period of operation necessary to accumulate service hours on test engines and stabilize emission levels
- Fee Filing Form
- If EPA submits a written request for an explanation of good engineering judgment, manufacturers must provide a written description of the judgment in question within 15 working days, unless otherwise specified
- Additional information may be submitted is the manufacturer requests a special provision

For Heavy-duty engines only:

 For evaporative families: a description of any unique procedures required to perform evaporative and/or refueling tests, and a description of the method used to develop those unique procedures

- Canister working capacity, canister bed volume, and fuel temperature profile for the running loss test
- Maximum nominal fuel tank capacity
- Certification standard
- Weight category
- Identification of those families that will not comply with cold temperature CO standards
- For families incorporating an emission control diagnostic system: a full and detailed description of its functional characteristics, the method of detecting malfunctions, and provisions taken to prevent tampering
- For methanol-fueled vehicles: whether the vehicle is flexible or dedicated, and the fuel for which the vehicle was designed

For Marine CI engines only:

- All information required for EPA to interpret all messages and parameters broadcast on an engine's controller area network
- Information about the engine family's compliance with the Not-to-Exceed (NTE) Standards
- Manufacturers who wish to "dress" or "marinize" a land-based engine for use as a propulsion engine on a vessel must label the marinized engine (1042.605(e)). If an original engine manufacturer marinizes its own engines, it must notify EPA in the certification application (1042.605(g)(1)). An original engine manufacturer may be required to submit emissions data on engines marinized by someone else (1042.605(g)(2)).

Recordkeeping:

Manufacturers must keep certification-related records for eight years (86.094-7(a)(3), 89.124-96(b), 1039.250(c) and 94.215(a)(3)) except routine emission records. Manufacturers must keep routine emission records for only one year. The recordkeeping requirements for the Certification Program are listed below:

General records:

- Identification and description of all engines for which testing is required
- Description of emission control systems
- Description of test procedures

Individual Records:

- Copies of all the applications submitted
- Brief history of all test engines and running changes
- Complete records of all emission tests performed
- Description of service accumulation, including dates and number of hours/mileage accumulated
- Record and description of all maintenance and other servicing performed
- Record and description of each test performed to diagnose engine or emission control system performance
- Brief description of any significant events affecting the vehicle
- Production figures for each engine family by assembly plant (Nonroad CI)
- List of engine identification numbers for all engines produced (Nonroad CI)
- Actual U.S. sales volume
- Routine emission test data.

Running Changes:

Manufacturers may make changes to a certified engine, or add an engine model to an already certified engine family, which are referred to as running changes. Running changes are submitted using the same electronic format used to apply for a certificate of conformity. If a manufacturer requests running changes, the following information must be submitted.

- Notification of changes made to the application and/or request for amendment of the application
- Full description of the change to be made
- Engineering evaluations or data showing that engines as modified or added will comply with all applicable emission standards
- Determination of whether the original test fleet selection is still appropriate, and proposed new test fleet selections, if applicable
- Upon request, test data on the engine changed or added
- Supporting documentation, test data and engineering evaluations as appropriate to demonstrate that all affected engines will still meet applicable emission standards

(4)(b)(i)(1)(a) Confirmatory Testing

From time to time, EPA may conduct confirmatory testing. At its own expense, EPA purchases or rents engines and test them to verify the reliability of the test data submitted at certification. Manufacturers may be notified about this testing in advance and may be required to explain

discrepancies found between data generated during EPA confirmatory tesing and data submitted by the manufacturer.

(4)(b)(i)(1)(a) Rebuilders & Aftermarket Part Manufacturers

Manufacturers or rebuilders of aftermarket engine parts for nonroad CI engines are not required to apply for certificates of conformity, but must keep information that shows how their parts or service affect emissions. EPA may test engines and equipment to investigate potential defeat devices or may require the manufacturer to complete this testing. Manufacturers may need to provide information regarding test programs, engineering evaluations, design specifications, calibrations, on-board computer algorithms, and design strategies. (see Section 1068.110)

The following records must be kept for at least two years after rebuilding an engine, and must be accessible for EPA's review. Records may be based on engine families rather than individual engines if that is a normal business practice.

- Hours of operation (or mileage, as appropriate) at the time of the rebuild
- Work completed on the engine or any emission-related control components, including a listing of parts and components used
- Engine parameter adjustments
- Emission-related codes or signals responded to and rests

(4)(b)(i)(1)(b) Alternative Fuel Converters

Aftermarket fuel conversion systems allow gasoline or diesel vehicles to operate on alternative fuels such as natural gas, propane, alcohol, or electricity. Use of clean alternative fuels opens new fuel supply choices and can help consumers address concerns about fuel costs, energy security, and emissions. EPA is responsible for ensuring that all vehicles and engines sold in the United States, including aftermarket conversions, meet emission standards. Regulations pertaining to alternative fuel conversions are codified at 40 CFR Part 85, Subpart F.

Alternative fuel converters must obtain certificates of conformity with emission standards. However, the amount of information collected from converters is reduced due to a provision that allows the grouping of multiple engine families into a larger one. Engine families must share certain characteristics before they can be combined into a larger family. Converters of intermediate age engines can submit a simplified testing demonstration instead of a full certification application.

Converters of engines outside their useful life also benefit from a reduced burden. Converters can simply submit an On-Board Diagnostics (OBD) scan tool test report and a detailed technical description of the conversion system sufficient in detail for EPA to confirm the conversion system's ability to maintain or improve on emission levels in the converted engine.

The following is a list of data items unique to alternate fuel converters. This items are submitted in the same manner as a regular exhaust certification application; that is, through VERIFY.

Summary of data items:

For all engines:

- Expanded conversion engine families
- New engine label requirement describing OEM engine family, mileage, and date

For intermediate-age and outside useful-life age vehicles (25%)

- Online notification and test result report rather than application for certification
- A engineering judgement "demonstration" for intermediate age and outside useful life conversions
- OBD scan tool report showing results of an OBD scan tool test procedure
- A statement that the OBD system remains fully functional in the converted engine.
- Intermediate age and outside useful life engine families will not be required to pay a certification fee.

(4)(b)(i)(1)(c) Production Reports

Each manufacturer is required to submit an Annual Production Report identifying the number of engines produced by engine family, by gross power, by displacement, by fuel system, or by other categories. EPA has developed an Excel-based form for Annual Production Reports. Form 5900-90, which is used for multiple industries including those beyond the scope of this ICR, is submitted electronically via VERIFY. The data is then electronically uploaded into the Compliance Database.

(4)(b)(i)(2) Averaging, Banking and Trading (AB&T)

AB&T is a tool that manufacturers may use to introduce into the US market engines that emit above emissions limits provided other cleaner engines compensate for the additional emissions. Engine manufacturers may earn positive credits for engine families that emit below emissions limits and then use those credits on engine families that emit above the limits. The overall credit balance, also called 'average', is calculated taking into account how many units of each engine family were sold during the year. At the end of the year, that average must be zero or above. This means that the participant's overall production meets or exceeds the emissions limits. Credits may be banked for use in subsequent years or traded among participants. Participation in AB&T is voluntary.

Participants must indicate in each engine family's certification application whether that family is participating in AB&T. Then, the following year, the manufacturer must submit two reports that cover all the participating engine families: an end-of-the-year report (draft) and a final report. AB&T reports provide data on the number of credits used or generated by each engine family; and verify that participants have a zero or above credit balance at the end of each model year. Reports are submitted through VERIFY using the following forms:

- AB&T Report for Heavy-duty On-highway Engines, Form Number 5900-134
- AB&T Report for Nonroad Compression Ignition Engines, Form Number 5900-125
- AB&T Report for Marine Compression-ignition Engines, Form Number in process.

AB&T data requirements are codified at:

- NRCI: Part 89, Subpart C & Part 1039, Subpart H
- HD: Part 86, Subpart A
- Marine CI: 40 CFR Part 94, Subpart D & Part 1042, Subpart H

Summary of AB&T data items:

- Intent to include this specific engine family in the ABT program
- Declaration that participation in this program will not cause the applicable emission standard to be exceeded (have negative credit balance)
- Family emission limit
- Projected applicable production volumes for the model year
- Values required to calculate credits
- Projected number of credits generated/used
- If credits are generated, the designated use of the credits involved or if credits are used, the source of those credits

AB&T Recordkeeping:

ABT records are to be kept for eight years [86.094-7(c)(3), 89.210-96(d), 1039.735(b), 94.308(d), and 1042.735(b)]:

- EPA Engine Family
- Engine Identification Number
- Engine build date and model year
- Power Rating
- Purchaser and Destination
- Assembly Plant
- Family Emission Limit
- Useful Life
- Projected and actual production model

For families participating in trading, the following records must be kept quarterly.

- Actual quarterly and cumulative applicable production/sales volume
- Value required to calculate credits
- Resulting type and number of credits generated/required
- How and where credit surpluses are dispersed
- How and through what means credit deficits are met

(4)(b)(i)(3) Production-Line Testing (PLT) and Product Verification

(4)(b)(i)(3)(a) Marine CI PLT

Of the industries covered under this ICR, only Marine CI engines are subject to PLT. PLT requires engine manufacturers to test a sample of production engines to ensure that they in fact have the same emissions profile as the prototype tested for certification.

Under Part 1042, marine CI engine manufacturers must test "one engine or one percent of the projected US-directed production volume for all their Category 1 or Category 2 engine families" [1042.310(a)(1) and (2)]. Manufacturers may request a reduced rate for carryover engines families which have consistently passed PLT testing on each of the preceding two years. Small volume manufacturers and engine families with projected productions of less than 100 units may be exempted from PLT [1042.301 (a)(1) and (2)].

PLT testing is conducted quarterly, and respondents must report their PLT results within 45 days

after the end of each quarter (1042.345(a)). Information requested under the PLT testing program consists mainly of test results, a description of the engines tested and the conditions under which the tests took place. PLT Reports will be submitted electronically, via VERIFY, using Forms 5900-297 (CumSum) or Form 5900-298 (non-CumSum). Records must be kept for 8 years (1042.350(b)).

If an engine fails PLT or the manufacturer fails to comply with reporting requirements, EPA may revoke or suspend that engine family's certificate [1042.301(b)]. Manufacturers may request alternative testing methods for PLT under 1042.301(d)(3).

EPA may audit marine CI engine manufacturers' PLT testing procedures. During an audit, manufacturers are required to allow EPA officials to enter into facilities where engines are being manufactured, stored, or tested and where records may be located. Manufacturers are also expected to afford reasonable assistance (such as clerical or translation services, photocopying, etc) to EPA personnel conducting the audit.

PLT audit failures and hearing requests are handled in the same manner as SEAs failures and hearings. Please see subsection (4)(b)(i)(6) below for details.

(4)(b)(i)(3)(a) Evaporative Family Product Verification

Evaporative families are subject to Product Verification under Part 1060, Subpart D. Manufacturers are required to use good engineering judgement to verify compliance, which may include testing. While there are no reporting requirements, manufacturers must make the information available (1060.301(b)) and provide samples for testing (1060.310) upon request from EPA.

(4)(b)(i)(4) In-Use Testing

The In-use Program seeks to verify that engines comply with emission standards throughout their useful lives, as mandated in the CAA. There are two types of in-use testing programs: (1) Manufacturer-run testing, where EPA orders engine manufacturers to in-use test at their expense certain engine families; and (2) EPA-run testing where the agency locates and tests engines at its own expense.

(4)(b)(i)(4)(a) Manufacturer-run In-Use Testing

Of the industries covered by this ICR, this program only applies to HD engines/vehicles. Per 40 CFR Part 86, Subsection T, every year EPA issues in-use test orders to a number of manufacturers and engine families. A minimum of five engines/vehicles per engine family are tested. Once manufacturers have collected test data, they submit data in Excel files via VERIFY's Document Module, but there is no standard form.

(4)(b)(i)(4)(a) EPA-run In-Use Testing

EPA may also run in-use testing programs, at its own expense. For example, there is no specific requirement for marine CI engine manufacturers to conduct in-use testing, submit information or keep in-use records. However, EPA may perform in-use testing on any marine CI engine (Part 1042, Subpart E) or evaporative family (Part 1060, Subpart E).

EPA-run in-use testing programs are conducted at the National Vehicle and Fuel Emissions Laboratory (NVFEL). Until now, all samples tested have been HD vehicles, but EPA expects to start testing NRCI equipment later this year. The heavy-duty trucks or engines obtained by EPA for in-use testing purposes are leased from businesses or other government entities. EPA locates trucks and engines for in-use testing through either: (1) potential fleet owners/lessees in registration lists; (2) engine manufacturer-supplied customer lists; and/or (3) existing contacts that have provided EPA with valuable information in the past.

EPA contracts out most of the work related to finding the necessary vehicles/engines. EPA staff directs a contractor to locate heavy-duty vehicles with specific engine families. The contractor then calls fleet facilities to locate vehicles that meet the criteria and specifications outlined by EPA staff. Once potential sources are identified and leased for EPA's in-use testing program, EPA staff install a mobile emission measurement equipment. On-road testing is conducted with the contractor assistance onsite at NVFEL. Within a typical year, between 2 and 10 vehicles/engines are leased and tested. Testing for each one of those vehicles/engines lasts about 2 weeks (8 hours per day). The driving conditions and information gathered may vary depending on the issues relevant to the type of heavy-duty vehicle selected and tested. After testing, the emissions measurement equipment is removed and the vehicle is returned to the owner.

While EPA contacts fleet owners to locate vehicles/engines, there is no communication with the engine/equipment manufacturer unless a compliance issue is found. Since EPA compensates the fleet owners for the use of their vehicles/engines as any other customer would, the activities associated with this program are considered customary business practices.

(4)(b)(i)(5) Selective Enforcement Audits (SEAs)

During an SEA, EPA visits the facilities where a particular manufacturer's test are conducted. The primary purpose of a SEAs is to verify that the laboratory's testing methods comply with EPA regulations. Only Nonroad CI and HD engine manufacturers' laboratories are subject to be audited by EPA. Marine CI engine manufactures are not since they are subject to a robust PLT program.

EPA collects the information needed for SEAs in two stages: First, a limited number of manufacturers are asked to submit their production plans for a specified period of time, as described below. EPA uses this "pre-audit" information to efficiently determine which manufacturers and engine models to audit. After a manufacturer has been chosen, EPA issues a test order specifying which engine models and configurations will be tested. Testing is then performed on engines coming out of the assembly line under the observation of EPA staff. When all required testing is completed, manufacturers submit a report containing all testing results. This "audit" information is then used to determine compliance with applicable emission standards.

Per 89.505 (d), 86.1005-90(d), and 1068.450, EPA can request manufacturers to submit additional SEA information or keep records not specifically listed in this section. SEA data requirements can be found at Part 1068 Subpart E for nonroad CI engines and Part 86 Subpart K for HD Engines.

Summary of SEA data items:

Upon EPA's request, engine manufacturers must submit the following information regarding engine production. This information is used by EPA as pre-audit data under the SEA Program to determine which engines will be audited.

- Projected U.S. sales data for each engine configuration and engine family
- Number of engines, by configuration and assembly plant, scheduled for production within the time period designated by EPA
- Number of engines, by configuration and assembly plant, storage facility or port facility, scheduled to be stored during the time period designated by EPA
- Number of engines, by configuration and assembly plant, produced during the designated period that are complete for introduction into commerce

Within 30 days after all tests ordered by EPA are completed, manufacturers must submit a report with the following information:

- Testing facilities' location and description
- Applicable standards or compliance levels against which the engines were tested

- Deterioration factors for the selected configurations
- Description of the engine and the method used to select its emission-related components.

For each test conducted:

- Test engine description
- Location where service accumulation was conducted and a description of the procedure
- Test information, raw results, which includes emission figures for all measured pollutants, for both valid and invalid test results
- A complete description of any modification, repair, preparation, maintenance and/or testing performed on the engine not previously reported. This must include the results of any emission measurements, regardless of the procedure or type of equipment
- If an engine was deleted from the test sequence by authorization of EPA, the reason to delete it
- Brake-specific fuel consumption values for all valid and invalid tests
- Any other information requested by EPA
- Statement of compliance and endorsement
- For nonroad CI engines, a report on each failed engine
- Request for re-testing of failed engines, if applicable
- For nonroad CI engines, an authorized representative of the company must sign the statement under Section 1068.450(c) to accompany reports.

Recordkeeping

Records must be kept for one year after all ordered tests have been completed. Records may be kept in any media, according to the manufacturer's procedures, provided that in every case all the information contained in the hard copy is kept. Note that EPA may review manufacturer records at any time.

General records: a description of all test equipment used, including the information submitted with the audit report described above.

Individual records for each audit:

- If a nonroad CI engine was shipped for testing, the date of shipping, the associated storage or port facility, and the date the engine arrived at the testing facility
- Date, time and location of each test
- Any records related to an audit that are not in the written report for nonroad CI engines
- Number of hours accumulated in each engine when testing began
- Names of all supervisory personnel involved

- Detail records of all repairs performed prior/after EPA's authorization
- Date engine was shipped and date it was received
- Complete record of all tests performed including worksheets and other documentation
- Brief description of any significant event that occurred during the audit
- For nonroad CI engines, a manufacturer must be able to provide projected or actual production for an engine family, which includes each assembly plant
- Copy of the trace for each test
- Description of the equipment in each test cell that can be used to perform SEA testing

As with Marine CI PLT audits, during an SEA manufacturers are required to allow EPA officials to enter into facilities where engines are being manufactured, stored, or tested and where records may be located. Manufacturers are also expected to afford reasonable assistance (such as clerical or translation services, photocopying, etc) to EPA personnel conducting the audit.

When an engine family fails an audit, the certificate of conformity issued to that engine family may be revoked or suspended, in whole or in part, effective no later than 10 days after failure. A certificate may be suspended for other reasons including refusal by the engine manufacturer to allow EPA to gain access to the appropriate facilities. The affected manufacturer must then remedy the nonconformity, retest or reaudit. In any of these cases, the affected manufacturer must submit a report describing the reason for the noncompliance and the remedy to be implemented, among other items appropriate to each case. Section 86.1012 explains revocation of certificates for heavy-duty, on-highway engines. Section 1068.445 includes the corresponding provisions for nonroad CI engines.

If the affected manufacturer disagrees with EPA's determination to revoke a certificate of conformity, the manufacturer may request a public hearing. Under the SEA Program and the Marine CI PLT Audit Program, a request for public hearing must be filed within 15 days after the revocation and must include the following information.

- Statement regarding which configuration(s) within a family is to be the subject of the hearing
- Concise statement of the issues to be raised by the manufacturer at the hearing
- Statement specifying reasons why the manufacturer believes it will prevail on the merits of each of the issues raised
- Summary of the evidence which supports the manufacturer's position on each of the issues raised

(4)(b)(i)(6) Transition Program for Equipment Manufacturers (TPEM)

When EPA establishes new regulations with tighter engine emission standards, engine manufacturers often need to change the design of their engines to achieve the emissions reductions

required by the new standards. Consequently, original equipment manufacturers may also need to redesign their products to accommodate these engine design changes. Sometimes, equipment manufacturers, many of whom are small businesses, have trouble making the necessary adjustments by the effective date of the regulations. In an effort to provide equipment manufacturers with some flexibility in complying with the regulations, EPA created the Transition Program for Equipment Manufacturers (TPEM). Under the program, equipment manufacturers are allowed to delay compliance with the new standards for up to seven years as long as they comply with certain limitations. Participation in the program is voluntary. Participating equipment manufacturers and engine manufacturers who provide the noncompliant engines are required to keep records and submit reports of their activities under the program.

TPEM is currently available only NRCI manufacturers. NRCI TPEM regulations can be found at 40 CFR 89.102 for Tier 1 through Tier 3 engines, and 1039.625 for Tier 4 engines. While the Part 89 program has ended, recordkeeping requirements and potential enforcement actions may remain.

TPEM consists of two "allowances": the Percent-of-production Allowance and the Small Volume Allowance. It also contains provisions for manufacturers facing economic or technical hardship to seek additional relief (see section 4(b)(i)(7) for details). Equipment manufacturers can claim only allowance one per power category³ for the life of the program. Equipment manufacturers must demonstrate compliance with the provisions of the allowance they have selected for each power category by submitting the corresponding calculations and by keeping adequate records of all exempt equipment. Participating manufacturers use the following forms to submit their TPEM notifications and reports:

- TPEM Equipment Manufacturer Notification, Form number 5900-242
- TPEM Equipment Manufacturer Report, Form number 5900-240
- TPEM Engine Manufacturer Report, Form number 5900-241

Equipment manufacturers participating in TPEM must also provide the engine manufacturer supplying the noncompliant engines with written assurance that the noncompliant engines are going to be used under TPEM. Engine manufacturers need that written assurance to protect themselves against the liabilities found in 40 CFR 89.1003, 1039.101(a)(1) and 1068.101(a)(1). There are also engine labeling requirements under Part 1039.

For imported Part 1039 TPEM equipment, equipment manufacturers may need to post a bond "to cover any potential enforcement actions under the CAA" (1039.626(a)(9)). NRCI engine manufacturers who also manufacture equipment abroad may request a bond waiver if their US assets exceed \$10

³ Engines and equipment are grouped according to the rating of the engine. See applicable regulations for a list of power categories that apply to TPEM, which could be different from the power categories used in certification.

million (1039.626(a)(9)(ii)(B)). EPA has developed a simple worksheet that importers can use to calculate the amount of the bond or apply for a bond waiver: TPEM Bond Worksheet, Form number 5900-239.

Data Items Requested from Equipment Manufacturers:

- Letter to the engine manufacturer
- Annual calculation to verify compliance

Data Items Requested from Engine Manufacturers

Every year, within 30 days of the end of the model year, engine manufacturers supplying noncompliant engines under the provisions of TPEM must report the number of engines produced by: engine model, purchaser or shipping destination, or other categories that EPA may require.

Recordkeeping Requirements

Equipment manufacturers must keep records of all exempt equipment sufficient to demonstrate compliance until at least two full years after the last year in which the allowances are available for each power category (if subject to 89.102(e)(2)) or for at least five full years after the final year in which allowances are available for each power category (if subject to 1039.625(h)). These records must be made available to EPA upon request.

- Equipment and engine model numbers89.102(e)(2); 1054.625(h)(1); 1039.625(h)(1)
- Serial numbers
- Dates of manufacture
- Engine rated power
- Sufficient information to verify 89.102(e)(2); 1054.625(g); 1039.625(g)

(4)(b)(i)(7) Hardship Relief Requests

Engine and equipment manufacturers for whom the TPEM provisions are not enough for them to comply with emissions regulations on a timely manner, and, as a consequence, will face serious hardship, can apply for hardship relief. There are two types of hardship relief available to equipment manufacturers: economic (1039.635 & 1068.250) and technical (1039.625(m)). Engine manufacturers have the option of applying for hardship relief when facing "unusual circumstances" (1068.245). Time limits exist on hardship relief availability.

Hardship relief is given on a case-by-cases basis. When applying for hardship, manufacturers must submit information in writing about the circumstances that created the hardship, demonstrate that these circumstances are beyond their control and not their fault and, depending on the type of hardship requested, technical and/or financial information.

In an effort to increase transparency and avoid creating an unleveled playing field in the marketplace, EPA has decided to post on its website the names of companies seeking relief, especially those applying under economic hardship relief. While the application for relief is held as confidential per the applicant's wishes, giving public notice of the request gives stakeholders an opportunity to submit information they believe EPA should consider. EPA may also contact a limited number of direct competitors and/or engine manufacturers to verify the availability of compliant engines in the market.

Summary of data requested:

Economic hardship relief

- Evidence showing that the conditions causing the impending violation are substantially not the applicant's fault
- Evidence showing that, if relief is not granted, the applicant will face serious economic hardship
- Demonstration that no other allowance will help to avoid the impending violation
- Number of engines or components involved
- The size of the company and its ability to endure hardship
- The amount of time the company had to redesign the equipment and accommodate complying products
- Breach of contracts by suppliers

Technical Hardship

- A description of the equipment designing process
- A description of the cooperation process with the engine supplier
- A description of the engineering problems causing the technical hardship and the steps taken to address them
- Other relevant information

Hardship due to "Unusual Circumstances"

• A demonstration that the manufacturer meets the conditions established in 1068.255(a)

- Unusual circumstances beyond the applicant's control prevent them from complying with current regulations
- *o* Prudent planning was exercised & no other allowances would help
- *o* Not receiving hardship relief would jeopardize the solvency of the company
- A plan showing that how the company will meet applicable requirements as soon as possible
- Other information EPA may request
- There are labeling requirements

The regulations provide other hardship relief opportunities with similar requirements as those described, but that are rarely used.

(4)(b)(i)(8) Special Compliance Provisions

There are a number of provisions that address special or unusual situations. These provisions are generally found at Part 1039 Subpart G, 1042 Subpart G, and/or Part 1068 Subparts C & D. For example, EPA regulations afford respondents the opportunity to exempt their products (avoid certification) when the engines are to be used in certain circumstances, such as:

- National Security Exemptions (NSEs, 1042.635, 1068.225) Agencies of the US Federal Government related to national defense may exempt engines without request if the engines are used in armored and/or specialized vessels. Engine manufacturers may request a NSE if it is endorsed by a defense-related Federal Agency.
- Testing Exemptions for engines to be used in research, investigations, demonstrations or training
- Engines used for display only
- Manufacturer-owned engines
- Emergency applications
- Branded engines
- Competition engines, among others

Some of these exemptions do not require any reporting, but most require labeling and recordkeeping. With very few exceptions, engines exempted under any of these provisions must not be made available for sale in the US. To request an exemption, the requester submits a letter explaining why they need the exemption and, upon approval, must label the exempted engines accordingly.

Under unusual circumstances, an engine manufacturer may ask EPA to allow the use of a replacement engines. A replacement engine is a newly manufactured engine that complies with the

standards in effect at the time the engine being replaced was built. A replacement engine may only be used if the engine manufacturer determines that no engine certified to current standards, regardless of who manufactures it, is suitable to repower the vessel. Manufacturers who build replacement engines must notify EPA, keep records and label the engines accordingly.

When an engine undergoes a major overhaul, or is 'rebuilt,' the rebuilder must keep certain records for two years and make them available to EPA if the agency asks for them (1068.120(k)). The records may be kept on an engine family basis, as opposed to a per engine basis, if that is more consistent with the business' practices (1068.120(3)). The records must include (1068.120(j)):

- The number of hours of operation or mileage at the time of rebuild.
- The work done on the engine and/or emissions components
- A description of any engine parameters adjustments
- A list of any emission-related codes or signals that the rebuilder responded to.

Section 1042.660 establishes reporting and recordkeeping requirements for owners and operators of marine CI vessels. For Category 1 &2 vessels equipped with SCR systems which require urea or other reductants, owners and operators are required to inform EPA within 30 days of any operation of the vessel without the appropriate reductant (1042.660(b)). EPA, however, is currently not collecting or soliciting these reports and plans <u>not</u> to implement this reporting requirement. To date, no such reports have been received either.

Manufacturers, owners and operators must allow required emission tests and inspections and must provide reasonable assistance (1042.660(e)).

4(b)(ii) Respondent Activities

In general terms, the activities respondents carry out under the programs included in this collection are fairly similar. As applicable, respondents:

- Review regulations and guidance documents
- Test engines/vehicles for compliance with emission standards
- Gather data
- Pay fees
- Submit applications and/or reports
- Retain and maintain records

5. The Information Collected--Agency Activities, Collection Methodology, and Information Management

5(a) Agency Activities

As part of the implementation of the programs included in this ICR, EPA officials carry out the following activities:

- Review, interpret and implement regulations, provide guidance
- Gather applications from the industry, enter data into the applicable databases
- Review the applications and issue approvals or disapprovals
- Answer questions from manufacturers and the public
- Develop forms and system to improve data collection and processing
- Work with other federal agencies, such as Customs or the Justice Department, as needed
- Monitor compliance and take enforcement actions as needed
- Make data available to the public through FOIAs and the internet
- Analyze and manage requests for confidentiality
- Store, file and maintain data.

5(b) Collection Methodology and Management

EPA has developed a web-based system for engine manufacturers to submit their applications for certification and compliance data. The applications for certification are submitted via webforms into the 'Document Module.' The information is then uploaded into VERIFY. EPA's engine and vehicle compliance information system, VERIFY, collects emissions and fuel economy compliance information for most types of engines and vehicles. Additional information about VERIFY and how manufacturers use the system can be found at http://epa.gov/otaq/verify/basicinfo.htm.

For compliance programs, such as AB&T, PLT, and In-use Testing, as well as for production reporting, EPA has developed Excel-based forms. These forms can be downloaded from EPA's website at http://www.epa.gov/otaq/certdat2.htm and submitted through the Document Module. The information is then uploaded into, analyzed and stored in the Compliance Database. SEA reports can be submitted electronically, but the manufacturer may submit these reports using other methods. Once the data is received, EPA staff analyzes it to ensure compliance with the CAA and applicable regulations.

Excel-based forms for TPEM notifications and reports are also available at http://www.epa.gov/otaq/certdat2.htm. Once completed, participating engine and equipment manufacturers must submit them via email to TPEM-CI@epa.gov. Questions can also be submitted at

that email address. A contractor receives the forms and uploads them into the TPEM Tracking System, a section of the Compliance Database.

Non-confidential portions of the applications for certification are available through the Engine Certification Information Center at http://www.epa.gov/otaq/certdata.htm.

5(c) Small Entity Flexibility

There are a number of flexibilities built into the regulations covered in this ICR that address the needs of small businesses. This section discusses some of them.

Small HD engine manufacturers may use optional procedures outlined in 40 CFR part 86, subpart A to demonstrate compliance with the general standards and specific emission requirements. These procedures, also available to HD converters, and apply to conversion manufacturers with US sales of fewer than 10,000 units. The alternate procedures reduce small volume manufacturers' burden associated with durability data requirements, testing, determination of deterioration factors and certification test data. Converters may also request EPA to assign deterioration factors, thus eliminating the durability testing burden. Small volume conversion manufacturers are also exempt from some reporting and recordkeeping requirements associated to the certification of evaporative families (86.098-14). Small volume HD manufacturers are also exempt from some reporting and recordkeeping requirements associated to the certification of evaporative families (86.098-22(m)). Also, section 86.1008-2001 provides a reduced SEA testing schedule for heavy-duty engine manufacturers with projected U.S. sales of 30,000 engines or less.

For small entities (i.e., less than 1,000 employees) that manufacturer nonroad CI engines below 130 kW, there are provisions that allow for delayed compliance and/or compliance with an interim standard (1039.104(c)). Per 1042.301(a)(1), small volume manufacturers of marine CI engines may be exempt from PLT requirements. Engine families of fewer than 100 units may also be exempt from PLT requirements (1042.301(a)(2)).

Any manufacturer with the following characteristics may be granted a reduction in the certification application fee: (1) the certificate is to be used to sell engines within the United States; and (2) the full fee exceeds 1% of the aggregate projected retail sales price of all vehicles covered by the certificate of conformity. Although this is a provision available to all manufacturers, it is beneficial to small manufacturers. Furthermore, EPA does provide avenues to lower costs such as allowing the carry-over of data from one model year to the next and the use of alternative methods to demonstrate

compliance.

The Transition Program for Equipment Manufacturers (TPEM; 1039.625) is particularly useful to small businesses as it provides them with additional time to comply with EPA emission regulations. Actually, the format of the program is based on recommendations made by the panel convened for the August 1998 rule under the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA). TPEM's small volume allowance is intended to address the needs of small businesses with a limited product line. The percent-of-production allowance requires equipment manufacturers to use certified engines in a portion of their production. The small volume allowance eliminates that requirement and allows equipment manufacturers to exempt up to 200 pieces of equipment without using certified engines at all. Regulations at 1039.625 (m) and 1068.255 provide additional flexibilities for small volume manufacturers through hardship relief.

Under the other programs included in this ICR, the information being requested is considered to be the minimum needed to effectively conduct and maintain integrity of the required certification and enforcement programs. Further measures to simplify reporting for small businesses do not appear prudent or necessary.

5(d) Collection Schedule

Collection frequency depends on the program. For certification, engine manufacturers decide when to submit their applications. That schedule is largely determined by the manufacturer's marketing and production plans. Running changes and corrections are submitted as the need arises. Production reports are submitted once a year, while AB&T reports are submitted twice a year. PLT reports are submitted quarterly, as manufacturers update their own production records. In-use testing and SEA information is submitted on occasion, when EPA orders tests or audits a particular manufacturer.

TPEM notifications are submitted on occasion, when an equipment manufacturer decides to start participating in the program. Afterwards, annual reports must be submitted. Engine manufacturers also submit reports annually.

6. Estimating the Burden and Cost of the Collection

6(a) Estimating Respondent Burden

Burden estimates were taken from previous ICRs and adjusted to reflect comments from fewer than ten respondents consulted by EPA (see Section 3(c)) and EPA experience in these and other similar

programs. Tables <u>2 through 12 in the accompanying Excel file</u> summarize the respondents' overall burden associated with this ICR. The tables are discussed in detail in sections 6(b)(ii) and 6(d) below.

6(b) Estimating Respondent Costs

6(b)(i) Estimating Burden Hours

To estimate labor costs, EPA used the Bureau of Labor Statistics' (BLS) National Industry-specific Occupational Wage Estimates (May 2013) for the Engine, Turbine, and Power Transmission Equipment Manufacturing Industry and increased by a factor of 2.1 to account for benefits and overhead. This information can be found at: http://www.bls.gov/oes/current/naics4 333600.htm . Mean, hourly rates were used for this estimate and are listed below.

Table 13 Labor Costs Estimates

Occupation	SOC Code Number	Mean Hourly Rate (BLS)	Rate Increased by a Factor of 2.1
Mechanical Engineers	17-2141	\$39.26	\$82.45
Engineering Managers	11-9041	\$58.80	\$123.48
Lawyers	23-1011	\$77.10	\$161.91
Mechanical Engineering Technicians	17-3027	\$25.08	\$52.67
Truck Drivers, Heavy and Tractor-Trailer	53-3032	\$18.62	\$39.10
Secretaries, Except Legal, Medical and Executive	43-6014	\$18.60	\$39.06
Engine and Other Machine Assemblers	51-2031	\$17.96	\$37.72

6(b)(ii) Estimating Capital and Operations and Maintenance Costs

Capital costs (associated with building emission testing facilities) were incurred by manufacturers when their industries became regulated for the first time. Many respondents are companies which manufacture engines for two or more of the industries covered in this and other ICRs

and have already invested in developing their own test cells. Small companies with just a few engine families contract out testing services all around the world. Therefore, capital costs are excluded from this ICR. EPA does not expect any new engine manufacturers to build their own emission testing laboratories in the next three years. Other emission testing expenses are included as Operation and Maintenance costs (O&M Costs) costs as described below.

O&M Costs associated with this information collection include electronic data storage, photocopying, postage and other shipping expenses, calls, maintenance of emission laboratories (for those manufacturers that own testing cells), testing costs (for those manufacturers that contract testing facilities), and travel where applicable.

Engine manufacturers that have in-house testing facilities use them for all their certification and compliance testing needs as well as for research and development. The cost of maintaining these laboratories have been estimated at \$75,343 per year. This estimate (which appears under the certification program estimates in Table 2) includes the cost of test fuels, calibration gases and equipment.

Those manufacturers that hire private firms to conduct testing, spend per test an estimated average of:

Heavy-Duty and Large Nonroad CI: \$44,467 Marine CI (average among Categories 1 & 2): \$50,000

Testing cost, however, is a one-time cost per engine family since manufacturers can carry over emissions data from one model year to the next. This cost has been <u>annualized</u> over the approval period requested for this ICR (3 years):

Heavy-Duty and Large Nonroad CI: \$14,822 Marine CI (average among Categories 1 & 2): \$16,667

Engine manufacturers are required to pay a fee every model year when submitting an application for a certificate of conformity. This fee is requested under the authority of the CAA Section 217. On February 26, 2014, EPA published the 2015 schedule of fees in the document CISD-14-06, which can be found at: http://iaspub.epa.gov/otaqpub/display_file.jsp?docid=31857&flag=1. The relevant fees for calendar year 2015 are:

Nonroad CI Engines: \$2,973

Heavy-Duty Engines:

Federal Certificate: \$47,664 California-only: \$563 Evaporative-only: \$563 Marine CI Engines: \$563

The fees rule provides for a reduction in fee when "the full fee exceeds 1.0 percent of the projected aggregate retail price of all vehicles or engines covered by that certificate" (69 FR 26226, Section F). The reduced fee must not exceed one percent of the aggregate retail price of the vehicles and engines covered by the certificate.

For TPEM, the highest O&M cost is the bond equipment manufacturers must post for each piece of equipment brought into the US from abroad. While bond requirements mostly affects foreign equipment manufacturers, domestic manufacturers who own manufacturing plants abroad must also post a bond or obtain a waiver. EPA has estimated the average bond at \$5,000 and that 150 equipment manufacturers will need to post a bond each year for the next three years.

6(b)(iii) Capital/Start Up Costs

There are no capital or start up costs associated with the revision of this ICR. (See 6(b)(ii) for details.)

6(b)(iv) Annualizing capital costs

There are no capital costs associated with the revision of this ICR. (See 6(b)(ii) for details.)

6(c) Estimating Agency Burden

Table 14 of the Excel file that accompanies this document summarizes EPA's approximate overall burden associated with this ICR. The Diesel Engine Compliance Center (DECC) administers HD/CI certification and compliance programs. This group currently counts with approximately 15 full-time employees in Washington, DC and Ann Arbor, MI. Most of their time is dedicated to the activities covered by this ICR. DECC spends \$1,531,001 in annual salaries for its 15 employees or \$2,449,602 when increased by a factor of 1.6 to account for benefits and overhead. Since these employees also

manage locomotive, marine CI Category 3 and other programs covered under other ICRs, we have discounted their time and salaries by 15% for a total of \$2,082,161 and 26,520 hours.

In addition, DECC gets full-time support from one member of the Senior Environmental Employment Program (SEEP) at a total cost of \$54,000 annually. Ninety-five percent of this cost is related to the programs in this collection.

Other EPA employees from Washington, DC and Ann Arbor, MI provide part-time support for these activities. These include administrative assistants, IT personnel, agency lawyers at the Office of General Counsel (OGC) and the Office of Enforcement and Compliance Activities (OECA), work assignment/contract managers, and upper management, among others. EPA estimates that the portion of these employees' salaries related to activities covered by this collection amount to about \$229,201 annually.

For purposes of estimating labor costs for EPA staff outside DECC, we used 2014 annual wage rates obtained from the Office of Personnel Management (OPM) and adjusted by a factor of 1.6 to account for benefits and overhead (see Table 13). These rates are available at http://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/14Tables/html/DCB.aspx. The rates for executives (SES-1) were also obtained from OPM at:

http://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/14Tables/exec/html/EX.aspx.

In addition, EPA contracts out certain activities. For this, DECC participates in three contracts. One contract provides a help desk that answers questions from manufacturers and the public, TPEM report processing, and processing of special requests such as NSEs and exemptions. This work amounts to about \$43,000 annually. Agency-conducted in-use testing amounts to \$235,000 a year while confirmatory testing costs about \$64,000 annually.

EPA receives, processes and stores much of the information it receives under this collection electronically. Two contracts support database development and maintenance. The Compliance Division spends approximately \$766,667 in the contract that develops and maintains the portions of the VERIFY system related to this collection. VERIFY is an umbrella system that, among other tasks, receives and helps process certification applications. Compliance reports such as AB&T, production data, PLT and TPEM reports are housed in the Compliance Database. The cost to develop and maintain the portion of that system that related to this collection is expected to be \$50,280 a year during the next three years.

6(d) Estimating the Respondent Universe and Total Burden and Costs

6(d)(1) Exhaust & Evaporative Certification Estimates (See Tables 2 & 3 – Excel file)

EPA issued approximately 658 exhaust emissions certificates to 95 engine manufacturers in model year 2013 under the programs included in this collection request (nonroad CI, on-highway heavy-duty and marine CI). These numbers are expected to remain consistent during each of the next three years. These responses are distributed as follows:

EPA received about 68 on-highway heavy-duty applications and 402 nonroad CI applications for a total of 470 applications. There are 54 companies in this sector, many of which manufacture both on-highway heavy-duty and nonroad CI engines. Of these applications, 265 (or 56%) are carry overs.

In the marine CI sector, EPA received 185 applications from 41 manufacturers in model year 2013 of which 139 were carry overs. EPA also received 13 running changes by 3 marine CI engine manufacturers.

Nine on-highway engine manufacturers also submitted 21 applications for evaporative engine families. EPA also accounts for 29 running changes from 2 manufacturers.

6(d)(1)(a) Alternative Fuel Conversions (Tables 4 & 5 – Excel file)

Interest in HD conversions has been low in the past. In model year 2013, only one company submitted applications for a total of four families. Two of the applications were for inside-useful-life conversions, and two for intermediate-life conversions. In model year 2012, EPA only received one CI alternative fuel conversion application. For the purposes of this ICR, we have used model year 2013 numbers to calculate respondents' burden associated with alternative fuel conversions.

Intermediate age engine converters do not have to pay a certification fee.

6(d)(2) Averaging, Banking and Trading (Table 6 – Excel file)

Participation in ABT is voluntary for all sectors. Forty-one engine manufacturers are currently participating in ABT with a total of 57 families. This is a considerable decrease from previous years.

Reports and other activities in this program are carried out from a company perspective as opposed to on a per-engine family basis. Therefore, manufacturers need to submit only one report quarterly and one final report in which they account for their company's activities under ABT.

6(d)(3) Production-line Testing (Table 7 – Excel file)

Only marine CI manufacturers are required to conduct PLT. Participation is mandatory. Small volume manufacturers³ are exempt. Since there are an estimated 15 small volume manufacturers participating in the marine CI certification program, only 26 manufacturers are subject to marine CI PLT requirements with approximately four engine families each. Some have in-house laboratories while others contract outside laboratories to perform their testing.

6(d)(4) In-Use Testing Program (Table 8 – Excel file)

As discussed in section 4(b)(i)(4), there are two in-use testing programs. One program is run by the engine manufacturers, the other by EPA. Per 40 CFR Part 86, Subsection T, every year EPA issues in-use test orders to a number of manufacturers and engine families. On average, EPA orders 6 manufacturers to test one engine family each. A minimum of five engines per engine family must be tested. HD engine manufacturers who receive test orders must find HD trucks in actual use. The engines must have been maintained according to the manufacturer's instructions and must have been on the road for a certain portion of their useful lives. Manufactures then installs equipment that measures real time emissions as the truck is driven. Some manufacturers pay an incentive to truck owners in return for letting them use their fleet. The incentive is voluntary and not mandated by EPA. However, we have accounted for this expense (\$1,000 per truck) in our estimates.

EPA also in-use tests, at its own expense, between 2 and 10 engines per year. These tests are conducted by contractors in cooperation with EPA staff. EPA reviews the test results and analyzes the data to ascertain whether engines in fact comply with emission standard throughout their useful life, as prescribed by the Clean Air Act. No communication is established with the manufacturer unless there is a failure. The trucks/equipment used for these tests are leased from private fleets. EPA pays the going rate for those leases as any other customer would, thus rendering all activities associated with this program customary business practices. Therefore, no burden has been added to this collection request.

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³³Section 94.2 defines 'small-volume manufacturer' as a "manufacturer with annual U.S.-directed production of fewer than 1,000 internal combustion engines (marine and nonmarine). For manufacturers owned by a parent company, the limit applies to the production of the parent company and all its subsidiaries." §1042.930 defines 'small-volume manufacturer' as a "manufacturer of Category 1 and/or Category 2 engines with annual worldwide production of fewer than 1,000 internal combustion engines (marine and nonmarine). As in Part 94, for manufacturers owned by a parent company, the limit applies to the production of the parent company and all its subsidiaries.

6(d)(5) Selective Enforcement Audits (Table 9 – Excel file)

EPA plans to conduct two audits per year in the sectors included in this collection request. EPA has accounted for one audit in a company with its own in-house laboratory and one audit with a manufacturer who contract out testing.

6(*d*)(6) TPEM (Tables 10 & 11 – Excel file)

EPA estimates that approximately 1,432 equipment manufacturers and 30 engine manufacturers will be participating in TPEM during the next three years. 867 equipment manufacturers are filing notifications while all 1432 participants must submit annual reports.

6(d)(6) Special Compliance Provisions (Table 12 – Excel file)

As discussed in section (4)(b)(i)(8), there are a number of provisions designed to address a variety of special circumstances, from imports to national security. EPA receives about 2,228 questions from manufacturers and the public related to those provisions. Table 12 lists the number of respondents for each of the most visible provisions.

(6)(d)(7) Total Number of Reports per Respondent (Table 15 – Excel file)

The number of reports each respondent submits per year varies depending on several factors, such as: (1) number of engine families produced each model year, (2) the size of each family, (3) the number of corrections to the application for certification needed throughout the year, and (4) whether the respondent elects to avail itself of a special provision, such as an exemption. The total number of responses for this collection has been calculated at 3,880 by a total of 2,528 respondents. Table 15 below lists the amount of reports per program and respondent. The average number of responses per respondent is 1.5.

Table 15
Total Estimated Number of Reports

Program	Number of Respondents who must submit reports	Initial Application/ Notification/ Report	Running Changes/Amendments/ Follow up Reports	Total number of Responses Per Program	Number of Reports per Respondent	
Certification	95	658	306	964	10.1	
Evaporative Cert	9	21	29	50	5.6	
HD Alternative Fuel Conversions (Beginning of UL)	1	2	0	2	2.0	
HD Alternative Fuel Conversions (Intermediate UL)	1	2	0	2	2.0	
AB&T	9	9	9	18	2.0	
PLT	26	104	0	104	4.0	
In-use	6	6	0	6	1.0	
SEAs	2	2	0	2	1.0	
TPEM – equipment mfr	1432	867	1432	2299	1.6	
TPEM - engine mfr	30	0	30	30	1.0	
Special Compliance Provisions	1000	287	116	403	0.4	
Total:	2,528 ⁴	1958	1,922	3,880	N/A	
Overall number of reports per respondent:						

⁴ Please note that the total number of respondents is not the total sum of all respondents per program, as many of the same companies respond to most of the programs listed. For example, the companies that respond to AB&T, PLT, In-use, SEAs, and TPEM Engine Manufacturers are the same companies that respond to Certification.

6(e) Bottom Line Burden Hours and Cost Tables

(i) Respondent Tally

Table 16- Total Estimated Respondent Burden and Cost Summary by IC

Program	Table Number (Section 6(a))	Number of Respondents	Number of Activities	Total Hours Per Year	Total Labor Annua Cost Per Year Capita		Total Annual Capital Costs	Total Annual O&M Costs		Total Costs	
Certification IC											
Certification	2	95	Varies	74,196	\$	5,512,918	0	\$	11,911,818	\$	17,424,736
Evaporative Cert	3	9	Varies	636	\$	39,640	0	\$	12,536	\$	52,176
AB&T	6	9	Varies	1,629	\$	113,982	0	\$	990	\$	114,972
PLT	7	26	Varies	12108	\$	856,385	0	\$	2,852,247	\$	3,708,632
In-use	8	6	Varies	360	\$	55,862	0	\$	1,630,608	\$	1,686,470
SEAs	9	6	Varies	276	\$	21,458	0	\$	15,102	\$	36,561
			<u>Alternati</u>	ive Fuel C	onv	<u>ersions IC</u>					
HD Alt Fuel Conversions (Beginning UL)	4	1	Varies	142	\$	12,718	0	\$	118,979	\$	131,697
HD Alt Fuel Conversions (Intermediate UL)	5	1	Varies	151	\$	13,841	0	\$	13,841	\$	40,863
				TPEM	<u>IC</u>						
TPEM – equipment mfrs	10	1432	Varies	97271	\$	8,309,455	0	\$	791,403	\$	9,100,858
TPEM - engine mfrs	11	30	Varies	3795	\$	291,212	0	\$	1,140	\$	292,352
			Special C	omplianc	e Pr	ovisions IC					
Special Compliance Provisions	12	1000	Varies	10469	\$	844,774	0	\$	23,329	\$	868,103
Overall Tally:	N/A	2,528 ⁵	Varies	201,033	\$	16,072,245	0	\$	17,371,995	\$	33,457,421

⁵ See footnote #4.

_(ii) The Agency Tally

Number of Respondents: 3,388
Number of Activities: Varies
Total Hours Per Year: 34,944
Total Labor Cost: \$2,362,663
Total Annual Capital Costs: \$0
Total Annual O&M Costs: \$1,183,947
Total Costs: \$3,546,609

6(f) Change in Burden

There is a net increase of 26,851 hours in the total estimated burden for ICR 1684.18 from the burden currently identified in the OMB Inventory of Approved ICR Burdens of 174,186 for the previous ICR 1684.17. This net increase is mainly due to the incorporation of former ICR 1826.05 into 1684.18 (see IC #4 below). In an effort to increase accuracy, EPA has reviewed the estimates for each individual IC. This resulted in a decrease in burden for most ICs and an increase in burden due to the addition of two ICs, as discussed below. The largest contribution to the new estimated total burden came from IC #4. The tables 17 and 18 below shows the change in this ICR:

1. IC #1 – Certification:

Although, there is an increase in the number of responses in this IC, the total burden has decreased by 80,915 hours from the currently approved burden of 170,124 hours per year. This is due to a decrease in the number of new applications from certification in favor of an increase in carry-over applications, which now account for 56% of all certification applications (section 6(d)(1).⁶ Carry-over applications carry a significant lower burden for the respondent.

2. IC #2 - Requirements for Heavy-duty (HD) Engines with On-Board Diagnostics -

This IC was deleted in this ICR revision package. IC #2 had been created to reflect the previous ICR review which only dealt with a regulatory change in certification requirements. The burden for this changes is already accounted for in IC #1. By deleting this IC, its previously approved burden of 2,484 hours per year has been discounted as a change due to office discretion.

⁶ Please see section (4)(b)(i)(1) for an explanation of carry-over applications vs new applications.

3. IC #3 – Certification and Compliance for Alternative Fuel Conversions –

A sharp decrease in the number of responses (from 26 currently approved to 4), accounts for a decrease of 1,285 hours in burden for this IC from the currently approved burden of 1,578 hours per year to 293 in the new estimates, as shown in the table below.

4. IC #4 – Transition Program for Equipment Manufacturers (TPEM – Burden from former ICR 1826.05) –

We have consolidated former ICR 1826.05 and 1684.17 into a single ICR (1684.18) to avoid duplication of respondent effort. With this, there will be an annual net increase of 745 responses and 20,886 hours resulting in a total of 101,066 hours and 2,329 annual responses for ICR 1684.18 per year.

ICR	Annual responses	Annual hours
1826.05	792	40,090
1684.17	1,537	60,976
1684.18	2,329	101,066
Net Increase	745	20,8860

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5. IC #5 – Special Compliance Provisions –

This IC was created to reflect a series of provisions that address special or unusual situations, such as national security exemptions, testing exemptions and branded engines that did not quite fit in any other IC.⁷ Since this is a new IC, the totality of its burden, therefore, appears as an increase without previously approved burden. This IC contributes 10,464 hours to this collection's total burden.

⁷ Please see section (4)(b)(i)(8) for details

Table 17 Change in Response and hour burdens

	R	esponses		Hours			
	Previously Approved	Change (+/-)	Total Requested	Previously Approved	Change (+/-)	Total Requested	
IC #1 - Certification	1,058	-963	95	170,124	-80,915	89,209	
IC #2 – Requirements for Heavy-duty (HD) Engines with On-Board Diagnostics (removed)	12	-12	0	0	-2,484	0	
IC #3 – Certification and Compliance for Alternative Fuel Conversions	26	-22	4	1,578	-1,285	293	
IC #4 – Transition Program for Equipment Manufacturers	0	2,329	2,329	0	101,066	101,066	
IC #5 - Special Compliance Provisions	0	403	403	0	10,469	10,469	
TOTAL	0	0	0	0	26,851	0	

Table 18 – Change in Annual Cost Burden

	Annual Cost Burden				
	Previously Approved	Change (+/-)	Total Requested		
IC #1 - Certification	\$7,086,251	\$9,337,050	\$16,423,301		
IC #2 - Requirements for Heavy-duty (HD) Engines with On-Board Diagnostics (removed)	\$120,000	-\$120,000	\$0		
IC #3 - Certification and Compliance for Alternative Fuel Conversions	\$622,389	-\$489,569	\$132,820		
IC #4 – Transition Program for Equipment Manufacturers	\$0	\$792,543	\$792,543		
IC #5 - Special Compliance Provisions	\$0	\$23,329	\$23,329		
TOTAL	\$7,828,640	\$9,543,353	\$17,371,993		

6(g) Burden Statement

The annual public reporting and recordkeeping burden for this collection of information is 79.5 hours per respondent. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required

to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

To comment on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques, EPA has established a public docket for this ICR under Docket ID Number EPA-HQ-OAR-2007-1182, which is available for online viewing at www.regulations.gov, or in person viewing at the Air and Radiation Docket and Information Center in the EPA Docket Center (EPA/DC), EPA West, Room 3334, 1301 Constitution Avenue, NW, Washington, D.C. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Reading Room is (202) 566-1744, and the telephone number for the Air and Radiation Docket and Information Center is (202) 566-1742. The electronic version of the public docket at the site www.regulations.gov can be used to submit or view public comments, access the index listing of the contents of the public docket, and to access those documents in the public docket that are available electronically. When in the system, select "search," then key in the Docket ID Number identified above. Also, you may send comments to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW, Washington, D.C. 20503, Attention: Desk Officer for EPA. Please include the EPA Docket ID Number EPA-HQ-OAR-2007-1182 and the OMB Control Number 2060-0287 in any correspondence.