

# Control of Emissions from Marine SI and Small SI Engines, Vessels, and Equipment

## Final Regulatory Impact Analysis

### Chapter 10 Small-Business Flexibility Analysis

Assessment and Standards Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency



CHAPTER 10: Small-Business Flexibility Analysis

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## CHAPTER 10: Small-Business Flexibility Analysis

This chapter presents our Small Business Flexibility Analysis (SBFA) which evaluates the impacts of the rule on small businesses. Prior to issuing our proposed rule, we analyzed the potential impacts of our program on small businesses. As a part of this analysis, we convened a Small Business Advocacy Review Panel (SBAR Panel or ‘the Panel’), under the requirements of the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, 5 USC 601 *et seq.* Through the Panel process, we gathered advice and recommendations from small entity representatives (SERs) who would be affected by the regulation. The Panel issued a report recommending that EPA consider and seek comment on a wide range of regulatory alternatives to mitigate the impacts of the rulemaking on small businesses. The Panel report has been placed in the rulemaking record.

In the proposal, EPA proposed provisions consistent with each of the Panel’s recommendations and sought comments on all of the small business provisions. We received a number of comments during the comment period after we issued the proposal. A summary of all comments pertaining to the small business provisions can be found in our Summary and Analysis of Comments document contained in the public docket for this rulemaking. A list of the small business provisions being adopted with the final rule is presented in section 10.7 below.

### 10.1 Overview of the Regulatory Flexibility Act

In accordance with section 603 of the RFA, EPA prepared an initial regulatory flexibility analysis (IRFA) for the proposed rule and convened a Small Business Advocacy Review Panel to obtain advice and recommendations of representatives of the regulated small entities in accordance with section 609(b) of the RFA (see 72 FR 28098, May 18, 2007). A detailed discussion of the Panel's advice and recommendations is found in the Panel Report contained in the docket for this rulemaking. A summary of the Panel's recommendations is presented at (72 FR 28098).

Section 609(b) of the Regulatory Flexibility Act further directs the Panel to report on the comments of small entity representatives and make findings on issues related to identified elements of the IRFA under section 603 of the Regulatory Flexibility Act. Key elements of an IRFA are:

- A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;
- Projected reporting, record keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements and the type of professional skills necessary for preparation of the report or record;
- An identification to the extent practicable, of all other relevant Federal rules which may

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duplicate, overlap, or conflict with the proposed rule;

- Any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

The Regulatory Flexibility Act was amended by SBREFA to ensure that concerns regarding small entities are adequately considered during the development of new regulations that affect those entities. Although we are not required by the Clean Air Act to provide special treatment to small businesses, the Regulatory Flexibility Act requires us to carefully consider the economic impacts that our rules will have on small entities. The recommendations made by the Panel may serve to help lessen these economic impacts on small entities when consistent with Clean Air Act requirements.

For purposes of assessing the impacts of this action on small entities, a small entity is defined as: (1) a small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of smaller than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, we believe that this action will not have a significant economic impact on a substantial number of small entities. The small entities directly regulated by this final rule cover a wide range of small businesses including engine manufacturers, equipment manufacturers, boat manufacturers, fuel tank manufacturers, and fuel hose manufacturers. No small governmental jurisdictions or small non-profits are impacted by this final rule. We have determined that 61 small businesses will experience an impact of greater than 1 percent. These 61 companies represent less than 5 percent of the small business identified by EPA.

Despite the determination that this rule will not have a significant economic impact on a substantial number of small entities, we have prepared a Small Business Flexibility Analysis that has all the components of a final regulatory flexibility analysis (FRFA). An FRFA examines the impact of the final rule on small businesses along with regulatory alternatives that could reduce that impact. The Small Business Flexibility Analysis is presented in this chapter.

### **10.2 Need for and Objective of the Rulemaking**

A detailed discussion on the need for and objectives of this final rule are located in the preamble to the final rule. As presented in Chapter 8, controlling exhaust and evaporative emissions from Small SI engines and equipment and Marine SI engines and vessel has important public health and welfare benefits.

Section 213(a) of the CAA directs EPA to: (1) conduct a study of emissions from nonroad engines and vehicles; (2) determine whether emissions of CO, NO<sub>x</sub>, and VOCs from nonroad engines and vehicles are significant contributors to ozone or CO in more than one area

which has failed to attain the National Ambient Air Quality Standard (NAAQS) for ozone or CO; and (3) if nonroad emissions are determined to be significant, regulate those categories or classes of new nonroad engines and vehicles that cause or contribute to such air pollution. Section 213(a)(3) states that the emission standards “shall achieve the greatest degree of emission reduction achievable through the application of technology” giving appropriate consideration to cost, noise, energy, safety, and lead time.

The Nonroad Engine and Vehicle Emission Study required by section 213(a)(1) was completed in November 1991. The determination of the significance of emissions from nonroad engines and vehicles in more than one NAAQS nonattainment area was published on June 17, 1994. At the same time, the first set of regulations for new land-based nonroad compression-ignition (CI) engines at or above 37 kW was promulgated. EPA has also issued proposed or final rules for most other categories of nonroad engines, including engines used in lawn and garden equipment, recreational marine vessels, forklifts, recreational vehicles, locomotives, and ships. In addition, EPA has revised the emission standards for many of these categories of nonroad engines one or more times to achieve further emission reductions.

In addition to the general authority to regulate nonroad engines under the CAA, section 428 of the Omnibus Appropriations Bill for 2004 requires EPA to propose and finalize new regulations for nonroad spark-ignition engines less than 50 horsepower (hp). The Bill directs EPA to propose regulations by December 1, 2004 and finalize them by December 31, 2005. EPA’s assessment of new standards is to be carried out under section 213 of the CAA.

Finally, section 205 of Public Law 109-54 included an additional requirement that EPA complete a technical study, to look at safety issues related to the potential standards called for under the Omnibus Appropriations Bill for 2004. The law directed EPA to complete the study prior to issuing the proposal called for in the Omnibus Appropriations Bill for 2004. In response to this requirement, EPA prepared a technical study on safety in coordination with the Consumer Product Safety Commission (CPSC). The study analyzes the incremental risk of fire and burn to consumers that could result from the new standards. EPA published the study in March 2006.

In response to these requirements, today’s action adopts controls on exhaust and evaporative emissions from Small SI engines and equipment and Marine SI engines and vessels.

### **10.3 Summary of Significant Public Comments**

In the proposal, EPA proposed provisions consistent with each of the Panel's recommendations and sought comments on all of the small business provisions (see 72 FR 28245, May 18, 2007). As noted earlier, we received a number of comments during the comment period after we issued the proposal. A summary of all comments pertaining to the small business provisions can be found in our Summary and Analysis of Comments document contained in the public docket for this rulemaking. A few changes have been made to some of the proposed flexibilities in response to the comments as well as other changes made in the rulemaking. Those changes are noted in section 10.7.1 below.

## 10.4 Definition and Description of Small Entities

Small entities include small businesses, small organizations, and small governmental jurisdictions. As noted earlier, for the purposes of assessing the impacts of a rule on small entities, a small entity is defined as: (1) a small business that meets the definition for business based on the Small Business Administration’s (SBA) size standards (see Table 10.4-1); (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. Table 10.4-1 provides an overview of the primary SBA small business categories that will be affected by this regulation.

**Table 10.4-1: Small Business Definitions for Entities Affected by this Rule**

Industry	NAICS Codes <sup>a</sup>	Defined as small entity by SBA if less than or equal to: <sup>b</sup>
Nonroad SI Engine Manufacturers	333618	1,000 employees
Equipment Manufacturers:		
Farm Machinery	333111	500 employees
Lawn and Garden	333112	500 employees
Construction	333120	750 employees
Sawmill and Woodworking	333210	500 employees
Pumps	333911	500 employees
Air and Gas Compressors	333912	500 employees
Generators	335312	1,000 employees
Boat Builders	336612	500 employees
Fuel Tank Manufacturers:		
Other Plastic Products	326199	500 employees
Metal Stamping	332116	500 employees
Metal Tank (Heavy Gauge)	332420	500 employees
Fuel Hose Manufacturers:		
Rubber and Plastics Hoses	326220	500 employees

<sup>a</sup> North American Industry Classification System

<sup>b</sup> As defined in SBA’s regulations at 13 CFR part 121.

### 10.4.1 Small SI Engines and Equipment

For Small SI engines and equipment, the SBA small business size standards are 1,000 employees for engine manufacturers, 1,000 employees for generator manufacturers, 750 employees for construction equipment manufacturers, and 500 employees for manufacturers of other types of equipment. To identify companies that meet these criteria, we compiled a list of engine manufacturers and equipment manufacturers using information from a database prepared by Power Systems Research (PSR) that contains data on Small SI engines and equipment sold in the United States. EPA augmented this information with the list of engine manufacturers

currently certifying with EPA under the Small SI engine regulations. We then found employment data for each company (or parent company if an individual company is part of a larger group) using databases such as the Thomas Register and Dunn and Bradstreet.

The SBA small business size standard for manufacturers that produce fuel tanks or fuel hose is 500 employees. To identify companies that meet this criterion, we compiled a list of manufacturers that produce fuel tanks and fuel hoses for the Small SI equipment market. The list was based on information from the California Air Resources Board, who has recently adopted requirements for Small SI engine fuel tank and fuel hose manufacturers, and additional information from Small SI equipment manufacturers and the Association of Rotational Molders International. We then found employment data for each of the companies (or parent company if an individual company is part of a larger group) using databases such as Thomas Register and onsourceexpress.com and discussions with some of the manufacturers.

### **10.4.2 Marine SI Engines and Vessels**

For Marine SI engines and vessels, the SBA small business size standards are 1,000 employees for engine manufacturers and 500 employees for boat builders. To identify companies that meet these criteria, we used a number of different sources. For engine manufacturers, we compiled a list based on the engine manufacturers currently certifying with EPA and the California Air Resources Board (CARB) under the existing Marine SI engine regulations and augmented the list with additional information on SD/I manufacturers, who do not currently have to certify with EPA. We gathered additional information from boat shows, the Internet, trade magazines, the National Marine Manufacturers Association (NMMA), and discussions with individual manufacturers. For vessel manufacturers, we used information from a database of boat builders maintained by the U.S. Coast Guard.

The SBA small business size standard for manufacturers that produce fuel tanks or fuel hose is 500 employees. For fuel tank and fuel hose manufacturers, we compiled a list based on information gathered from the NMMA, trade shows, the Internet and discussions with manufacturers. We then found employment data for these companies (or parent company if an individual company is part of a larger group) using databases such as Thomas Register and discussions with trade groups and individual manufacturers.

## **10.5 Type and Numbers of Small Entities Affected**

As noted above, for each sector impacted by this final rule, SBA defines small entities by number of employees. This section gives an overview of the Small SI engine and equipment industries and the Marine SI engine and vessel industries, specifically related to small businesses.

### **10.5.1 Small SI Engines and Equipment**

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Based on EPA certification records, the Small SI nonhandheld engine industry is made up primarily of large manufacturers including Briggs and Stratton, Tecumseh, Honda, Kohler and Kawasaki. The Small SI handheld engine industry is also made up primarily of large manufacturers including Electrolux Home Products, MTD, Homelite, Stihl and Husqvarna. EPA has identified 10 Small SI engine manufacturers that qualify as a small business under SBA definitions. Half of these small manufacturers certify gasoline engines and the other half certify liquefied petroleum gas (LPG) engines.

The Small SI equipment market is dominated by a few large businesses including Toro, John Deere, MTD, Briggs and Stratton, and Electrolux Home Products. While the Small SI equipment market may be dominated by just a handful of companies, there are many small businesses in the market; however these small businesses account for less than 10 percent of equipment sales. We have identified over three hundred equipment manufacturers that qualify as a small business under the SBA definitions. More than 90 percent of these small companies manufacture less than 5,000 pieces of equipment per year. The median employment level is 65 employees for nonhandheld equipment manufacturers and 200 employees for handheld equipment manufacturers. The median sales revenue is approximately \$9 million for nonhandheld equipment manufacturers and \$20 million for handheld equipment manufacturers.

EPA has identified 25 manufacturers that produce fuel tanks for the Small SI equipment market that meet the SBA definition of a small business. Fuel tank manufacturers rely on three different processes for manufacturing plastic tanks – rotational molding, blow molding and injection molding. EPA has identified small business fuel tank manufacturers using the rotational molding and blow molding processes but has not identified any small business manufacturers using injection molding. In addition, EPA has identified two manufacturers that produce fuel hose for the Small SI equipment market that meet the SBA definition of a small business. The majority of fuel hose in the Small SI market is made by large manufacturers including Avon Automotive and Dana Corporation.

### **10.5.2 Marine SI Engines and Vessels**

Based on EPA certification records, the OB/PWC market is made up primarily of large manufacturers including, Brunswick (Mercury), Bombardier Recreational Products, Yamaha, Honda, Kawasaki, Polaris, Briggs & Stratton, and Nissan. Two companies qualify as a small business under the SBA definitions. Tohatsu makes outboard engines. The other small business is Surfango which makes a small number of motorized surfboards and has certified their product as a PWC.

The SD/I market is made up mostly of small businesses; however, these businesses account for less than 20 percent of engine sales. Two large manufacturers, Brunswick (Mercuriser) and Volvo Penta, dominate the market. We have identified 28 small entities manufacturing SD/I marine engines. The third largest company is Indmar, which qualifies as a small business based on the SBA threshold of 1,000 employees. Based on sales estimates, number of employees reported by Thomas Register, and typical engine prices, we estimate that

the average revenue for the larger small SD/I manufacturers is about \$50-60 million per year. However, the vast majority of the SD/I engine manufacturers produce low production volumes of engines and typically have less than 50 employees.

The two largest boat building companies are Brunswick and Genmar. Brunswick owns approximately 25 boat companies and Genmar owns approximately 12 boat companies. Based on a manufacturer list maintained by the U.S. Coast Guard, there are over 1,600 boat builders in the United States. We estimate that, based on manufacturer identification codes, more than 1,000 of these companies produce boats using gasoline marine engines. According to the National Marine Manufacturers Association (NMMA), most of these boat builders are small businesses. These small businesses range from individuals building one boat per year to businesses near the SBA small business threshold of 500 employees.

We have identified 14 marine fuel tank manufacturers in the United States that qualify as small businesses under the SBA definition. These manufacturers include five rotational molders, two blow molders, six aluminum fuel tank manufacturers, and one specialty fuel tank manufacturer. The small rotational molders average less than 50 employees while the small blow-molders average over 100 employees.

We have only identified one small hose manufacturer that produces for the Marine SI market. Novaflex primarily distributes hoses made by other manufacturers, but does produce its own fill neck hose. Because we expect vessel manufacturers will design their fuel systems such that there will not be standing liquid fuel in the fill neck (and therefore the low permeation fuel hose requirements will not apply to the fill neck), we have not included this manufacturer in our analysis. The majority of fuel hose in the Marine SI market is made by large manufacturers including Goodyear and Parker-Hannifin.

## 10.6 Reporting, Recordkeeping, and Compliance Requirements

For any emission control program, EPA must have assurances that the regulated products will meet the standards. Historically, EPA programs for Small SI engines and Marine SI engines have included provisions placing engine manufacturers responsible for providing these assurances. The program that EPA is adopting for manufacturers subject to this final rule will include testing, reporting, and record keeping requirements for manufacturers of engines, equipment, and vessels, and will also include fuel system component manufacturers if they choose to certify their fuel tank, fuel hose, and fuel cap products.

For Small SI engine manufacturers and OB/PWC engine manufacturers, EPA is generally continuing the same reporting, record keeping, and compliance requirements prescribed in the current regulations. For SD/I engine manufacturers, which are not currently subject to EPA regulation, EPA is planning to apply similar reporting, record keeping, and compliance requirements to those for OB/PWC engine manufacturers. Testing requirements for engine manufacturers will include certification emission (including deterioration factor) testing and production line testing. Reporting requirements will include emission test data and technical data on the engines. Manufacturers will also need to keep records of this information.

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Because of the new evaporative emission requirements, there will be new reporting, record keeping and compliance requirements for Small SI equipment manufacturers. Small SI equipment manufacturers participating in the transition program will also be subject to reporting, record keeping and compliance requirements. Depending on who chooses to certify fuel system components, there may also be new reporting, record keeping and compliance requirements for fuel tank manufacturers, fuel hose manufacturers, fuel cap manufacturers, and marine vessel manufacturers. Testing requirements for these manufacturers will include certification emission testing. Reporting requirements will include emission test data and technical data on the designs. Manufacturers will also need to keep records of this information.

### **10.7 Steps Taken to Minimize the Impact on Small Entities**

The Panel developed a wide range of regulatory alternatives to mitigate the impacts of the rulemaking on small businesses, and recommended that we propose and seek comment on the flexibilities. The Panel's findings and discussions were based on the information that was available during the term of the Panel and issues that were raised by the SERs during the outreach meetings and in their written comments. It was agreed that EPA should consider the issues raised by the SERs (and issues raised in the course of the Panel) and that EPA should consider the comments on flexibility alternatives that would help to mitigate any negative impacts on small businesses. Alternatives discussed throughout the Panel process included those offered in the development of the upcoming rule. Though some of the recommended flexibilities may be appropriate to apply to all entities affected by the rulemaking, the Panel's discussions and recommendations were focused mainly on the impacts, and ways to mitigate adverse impacts, on small businesses. A summary of the Panel's recommendations can be found in the SBREFA Final Panel Report.<sup>1</sup>

A list of the small business provisions being adopted with the final rule are presented in the following section.

#### **10.7.1 Small SI Exhaust Emission Standards**

Described below are the regulatory alternatives being adopted with the final rule related to the Small SI nonhandheld engine exhaust emission standards.

##### **10.7.1.1 Regulatory Flexibility Options for Nonhandheld Engine Manufacturers**

The following section contains a discussion of the provisions in the final rule for small business nonhandheld engine manufacturers.

***Additional Lead Time for Nonhandheld Engine Manufacturers*** - Small-volume engine manufacturers can delay implementation of the Phase 3 exhaust emission standards for two years (see §1045.145). Small-volume engine manufacturers will be required to comply with the Phase 3 exhaust emission standards beginning in model year 2014 for Class I engines and model year 2013 for Class II engines. Under this approach, small-volume engine manufacturers can apply this delay to all their nonhandheld engines or to just a portion of their production. They could

therefore sell engines that meet the Phase 3 standards on some product lines while delaying introduction of emission control technology on more challenging product lines. This option provides more time for small-volume engine manufacturers to redesign their products. They would also be able to learn from some of the hurdles overcome by larger manufacturers.

***Assigned Deterioration Factors*** - Small-volume engine manufacturers will be able to rely on an assigned deterioration factor to demonstrate compliance with the standards rather than doing service accumulation and additional testing to measure deteriorated emission levels at the end of the regulatory useful life (see §1054.240). EPA is not adopting actual levels for the assigned deterioration factors with this final rule. EPA intends to analyze emissions deterioration information that becomes available over the next few years to determine what deterioration factors would be appropriate for nonhandheld engines. This data is likely to include deterioration data for engines certified to comply with CARB's Tier 3 standards and engines certified early to EPA's Phase 3 standards. Prior to the implementation date for the Phase 3 standards, EPA expects to provide guidance to engine manufacturers specifying the levels of the assigned deterioration factors for small-volume engine manufacturers.

***Production Line Testing Exemption*** - Small-volume engine manufacturers will be exempt from the production-line testing requirements for all of their nonhandheld engine families (see §1054.301).

***Broader Definition of Engine Family*** - Small-volume engine manufacturers may use a broader definition of engine family than generally applies for certification purposes. Under the existing engine family criteria specified in the regulations, manufacturers group their various engine lines into engine families that have similar design characteristics including the combustion cycle, cooling system, cylinder configuration, number of cylinders, engine class, valve location, fuel type, aftertreatment design, and useful life category. With this final rule, we are allowing small-volume engine manufacturers to group all of their nonhandheld engines into a single engine family for certification by engine class and useful life category, subject to good engineering judgment (see §1054.230).

***Eligibility for the Small Business Flexibilities*** - We are retaining the current criteria (i.e., 10,000 units per year of nonhandheld engines) for determining who is a small-volume engine manufacturer and, as a result, eligible for the Phase 3 flexibilities described above (see §1054.801). Based on confidential sales data provided to EPA by engine manufacturers, the 10,000 unit cut-off for engine manufacturers would include all of the small business engine manufacturers using SBA's employee-based definition. However to ensure all small businesses that meet SBA's employee-based definition have access to the flexibilities described above, EPA is also allowing engine manufacturers which exceed the production cut-off level of 10,000 units but have fewer than 1,000 employees, to request treatment as a small volume engine manufacturer (see §1054.635). In such a case, the manufacturer would need to provide information to EPA demonstrating that the manufacturer has fewer employees than the 1,000 cut-off level established by SBA.

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### **10.7.1.2 Regulatory Flexibility Options for Nonhandheld Equipment Manufacturers**

The following section contains a discussion of the provisions in the final rule for small business nonhandheld equipment manufacturers.

***Additional Lead Time for Small SI Equipment Manufacturers*** - Small-volume equipment manufacturers will have two extra years beyond the implementation dates for the Phase 3 standards to continue using Phase 2 engines in their Class II equipment. Alternatively, the manufacturer can use Phase 3 engines without the catalysts, provided the engine manufacturer submitted data at the time of certification showing that the engine without the catalyst complied with EPA's Phase 2 standards. As described in Section V.E.3 of the preamble, EPA is adopting a flexibility program for all equipment manufacturers that produce Class II equipment. Under that program, equipment manufacturers can install Phase 2 engines in limited numbers of Class II equipment over the first four years the Phase 3 standards apply (i.e., 2011 through 2015). The number of equipment that can use Phase 2 engines is based on 30 percent of an average annual production level of Class II equipment. In an effort to provide additional flexibility to small-volume equipment manufacturers within the context of the flexibility program, EPA is adopting provision that allow small-volume equipment manufacturers to use Phase 2 engines at a level of 200 percent of an average annual production level of Class II equipment over the four year period (see §1054.625). Therefore, a small-volume equipment manufacturer can potentially use Phase 2 engines on all their Class II equipment for two years (consistent with the SBAR Panel's recommendation) or they may, for example, sell half their Class II equipment with Phase 2 engines for four years.

***Simplified Engine Certification for Equipment Manufacturers*** - We are adopting a simplified engine certification procedure for small-volume equipment manufacturers. (As discussed in Section V.E.4 of the preamble, we are also adopting this provision for other manufacturers, regardless of the company's size.) Generally, it has been engine manufacturers who certify with EPA for the exhaust emission standards because the standards are engine-based standards. However, because the Phase 3 standards under consideration are expected to result in the use of catalysts, a number of equipment manufacturers, especially those that make low-volume models, believe it may be necessary to certify their own unique engine/muffler designs with EPA, but using the same catalyst substrate already used in a muffler certified by the engine manufacturer. In order to allow the possibility of an equipment manufacturer certifying an engine/muffler design with EPA, we are adopting a simplified engine certification process for small-volume equipment manufacturers (see §1054.612). Under such a simplified certification process, the equipment manufacturer will need to demonstrate that it is using the same catalyst substrate as the approved engine manufacturer's family, provide information on the differences between their engine/exhaust system and the engine/exhaust system certified by the engine manufacturer, and explain why the emissions deterioration data generated by the engine manufacturer is representative for the equipment manufacturer's configuration.

***Eligibility for the Small Business Flexibilities*** - EPA is retaining the current criteria (i.e., 5,000 units per year of nonhandheld equipment) for determining who is a small-volume equipment manufacturer and, as a result, eligible for the Phase 3 flexibilities described above

(see §1054.801). Based on sales data, the 5,000 unit cut-off for equipment manufacturers would include the vast majority of the small business equipment manufacturers using SBA's employee-based definition. However to ensure all small businesses that meet SBA's employee-based definition have access to the flexibilities described above, EPA will also allow equipment manufacturers which exceed the production cut-off level noted above but have fewer employees than the SBA definition of small business (i.e., 500 employees for manufacturers of most types of equipment), to request treatment as a small-volume equipment manufacturer (see §1054.635). In such a case, the manufacturer will need to provide information to EPA demonstrating that the manufacturer has fewer employees than the applicable employee cut-off level established by SBA.

### **10.7.2 Marine SI Exhaust Emission Standards—Regulatory Flexibility Options for SD/I Engine Manufacturers**

Described below are the regulatory alternatives being adopted with the final rule related to the SD/I engine exhaust emission standards.

***Additional Lead Time for SD/I Engine Manufacturers*** - We are adopting an implementation date of 2011 for  $\leq 373$  kW SD/I engines produced by small business marine engine manufacturers and a date of 2013 for small business manufacturers of high-performance ( $>373$  kW) marine engines (see §1045.145). These dates provide 1 year of additional leadtime for small businesses producing  $\leq 373$  kW SD/I engines and 3 years of additional leadtime for small businesses producing  $>373$  kW SD/I engines compared the implementation dates for large manufacturers.

***Exhaust Emission ABT*** - We are adopting an averaging, banking, and trading (ABT) credit program for exhaust emissions from  $\leq 373$  kW SD/I marine engines (see part 1045, subpart H). Under the proposal, the ABT program would have applied to  $>373$  kW SD/I engines as well. However, as described in section 3.4 of the Summary and Analysis of Comments document for the Final Rule, we are adopting different standards for high performance SD/I engines than originally proposed. High performance ( $>373$  kW) SD/I engines are required to meet the new standards without the use of an ABT program.

***Early Credit Generation for ABT*** - We are adopting an early banking program in which bonus credits can be earned for certifying early (see §1045.145). This program, combined with the additional lead time for small businesses noted above, give small-volume manufacturers of SD/I engines  $\leq 373$  kW ample opportunity to bank emission credits prior to the implementation date of the standards and provide greater incentive for more small business engine manufacturers to introduce advanced technology earlier than would otherwise occur. Because the ABT program being adopted with the final rule only applies to SD/I engines  $\leq 373$  kW, the early credit provisions will not apply to high-performance ( $>373$  kW) SD/I engines.

***Assigned Emission Rates for High Performance ( $>373$  kW) SD/I Engines*** - In the proposal, we noted that in the case where an engine manufacturer is using emission credits to comply with the standard, the manufacturer will still need to test engines to calculate how many

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emission credits are needed. In order to minimize this testing burden, we proposed to allow manufacturers to use assigned baseline emission rates for certification based on previously generated emission data. As discussed in section 3.4 of the Summary and Analysis of Comments document for the Final Rule, we are adopting less stringent standards for high-performance (>373 kW) SD/I engines that do not allow for the use of the ABT program for demonstrating compliance with the standards. Therefore, we are not adopting baseline HC+NO<sub>x</sub> and CO emission rates for high-performance SD/I engines since the proposed levels were higher than the standards being adopted and therefore, are of no use without an ABT program.

***Alternative Standards for High Performance (>373 kW) SD/I Engines*** - In the proposal, EPA cited concerns raised by small businesses that catalysts had not been demonstrated on high-performance engines and that they may not be practicable for this application and therefore requested comments on the need for and level of alternative standards for high-performance marine engines. As described in section 3.4 of the Summary and Analysis of Comments document for the Final Rule, we are adopting a less stringent set of exhaust emission standards for high performance (>373 kW) SD/I engines than originally proposed. These standards are not expected to result in the use of catalysts on high performance (>373 kW) SD/I engines.

Furthermore, we are not adopting NTE standards for high-performance SD/I engines (See §1045.105). This is consistent with the SBAR Panel recommendation that NTE standards not apply to any high-performance SD/I engines.

***Broad Engine Families for High Performance (>373 kW) SD/I Engines*** - Typically in EPA engine and equipment programs, manufacturers are able to group their engine lines into engine families for certification to the standards. Engines in a given family must have many similar characteristics including the combustion cycle, cooling system, fuel system, air aspiration, fuel type, aftertreatment design, number of cylinders and cylinder bore sizes. A manufacturer would then only perform emission tests on the engine in that family that would be most likely to exceed an emission standard. We are adopting provisions that allow small businesses to group all of their high performance (>373 kW) SD/I engines into a single engine family for certification, subject to good engineering judgment (see §1045.230). A manufacturer will need to perform emission tests only on the engine design that will be most likely to exceed the emission standard.

***Simplified Test Procedures for High Performance (>373 kW) SD/I Engines*** - Existing testing requirements include detailed specifications for the calibration and maintenance of testing equipment and tolerances for performing the actual tests. For high performance (>373 kW) SD/I engines, it may be difficult to hold the engine at idle or high power within the tolerances currently specified by EPA in the test procedures. Therefore, we are adopting less restrictive specifications and tolerances, for small businesses testing high performance (>373 kW) SD/I engines, which would allow the use of portable emission measurement equipment (see §1065.901(b)). This will facilitate less expensive testing for these small businesses without having a negative effect on the environment.

***Reduced Testing Requirements for SD/I Engine Manufacturers*** - We are adopting provisions to allow small-volume engine manufacturers to use an assigned deterioration factor to demonstrate compliance with the standards for the purposes of certification rather than doing service accumulation and additional testing to measure deteriorated emission levels at the end of the regulatory useful life (see §1045.240). EPA is not specifying actual levels for the assigned deterioration factors in this final rule. EPA intends to analyze available emission deterioration information to determine appropriate deterioration factors for SD/I engines. The data will likely include durability information from engines certified to California ARB's standards and may also include engines certified early to EPA's standards. Prior to the implementation date for the SD/I standards, EPA will provide guidance to engine manufacturers specifying the levels of the assigned deterioration factors for small-volume engine manufacturers.

We proposed to exempt small-volume manufacturers of SD/I engines from the production -line testing requirements. As noted in section 3.10 of the Summary and Analysis of Comments document for the Final Rule, we are dropping the production-line testing requirements for all engine manufacturers including large manufacturers. Therefore, no production-line testing will be required of any SD/I engine manufacturer (see §1045.301).

***Eligibility for the Small Business Flexibilities*** - For purposes of determining which engine manufacturers are eligible for the small business flexibilities described above for SD/I engine manufacturers, we are adopting criteria based on the number of employees. SD/I engine manufacturers that have no more than 250 employees will be considered a small business for the purposes of the flexibilities being adopted with the final rule. We originally proposed criteria based on a production cut-off of 5,000 SD/I engines per year. However, engine manufacturers commented that it was more appropriate to use an employee level than a production level for defining which companies are small businesses. We believe a 250 employee limit should be roughly consistent with the production level we targeted in our proposal, although some manufacturers would likely be able to produce more than 5,000 units. Under the small-volume engine manufacturer definition being adopted for the final rule, there will be no option to consider the production volume instead of the 250 employee count.

### **10.7.3 Small SI and Marine SI Evaporative Emission Standards— Flexibility Alternatives for Equipment, Vessel, and Fuel Tank Manufacturers**

Described below are the regulatory alternatives being adopted with the final rule related to the evaporative emission standards for Small SI engines and equipment and Marine SI engines and vessels. The provisions discussed below applied to Small SI equipment and to SD/I marine vessels, except where noted. Because the majority of fuel tanks produced for the Small SI equipment and the SD/I marine vessel market are made by small businesses, the flexibility provisions being adopted for fuel tank manufacturers apply regardless of whether the manufacturer was a small business or not.

***Consideration of Appropriate Lead Time*** - We are adopting an implementation schedule that we believe provides sufficient lead time for blow-molded and marine rotational molded fuel tanks. For Small SI equipment, we are establishing tank permeation implementation dates of

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2011 for Class II equipment and 2012 for Class I equipment. For marine fuel tanks, we are implementing the tank permeation standards in 2011 with an additional year (2012) for installed fuel tanks which are typically rotational-molded marine fuel tanks (see §1054.110 and §1045.107).

With regard to the diurnal requirements for marine vessels, we are providing an additional year of lead time, compared to the proposal. This means that the diurnal standard will apply beginning with the 2011 model year. In addition, we are adopting an interim allowance program that will give additional time for a limited number of boats. Under this program, each boat builder will be allowed to sell these boats without the diurnal emission controls that would otherwise be required. Specifically, each boat builder will have a total of 1,200 allowances that may be used, at the manufacturer's discretion, for boats produced before December 31, 2012. These allowances are intended to help boat builders engage in an orderly transition to the new standards and will only be available for boats produced in 2011 and 2012. This allowance program applies only to boats with installed fuel tanks that are expected to use carbon canisters to meet the diurnal emission standards. Therefore, it does not apply to portable fuel tanks or personal watercraft. This provision will apply to both small and large businesses because we believe that even large businesses may have specific, small-volume models where additional lead time may be especially helpful due to atypical design constraints. For very small companies, we expect that this allowance program will result in an additional year, or even two, of lead time for them to address potential installation issues related to carbon canisters.

***Fuel Tank ABT and Early Incentive Program*** - We are adopting an ABT program for fuel tank permeation and an early-allowance program for fuel tank permeation. In the proposal, we requested comment on including service tanks in the ABT program. (Service tanks are fuel tanks sold as replacement parts for in-use equipment.) Based on comments received, we do not believe it is appropriate to include such tanks in the ABT program. Equipment manufacturers will be required to demonstrate that their equipment models meet the evaporative emission standards. If the certified equipment uses a fuel tank included in the ABT program, the credits generated were based on a useful life of five years. Therefore, if the tank being replaced is less than five years old, the replacement tank would result in double counting of some of the credits. While manufacturers could potentially gather information to account for the age of the fuel tank being replaced, we do not want to complicate the provisions of the ABT program and therefore we are not including replacement tanks in the fuel tank ABT program.

***Broad Definition of Evaporative Emission Family for Fuel Tanks*** - We are adopting provisions that allow fuel tank emission families to be based on type of material (including additives such as pigments, plasticizers, and UV inhibitors), emission control strategy, and production methods. This would allow fuel tanks of different sizes, shapes, and wall thicknesses can be grouped into the same emission family (see §1045.230 and §1054.230). In addition, Small SI and Marine SI fuel tanks could be allowed in the same emission family if the tanks meet these criteria. Manufacturers therefore will be able to broadly group similar fuel tanks into the same emission family and then only test the configuration most likely to exceed the emission standard.

***Compliance Progress Review for Marine Fuel Tanks*** - We believe the 2012 fuel permeation standards are technologically feasible for rotationally-molded marine fuel tanks. This conclusion is supported by data presented in the Regulatory Impact Analysis. In addition, several rotationally-molded tank manufacturers support EPA's proposed standards and implementation dates and have provided information to support their positions. However, several other rotationally-molded tank manufacturers are not as far along in their technological progress toward meeting the standards and are not certain about their ability meet the EPA requirements in 2012. To address this situation, these manufactures requested that EPA perform a technical review in 2010 to determine whether the compliance dates should be adjusted. However, for the reasons discussed above, we believe that the tank permeation standards have been demonstrated to be technologically feasible in the 2012 time frame and do not look favorably upon the request for a technology review of the permeation standard.

Nevertheless, we are concerned about the potential long-term impacts on the small businesses that have not yet developed technology that meets the requirements. During the next few years, EPA intends to hold periodic progress reviews with small businesses that rotationally mold fuel tanks. The purpose of these progress reviews will be to monitor the progress of individual companies towards compliance with the tank permeation standards and to provide feedback as needed. Rather than conducting a broad program with the entire industry, we will conduct separate, voluntary reviews with each interested company. These sessions will be instrumental to EPA in following the progress for these companies and assessing their efforts and potential problems.

To help address small business concerns, we expect we would rely on the small volume manufacturer hardship relief provisions contained in 40 CFR 1068.250, and described in the following section. In the event that a small business is unsuccessful in the 2012 model year and seeks hardship relief, the progress reviews described above would provide an important foundation in determining whether a manufacturer has taken all steps to comply with the permeation standards in a timely and orderly manner.

***Design-Based Certification*** - We are adopting design-based certification for carbon canisters for boats. For the carbon canisters, the design requirement call for a ratio of carbon volume (liters) to fuel tank capacity (gallons) of 0.04 liter/gallon for boats less than 26 feet in length, and 0.016 liter/gallon for larger boats. We are also adopting design-based certification for certain fuel tanks. For fuel tanks, we will allow design-based certification for metal tanks as well as plastic fuel tanks with a continuous EVOH barrier.

The National Marine Manufacturers Association (NMMA) the American Boat and Yacht Council (ABYC) and the Society of Automotive Engineers (SAE) have industry recommended practices for boat designs that must be met as a condition of NMMA membership. We will allow this data to be used as part of EPA certification as long as it is collected consistent with the test procedures and other requirements described in this final rule.

***Additional Lead Time for Small SI Fuel Hose Requirement*** - We proposed an implementation date of 2008 for Small SI hose permeation standards for non-handheld

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equipment (see §90.127). Given that we are not adopting the final rule until mid-2008, we have delayed the implementation of the low permeation fuel line requirement until 2009 for nonhandheld equipment. However, we are keeping the 2009 implementation date for low-permeation fuel line for small businesses producing Small SI nonhandheld equipment. We believe the 2009 date is feasible for all equipment manufacturers, given that fuel line meeting the low permeation standards is already widely available and manufacturers selling most types of nonhandheld equipment in California were required to use such hose starting in 2007 or 2008.

### **10.7.4 Hardship Provisions—Regulatory Flexibility Options for Engine, Equipment, Vessel, and Fuel System Component Manufacturers**

The following section summarizes the hardship provisions we are adopting which would be available to engine manufacturers, equipment manufacturers, vessel manufacturers, and fuel system component manufacturers (i.e., fuel tank, fuel hose, and fuel cap manufacturers).

***Unusual Circumstances Hardship*** - Under the unusual circumstances hardship provision, manufacturers can apply for hardship relief if circumstances outside their control cause the failure to comply and if failure to sell the subject engines or equipment will jeopardize the company's solvency (see §1068.245). The terms and time frame of the relief will depend on the specific circumstances of the company and the situation involved. As part of its application for hardship, a company will be required to provide a compliance plan detailing when and how it will achieve compliance with the standards. This hardship provision will be available to all business engine manufacturers, equipment manufacturers, vessel manufacturers, and fuel system component manufacturers, regardless of size.

***Economic Hardship*** - Under the economic hardship provision, small business manufacturers can petition EPA for limited additional lead time to comply with the standards (see §1068.250). A manufacturer will have to make the case that it has taken all possible business, technical, and economic steps to comply, but the burden of compliance costs will have a significant impact on the company's solvency. Hardship relief may include requirements for interim emission reductions and/or purchase and use of emission credits. The length of the hardship relief will be established during the initial review and will likely need to be reviewed annually thereafter. As part of its application for hardship, a company will be required to provide a compliance plan detailing when and how it will achieve compliance with the standards. This hardship provision will be available only to engine manufacturers, equipment manufacturers, vessel manufacturers, and fuel system component manufacturers that are small businesses.

## **10.8 Projected Economic Effects of the Rulemaking**

The following section summarizes the economic impact on small businesses of the new exhaust and evaporative emission standards for both Small SI engines and equipment and Marine SI engines and vessels. As noted earlier, the types of companies that will be affected by the new Marine SI standards include OB/PWC engine manufacturers, SD/I engine manufacturers, boat builders, and marine fuel system component manufacturers (e.g., fuel tank and fuel hose

manufacturers). Similarly, the types of companies that will be affected by the Small SI standards include nonhandheld engine manufacturers, equipment manufacturers, and Small SI fuel system component manufacturers (e.g., fuel tank and fuel hose manufacturers). For the purposes of this analysis, it is assumed that engine manufacturers will bear the cost of complying with the exhaust emission standards, whereas equipment manufacturers and vessel manufacturers will bear the cost of complying with the evaporative emission standards.

To gauge the impact of the new standards on small businesses, EPA employed a cost-to-sales ratio test to estimate the number of small businesses that would be impacted by less than one percent, between one and three percent, and above three percent. The costs used in this analysis are based on the cost estimates developed in Chapter 6 of this Final RIA with the exception of the costs used for Small SI engine and equipment manufacturers. A description of the inputs used for each affected industry sector (except small SI engine and equipment manufacturers) and the methodology used to develop the estimated impact on small businesses in each industry sector is presented in the docket for this rulemaking.<sup>2</sup>

For small SI engine and equipment manufacturers, we relied on the costs from the proposal instead of the final rule. The basic cost inputs for the final rule (e.g., the cost of the various technologies, the number of engine and equipment models, etc.) have not changed from the proposal. However, recent certification data suggests that a number of Class II engines may be able to comply with the standards without the use of a catalyst. Our cost analysis for the final rule reflects this change and results in significantly lower costs for Class II. Because we project that more than half of the engines in Class II will use catalysts, but we do not know which engines small business equipment manufacturers will purchase for their equipment, we believe it is appropriate to continue using the higher costs associated with the proposal rather than the final rule cost numbers in gauging the potential costs of the new standards on small manufacturers. We believe this approach will result in an overestimation of the impacts (i.e., a conservative estimate) of the new standards on small SI engine and equipment manufacturers.

For OB/PWC engine manufacturers, EPA identified two small businesses. One of the small businesses identified by EPA manufactures personal watercraft today using four-stroke engines with certified emission levels below the new standards, so we project negligible incremental costs resulting from our rule. The other small business manufactures outboard engines. Several of their currently certified engines already comply with the new standards, while the remaining engines would need to be recalibrated, which we project would cost on the order of less than \$10 per engine. Given the cost of personal watercraft and outboard engines, we therefore believe the impact of the rule is well below one percent of revenues for both of these OB/PWC engine manufacturers.

For <373 kW SD/I engine manufacturers, EPA identified nine small businesses. Of these companies, eight produce conventional SD/I engines and the remaining one company produces SD/I engines for airboats. Of the conventional SD/I small business engine manufacturers, five of the small businesses may incur compliance costs between one and three percent of their annual revenues. Three of the small businesses that produce <373 kW SD/I engines as part of a much broader line of work (such as engine rebuilding or selling land-based engines) will be impacted

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by less than one percent of annual revenues.

Using available information for the airboat engine manufacturer, we project that the manufacturer will have compliance costs between one and three percent of annual revenues. Some of this company's engines are >373 kW, so their estimated compliance burden reflects a combination of costs for conventional SD/I engines and for high-performance >373 kW engines. (They are included in the conventional SD/I category for this impact analysis.) This company is unique in that it manufactures many of its engines for sale to other airboat manufacturers, resulting in a concentrated cost impact relative to their revenues.

We also identified a number of other airboat manufacturers. These small businesses making engines for airboats are less reliant on selling engines to other boat builders, instead making engines for the boats they build themselves. Most of these businesses are very small, with little ability to marshal the technical resources needed to comply with emission standards. If these companies would take on the effort to design and certify compliant engines, they would likely experience compliance costs exceeding three percent of their revenues. However, given their place in the market and the fact that they are primarily boat builders with the resourcefulness to make their own engines, we believe the most likely approach for these companies is to buy a certified engine from manufacturers of conventional SD/I engines. As such, these companies would be treated with other boat builders, in which case their main compliance cost is related to evaporative emissions (as described below). We therefore do not consider any of these companies as engine manufacturers for the purposes of analyzing the impact of the new standards on engine manufacturers.

For >373 kW SD/I engine manufacturers, EPA identified 19 small businesses. Of the >373 kW SD/I small business engine manufacturers, all of the small businesses are projected to be impacted by less than one percent of annual revenues.

For boat builders, EPA believes there are over 1,000 small business manufacturers. Many of these companies make small numbers of vessels for certain segments of the marine market. Given the high cost of most boats, EPA believes the cost impact will be below one percent for all small business boat builders, including those that manufacture SD/I vessels, and OB/PWC boat manufacturers as well.

While boat builders have the primary responsibility under the new regulations for complying with evaporative emission standards, fuel hose and fuel tank manufacturers will have to certify their product with EPA. EPA has identified one small business that manufactures fuel hose for marine applications and 14 small businesses that manufacture fuel tanks for marine applications. The company producing fuel hose primarily distributes hoses made by other manufacturers but does produce its own fill neck hose. Because we expect vessel manufacturers will design their fuel systems such that there will not be standing liquid fuel in the fill neck (and therefore the new low permeation fuel hose requirements will not apply to the fill neck), we have not included this manufacturer in our analysis. Of the 14 fuel tank manufacturers, EPA has estimated that all of them will incur costs below one percent of annual revenues.

For Small SI engine and equipment manufacturers, EPA has identified 370 small businesses.<sup>3</sup> Ten of the small businesses are engine manufacturers and the remaining companies are equipment manufacturers. Based on an analysis of sales revenues by company, EPA projects that 314 of the small businesses are estimated to incur compliance costs representing less than 1 percent of their annual revenues. EPA projects that 38 companies will incur compliance costs between 1 and 3 percent of their annual revenues, and 18 companies will incur compliance costs representing more than 3 percent of their annual revenues.

Similar to the requirements noted above for boat manufacturers under the Marine SI evaporative emission regulations, equipment manufacturers will have the primary responsibility under the regulations for complying with the Small SI evaporative emission standards. However, fuel hose and fuel tank manufacturers will have to certify their product with EPA. EPA has identified two small businesses that manufactures fuel hose for Small SI applications and 25 small businesses that manufacturer fuel tanks for Small SI applications. Of these companies, EPA has estimated that all of these companies will incur costs below one percent of annual revenues.

Table 10.8-1 summarizes the impacts of the new regulations on small businesses impacted by the exhaust and evaporative emission standards for Small SI engines and equipment and Marine SI engines and vessels.

Table 10.8-1: Summary of Impacts on Small Businesses

Market Sector	0-1 percent	1 - 3 percent	> 3 percent
Manufacturers of Marine OB/PWC engines	2	0	0
Manufacturers of Marine SD/I engines < 373 kW	4	5	0
Manufacturers of Marine SD/I engines > 373 kW (high-performance)	19	0	0
Boat Builders	>1,000	0	0
Manufacturers of Fuel Hose and Fuel Tanks for Marine SI Vessels	14	0	0
Small SI engines and equipment	314	38	18
Manufacturers of Fuel Hose and Fuel Tanks for Small SI Applications	27	0	0
<b>Total</b>	380 plus >1,000 boat builders	43	18

After considering the economic impacts of today's final rule on small entities, we believe

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this action will not have a significant economic impact on a substantial number of small entities. The small entities directly regulated by this final rule cover a wide range of small businesses including engine manufacturers, equipment manufacturers, boat manufacturers, fuel tank manufacturers, and fuel hose manufacturers. Small governmental jurisdictions and small organizations as described above will not be impacted. We have determined that the estimated effect of the rule is to impact 43 companies with costs between one and three percent of revenues, and 18 additional companies with costs over three percent of revenues. These 61 companies represent less than 5 percent of the total number of small businesses impacted by the new regulations. All remaining companies (over 1,000 of them) would be impacted with costs by less than one percent of revenues. It should be noted that this estimate is based on the highest level of estimated cost in the first years of the program. We estimate substantially lower long-term costs as manufacturers learn to produce compliant products at a lower cost over time.

For a complete discussion of the economic impacts of the final rulemaking, see Chapter 9, the Economic Impact Analysis chapter, of this Final Regulatory Impact Analysis.

**Chapter 10 References**

1. Final Panel Report of the Small Business Advocacy Review Panel on EPA's Planned Proposed Rule—Control of Emissions from Nonroad Spark-Ignition Engines and Equipment, October 17, 2006. (A copy has been placed in docket EPA-HQ-OAR-2004-0008.)
2. “Small Business Impact Memo, Control of Emissions from Nonroad Spark-Ignition Engines and Equipment - Determination of No SISNOSE,” EPA memorandum from Phil Carlson to Alex Cristofaro, March 13, 2008. (Docket Identification EPA-HQ-OAR-2004-0008-\_\_\_\_.)
3. “Small Entity Analysis of Small Spark Ignition Nonroad Engine and Equipment Manufacturers,” memorandum from Alex Rogozhin and Brooks Depro, RTI Interational, to Phil Carlson, U.S. EPA, December 15, 2006. (Docket Identification EPA-HQ-OAR-2004-0008-0541.)