MEMORANDUM

Subject: Response to Public Comments on Proposed National Emission Standards for Hazardous Air Pollutants for Existing Stationary Reciprocating Internal Combustion Engines Located at Area Sources of Hazardous Air Pollutant Emissions or Have a Site Rating Less Than or Equal to 500 Brake HP Located at Major Sources of Hazardous Air Pollutant Emissions

From: Melanie King, Energy Strategies Group

To: EPA Docket EPA-HQ-OAR-2008-0708

Date: August 10, 2010

On March 5, 2009, the Environmental Protection Agency (EPA) proposed national emission standards for hazardous air pollutants (NESHAP) for stationary reciprocating internal combustion engines (RICE) that are either located at area sources of hazardous air pollutant (HAP) emissions or that have a site rating of less than or equal to 500 brake horsepower (HP) and are located at major sources of HAP emissions in 40 CFR part 63, subpart ZZZZ. EPA also proposed national emission standards for hazardous air pollutants for existing stationary compression ignition (CI) engines greater than 500 brake HP that are located at major sources of HAP emissions. It is important to note that the proposed rule covered both CI and spark ignition (SI) engines. The final rule is being promulgated in two parts. The first action covered CI engines only and was published in the Federal Register on March 3, 2010 (75 FR 9648). The comments on the proposed standards for CI engines and the responses to those comments were summarized in a separate document. The purpose of this document is to present a summary of the public comments that EPA received on the proposed standards for SI engines and the responses developed. This summary of comments and responses serves as the basis for revisions made to the standards between proposal and promulgation.

EPA received 199 public comments on the proposed rule. A listing of all persons submitting comments, their affiliation, and the Document ID for their comments is presented in Table 1. The comments can be obtained online from the Federal Docket Management System at http://www.regulations.gov. The docket number for this rulemaking is EPA-HQ-OAR-2008-0708. In this document, commenters are identified by the last three digits of the Document ID of their comments. Note that as stated above, this document includes the comments related to SI engines only. The comments that pertain to CI engines were summarized and responded to in a separate document (see document number EPA-HQ-OAR-2008-0708-0367 in the rulemaking docket). EPA received additional test data, information, and recommendations after the close of the public comment period; this information can also be obtained from the docket for this rulemaking.

Table 1. List of Commenters on the Proposed National Emission Standards for Hazardous Air Pollutants for Existing Stationary Reciprocating Internal Combustion Engines

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0036	Bo Quick Southwire Company
EPA-HQ-OAR-2008-0708-0038 EPA-HQ-OAR-2008-0708-0062	Jack Maley Director, Fleet Operations Exterran
EPA-HQ-OAR-2008-0708-0039 EPA-HQ-OAR-2008-0708-0180 EPA-HQ-OAR-2008-0708-0242	Stephanie R. Meadows Upstream Senior Policy Advisor American Petroleum Institute (API)
EPA-HQ-OAR-2008-0708-0040 EPA-HQ-OAR-2008-0708-0155	Lisa Beal Director, Environment and Construction Policy Interstate Natural Gas Association of America (INGAA)
EPA-HQ-OAR-2008-0708-0041	Craig S. Harrison Hunton & Williams on behalf of the Utility Air Regulation Group (UARG)
EPA-HQ-OAR-2008-0708-0042	R. L. Bedard
EPA-HQ-OAR-2008-0708-0043	Anonymous
EPA-HQ-OAR-2008-0708-0044	J. Hartz
EPA-HQ-OAR-2008-0708-0045	Mark Sutton Executive Director Gas Processors Association (GPA)
EPA-HQ-OAR-2008-0708-0046	Patrick J. Nugent Executive Director Texas Pipeline Association
EPA-HQ-OAR-2008-0708-0047	Anonymous
EPA-HQ-OAR-2008-0708-0048	Jorge Verde
EPA-HQ-OAR-2008-0708-0050	Quinton Hancock Cree, Inc.
EPA-HQ-OAR-2008-0708-0051	Nancy C. Wrona Director, Air Quality Division Arizona Department of Environmental Quality (ADEQ)
EPA-HQ-OAR-2008-0708-0052	K. W. Breeden Sr.
EPA-HQ-OAR-2008-0708-0053	L. Jordan
EPA-HQ-OAR-2008-0708-0054	Anonymous
EPA-HQ-OAR-2008-0708-0055	Suneet K. Sikka Eastman Chemical Company
EPA-HQ-OAR-2008-0708-0056	Bruce Chrisman Manager of Engineering Cameron's Compression Systems
EPA-HQ-OAR-2008-0708-0057 EPA-HQ-OAR-2008-0708-0059	Gary L. Smith Consulting Engineer Cummings & Smith, Inc.

Document ID	**Commenter/Affiliation**
EPA-HQ-OAR-2008-0708-0058 EPA-HQ-OAR-2008-0708-0060	Gary L. Smith Consulting Engineer Cummings & Smith, Inc.
EPA-HQ-OAR-2008-0708-0061	Dan Popp PM Technologies
EPA-HQ-OAR-2008-0708-0063	Robert L. (Bobby) Myers II Principal Cirrus Consulting, LLC
EPA-HQ-OAR-2008-0708-0064 EPA-HQ-OAR-2008-0708-0070	Chris Mello Program Manager, Rural Energy Alaska Energy Authority (AEA)
EPA-HQ-OAR-2008-0708-0065 EPA-HQ-OAR-2008-0708-0073	Alice Edwards Acting Director Alaska Department of Environmental Conservation Division of Air Quality
EPA-HQ-OAR-2008-0708-0066 Support the comments of EPA-HQ-OAR-2008-0708-0064	Scott Newlun General Manger Yakutat Power
EPA-HQ-OAR-2008-0708-0067	L. Stevens
EPA-HQ-OAR-2008-0708-0068 Support the comments of EPA-HQ-OAR-2008-0708-0064	Keith Berggren Generation Supervisor Inside Passage Electric Cooperative (IPEC)
EPA-HQ-OAR-2008-0708-0069	Ron Sober RFS Consulting, Inc.
EPA-HQ-OAR-2008-0708-0071	Joy Wiecks Air Quality Technician Fond du Lac Band of Lake Superior Chippewa (The Band)
EPA-HQ-OAR-2008-0708-0074	Ken Daubert Plant Superintendent Kapaia Generating Station, Kauai Island Utility Cooperative (KIUC)
EPA-HQ-OAR-2008-0708-0075 Support the comments of EPA-HQ-OAR-2008-0708-0064	Jodi Mitchell Chief Executive Officer (CEO)/General Manager and Keith Berggren Generation Supervisor Inside Passage Electric Cooperative (IPEC)
EPA-HQ-OAR-2008-0708-0076 EPA-HQ-OAR-2008-0708-0114 Supports the comments of EPA-HQ-OAR-2008-0708-0096 EPA-HQ-OAR-2008-0708-0123 EPA-HQ-OAR-2008-0708-0242	David F. Wesson EH&S (Environmental Health and Safety) Global Regulatory Affairs The Dow Chemical Company (Dow)

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0077	Robert E. Williams II Environmental Department FirstEnergy Corporation (FE)
EPA-HQ-OAR-2008-0708-0078	Russ D. Santiago Operations Superintendent, Port Allen Generating Station Kauai Island Utility Cooperative (KIUC)
EPA-HQ-OAR-2008-0708-0079	Bruce D. Alexander Environmental Regulatory Strategies Director Exelon Corporation
EPA-HQ-OAR-2008-0708-0080	Darryl Hoffman Utilities Program Manager Level 3 Communications, Inc.
EPA-HQ-OAR-2008-0708-0081	Kathleen Tobin Manager, Corporate Safety & Environmental Compliance Verizon Communications Inc.
EPA-HQ-OAR-2008-0708-0082	Don C. DiCristofaro CCM, President Blue Sky Environmental LLC
EPA-HQ-OAR-2008-0708-0083	Bruce J. Parker President and Chief Executive Officer (CEO), National Solid Wastes Management Association (NSWMA) and John H. Skinner Executive Director and Chief Executive Officer (CEO) Solid Waste Association of North America (SWANA)
EPA-HQ-OAR-2008-0708-0084 Incomplete Comment (No attachment)	Innoventive Power, LLC & CPower, Inc.
EPA-HQ-OAR-2008-0708-0085 Support the comments of EPA-HQ-OAR-2008-0708-0084	Demand Response Service Providers (DRSP Coalition) Innovative Power, LLC & CPower, Inc.
EPA-HQ-OAR-2008-0708-0086	Vincent St. Angelo Environmental Engineering Babcock & Wilcox Nuclear Operations Group (B&W NOG-L)
EPA-HQ-OAR-2008-0708-0087	Michael Garvin Assistant Vice President Scientific and Regulatory Affairs Pharmaceutical Research and Manufacturers of America (PhRMA)
EPA-HQ-OAR-2008-0708-0088	Michael Bradley Director The Clean Energy Group (CEG)

Document ID	**Commenter/Affiliation**
EPA-HQ-OAR-2008-0708-0089 Supports the comments of EPA-HQ-OAR-2008-0708-0112 EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0242	Kathleen M. Sgamma Director of Government Affairs Independent Petroleum Association of Mountain States (IPAMS)
EPA-HQ-OAR-2008-0708-0090	Steven A. Kent Manager -Standby Generation Industrial Energy Applications, Inc. (IEA)
EPA-HQ-OAR-2008-0708-0091 EPA-HQ-OAR-2008-0708-0096	Joseph L. Suchecki Engine Manufacturers Association (EMA)
EPA-HQ-OAR-2008-0708-0092	Debbie Angotto Facilities Coordinator, on behalf of Thomas L. (surname illegible) Greenwich Hospital, Greenwich, CT
EPA-HQ-OAR-2008-0708-0093 EPA-HQ-OAR-2008-0708-0211	Trina L. Vielhauer Chief, Bureau of Air Regulation Division of Air Resource Management Florida Department of Environmental Protection
EPA-HQ-OAR-2008-0708-0094 EPA-HQ-OAR-2008-0708-0165	Laurel L. Kroack Chief, Bureau of Air Illinois Environmental Protection Agency (Illinois EPA)
EPA-HQ-OAR-2008-0708-0095	Reynaldo Tuazon Utilities Manager Adventist Hinsdale Hospital
EPA-HQ-OAR-2008-0708-0097 EPA-HQ-OAR-2008-0708-0163	Kasey Gabbard Permits & Policy Group NiSource
EPA-HQ-OAR-2008-0708-0098	Brian W. Green Air Quality Specialist RRI Energy, Inc.
EPA-HQ-OAR-2008-0708-0099 Support the comments of EPA-HQ-OAR-2008-0708-0096	Brady Winkleman Caterpillar Inc.
EPA-HQ-OAR-2008-0708-0100 EPA-HQ-OAR-2008-0708-0208 Support the comments of EPA-HQ-OAR-2008-0708-0096	Lynn Palmer Vice President, Engineering Dresser Waukesha
EPA-HQ-OAR-2008-0708-0101 Supports the comments of EPA-HQ-OAR-2008-0708-0104 EPA-HQ-OAR-2008-0708-0111 EPA-HQ-OAR-2008-0708-0112 EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0225 EPA-HQ-OAR-2008-0708-0242	Lee O. Fuller Independent Petroleum Association of America (IPAA) et al.

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0102	Scott W. Snedden HSE Manager Westlake Longview Corporation
EPA-HQ-OAR-2008-0708-0103	John Dutton HSE Committee Chairman Gas Compressor Association (GCA)
EPA-HQ-OAR-2008-0708-0104	Angie Burckhalter Vice President, Regulatory Affairs Oklahoma Independent Petroleum Association (OIPA)
EPA-HQ-OAR-2008-0708-0105 Supports the comments of EPA-HQ-OAR-2008-0708-0155	Orland T. Pylant, Director, Compliance CenterPoint Energy-Mississippi River Transmission Corporation (MRT)
EPA-HQ-OAR-2008-0708-0106 Supports the comments of EPA-HQ-OAR-2008-0708-0155	Laura L. Guthrie Manager, Air Program CenterPoint Energy Field Services, Inc. (CEFS)
EPA-HQ-OAR-2008-0708-0107	Phil Kairis Vice President Energy Alternatives
EPA-HQ-OAR-2008-0708-0108	Bruce Chrisman Manager, Engineering Cameron's Compression Systems
EPA-HQ-OAR-2008-0708-0109	Mark A. Young Executive Director Lowell Regional Wastewater Utility (LRWWU)
EPA-HQ-OAR-2008-0708-0110	Union Pacific Railroad Company
EPA-HQ-OAR-2008-0708-0111	Frank Mortl President/Chief Executive Officer (CEO) Michigan Oil And Gas Association (MOGA)
EPA-HQ-OAR-2008-0708-0112 Supports the comments of EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0242	Johnny Dreyer Director of Industry Affairs Gas Processors Association (GPA)
EPA-HQ-OAR-2008-0708-0113 EPA-HQ-OAR-2008-0708-0222	John P. Duraes President New England Healthcare Engineers' Society (NEHES)
EPA-HQ-OAR-2008-0708-0115	Christopher Collins Source Water Manager Pawtucket Water Supply Board (PWSB)
EPA-HQ-OAR-2008-0708-0116	G. Vinson Hellwig Michigan and Robert H. Colby Chattanooga, Tennessee, Co-Chairs, Air Toxic Committee National Association of Clean Air Agencies (NACAA)

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0117	Anonymous
EPA-HQ-OAR-2008-0708-0118	Robin Seguin CHMM, Environmental Manager, Qwest Risk Management Qwest
EPA-HQ-OAR-2008-0708-0119 EPA-HQ-OAR-2008-0708-0143	Marie Robinson Chairperson, National Telecommunications Safety Panel (NTSP) AT&T Services, Inc.
EPA-HQ-OAR-2008-0708-0120	Matt Shields Milford Facilities Manager Milton Cat
EPA-HQ-OAR-2008-0708-0121	Valerie Ughetta Director, Stationary Sources Alliance of Automobile Manufacturers
EPA-HQ-OAR-2008-0708-0122 Supports the comments of EPA-HQ-OAR-2008-0708-0155	John B. Kuhn Global Air Leader Celanese Corporation
EPA-HQ-OAR-2008-0708-0123 EPA-HQ-OAR-2008-0708-0134	Jim Griffin Senior Director American Chemistry Council (ACC)
EPA-HQ-OAR-2008-0708-0124 EPA-HQ-OAR-2008-0708-0235	Tim Knox Vice President, Engineering and Production Compressor Systems, Inc. (CSI)
EPA-HQ-OAR-2008-0708-0125	Martin E. Rock, P.E., J.D. President & Senior Principal OMNI Professional Environmental Associates, P.A.
EPA-HQ-OAR-2008-0708-0126	F. William Brownell and Craig S. Harrison Hunton & Williams LLP on behalf of the Utility Air Regulatory Group (UARG)
EPA-HQ-OAR-2008-0708-0127	Julie Frazier Senior Environmental Specialist Butler County Water and Sewer Department (BCWS)
EPA-HQ-OAR-2008-0708-0128 Supports the comments of EPA-HQ-OAR-2008-0708-0155	Nicholas DeMarco Executive Director West Virginia Oil and Natural Gas Association
EPA-HQ-OAR-2008-0708-0129	Cathy Waxman Manager Air Quality Compliance, National Grid
EPA-HQ-OAR-2008-0708-0130	Steve Hensley Senior Director Regulatory Affairs USA Rice Federation
EPA-HQ-OAR-2008-0708-0131	John Dutton Manager, Operations J-W Power Company

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EPA-HQ-OAR-2008-0708-0132	Gerald Meinecke Vice President - Procurement & Compression Exterran
EPA-HQ-OAR-2008-0708-0133	Jim Griffin Senior Director American Chemistry Council (ACC)
EPA-HQ-OAR-2008-0708-0135	R. J. Riley Texas Agriculture Energy Users Association (TAEUA) and Texas Corn Growers Association
EPA-HQ-OAR-2008-0708-0136 EPA-HQ-OAR-2008-0708-0237 Supports the comments of EPA-HQ-OAR-2008-0708-0045 EPA-HQ-OAR-2008-0708-0046 EPA-HQ-OAR-2008-0708-0104 EPA-HQ-OAR-2008-0708-0242	Darren Smith Manager, Environmental Health and Safety (EHS) Devon Energy Corporation
EPA-HQ-OAR-2008-0708-0137	Tim Knox Vice President Engineering and Production Compressor Systems, Inc. (CSI)
EPA-HQ-OAR-2008-0708-0138 Supports the comments of EPA-HQ-OAR-2008-0708-0101 EPA-HQ-OAR-2008-0708-0104	Gregory D. Russell Vorys, Sater, Seymour and Pease LLP on behalf of Ohio Oil and Gas Association (OOGA)
EPA-HQ-OAR-2008-0708-0139	Craig Eckberg NRG Energy, Inc.
EPA-HQ-OAR-2008-0708-0140	Golder Associates Inc. on behalf of David A. Buff Principal Engineer Mosaic Fertilizer LLC (Mosaic)
EPA-HQ-OAR-2008-0708-0141	John Preczewski P.E., Assistant Director State of New Jersey Department of Environmental Protection (NJDEP)
EPA-HQ-OAR-2008-0708-0142	Michael S. Dae Wellfield and Environmental Compliance Manager Energy Developments, Inc. (EDI)
EPA-HQ-OAR-2008-0708-0144	Richard T. Wolbach CEM, Department of Physical Plant The University of Vermont (UVM)
EPA-HQ-OAR-2008-0708-0145 Supports the comments of EPA-HQ-OAR-2008-0708-0155	Debra A. Ristig Vice President, Engineering and Compliance CenterPoint Energy Gas Transmission Company (CEGT)

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0146	Karl M. Bhatnagar, P.E., ESH&M, Air Quality Northrop Grumman, Aerospace Systems (NGAS)
EPA-HQ-OAR-2008-0708-0147	David A. Buff Principal Engineer, Golder Associates Inc. on behalf of The Florida Sugar Industry (FSI)
EPA-HQ-OAR-2008-0708-0148	Ethan W. Hinkley Environmental Compliance Specialist, Air Quality Red Cedar Gathering Company
EPA-HQ-OAR-2008-0708-0149	Kathryn Garcia Commissioner New York City Department of Environmental Protection (NYCDEP)
EPA-HQ-OAR-2008-0708-0150 Supports the comments of EPA-HQ-OAR-2008-0708-0112 EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0242	Patrick J. Nugent Executive Director Texas Pipeline Association (TPA)
EPA-HQ-OAR-2008-0708-0151 Supports the comments of EPA-HQ-OAR-2008-0708-0112 EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0242	Bruce Thompson President American Exploration and Production Council (AXPC)
EPA-HQ-OAR-2008-0708-0152	Shannon S. Broome Air Permitting Forum
EPA-HQ-OAR-2008-0708-0153	Marilyn Leland Executive Director Alaska Power Association
EPA-HQ-OAR-2008-0708-0154	Robert D. Bessette President Council of Industrial Boiler Owners (CIBO)
EPA-HQ-OAR-2008-0708-0156	Kevin D. Bailey Air Compliance Supervisor ExxonMobil Production Company
EPA-HQ-OAR-2008-0708-0157 EPA-HQ-OAR-2008-0708-0096 EPA-HQ-OAR-2008-0708-0123 EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0221 EPA-HQ-OAR-2008-0708-0242	Debra J. Jezouit and Megan Berge Baker Botts L.L.P. on behalf of Class of '85 Regulatory Response Group
EPA-HQ-OAR-2008-0708-0158	Terry L. Steinert Environmental Compliance Manager Koch Carbon, LLC (Koch Carbon)

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0159 Supports the comments of EPA-HQ-OAR-2008-0708-0257	Mary Uhl Chief, Air Quality Bureau (AQB) New Mexico Environment Department (NMED)
EPA-HQ-OAR-2008-0708-0160 EPA-HQ-OAR-2008-0708-0257	Cynthia Finley Director, Regulatory Affairs National Association of Clean Water Agencies (NACWA)
EPA-HQ-OAR-2008-0708-0161	Dave Copeland Manager, Air Quality, Corporate Safety & Environmental Services Praxair, Inc.
EPA-HQ-OAR-2008-0708-0162	Kathryn R. Ross Senior Environmental Planner Consumers Energy Company
EPA-HQ-OAR-2008-0708-0164	Mary Uhl Air Quality Bureau New Mexico Environment Department (Incomplete)
EPA-HQ-OAR-2008-0708-0166	Andy Ly, PE CEM Director, Facilities Management & Planning, Energy Administration & Operations Boston University (BU)
EPA-HQ-OAR-2008-0708-0167 Supports the comments of EPA-HQ-OAR-2008-0708-0121 EPA-HQ-OAR-2008-0708-0154	Lawrence W. Kavanagh Vice President American Iron and Steel Institute (AISI) and Bruce A. Steiner President American Coke and Coal Chemicals Institute (ACCCI)
EPA-HQ-OAR-2008-0708-0168 Supports the comments of EPA-HQ-OAR-2008-0708-0126	William T. Horton Senior Environmental Specialist Environmental Health and Safety Air Management Duke Energy Corporation (Duke Energy)
EPA-HQ-OAR-2008-0708-0169	Rick N. Soucy Senior Project Manager GZA GeoEnvironmental, Inc.
EPA-HQ-OAR-2008-0708-0170	Mark Macarro Tribal Chairman Pechanga Band of Luiseno Indians (Tribe)
EPA-HQ-OAR-2008-0708-0171	Mark J. Sedlacek Director Environmental Services Los Angeles Department of Water and Power (LADWP)
EPA-HQ-OAR-2008-0708-0172	Kerwei Sew Senior Environmental Engineer, Environmental Operations 3M Company

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0173 Supports the comments of EPA-HQ-OAR-2008-0708-0206	T. Moser Chairman, Strategic Team and Resource Sharing (STARS) Integrated Regulatory Affairs Group
EPA-HQ-OAR-2008-0708-0174	Mark Maslyn Executive Director, Public Policy American Farm Bureau Federation (AFBF)
EPA-HQ-OAR-2008-0708-0175 Supports the comments of EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0241	Pamela A. Lacey Senior Managing Counsel American Gas Association (AGA)
EPA-HQ-OAR-2008-0708-0176	Deirdre K. Hirner Executive Director Illinois Environmental Regulatory Group (IERG) et al.
EPA-HQ-OAR-2008-0708-0177	Shawne C. McGibbon Acting Chief Counsel for Advocacy and Keith Holman Assistant Chief Counsel for Environmental Policy, Office of Advocacy U.S. Small Business Administration (SBA)
EPA-HQ-OAR-2008-0708-0178	Lisa Goldberg Director, Environment, Safety and Health Aerospace Industries Association of America (AIA)
EPA-HQ-OAR-2008-0708-0179	Marilyn Crockett Executive Director Alaska Oil and Gas Association (AOGA)
EPA-HQ-OAR-2008-0708-0181 EPA-HQ-OAR-2008-0708-0243	Scott Davis Director, Environmental, Health & Safety Arizona Public Service (APS)
EPA-HQ-OAR-2008-0708-0182	Shawn Wade Director, Communications Plains Cotton Growers, Inc. (PCG)
EPA-HQ-OAR-2008-0708-0183	Don Mark Anthony Air Quality Engineer Alyeska Pipeline Service Company (Alyeska)
EPA-HQ-OAR-2008-0708-0184	Jack F. Alvey Vice President, Generation Indiana Municipal Power Agency (IMPA)
EPA-HQ-OAR-2008-0708-0185	Earl C. Burke Facilities Engineering Manager Baltimore Washington Medical Center (BWMC)

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0186 Supports the comments of EPA-HQ-OAR-2008-0708-0112 EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0242	William W. (Bill) Grygar II Environmental and Regulatory Manager Anadarko Petroleum Corporation
EPA-HQ-OAR-2008-0708-0187 Supports the comments of EPA-HQ-OAR-2008-0708-0096 EPA-HQ-OAR-2008-0708-0155	Karen St. John Director, Regulatory Affairs BP America Inc. (BP)
EPA-HQ-OAR-2008-0708-0188	Steve Donatiello, P.E. Senior Environmental Engineer Laclede Gas Company
EPA-HQ-OAR-2008-0708-0189	Rick A. Kress President Southern Gardens Citrus Holding Corporation
EPA-HQ-OAR-2008-0708-0190	Stuart Latham Manager, Land and Environmental Southern Star Central Gas Pipeline, Inc. (Southern Star)
EPA-HQ-OAR-2008-0708-0191 EPA-HQ-OAR-2008-0708-0239 Supports the comments of EPA-HQ-OAR-2008-0708-0083 EPA-HQ-OAR-2008-0708-0126 EPA-HQ-OAR-2008-0708-0155	Skiles Boyd Vice President, Environmental Management and Resources DTE Energy
EPA-HQ-OAR-2008-0708-0192	Terry Steinert Koch Carbon LLC
EPA-HQ-OAR-2008-0708-0193	James D. Jones Senior Consultant, EHS Services North America Alcoa Inc.
EPA-HQ-OAR-2008-0708-0194	Larry LeJeune Director, Pesticide and Environmental Programs Division, Office of Agricultural and Environmental Sciences Louisiana Department of Agriculture and Forestry
EPA-HQ-OAR-2008-0708-0195	Michael L. R. Housley President Legacy Energy Group, LLC
EPA-HQ-OAR-2008-0708-0196	Sarah E. Amick Environmental Counsel Rubber Manufacturers Association (RMA)
EPA-HQ-OAR-2008-0708-0197 Supports the comments of EPA-HQ-OAR-2008-0708-0126	Nilaksh Kothari General Manager Manitowoc Public Utilities (MPU)
EPA-HQ-OAR-2008-0708-0198	Bernard Milam Energy Manager University of Maryland Medical Center (UMMC)

Document ID	**Commenter/Affiliation**
EPA-HQ-OAR-2008-0708-0199	Joseph Kubsh Executive Director Manufacturers of Emission Controls Association (MECA)
EPA-HQ-OAR-2008-0708-0200 Supports the comments of EPA-HQ-OAR-2008-0708-0242	Michelle Koch HES (Health/Environment/Safety) Professional Marathon Oil Corporation
EPA-HQ-OAR-2008-0708-0201	Chad Gregory Senior Vice President United Egg Producers (UEP)
EPA-HQ-OAR-2008-0708-0202	Theresa Pfeifer Regulatory Compliance Officer Metro Wastewater Reclamation District
EPA-HQ-OAR-2008-0708-0203	Caroline Choi Director, Energy Policy & Strategy Progress Energy
EPA-HQ-OAR-2008-0708-0204	Jon E. Kallen Manager, Environmental Policy and Strategy MidAmerican Energy Holdings Company
EPA-HQ-OAR-2008-0708-0205 Supports the comments of EPA-HQ-OAR-2008-0708-0155	Michael Tomko Counsel, Parsons Behle & Latimer on behalf of Utah Industry Environmental Coalition (UIENC)
EPA-HQ-OAR-2008-0708-0206	Amy Van Kolken Banister Senior Director, Air and Landfill Gas Programs and Kerry Kelly Director, Federal Public Affairs Waste Management (WM)
EPA-HQ-OAR-2008-0708-0207 EPA-HQ-OAR-2008-0708-0126	John C. Butler Director, Operations Support Nuclear Energy Institute (NEI)
EPA-HQ-OAR-2008-0708-0209	Stephen R. Gossett, P.E. Senior Environmental Associate Eastman Chemical Company (ECC)
EPA-HQ-OAR-2008-0708-0210 Supports the comment of EPA-HQ-OAR-2008-0708-0155	Vincent L. Brindley Principal Environmental Engineer El Paso Pipeline Group
EPA-HQ-OAR-2008-0708-0212	G. William Fowler Attorney, on behalf of the West Texas Gas Inc. (WTG)
EPA-HQ-OAR-2008-0708-0213	Ed Torres Director of Technical Services Orange County Sanitation District (OCSD)
EPA-HQ-OAR-2008-0708-0214	Brian Bonnell Senior Manager, Strategic Sourcing and Procurement Human Genome Sciences

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0215	Hilary Sinnamon Consultant Environmental Defense Fund (EDF)
EPA-HQ-OAR-2008-0708-0216 Supports the comments of EPA-HQ-OAR-2008-0708-0088 EPA-HQ-OAR-2008-0708-0157 EPA-HQ-OAR-2008-0708-0207	Rayburn L. Butts Director, Environmental Services Florida Power and Light Company (FPLC)
EPA-HQ-OAR-2008-0708-0217	Michael Hutcheson Ameren Corporation
EPA-HQ-OAR-2008-0708-0218 EPA-HQ-OAR-2008-0708-0233 Supports comments of EPA-HQ-OAR-2008-0708-0155	Everette Johnson Director, Engineering Cameron Compression Systems
EPA-HQ-OAR-2008-0708-0219	Dan Pugliese Director, Engineering Hines
EPA-HQ-OAR-2008-0708-0220	Cathy S. Formigoni Legal Assistant, Hodge Dwyer & Driver on behalf of Illinois Municipal Electric Agency (IMEA)
EPA-HQ-OAR-2008-0708-0221 Supports the comments of EPA-HQ-OAR-2008-0708-0112 EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0242	Deb Hastings Vice President, Environmental Affairs Texas Oil and Gas Association (TXOGA)
EPA-HQ-OAR-2008-0708-0223	Elizabeth A. Rubino SVP Human Resources QVC
EPA-HQ-OAR-2008-0708-0224 Supports the comments of EPA-HQ-OAR-2008-0708-0155	Edward L. Kropp Chair, Air Subcommittee, Environmental Committee West Virginia Chamber of Commerce
EPA-HQ-OAR-2008-0708-0225	Deborah Seligman Vice President, Governmental Affairs New Mexico Oil & Gas Association (NMOGA)
EPA-HQ-OAR-2008-0708-0226	Shawne C. McGibbon Acting Chief Counsel and Kevin Bromberg Assistant Chief Counsel, Environmental Policy, Office of Advocacy Small Business Administration (SBA)
EPA-HQ-OAR-2008-0708-0227	Quinn V. Kilty Manager Air/Water, Xcel Energy, Inc.
EPA-HQ-OAR-2008-0708-0228	Eric L. Riser Jorden Bischoff & Hiser PLC Counsel for Nucor Corporation

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0229	Carl H. Batliner Director, Environmental Affairs AK Steel Corporation
EPA-HQ-OAR-2008-0708-0230	Andrew C. Lawrence Director, Office of Nuclear Safety, Quality Assurance and Environment, Office of Health, Safety and Security U.S. Department of Energy (DOE)
EPA-HQ-OAR-2008-0708-0231 Supports the comments of EPA-HQ-OAR-2008-0708-0112 EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0242	John Robitaille Vice President Petroleum Association of Wyoming (PAW)
EPA-HQ-OAR-2008-0708-0232	David R. Bell Sustainability Engineer, Facilities Supervisor Becton Dickinson Diagnostic Systems Baltimore Campus
EPA-HQ-OAR-2008-0708-0234 Supports the comments of EPA-HQ-OAR-2008-0708-0112 EPA-HQ-OAR-2008-0708-0155	Ann W. McIver QEP, Director, Environmental Stewardship Citizens Gas
EPA-HQ-OAR-2008-0708-0236	John Quinn Director, Environmental Issues Constellation Energy
EPA-HQ-OAR-2008-0708-0238 EPA-HQ-OAR-2008-0708-0248 EPA-HQ-OAR-2008-0708-0252	Karl M. Kyriss President Aqua America, Inc.
EPA-HQ-OAR-2008-0708-0240	Bruce R. Byrd Vice President and General Counsel-Washington AT&T Services, Inc.
EPA-HQ-OAR-2008-0708-0241 Supports comments of EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0175	William D. Schrand Administrator, Environmental Programs Southwest Gas Corporation
EPA-HQ-OAR-2008-0708-0244 Supports the comments of EPA-HQ-OAR-2008-0708-0112 EPA-HQ-OAR-2008-0708-0155	Richard Bye Director, Environmental Services CenterPoint Energy, Inc.
EPA-HQ-OAR-2008-0708-0245	Ronald J. Schott Esq. Senior Corporate Counsel, Environment, Health and Safety Wyeth
EPA-HQ-OAR-2008-0708-0246	Jim Valentine Combustion Components Associates, Inc. (CCA)

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0247 Supports the comments of EPA-HQ-OAR-2008-0708-0126 EPA-HQ-OAR-2008-0708-0155 EPA-HQ-OAR-2008-0708-0175	Pamela F. Faggert Vice President and Chief Environmental Officer Dominion Resources Services, Inc.
EPA-HQ-OAR-2008-0708-0249	Kenneth D. Schisler Senior Director, Regulatory Affairs EnerNOC, Inc. (EnerNOC)
EPA-HQ-OAR-2008-0708-0250	Michael A. Caldarera Vice President, Regulatory and Technical Services National Propane Gas Association (NPGA)
EPA-HQ-OAR-2008-0708-0251	Marielle Daniels Manager, Patient Care Regulation Connecticut Hospital Association (CHA)
EPA-HQ-OAR-2008-0708-0253 EPA-HQ-OAR-2008-0708-0258 EPA-HQ-OAR-2008-0708-0260	Sean M. O'Keefe Director, Environmental Affairs Alexander & Baldwin, Inc. (A&B)
EPA-HQ-OAR-2008-0708-0255	John Otto Engineering Manager Brush Resources, Inc.
EPA-HQ-OAR-2008-0708-0256	Craig Wysong EHS Manager CARBO Ceramics, Inc.
EPA-HQ-OAR-2008-0708-0259	John Prescott Executive Vice President and General Manager Power Resources Cooperative (PRC)
EPA-HQ-OAR-2008-0708-0261	Michael H. Bernard President Mid-Continent Oil and Gas Association of Oklahoma (MCOGAO)
EPA-HQ-OAR-2008-0708-0262	Ed Hasely, Sr. Environmental Engineer Energen Resources
EPA-HQ-OAR-2008-0708-0263	Michael J. Kelly Director, Facilities Management University of Massachusetts Memorial Medical Center (UMassMMC)
EPA-HQ-OAR-2008-0708-0264	Chelly Reesman Environmental Engineer J.R. Simplot Company
EPA-HQ-OAR-2008-0708-0265	Scott Salisbury President Landfill Energy Systems

Document ID	Commenter/Affiliation
EPA-HQ-OAR-2008-0708-0267	Jeffrey A. Smith Lead Environmental Scientist, Infrastructure Maintenance Division South Florida Water Management District
EPA-HQ-OAR-2008-0708-0268	Peter H. Zeliff President and CEO Innovative Energy Systems
EPA-HQ-OAR-2008-0708-0269	Louisiana Farm Bureau Federation

Summary of Public Comments and Responses

The summary of public comments and responses is organized as follows:

9.4 Other

10.0 Recordkeeping, Reporting and Notifications

11.0 Docket Materials/Transparent Regulatory Process

12.0 Rule Impacts
- 12.1 Economic Impacts
- 12.2 Environmental/Health Impacts
- 12.3 Cost of Controls
- 12.4 Implementation and Enforcement
- 12.5 Energy Impacts
- 12.6 Small Businesses

13.0 Miscellaneous
- 13.1 Definitions
- 13.2 Clarifications
- 13.3 Errors
- 13.4 Discrepancies
- 13.5 Other

1.0 General Approach

1.1 Comment: A few commenters (61, 94, 116) support EPA's proposed rulemaking. One commenter (94) supports EPA's proposed actions to reduce exhaust pollutants from existing stationary RICE that are located at area sources of HAP emissions and certain existing stationary RICE and stationary compression ignition (CI) engines that are located at major sources of HAP emissions. One commenter (116) commended the EPA for proposing a regulation that will reduce HAP and diesel emissions from the RICE source category.

Response: No response is needed.

1.2 Comment: A few commenters (155, 224 and 242) are concerned with how the proposed rulemaking is in some cases the first in addressing recent Court decisions. Some of the recent issues include the following:

- The Brick maximum achievable control technology (MACT) decision determined that EPA must set standards for HAP and cannot avoid standards in cases when the MACT floor is no control,
- The Brick MACT decision indicated that EPA has to consider the range of emission level associated with the best performing sources; and
- The rejection of the startup, shutdown and malfunction (SSM) exemption meaning that HAP emission standards must apply continuously. The Court expressed the need for some standard, but this does not mean an unchanging standard.

The proposed rule is setting a precedent, but the commenters (155, 242) noted that there is no clear evidence of how EPA considered integrating these decisions into the rulemaking. Regarding the MACT floor decisions, the commenters (155, 242) believe the floor was based on flawed and deficient data. The commenters (155, 242) do not believe EPA has considered emissions variability. For SSM limits, the commenters (155, 242) said that EPA has set limits without any data from actual SSM events. The importance of integrating these Court decisions warrants considerable additional effort by EPA for this rulemaking, the commenters (155, 242) said. Commenters 155 and 242 specifically addressed each particular issue in separate comments, but noted that the issues reach beyond this rulemaking and will convey the Agency's perspective that may be applied to future rulemakings. For these reasons, the commenters (155, 242) firmly believe that EPA should provide guidance material to communicate to the public the Agency's interpretation of Court decisions and how those will be incorporated into future rules.

<u>Response</u>: EPA understands the commenters' concerns with respect to recent court decisions affecting how the regulations for existing stationary engines at area sources and existing stationary engines less than or equal to 500 HP at major sources were developed. The U.S. Court of Appeals for the District of Columbia Circuit on March 13, 2007 vacated EPA's MACT standards for the Brick and Structural Manufacturing category (40 CFR part 63, subpart JJJJJ). This is referred to as the "Brick MACT decision" (<u>Sierra Club</u> v. <u>EPA</u>, 479 F.3d 875 (D.C. Cir. 2007).) EPA recognizes that it had limited emissions data when it developed the MACT floor standards for the proposed rule. EPA has on several occasions requested emissions data from industry and solicited data in the preamble to the proposed rule. However, EPA had to propose emission standards based on what data was available at the time. During the public comment

period and the months following the close of the public comment period, EPA has worked with various groups and been able to gather additional emissions test data for stationary engines. EPA has reviewed the original emissions test data used to develop the proposed standards to ensure that engines were properly identified and categorized, as well as to determine if there was any other information that may indicate that the data was used inappropriately at proposal.

For the proposed MACT floor for existing engines at major sources, EPA selected the best performing 12 percent of sources it had emissions data for within each engine subcategory. Commenters argued that EPA's approach at proposal did not consider emissions variability. The approach at proposal counted each emissions test as a single data point. This meant that for cases where an engine was tested multiple times, the MACT floor may have included multiple data points from one engine, but only one data point from another engine. Commenters argued that this approach does not sufficiently take into account emissions variability or potentially inappropriately skews the MACT floor toward the one engine that was tested multiple times because with multiple data points emissions from that engine would have more weight in the top 12 percent. EPA believes that it is appropriate to use a different approach for incorporating emissions variability in the final standards. Subsequently, EPA has reanalyzed the available emissions data and considered different ways of taking into account the range of emissions that can occur. EPA discussed the final approach in setting the MACT floor limits more extensively in the memo entitled "MACT Floor and MACT Determination for Existing Stationary SI RICE ≤500 HP Located at Major Sources."

Regarding the proposed SSM limits, EPA received numerous concerns from affected stakeholders on a range of issues. These issues are discussed in Section 3.0. EPA is not finalizing particularized numerical emission limits specifically for periods of SSM, but is issuing operational standards for periods of startup and including periods of shutdown and malfunction within the emission standards that generally apply to the various subcategories of stationary SI engines. The reasons for the approach we take in the final rule are discussed in the responses to comments in Section 3.0.

EPA plans to make implementation and compliance material available to the regulated community following the promulgation of this rule. However, EPA cannot promise that such material will include the Agency's interpretation of Court decisions and how those will be used in future rules.

1.3 Comment: Several commenters (89, 93, 101, 104, 112, 129, 150, 151, 172, 186, 221, 231, 242, 261, 264) noted concerns due to a complex proposed rulemaking and some commenters added that it is extra problematic to implement due to previous rulemakings issued that affect similar and sometimes the same engines. One commenter (242) noted that it has a number of outstanding and unresolved petitions submitted to EPA on the CI NSPS and SI new source performance standards (NSPS)/NESHAP, where it has questions concerning implementation and enforcement of those rules. There is ongoing confusion among State and regional agencies in implementing these rules, something that is exacerbated by EPA's lack of response and guidance on several implementation questions, the commenter (242) said. According to the commenter (242), the inclusion of natural gas engines with diesel engines in this rulemaking will lead to a further increase in unresolved, issues complicating rule requirements and implementation. For example, for the SI NSPS/NESHAP, the commenter (242) pointed out various issues, which included a discussion on the integration of risk-based criteria for area source engines under the NESHAP. For that rulemaking, compliance with the NESHAP was mostly shown by demonstrating compliance with the NSPS, therefore it seems the comment went largely unanswered by EPA, the commenter (242) said. The commenter (242) indicated that it was hoping EPA would address this issue in this rulemaking, but has not. In general, the commenter (242) recommended that EPA develop and publish substantive compliance tools and provide assistance in interpreting rule requirements from multiple overlapping engine rules.

Commenters 89, 101, 151, 221, 231 stated that the rules are complex because of their overlap with and references to the mobile source engine rules (i.e., for automobiles, boats, construction equipment, etc.). The commenters (89, 101, 151, 221, 231) believe that the mobile source rules are not well understood by the agencies and industries involved with the stationary source rules, and added that EPA has done little to aid the agencies and industry in understanding these rules. Additionally, the commenters (89, 101, 151, 221, 231) believe that EPA should delay promulgation of these rules until compliance assistance material can be developed to aid the state agencies and regulated community in their compliance efforts.

One commenter (112) in the natural gas industry stated the member companies in his organization are interpreting and complying with five sweeping new federal engine regulations that have been promulgated in the last several years, which include 40 CFR part 63, subpart ZZZZ, the consolidated engine rule - MACT, subpart ZZZZ amendments for small engines, the consolidated engine rule – Generally Available Control Technology (GACT), subpart ZZZZ amendments for area source engines, 40 CFR part 60, subpart JJJJ (SI NSPS), and 40 CFR part 60, subpart IIII (CI NSPS).

Two commenters (112, 150) contended that each of these engine regulations has brought significant changes to control requirements, training, monitoring, recordkeeping, and reporting. In addition, the commenter (112) pointed out that both the Consolidated Engine Rule and the CI

NSPS are still under litigation by API. The commenter (112) believes that the proposed regulations add tremendously to the current requirements by bringing existing engines under the rules with more stringent requirements than new or reconstructed sources. The commenter (112) stated that its member companies have serious concerns with interpreting the complex current and proposed compliance requirements and asked that EPA attempt to simplify existing federal engine rule requirements before the SI rules are finalized.

The commenter (112) noted that determining applicability of the rule requires companies to define engines as existing, new, or reconstructed, which is difficult, and often impossible, primarily because records that are required to determine if the engine has been reconstructed may be on multiple authorizations for expenditures (AFEs) or may simply not exist. The commenter (112) said that most, if not all, states have preconstruction authorizations that require companies to begin the permitting process well in advance of commencement of construction. The permitting process is complicated because specific regulatory requirements cannot be determined until the unit is overhauled and the final invoices are received, according to commenter 112. Frequently, engines are leased and returned to distributors and later purchased or leased by other companies and records get lost or possibly never obtained or maintained, making it nearly impossible for the new owner to establish a complete life history of an engine, commenter 112 added. Commenter 112 also pointed out that competing companies may be reluctant or unwilling to share their records with new owners. Also, in absence of sufficient documentation, some companies may make the conservative assumption that the rule applies, while others will assume by lack of documentation that the rule does not apply, the commenter (112) said.

Two commenters (112 and 150) said that a modified engine could be "new" under NSPS and "existing" under NESHAP because NESHAP considers only reconstruction and not modification, whereas NSPS considers both reconstruction and modification.

The commenter (112) additionally indicated that subpart ZZZZ is already very complex due to the numerous cross references to the mobile source regulations in 40 CFR parts 90 and 1068, as well as the 2008 amendments that added requirements for new small lean burn engines at major sites. The commenter (112) believes that adding this proposed major amendment to cover existing sources would make subpart ZZZZ even more difficult for both regulatory agencies and industry to interpret and for those who are subject, to comply. To simplify the proposed regulation, several commenters (89, 101, 112, 151, 221, 231, 242) recommended a new separate section, subpart ZZZZa. Commenter 261 suggested a similar separation of subsections and that EPA should delay promulgation until compliance assistance material can be developed to aid the State agencies and regulated community in their compliance efforts.

One commenter (112) in the natural gas industry objected that the proposed rules are inflexible and the requirements are difficult with minimal or no added environmental benefit. The commenter (112) stated that the member companies in his organization are concerned with the overly prescriptive nature of the proposed requirements, particularly as they relate to testing, maintenance practices, reporting, and recordkeeping requirements.

One commenter (104) in the oil and gas industry stated that the proposed rule requires a person with significant knowledge and experience with Clean Air Act (CAA) laws and rules in order to fully evaluate and understand the proposed rule. The commenter (104) was very concerned that many small businesses that operate crude oil and natural gas facilities, especially those that operate marginal wells, do not have the knowledge or the level of experience to fully understand and evaluate the proposed rule, and determine the impacts to their operations. The commenter (104) noted that the majority of the upstream crude oil and natural gas facilities have low emissions that fall below air permitting thresholds, and as such, are not familiar with air requirements. The commenter (104) was concerned that EPA will not receive feedback from many operators, especially the smaller businesses/companies who will be directly impacted by the proposed rule.

Commenter 150 said that the complexity has been exacerbated by the fact that the applicability of some requirements is uncertain due to ongoing litigation. The commenter (150) believes that the proposed rules will add to the complexity by bringing in existing engines. The commenter (150) gave the following examples of instances when it will be difficult to determine which rules apply to which engines:

- Applicable requirements are different depending on whether an engine had or had not been reconstructed. Making that determination would be difficult or impossible in some cases because records may be hard to locate and hard to access or they may no longer exist.
- Requirements may differ based on whether a source is a major source or minor source. As engines were added or subtracted, the facility's status could vary, and so could the applicable rules. In this regard, the commenter (150) believes that EPA should allow a facility sufficient time to come into compliance when a facility's status changes due to addition or removal of equipment. The commenter (150) proposed a 3-year compliance period, which the commenter said was done in the NESHAP for natural gas transmission and storage [40 CFR 63.1270(d)(1)].

One commenter (93) provided an 18-page applicability flow chart to illustrate the permitting and compliance applicability requirements for the subject engines. The commenter (93) reported that differing state agency flow charts and guidance materials reviewed by them (Texas and Nebraska) have reached different interpretations regarding the applicability of the proposed rule. The commenter (93) stated that this highlights concerns regarding the rule's complexities, which the commenter believed could result in inconsistent implementation throughout the country. The commenter (93) further reported that it had received numerous telephone calls from consultants outside of Florida asking for the commenter's interpretation of the proposed changes in an effort to gain a general consensus of the states on the rule's applicability. For example, a new category was proposed for existing emergency SI engines with a site rating of less than or equal to 500 HP located at a major source of HAP. The commenter (93) reported that they were able to determine the emission and operating limitations, maintenance requirements and equipment needed. However, they stated that the compliance requirements (40 CFR 63.6630 Table 5 in the Appendix) are clearly identified for only a few specific engine categories and then appear to group the rest of the engine categories in one large category of engines with a site rating of less than or equal to 500 HP located at a major source of HAP. The commenter (93) expressed that it is unclear if this large category is meant to be inclusive or exclusive of the remaining specific engines categories, such as emergency engines and SI engines.

The commenter (93) recommended that EPA revise the NESHAP to specify all the applicable requirements under a given engine category subheading. The commenter (93) opined that, this way, applicability would then only need to be determined once for each engine category as the applicable requirements (emissions and operating limitations, general compliance requirements, etc.) would be specified by regulated engine category.

Response: The engines that are subject to the NSPS are new engines and are not the focus of this rulemaking. EPA, therefore, does not believe that those issues will affect this rulemaking. EPA notes that it is required to promulgate standards for new engines under section 111 NSPS provisions and for new and existing engines under section 112 NESHAP provisions. Much of the complications commenters discuss results from the straightforward implementation of the requirements of the Clean Air Act. In terms of having a combined rulemaking for natural gas and diesel engines, EPA does not think that this complicates the rule. Issuing a rulemaking that addresses all types of stationary engines regardless of fuel type is consistent with how the original 2004 RICE NESHAP was developed.

It is not true that there are multiple overlapping engine rules for existing engines. This rule addresses engines that have not been addressed before, i.e., existing stationary engines at area sources and existing stationary engines less than or equal to 500 HP at major sources. EPA has not issued regulations for these engines previously, but noted in earlier final rules that EPA would be addressing these engines in the future. Since the final CI NSPS and SI NSPS rules covered only new stationary engines and the original 2004 RICE NESHAP covered only stationary engines at major sources greater than 500 HP, there are no other requirements affecting existing stationary engines at area sources. There are also no other requirements affecting existing stationary engines less than or equal to 500 HP located at major sources since again, the CI NSPS and SI NSPS rules covered only new stationary engines and the original 2004 RICE NESHAP covered only stationary engines at major sources greater than 500 HP.

Commenters expressed concern regarding overlap and references to mobile sources rules. It is not clear what the commenters' concerns are because there are minimal references to the mobile source regulations in the proposed rule. EPA recognizes that individual owners and operators may not be familiar with the mobile source requirements. That is one reason why this rulemaking is focused on source-specific requirements and is not a manufacturer-based program. In the NSPS rules for new CI and SI stationary engines it made sense to implement a program that addresses emissions from engines at the point of manufacturing rather than when these engines are installed in the field, and to coordinate the requirements for new stationary engines with requirements for similar new mobile engines. The coordination of mobile and stationary engine requirements has in fact reduced the complexity of meeting EPA regulations for these new engines, since manufacturers and users of such engines can comply by meeting the same standards whether they are mobile or stationary.

In this regulation, since it affects existing stationary engines, the engines are already located at the affected source. EPA has made reference to the mobile source rules only when absolutely necessary in order to demonstrate that for example certain control technologies or fuels are currently available and technically feasible. Other references include citing parts of 40 CFR part 80, which contain the specifics of the fuel requirements for existing non-emergency diesel engines. Therefore, it is unclear what references to the mobile source rules the commenters are referring that are problematic.

EPA cannot delay promulgation of the final rule due to a court-ordered schedule requiring EPA to finalize the regulation by August 10, 2010. As discussed elsewhere in this document, EPA has already previously delayed the rulemaking affecting existing stationary engines at area sources and existing stationary engines less than or equal to 500 HP at major sources.

In the final rule, EPA has made an effort to promulgate requirements that are as clear as possible and that minimize the burden of implementing these requirements. In conjunction with the promulgation of the final rule, EPA is publishing this Response to Comments (RTC) Document, which summarizes the comments EPA received on the proposed rule and EPA's responses to each comment. The RTC document explains and provides supporting rationale for EPA's regulatory decisions. The document is also helpful as a compliance assistance tool in cases where commenters have asked for clarification on certain issues. Further, EPA also plans to provide other compliance assistance and implementation material to help sources in demonstrating compliance with the final rule.

As far as the comment regarding the compliance period when a facility's status changes from a minor to a major source, EPA already includes provisions in 63.6595(b) of the rule that allows an area source that becomes a major source, where construction or reconstruction is commenced before the date the area source becomes a major of HAP, up to 3 years to comply with the rule. EPA believes this addresses the commenter's concern on this issue.

1.4 Comment: Numerous commenters (38, 39, 41, 42, 45, 46, 130, 194, 205) believe that the comment period provided in the proposal was inadequate. Two commenters (45, 46) requested a 90-day extension to the public comment period for the proposed rule, to August 3, 2009. The commenters (45, 46) believe that due to the breadth of coverage and implications for thousands of existing RICE, the proposed 60-day comment deadline is entirely inadequate to assess implications, review background documentation, and develop comments supported with complete technical data and facts. The commenters (45, 46) asserted that, in light of the pending EPA proposed rule that addresses Mandatory Reporting of Greenhouse Gases (GHGs) and affects the same stakeholders, failure to grant an extension will undermine the ability to provide necessary comments and respond effectively to either rule proposal. One commenter (39) requested an additional 90 days to comment in order to develop a more comprehensive analysis and subsequent comment submittal to EPA. Commenter 40 agreed with commenter 39, but said that if a 90-day extension was not provided that at least 60 days be provided.

The commenter (45) added that it will take time to fully assess the implications of the proposed rule because it affects thousands of smaller engines at area source facilities that historically have been considered exempt or inconsequential emission sources. The commenter (45) asserted that his organization's historical comments have been consistent with the administration goal of science-based decision making, and that a limited comment period will compromise scientific integrity in the decision making for the proposed rule. The commenter (45) understands that EPA's schedule is constrained by a commitment to develop a final diesel engine rule, but believes that if a 90-day extension cannot be accommodated, at least an additional 60-days extension (i.e., 120 days total) is necessary. In the alternative, the commenter (45) suggested removing natural gas-fired engines from the proposal (see Section 1.2). Commenter 38 supported a 60-day extension.

Due to the breadth of coverage and implications for thousands of existing engines, two commenters (41, 42) believe that the 60-day comment deadline is inadequate to assess implications, review background documentation, and develop comments substantiated with technical data and facts. Additionally, in order to prepare joint comment for its member companies, the commenter (41) must coordinate among its member companies, making location of relevant information and preparation of comments on the proposal in 60 days difficult.

One commenter (194) requested on behalf of the agricultural industry in its state that EPA allow further consideration and review time to allow a more detailed comment to be submitted.

Response: EPA provided a 30-day extension to the public comment period to allow additional time for commenters to prepare and submit their comments. EPA could not provide additional time beyond the 30 days due to the court-ordered deadline for the final rule of August 10, 2010. In addition, EPA attempted to the best of its ability to review information that came to the Agency from the public after the end of the comment period.

1.5 Comment: Five commenters (89, 101, 151, 221, 231) stated that it is critically important that EPA enter into a deliberative, well-informed dialogue with the oil and natural gas industry so that regulations can be formulated that are both protective of the environment and conducive to existing and future oil and natural gas production activities.

Response: EPA agrees that it is important to involve different affected stakeholders during regulation development. EPA has a long history of actively engaging various segments of industry during the process of rule development. This rulemaking is no different and EPA has met with members of industry on several occasions. EPA has also contacted different industry groups and individual companies with an interest in this rulemaking by phone and email to obtain information on various issues related to stationary engines from control technology feasibility to the cost of installing and operating such controls, as well as to gather emissions data from stationary engines.

1.6 Comment: Two commenters (176, 220) expressed that it is inappropriate for EPA to use section 112 of the CAA to target non-HAP pollutants. The commenter (176) opined that EPA addresses criteria pollutants, both in terms of the degree to which such pollutants are emitted from these types of engines, and the benefits that the proposed compliance requirements would have on criteria pollutants to justify regulation of engines located at area sources that have minimal impact on urban areas from HAP emissions.

Response: EPA is not using the CAA to target non-HAP pollutants from existing stationary RICE, but is applying the use of a surrogate for HAP emissions from certain engines. Measuring emissions of HAP is in many cases much more expensive than measuring surrogate emissions and setting a standard in terms of a single pollutant would mean simpler and cheaper emissions testing. Formaldehyde is the HAP emitted in the largest quantity from stationary RICE and is related to the level of other HAP emissions. Therefore, formaldehyde is an appropriate representation of HAP emissions. EPA studied emissions data to determine if CO would be representative of HAP emissions. Because EPA determined that there is a relationship between CO and formaldehyde for certain engine types, EPA is using CO as a surrogate for HAP emissions for these engines. Also, while EPA’s standards are based on HAP reductions, there is no reason to ignore the co-benefits of the rule in terms of reduction in non-HAP pollutants when calculating the benefits of the rule.

1.7 Comment: One commenter (69) opposes the proposed rulemaking because it imposes a tremendous hardship on the regulated community; strains the resources needed to demonstrate and/or achieve compliance, and is of marginal benefit, particularly for the oil and gas industry. The commenter (69) suggests that the proposal rule should be stayed indefinitely, or at least phased until a more favorable economic time.

Response: EPA is required by statute to develop regulations for all existing stationary engines to address HAP emissions under sections 112(d), 112(c)(3) and 112(k) of the CAA. To the extent possible, EPA has attempted to minimize the burden on the regulated community, but EPA does not believe that the requirements are significantly burdensome. EPA does not have the option to delay the rulemaking due to consent decrees requiring EPA to finalize and issue the regulation by August 10, 2010.

1.8 Comment: One commenter (220) proposed an alternative approach for regulating non-emergency units based on a nitrogen oxides (NO_x) rulemaking in Illinois for the Chicago and Metro-East nonattainment areas. In that rulemaking sources may elect to comply by designating their units as low-use with operational limitations of no more than 8 million HP-hrs/yr or NO_x emissions less than 100 tons per year (tpy). Using AP-42 factors, the latter low-use option translates to an effective cap on HAP emissions of approximately 94 pounds per year, per municipality.

Response: The commenter did not provide any information to support the comment that an emissions cap or limitation on operating hours would be appropriate as MACT for engines located at major sources or GACT for engines located at area sources.

1.9 Comment: Several commenters (45, 46, 81, 97, 111, 112, 128, 130, 132, 150, 155, 175, 186, 205, 224, 225, 242, 247) expressed concern over a combined rulemaking with natural gas and diesel engines and felt that a separate rulemaking and potential schedule should be developed for natural gas engines. Some commenters (155, 186, 242, 247) said that the information supporting the rule focuses on diesel particulate benefits and does not sufficiently address benefits associated with natural gas engines. In addition, the docket contains less information on gas engines than diesel engines, commenter 155 said. For this reason, the commenters (132, 155, 175, 242, 247) believe that the rule is focused on diesel engines and that a separate rule based on data should be developed for natural gas engines. One commenter (81) said that the regulations should specifically exempt non-diesel engines. This would allow a more reasonable time for EPA to decide if it is necessary to promulgate rules for other engines and if so, to draft rules that deal appropriately with issues that those engines may have, according to the commenter (81)

The commenters (155, 242) referred to how the Advanced Notice of Proposed Rulemaking (ANPRM) had discussed emissions from stationary diesel engines and that it did not expect a rule to be issued for natural gas engines following the same timeline as the diesel engine consent decree. In other words, the commenter (155) indicated that it was surprised by the proposed rule affecting natural gas engines and had it known, it would have been actively involved and in touch with EPA during the process of developing the proposal. The commenter (155) also noted that the ANPRM provided an opportunity for EPA to receive new diesel data, but that EPA is using the same, old data for gas engines. The proposed rulemaking is based on insufficient and flawed data for gas engines and the commenter (155) offered to assist EPA in addressing data gaps and other issues. However, the commenters 155 and 242 pointed out, such effort will take time. Commenters 155 and 242 recommended that EPA consider a different schedule for gas engines in order to gather sufficient and appropriate data and conduct a more thorough analysis on impacts, costs and benefits. This will allow EPA to engage stakeholders in the rule development process and to obtain appropriate information to support the rulemaking, commenters 155 and 242 expressed.

A few commenters, including commenters 132, 155, and 242 indicated that they are willing to assist EPA in collecting additional data for natural gas engines, but that such an effort will be difficult to complete and it would be hard to incorporate the data resulting from such an effort into a rule that has to be finalized by February 2010. The commenter (242) offered to work with EPA to develop a plan to obtain test data and to come up with a revised rulemaking schedule for natural gas engines. Multiple commenters, including commenters 97, 132, 155, and 242 asked that EPA negotiate a different schedule for natural gas engines and commenters 155 and 242 asked that EPA develop a separate rulemaking for these engines. The commenter (132) believes that a minimum of 10 to 12 months is required to collect the emissions data, which includes; 60 days to develop and finalize a test plan, six to eight months for testing to occur, and 60 days to develop a project test report.

The commenters (155, 242) added that EPA's current review and revision of the Integrated Risk Information System (IRIS) unit risk estimate (URE) for formaldehyde further supports the need for a separate rulemaking for natural gas engines. One commenter (224) suggested that EPA await the results on the ongoing formaldehyde URE review before adopting area source standards for natural gas-fired engines. The commenter (224) stated that EPA recently concluded that a lower URE is the current "best science" for formaldehyde, which is the primary HAP of concern from natural gas-fired engines. The commenter (224) further noted that area source standards are specifically established to reduce the risk to public health from area source emissions in urban areas, so the URE of formaldehyde is relevant to the proposed emission limits for area sources.

Formaldehyde constitutes a large portion of the HAP emissions from natural gas engines. EPA's review is not expected to be completed until late 2011 and the risk and urban source impacts due to formaldehyde emissions could be significantly impacted by the IRIS review, the commenters (155, 242) said. The outcome of the IRIS review may indicate a large reduction in the URE for formaldehyde leading to a reduced risk associated with natural gas engines and may also question the need for regulation.

One commenter (225) believes that the current rulemaking timeline is too short to properly consider all of the issues raised by the commenters. The commenter (225) asserted that this proposed rule lacks supporting data in critical areas, and would have a significant impact on industry. Given that the current schedule would have the final rule promulgated in February 2010 with compliance required by February 2013, the commenter (225) suggested that the rule be reconsidered and these areas addressed.

One commenter (45) who requested an extension of the comment period for the proposed rule (see Section 1.1) recommended that EPA remove the natural gas-fired engines from the proposed rule if EPA believes that the court-ordered schedule for diesel engines precludes granting such an extension. The commenter (45) pointed out that the inflexible consent decree schedule requiring a February 2010 final rule only applies to diesel engines, and EPA elected to include natural gas RICE in the proposed rule. Thus, the commenter (45) believes that the specific deadline for non-diesel engines is self-imposed, and alternatives are available to provide a more reasonable opportunity for stakeholders to prepare constructive comments by choosing a different timeline for natural gas-fired engines. The commenter (45) stated that in this way, EPA will be provided an opportunity to engage affected stakeholders in the rule process to obtain credible information and support for emission limits, MACT floor determinations, and cost data that at present appear to be limited in scope and questionable in at least some cases. A second commenter (46) similarly recommended that, given a choice between (1) imposing unnecessarily tight deadlines on the comment period related to non-diesel engines based on a consent decree that does not relate to non-diesel engines, and (2) excluding non-diesel engines from this rulemaking, EPA should choose the latter.

These two commenters (45 and 46), whose initial comments focused on requesting extension of the commenter period, subsequently submitted substantive comments (112 and 150, respectively). The two commenters (112, 150) further emphasized that the rulemaking process related to natural gas-fired engines should be separated from the diesel engine rulemaking process so that more thorough consideration can be given to the proposed gas-fired engine standards. The commenters (112, 150) gave following reasons that the SI portion of the rule should be delayed:

- Legal challenges [API petitions for review on the CI NSPS and consolidated SI engine rule (SI NSPS (40 CFR part 60, subpart JJJJ and RICE NESHAP (40 CFR part 63, subpart ZZZZ))] related to key issues implicated by the proposed rules have yet to be resolved.
- The supporting docket material is limited and incomplete.

- The proposed rules would significantly affect a large number of SI engines.

  Commenter 112 asserted that EPA has greatly underestimated the breadth and scope of this rule and there has been very little or no dialogue with the multitude of industries that will be affected. The commenter (112) believes that the current timeline is too short to educate those to be impacted and implement the required management practices and maintenance, recordkeeping, and reporting requirements. Commenter 150 added that rules that would have such an impact should receive a thorough review of economic impact and technical feasibility. The commenter (150) believes that the timeline is too short to properly consider all the important and precedent-setting issues related to natural gas-fired engines.
- Commenter 112 also believes that the SI engine rulemaking should be separated from the CI rule because EPA has defined the MACT floor for SI engines lower than the courts have required.

Commenter 112 added that although EPA is required by recent Court Consent Decrees to finalize the SI area source rules, there is good reason not to finalize by February 10, 2010 because no party is well served by the promulgation of a standard that is unattainable and has an unacceptable cost/benefit ratio. Several commenters, including commenters 112 and 186 recommended that EPA negotiate with the Sierra Club to provide for an extended timeline so that all parties can better evaluate the assumptions in this proposal prior to promulgation of the final rule.

One commenter (111) pointed out that the proposed rule lumps together natural gas-fired SI engines with diesel/CI engines, unlike the 2008 NSPS/NESHAP "new engine" rule. Because natural gas-fired SI engines are much cleaner burning and do not emit the metallic HAP and particulates associated with diesel/CI engines, the commenter (111) questioned the entire basis for the cost/benefit analysis since the majority of RICE in the analysis were CI (78 percent or 1 million) versus SI (22 percent or 290,000).

One commenter (175) pointed out that in order to achieve a 75 percent reduction in cancer incidence attributable to HAP from stationary sources, the EPA is required by the CAA to ensure that area sources representing 90 percent of the emissions of the 30 urban HAP are subject to regulation. Information according to one study[1] shows that the toxicity (cancer potency) of diesel emissions in a range from 38 to 81 times greater than the toxicity of natural gas emissions. To apply identical control requirements on diesel and natural gas engine emissions is to erroneously equate their toxicity, in the commenter's (175) opinion. Therefore, the economic impact on operators of natural gas-fired engines would far exceed the emissions reduction benefit and consequently the commenter (175) believes that EPA should conduct a reasoned analysis of actual emissions, toxicity, and appropriate controls for natural gas-fired engines.

<u>Response</u>: EPA initially proposed requirements for existing stationary engines located at area sources of HAP emissions and existing stationary engines less than or equal to 500 HP located at major sources of HAP emissions on June 12, 2006 (71 FR 33804). Therefore, it should come as no surprise that EPA intended to address emissions from existing stationary engines that were not included as part of EPA's first stationary engine rulemaking in 2004 in 40 CFR part 63, subpart ZZZZ, which include natural gas engines. (40 CFR part 63, subpart ZZZZ addressed emissions from stationary engines greater than 500 HP located at major sources of HAP

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[1] South Coast Air Quality Management District Staff Report, Proposed Rule 1194 – Commercial Airport Ground Access, August 2000.

emissions.) After the proposal of the 2006 rulemaking, the U.S. Court of Appeals for the District of Columbia Circuit issued a ruling, which impacted EPA's ability to finalize the proposed standards of "no reduction" MACT standards for existing sources. Sierra Club v. EPA, 479 F.3d 875 (D.C. Cir. 2007). EPA discussed in the preamble to the final rule that was published on January 18, 2008 (73 FR 3568) that EPA planned to reevaluate the MACT floors for existing stationary engines located at area sources of HAP emissions and existing stationary engines less than or equal to 500 HP located at major sources of HAP emissions. EPA informed the public in the final rulemaking in 2008 that a separate rulemaking would be developed to address HAP emissions from these sources that would likely be proposed in early 2009. Therefore, the timeline of a rulemaking for natural gas engines should not be a surprise. The commenters should have anticipated a rulemaking and EPA believes that industry has had ample time to participate in the development of the proposed rule.

EPA has over the past several years encouraged industry to submit stationary engine emissions data under various rulemakings. Industry has had the opportunity to provide emissions data over the last few years. EPA specifically asked commenter 242 in early 2007 if the commenter had any stationary engine testing data. At that time, commenter 242 had indicated that it was working on a testing program and would have engine test data available. Commenter 242 also indicated at that time that a rich burn engine test program might be developed in conjunction with other groups in order to collect data from rich burn engines with NSCR (EPA-HQ-OAR-2005-0030-0269).

Nonetheless, in order to provide additional time post-proposal for the submittal of emissions data and other supporting information as requested by the commenters, EPA received a 6-month extension of the deadline for signature of the final rule for SI engines, from February, 2010 to August, 2010. As a result, EPA received several documents providing further data for SI engines and EPA was able to use these documents in promulgating this final rule.

Regarding the comment related to the current review of the URE for formaldehyde, EPA does not have the ability to wait until results are available from that study. EPA is under court-order deadline to finalize the rule by August 2010 and was not able to delay finalizing the rule until the formaldehyde URE review is complete. The consent decree that affects existing stationary engines located at area sources and existing stationary engines less than or equal to 500 HP at major sources requires a final rule by August 10, 2010. So EPA must finalize requirements for all engines, including natural gas engines. Moreover, as formaldehyde is a listed hazardous air pollutant and section 112(d) of the CAA regulations are primarily technology-based, not risk based, and as stationary RICE emit several pollutants in addition to formaldehyde, it is not clear that waiting for such results would have any impact on the final regulations.

EPA does not believe that the legal challenges that the commenters refer to regarding the CI and SI NSPS rules will prevent or impact EPA in finalizing appropriate requirements in the NESHAP for natural gas engines and a delay in the natural gas portion of the rule is not necessary.

1.10 Comment: Several commenters (89, 101, 103, 130, 136, 151, 155, 167, 172, 187, 221, 224, 226, 231, 241, 242) said that EPA should attempt to harmonize the proposed rule requirements with requirements in the other stationary engine rules (2004 RICE NESHAP, CI NSPS, SI NSPS, and 2008 RICE NESHAP revisions) in order to simplify the implementation process.

According to commenter 155, owners/operators of the stationary engine rules have experienced issues with implementing these rules.

The commenter (242) thinks that EPA should simplify and harmonize the various engine rules to simplify the implementation and enforcement process. As mentioned, the regulated community has been having issues and a hard time implementing the various engine rules that have been issued by EPA over the years since 2004 when the first engine rule was published. This proposed rulemaking will add to the confusion with competing requirements and other issues, the commenter (242) said. EPA should revisit rule requirements and think about options to harmonize requirements across rulemakings, the commenter (242) recommended. The commenter (242) referred to EPA simplifying the reporting and recordkeeping requirements for engines subject to the NESHAP (new and reconstructed) under the 2008 rulemaking. Those engines were allowed to demonstrate compliance by meeting the NSPS. However, the current proposal affecting existing engines will result in these existing engines having more onerous recordkeeping and reporting requirements than what is required for new engines, the commenter (242) said. In addition, existing engines will in some cases have more stringent emission limits than new engines, the commenter (242) noted. The commenter (242) suggested that EPA think about separating the requirements for existing area sources and existing small engines at major sources into a new subpart (e.g., subpart ZZZZa). In the new subpart, EPA could clearly indicate that only certain provisions of 40 CFR part 63, subpart A GP (GP) apply to these engines so that similar reporting, recordkeeping and maintenance requirements apply for the NSPS and subpart ZZZZa affected engines, the commenter (242) recommended.

Commenter 136 noted that the 2004 RICE MACT and 2008 Consolidated NSPS and NESHAP engine rule and this proposed rule are inconsistent; for example, the proposed standards for some existing RICE are more stringent than the recent emission standards for new/reconstructed RICE. Commenters 130 and 136 believe that EPA should allow areas source RICE that require control to comply with the NSPS requirements in lieu of NESHAP requirements. Further, the commenter (136) urged that EPA simplify and harmonize the rules to avoid contradictions and minimize the potential for compliance and enforcement confusion.

One commenter (103) stated that the requirements for all of the different rules (original 40 CFR part 63, subpart ZZZZ; part 60, subpart JJJJ; and now revised part 63, subpart ZZZZ) are overly burdensome. The commenter (103) indicated that EPA should consider having standards for area sources that are consistent for all rules, and noted that new sources already have this standard, but existing sources are treated differently under this proposal.

The commenter (103) asserted that specific surrogates for HAP are not needed for area sources if an overall level of performance can be demonstrated by the engine. The commenter (103) asserted that if the costs for controls for rural area sources can be justified, then surrogates for the existing engines should be the same as for new sources. As an example, the commenter (103) indicated that if an existing rich burn engine is operating at NSPS standards (2.0 grams per horsepower-hour (g/HP-hr) NOx, 4 g/HP-hr carbon monoxide (CO), and 1.0 g/HP-hr volatile organic compounds (VOC)) then the NSCR can be considered to be functioning correctly and HAP will be reduced even though formaldehyde is not measured directly.

One commenter (172) noted that there were inconsistent thresholds between these proposed rules and the related SI and CI NSPS, creating complications. For instance, engine size in the CI NSPS is defined in terms of cylinder displacement, while HP or kilowatt (KW) ratings are used in other rules.

Another commenter (172) noted that while EPA based setting the 300 HP subcategory for CI RICE and the 250 HP subcategory for SI RICE on where the greatest emission reductions are achieved, the multiple levels resulted in more confusion. The commenter (172) suggested that 500 HP be kept as the cutoff to identify a "large" engine for greater consistency and clarity.

Response: To the extent possible, EPA has attempted to harmonize requirements and make provisions consistent across rulemakings affecting stationary engines. Existing stationary engines addressed in this rulemaking are not covered in the NSPS rules. In the CI and SI NSPS rules, EPA is primarily relying on engine manufacturer certifications. For engines likely to be covered under a certification program, EPA believes it is more appropriate to lessen the recordkeeping, reporting, and testing requirements on the individual owners and operators because of engine certificates. However, for existing stationary engines covered in this rulemaking, EPA is relying on each individual owner and operator to demonstrate compliance with the requirements. Records and testing are necessary to demonstrate that the engine is meeting the emission standards and that other requirements in the rule are followed appropriately. Also, NESHAP and NSPS rulemakings are developed under different sections of the statute and address different pollutants. In the NESHAP, EPA must address HAP emissions, but in the NSPS, EPA must address criteria pollutants like NO_x, CO, and PM.

Regarding the comments that requirements applicable to existing stationary engines may be more stringent than the requirements for new stationary engines, EPA understands the concerns. However, due to the recent Brick MACT decision, which said that EPA could not set MACT floors of no emission reduction, EPA had to take a different approach in setting standards for existing stationary engines than was taken in earlier regulations. The outcome of the Brick

MACT decision and the SSM decision occurred after the previous engine rulemakings and therefore EPA cannot help the fact that standards may become more stringent for older engines under a different analysis.

In response to the comment regarding inconsistent threshold across rules, EPA again notes that the rules, in particular the NESHAP versus NSPS rules, rules for new versus existing engines, and rules for engines at major sources versus area sources, are developed to address different statutory requirements. Further, in the rules targeting new engines, EPA relied heavily on a manufacturer-based certification program. For both NSPS regulations, but more so in the CI NSPS, EPA modeled emission standards and requirements in the nonroad engine rules affecting similar engines. In those two rules, the emission standards were mostly targeted to engine manufacturers and since EPA followed nonroad requirements in many cases, it made sense to adopt engine size thresholds and emission standards similar to, and in the same units as was done in the nonroad engine rules.

2.0 Applicability

2.1 Major Sources

2.1.1 Comment: Two commenters (112, 148) noted that the requirements for individual engines are dependent upon the facility determination of major or area source status, which is subject to change as engines are added and removed from the site. The commenters suggested that major sources that become area sources should be provided a 3-year compliance period because some requirements proposed for area sources are more stringent than the comparable requirement for major sources. One of the commenters (112) stated that this is particularly important for 2-stroke lean burn (2SLB) engines that are at a major source that becomes an area source or is relocated to an area source.

Response: EPA does not agree with the commenter. Under EPA's "once in, always in" interpretation, if the engine was located at a major source at any time after the first substantive compliance date of the MACT standard (subpart ZZZZ), which for existing engines more than 500 HP at a major source is June 15, 2007, then the engine continues to be a major source for the purposes of subpart ZZZZ. To the extent the commenter is referring to relocated engines, we would need to analyze the facts and circumstances of each particular situation. The commenter can request an applicability determination regarding particular circumstances.

2.2 Area Sources

2.2.1 Comment: Numerous commenters (64, 66, 68, 75, 104, 111, 112, 124, 131, 132, 136, 148, 150, 155, 175, 183, 187, 225, 226, 241, 247, 253, 261, 262) expressed concern over EPA's decision to not distinguish between rural and urban engines at area sources in the proposed rule. Several commenters (64, 66, 68, 75, 104, 112, 136, 183, 226) requested that EPA reevaluate its congressional authority to regulate area HAP sources in rural areas. The commenter (112) believes that the proposal is inconsistent with 42 U.S.C. 7412(n)(4)(B) [CAA section 112(n)(4)(B)], which states that:

"The Administrator shall not list oil and gas production wells (with its associated equipment) as an area source category under subsection (c) of this section, except that the Administrator may establish an area source category for oil and gas production wells located in any metropolitan statistical area or consolidated metropolitan statistical area with a population in excess of 1 million, if the Administrator determines that emissions of hazardous air pollutants from such wells present more than a negligible risk of adverse effects to public health."

Three commenters (104, 112, 136) requested clarification of EPA's rationale to regulate low levels of emissions from engines at oil and gas production facilities outside metropolitan areas, contending that EPA has applied this rule more broadly than the Congressional intent of the CAA, and requested that EPA reevaluate this issue of whether EPA can regulate rural area sources in light of the 42 U.S.C. 7412(n)(4)(B) language.

One commenter (220) stated most of its members are located at area sources in non-urban locales, where HAP emissions from the affected engines, some of which are emergency engines, are unlikely to impact urban areas. Thus, engines located at non-urban sources should be exempt from the requirements of the proposed rule. Commenter 220 added that EPA has not made a case for such stringent regulation of units in non-urban areas, particularly where operation of such units is minimal. EPA should only impose requirements for non-emergency units in urban areas.

Four commenters (111, 150, 187, 225) stated that EPA has based this rulemaking for area sources on sections of the CAA and its Urban Air Toxics Strategy that are intended to remove threats to public health in urban areas. The commenters (111, 150, 225) do not believe that the remote RICE at area sources in the oil and gas industry threaten public health in urban areas. Three of the commenter (150, 187, 225) noted that the NESHAP for glycol gas dehydrators (40 CFR part 63, subpart HH) takes into account the location of area sources and does not apply the specific requirements of the rule to rural area sources. The commenters (150, 225) believe that the same approach should be used for the RICE rule, i.e., engines that are not located in or near populated areas should be exempt or subject to an alternative set of requirements so as not to force expensive requirements on remote engines that have no impact on public health. In particular, one of these commenters (150) stated that rural sources should be excluded from requirements relating to catalytic controls.

One commenter (111) questioned the rationale for the statement in the proposal preamble the "it would not be practical or appropriate to limit the applicability to urban areas…." Regarding practicality, the commenter (111) stated that urban area and urban cluster boundaries have been well defined by the Census Bureau (2000 Census) and that it would be easy to determine whether a facility is inside or outside these boundaries. Regarding appropriateness, the commenter (111) stated that the rationale in the proposal preamble does not relate the density of RICE to population density nor other HAP sources, both stationary and mobile, while the 1999 Integrated Urban Air Toxics Strategy document (which is the basis of this proposal) stated that "the vast majority of HAP emissions…are within counties with urban areas. Additionally, a greater number of different HAP may be emitted from the multiple sources present in urban areas than from the more limited number and variety of sources present in rural areas." The commenter (111) indicated that significant impacts from small sources in non-urban areas are dependent on them being additive to another major emitter (i.e., at major sources) or dependent on multiple sources of the same or different types being located within additive impact areas.

The commenter (111) noted that the monetized benefits of the proposed rule (74 FR 9712) do not distinguish between rural and urban benefits. The commenter (111) anticipates that the risk avoidance benefits would be skewed to urban populations and requested that the benefits be analyzed in this manner if rural sources are to be included in the rule. In addition, the commenter (111) requested that the rule be limited to urban areas as defined in the 1999 Urban Air Toxics Strategy document or, at a minimum, be limited to major sources (RICE less than or equal to 500 HP) in rural areas if a clear positive cost/benefit can be demonstrated.

Several commenters (112, 124, 131, 132, 148, 155, 175, 187, 241, 242, 247, 253, 261, 262) cited rules where EPA considered urban proximity by allowing owners/operators to determine whether their engines were located in an urban area by the distance to an urban cluster as defined by the U.S. Census Bureau. For those rules, requirements and implementation schedules are based on location, and units that are considered non-urban show compliance by meeting work practices.

Several commenters recommended that EPA follow 40 CFR part 63, subpart HH for existing stationary engines and only require work practices for area sources engines in rural areas. Commenter 241 concluded that following urban criteria ((defined as urban areas [UA] plus a 2 mile buffer area and urban clusters [UC] greater than 10,000)) that parallel 40 CFR part 63, subpart HH, the final rule could provide an exemption for area source engines located in a rural area or require GACT work practices rather than MACT-equivalent emission limits. In addition, commenters 97 and 241 stated that with technology and cost limitations for emissions measurement and a lack of emissions data, EPA should consider section 112(h) of the CAA alternatives for promulgating design, equipment, work practice, or operational standards. Similarly, commenter 112 concluded that the proposed rules will be onerous and costly, and should not be imposed at area sources in rural areas unless the science supports the need for this type of regulation.

Some commenters (97, 226, 247) believes that EPA should conduct an analysis of urban versus rural emissions and rural engine impacts on urban areas. Commenter 97 believes that the results of the analysis will warrant different standards, or overall exemption, for rural engines, especially those in remote locations. The commenter (97) stated that section 112(h) of the CAA provides alternative approaches to emission limits if it is infeasible to prescribe or enforce emission standards based on the technical and economic practicality of applying measurement methodology. The commenter (97) believes that EPA should consider additional opportunities to rely on management or operating practices for compliance. The commenter stated that management practices are warranted for area sources under GACT provisions, and for both area and major sources engines under CAA section 112(h).

Response: EPA is finalizing its proposal to regulate existing stationary SI engines located at area sources on a nationwide basis. EPA believes that the CAA provides the Agency with the authority to regulate area sources nationwide. Section 112(k)(1) of the CAA states that “It is the purpose of this subsection to achieve a substantial reduction in emissions of hazardous air pollutants from area sources and an equivalent reduction in the public health risks associated with such sources including a reduction of not less than 75 per centum in the incidence of cancer attributable to emissions from such sources.” Consistent with this expressed purpose of section 112(k) of the CAA to reduce both emissions and risks, CAA section 112(k)(3)(i) requires that EPA list not less than 30 HAP that, as a result of emissions from area sources, present the greatest threat to public health in the largest number of urban areas. Sections 112(c)(3) and (k)(3)(ii) of the CAA require that EPA list area source categories that represent not less than 90 percent of the area source emissions of each of the listed HAP. Section 112(c) of the CAA requires that EPA issue standards for listed categories under CAA section 112(d). These relevant statutory provisions authorize EPA to regulate listed area source engines and not just engines located in urban areas. EPA believes that sections 112(c) and 112(k) of the CAA do not prohibit issuing area source rules of national applicability.

EPA also disagrees with the statement that the proposal was inconsistent with section 112(n)(4)(B) of the CAA. The term “associated equipment” was defined for the purposes of subpart ZZZZ in the first RICE MACT rule not to include stationary RICE. EPA has not revisited that determination in this rule. In the discussion of the definition for “associated equipment” in the preamble to the NESHAP for Oil and Natural Gas Production Facilities (63 FR 6287, 6300-02, February 6, 1998), EPA noted that while the CAA provides no definition of ‘‘associated equipment,’’ the legislative history does indicate that the Congress, in drafting section 112(n)(4), believed that production wells and their associated equipment generally have low HAP emissions, but that, even if the wells are far apart, such emissions would be subject to aggregation under the definition of major source in section 112 because emissions from production wells in an oil or gas field are commonly owned and connected by pipeline. In that rulemaking, EPA rejected an approach suggested by industry that would have defined all equipment to the point of custody transfer to be associated equipment. Such an interpretation would define all such equipment as associated with a well, regardless of (1) the type of equipment, (2) any processing or commingling of streams that may occur, or (3) distance from the well, and would suggest that the Congress intended that aggregation of HAP emissions not be allowed within this industry under any circumstances. When viewed within the framework of section 112, the EPA did not believe this to be the case.

EPA noted that, for example, natural gas processing plants, which are generally situated prior to custody transfer, have numerous HAP emission points grouped together (e.g. glycol dehydrators, condensate storage vessels, gas treatment and separation steps, and various containers) that, when taken together, may emit above the levels associated with major sources. Inclusion of all of these equipment in the definition of "associated equipment" would likely leave the plants unregulated, despite the fact that the plant would emit the same level of emissions as found at major sources for other similar industries. EPA determined at that time that glycol dehydration units and storage vessels with the potential for flash emissions were not part of "associated equipment" because they were not the type of small HAP emission points that Congress intended to be included in the definition of associated equipment.

When EPA proposed the NESHAP for stationary RICE and stationary combustion turbines, EPA defined "associated equipment" as not including stationary RICE and stationary combustion turbines. Similar to glycol dehydration units and storage vessels, stationary RICE and combustion turbines are also not the type of small emission points that EPA believes Congress intended to be considered associated equipment. No adverse comments were received on that definition. Furthermore, it is EPA's understanding that the stationary engines are typically located downstream of the well and glycol dehydrator, and therefore are not part of the operation of the well. EPA did not propose to revise its definition of associated equipment in the proposal for this rule and the commenters have not provided sufficient justification to justify reopening this definition.

In response to the commenter who noted that the monetized benefits of the proposed rule did not distinguish between rural and urban benefits, the monetized benefits associated with reducing $PM_{2.5}$ exposure by reducing precursor emissions such as NO_x and VOC were estimated using national average benefit-per-ton estimates that are based on emissions and air quality modeling that reflect the current distribution of sources. Using this methodology in conjunction with a lack of information regarding the specific location of most of these engines, EPA is not able to provide an estimate of the fraction of monetized benefits that would occur in rural areas. This methodology does not systematically bias the benefits results as the underlying modeling reflects both urban and rural sources, these pollutants contribute to the secondary formation of $PM_{2.5}$ well distant from the source, and $PM_{2.5}$ can travel tens to hundreds of kilometers. EPA wase unable to monetize the benefits associated with reducing HAP emissions, CO emissions, ecosystem impairment, or visibility impairment.

EPA reviewed its proposed requirements for existing SI engines at area sources based on comments received on the proposed rule. In the final rule, all existing stationary SI RICE that are 500 HP or less and located at area sources are required to meet management practices rather than numeric emission limitations. In addition, existing stationary RICE larger than 500 HP located at area sources that are 2SLB, landfill/digester gas-fired, or emergency stationary RICE are required to meet management practices. EPA received comments and supporting information indicating that EPA had underestimated the cost of emission controls and overestimated how many engines were already using these controls. EPA reevaluated the cost impacts associated with establishing numeric emission limitations for these engines and determined that the cost impacts would be unreasonable given the expected emission impacts both with and without the expectation of use of emission control technologies. For example, for 4SRB engines, the annual cost per ton of HAP reduced, assuming the engine will have to install emission controls to meet the emission limit, is estimated to be $762,000 for a 50 HP engine and $167,000 for a 250 HP engine. For 2SLB and 4SLB engines at 250 HP, the annual cost per ton of HAP reduced is estimated to be $224,000 and $55,000, respectively, assuming the engines will have to install emission controls to meet the emission limit. Engine owners/operators have indicated that most of these smaller area source engines are not equipped with the control technologies required to meet these limits. Based on this information, EPA determined that management practices for these stationary SI RICE located at area sources of HAP are generally available and cost effective is promulgating management practices for these engines in the final rule. Additional information regarding this determination can be found in the memorandum titled, "MACT Floor and MACT Determination for Existing Stationary Non-Emergency SI RICE <100 HP and Existing Stationary Emergency SI RICE Located at Major Sources and GACT for Existing Stationary SI RICE Located at Area Sources," which is available from the rulemaking docket. EPA believes that requiring management practices instead of specific emission limitations and/or control efficiency requirements on the majority of existing stationary CI engines at area sources alleviates concerns regarding costly and burdensome requirements for rural sources.

For existing non-emergency 4SRB and 4SLB stationary SI RICE greater than 500 HP at area sources that operate more than 24 hours per year, EPA determined for the final rule that it is appropriate to set numerical emission limits that EPA expects would be met using emission control technologies. The costs and economic impacts are reasonable and the control technologies that would be expected to be used are generally available for these area source engines. The cost per ton of HAP removed from a 500 HP 4SLB engine is $29,000 and is $16,000 for a 1,000 HP engine. For 4SRB engines, the cost per ton of HAP removed is $93,000 for a 500 HP engine and $26,000 for a 1,000 HP engine. Information on the specific add-on control costs and cost per ton estimates can be found in the memorandum "Cost per Ton of HAP Reduced for Existing Stationary SI RICE," available from the docket (EPA-HQ-OAR-2008-0708). Also, the controls that are expected to be used on these engines will have the co-benefit of reducing volatile organic compounds (VOC), NO_x, and CO emissions as well. Based on this, EPA believes it is appropriate to go beyond management controls for existing stationary non-emergency 4SLB engines greater than 500 HP at area sources. Therefore, EPA has determined that the final emission limits should be based on the use of oxidation catalysts for existing stationary non-emergency 4SLB engines greater than 500 HP that operate more than 24 hours per year that are located at area sources.

EPA also believes that it is appropriate to establish emission limits for engines located in rural areas because their emissions can impact urban areas. HAP such as formaldehyde, acetaldehyde, acrolein, methanol, and benzene are emitted as gases. Regional photochemical model simulations, examining particular scenarios, have shown that gaseous HAP like formaldehyde and acetaldehyde can be transported hundreds of kilometers from their emissions source in distinct plumes.[2] Further, these emissions can contribute to regional air masses with elevated concentrations of gaseous HAP. These polluted air masses can be transported thousands of kilometers and affect locations well distant from the original emissions source. A nationwide rule also ensures an equal degree of protection to the public in both urban and rural areas.

2.2.2 Comment: Two commenters (140, 148) suggested alternate ways to delineate major source RICE located in rural areas. Commenter 140 said its engines should not be regulated as major sources. Instead, EPA should clarify that RICE located in rural areas, used for mining or agricultural purposes, and operated for limited hours, will be subject to rules for area sources, even if such RICE are located at a major source. The commenter (140) concluded that there is

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[2] U.S. Environmental Protection Agency (U.S. EPA). Air Quality Modeling Technical Support Document: Changes to the Renewable Fuel Standard Program, Office of Air Quality Planning and Standards, EPA 454/R-10-001. February. Available at <http://www.epa.gov/OMS/renewablefuels/454r10001.pdf>.

no reason to impose new testing and emissions requirements on RICE units that, individually and collectively, are a very small source of HAP emissions. Alternatively, EPA could establish a separate subcategory of "rural" RICE under the major source category that would consider geographical location, emissions, and air quality impacts of these engines, the commenter (140) asserted. If established, this subcategory should have standards that are no more stringent than those promulgated for area sources, the commenter (140) said.

Response: EPA has to follow the definitions of a major source and an area source in CAA sections 112(a)(1) and (2). EPA is not at liberty to change those definitions, and EPA must regulate as major sources those stationary engines that are classified as being located at major sources under section 112(a). If a stationary engine is located at a source that has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any HAP or 25 tons per year or more of any combination of HAP, it must be regulated as a major source.

EPA is statutorily required to address HAP emissions from all existing major sources in listed source categories regardless of whether those sources are small or large or whether they are located in rural or urban areas. EPA is also required to use the specific procedures in section 112(d) to determine MACT for engines, and the comment has provided no information to indicate MACT would be any different for the engines the commenter identified.

2.2.3 Comment: Commenter (242) stated that EPA should evaluate whether generic risk-based applicability alternatives and work practice determinations are appropriate for natural gas engines. EPA should consider a tiered approach that takes into account engine size, distance to urban clusters, and emission-based exemptions. The commenter (242) asserted that annual formaldehyde area source emission exemptions or work practice requirements should be based on the generic risk assessment. A set of concentration curves using both the current and proposed URE by engine type, size and distance should be developed to be used to evaluate the impacts from rural area sources on urban clusters, the commenter (242) said. Finally, EPA should incorporate flexibility in the rule for each source to determine and show that if impacts are less than 1 in 1,000,000 formaldehyde risk levels an exemption from the rule or that only work practice standards are appropriate.

Commenter (241) argued that because legislative history reinforces the perception that the fundamental purpose of the area source program is urban area risk reduction, EPA should incorporate risk in its consideration of cost effectiveness – for example, the cost effectiveness threshold for beyond the floor controls should consider the HAP of concern for different engine types. Further commenter (241) stated that any controls which do not contribute to significant reductions in risk cannot be considered cost effective or consistent with CAA section 112(k), and that this issue is even more compelling for natural gas-fired engines when considering the uncertainty in the Unit Risk Estimate for formaldehyde.

Two commenters (74, 78) said that the section 112(k) of the CAA mandate seems specifically focused on sources in urban areas and does not appear to provide a basis for regulating area sources in nonurban areas. The commenters (74, 78) added that EPA's determination that there are high concentrations of stationary RICE in rural areas does not mean that these area sources necessarily expose a large number of persons to HAP emitted by stationary RICE. According to the commenters (74, 78), EPA must demonstrate that stationary RICE at area sources in rural areas present significant risks to public health before imposing these regulations on area sources in rural areas. Any assessment of potential public health risks should also take into account Hawaiian meteorology, which enhances dispersion and thus reduces potential exposures, and the significantly lower population density that reduces the potential health risks.

Commenter (136) asserted that application of an urban health risk standard to non-urban area sources is not justified and appears to be arbitrary and capricious and not otherwise in accordance with applicable law – the scope of the proposed rule for existing area sources RICE should be limited to those facilities with HAP emissions that pose an unacceptable risk to human health.

Commenter (78) added that engines located in remote areas present a lower health risk than engines located in densely populated areas. EPA should consider excluding engines that do not present significant health risks from the retrofit requirements under this rule, commenter 78 said.

Four commenters (76, 150, 241, 242) noted that the uncertainty in the toxicological dose response values for formaldehyde should be considered when determining the regulation of RICE in non-urban areas. A commenter (150) asserted that the docket lacks support for the proposition that formaldehyde poses the sort of risk to human health that would justify the proposed rules, particularly in rural areas. Moreover, the commenter (150) indicated that the formaldehyde unit risk estimate (URE) is under review and may be revised. The commenter (150) believes that EPA should delay area source requirements for gas-fired engines until this review is complete and a technically sound risk assessment can be completed.

Regarding the URE for formaldehyde, commenters 76 and 242 said that EPA should consider the fact that the formaldehyde URE review is ongoing. The review is not scheduled to be completed until August 2011. The outcome of the review is meaningful for classifying natural gas engines as key area sources, for estimating the cost-benefits associated with a NESHAP rulemaking, for risk relief from control of natural gas engines, and for determining if a separate category and de-listing from section 112 of the CAA is warranted for natural gas engines.

Response: EPA does not agree that it should have conducted risk-based analyses for area sources. Section 112(d) rulemaking is intended to be technology based, with only certain provisions, not applicable here, dealing with risk. See also our responses to comments 2.2.1 and 1.9 regarding the decision to regulate engines at rural locations and the URE for formaldehyde.

2.2.4 Comment: Three commenters (104, 112, 136) stated that the physical and chemical properties of the HAP formaldehyde emitted by RICE should play a role in determining whether non-urban sources would be regulated in the proposed rule. One commenter (136) indicated that alternative standards for non-urban area source RICE are warranted considering the short half-life of formaldehyde in the atmosphere and the remote proximity to population clusters for the majority of RICE in the oil and gas upstream sector. This commenter (136) stated that EPA should consider a maintenance program in lieu of numeric standards for rural area source RICE, consistent with the precedent of the Oil and Gas MACT (40 CFR part 63, subpart HH) and 40 CFR part 63, subpart GGGGG.

One commenter (104) asserted that EPA has not adequately justified the need to regulate engines in rural areas at area sources, and requested that EPA re-evaluate this issue. The commenter (104) noted that EPA has proposed to limit emissions of HAP through emissions standards for formaldehyde for some engines and through emissions standards for CO for other engines. The commenter (104) stated that formaldehyde is short-lived compound that breaks down quickly by sunlight and other atmospheric conditions can shorten its life-span and rapidly disperse it, and also stated that carbon monoxide is short-lived. The commenter (104) asked what impacts there are to public health in rural, remote areas where there are no receptors in close proximity to engines at oil and gas production facilities.

One commenter (112) requested that EPA reconsider the physical properties of formaldehyde and provide exemption status for area HAP sources in rural areas. The commenter (112) stated that formaldehyde is a naturally occurring and anthropogenic chemical that is neither persistent nor bioaccumulative. According to the commenter (112), formaldehyde is highly reactive and quickly removed from the environment:

- When released to the atmosphere from combustion processes, formaldehyde is rapidly dispersed into ambient air.
- Formaldehyde is removed from the atmosphere by direct photolysis and oxidation by photochemically produced hydroxyl radicals.
- It is estimated that in the presence of sunlight the lifetime of formaldehyde in ambient air is approximately 1.6-19 hours. (Agency for Toxic Substances and Disease Registry, "Toxicological Profile for Formaldehyde" Section 5 – Potential for Human Exposure, pages 296-298; http://www.atsdr.cdc.gov/toxprofiles/tp111.html.)
- Formaldehyde in air that reaches water and soil is expected to be rapidly biodegraded and would not be expected to be present to provide for exposure via ingestion of soils or water (ATSDR, 1999). (Agency for Toxic Substances and Disease Registry (ATSDR), 1999. Toxicological Profile for Formaldehyde, Atlanta, July.)

- It has been concluded that the bioavailability of formaldehyde from the ingestion of food is not expected to be significant (ATSDR, 1999; EPA, 1998).
- There has been no evidence of bioaccumulation of formaldehyde into the aquatic or terrestrial food chain (HSDS, 2004). (Hazardous Substances Data Bank (HSDS), 2004. National Library of Medicine, queried on-line at www.nlm.nih.gov, July.)

Response: Formaldehyde is a hazardous air pollutant regulated under section 112 of the CAA. As noted in the preamble of the final rule, standards under section 112(d) of the CAA are technology-based, not risk-based. EPA did take into account that formaldehyde is a probable human carcinogen, the magnitude of formaldehyde emissions from these engines, and the goal of providing equal protection for all communities, in determining not to exempt rural sources from regulation.

While formaldehyde may have a short half-life in the presence of sunlight, secondary formation of formaldehyde from VOC precursors can be significant. Regional photochemical model simulations examining particular scenarios have shown that formaldehyde and acetaldehyde can be transported hundreds of kilometers from their emissions source in distinct plumes.[3] Further, these emissions can contribute to polluted air masses with elevated concentrations of gaseous HAP. These polluted airmasses can be transported thousands of kilometers and affect locations well distant from the original emissions source.

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[3] U.S. Environmental Protection Agency (U.S. EPA). Air Quality Modeling Technical Support Document: Changes to the Renewable Fuel Standard Program, Office of Air Quality Planning and Standards, EPA 454/R-10-001. February. Available at <http://www.epa.gov/OMS/renewablefuels/454r10001.pdf>.

2.2.5 Comment: One commenter (130) stated that the applicability of the rule (e.g., to all existing area source engines regardless of size) is not consistent with the legacy of affected units for other source categories. According to commenter 130, area sources and existing sources typically have lower control and assurance requirements than MACT source, not more stringent, as was proposed. For the area source regulation, EPA has chosen nationwide applicability, instead of considering proximity to urban areas as done in similar rules. The commenter (130) stated that formaldehyde is the primary HAP emitted by gas-fired sources and is used by EPA as an indicator and the commenter believed that using formaldehyde in this way is inappropriate because the formaldehyde URE is under review and may be revised, and also, formaldehyde has a short half life in the atmosphere thus receptors must be in close proximity for health affects to occur. The commenter recommended that a size-based exemption be added to the rule for area sources based on risk analysis. According to the commenter (130), rural sources should be excluded from catalytic controls similar to the oil and gas GACT for dehydrators. EPA should consider whether a size-based threshold can be included for engines as an emission limitation at major sources.

Response: The commenter is correct that in some cases the proposed standards, and the final standards, for existing engines at area sources are more stringent than pre-existing standards for engines at major sources or new engines. This is a product of certain court decisions that have provided less flexibility in standard-setting under section 112 than EPA used in previous rules, as well as new and better information regarding emissions from existing engines. As discussed in response to comment 2.2.1, EPA determined that it is justified to finalize nationwide requirements that would apply equally to urban and rural area sources. EPA is finalizing management practices for the majority of existing SI engines at area sources (except non-emergency 4SLB and non-emergency 4SRB greater than 500 HP that operate more than 24 hours per year). For existing stationary non-emergency 4SLB and non-emergency 4SRB greater than 500 HP that operate more than 24 hours per year, EPA determined that it was justified to require numerical emission levels that are based on levels expected with catalytic controls. Also, EPA must address existing stationary SI engines at area sources of all sizes, but small engines are under the final rule subject to management practices only, and not to numerical emission limits. EPA agrees that it is appropriate to distinguish smaller engines from larger engines for existing SI engines at major sources and has for the final rule established a subcategory of existing SI engines less than 100 HP. Existing SI engines less than 100 HP that are located at major sources are subject to maintenance practices under the final rule.

EPA disagrees with the commenter that formaldehyde is not an appropriate surrogate for HAP emissions from stationary engines. Formaldehyde is the hazardous air pollutant that is emitted in the largest quantity from stationary engines and if formaldehyde emissions are reduced, HAP emissions are reduced. Formaldehyde is a HAP and must be regulated regardless of the formaldehyde URE being under review.

2.3 Small Engines

2.3.1 Comment: Numerous commenters (51, 96, 116, 121, 132, 150, 154, 176, 225, 228, 230, 262) said EPA must provide an appropriate applicability cut-off for smaller rated engines.

One commenter (262) noted that the proposed rule applies to all engines, regardless of size or emissions. The commenter (262) noted that there are maintenance and recordkeeping requirements and emission limits for engines as small as 50 HP. The commenter (262) said that the basis for extending these requirements to such small units is not clear or explained in the preamble. The commenter (262) noted that previous NESHAP rules have taken into account the size and emissions of the source when setting regulations. The commenter (262) recommended exempting engines below a minimum HP and minimum emissions, so as not to force expensive, burdensome requirements on small engines that do not have significant emissions.

One commenter (176) reported that the state of Illinois exempts small engines from state permitting requirements when they are not covered from section 112 of the CAA. The commenter (176) asserted that the proposed rule would subject numerous owners and operators, who are not required to have a permit to operate their engines, to state permitting requirements. The commenter (176) expects that this would contribute to an increased delay in permitting and additional costs for owners and operators to obtain a permit.

One commenter (51) believes that it is more important to regulate larger engines at all sources than to regulate small engines at area sources. One commenter (116) believed that it is inconsistent to exempt larger engines at major sources while requiring smaller engines to comply with the rule. The commenter (116) recommended that the standard include the same requirements for all categories of engines in excess of 500 HP at major and area sources.

One commenter (118) noted the questionable value of regulating small RICE (between 50 and 500 HP) at area sources. The commenter (118) noted that although the costs of the management practices would be minimal, some State rules are written such that they require any equipment subject to a MACT standard obtain a permit regardless how small the equipment may be. The commenter (118) felt that the air quality benefit of regulating these smaller sources is outweighed by the burden placed on area sources where a small engine may be their only equipment, and the administrative burden placed on the state agencies to administer permit programs for the large number of sources who would not otherwise be regulated.

One commenter (225) stated that the proposed rule applies to all RICE regardless of size or emissions, with maintenance and recordkeeping requirements for engines less than 50 HP and emission limits for engines as small at 50 HP (4-stroke rich burn (4SRB)). The commenter (225) asserted that the basis for extending these requirements to such small units is not clear or explained in the preamble. The commenter (225) indicated that previous NESHAP (specifically 40 CFR part 63, subpart HH for glycol gas dehydrators) took into account the size and emissions of the source and urged EPA to adopt this approach for the RICE rule. The commenter (225) believes that a HP threshold should be identified based on a risk analysis of emissions from the universe of potentially affected engines and their health effects, below which engines are exempt from the regulations. The commenter (225) stated that the focus is public health, so the rule should not force expensive requirements on small engines that do not have significant emissions.

One commenter (132) believes that establishing a small natural gas-fired engine subcategory is a reasonable application of section 112(d)(1) of the CAA that will allow EPA to calculate defensible MACT floors, and also consider cost and other relevant factors in evaluating "beyond the floor" standards, appropriate GACT standards, and SSM requirements in accord with common sense and the reasonable meaning of the statute. The commenter (132) suggested using the following definition for the small natural gas-fired engine subcategory:

"Small NG Rice means any SI RICE with HP less than 500 that is fueled by natural gas, located at a crude oil or natural gas production well, gathering station, processing station or otherwise included in SIC Major Group 13."

One commenter (96) believes that EPA should exempt engines less than 100 HP from the NESHAP. The commenter (96) said that it is not practical, feasible or cost effective to implement emission standards and requirements on all size engines. Small engines do not typically operate frequently and contribute little to the total HAP emissions and owners and operators of these engines have not been subject to regulation until now and may not be familiar with EPA or State requirements to demonstrate compliance, the commenter (96). Also, the cost of testing and compliance would be high for owners, States, and EPA, if such requirements are promulgated for the significant number of small engines.

One commenter (150) stated that a size-based exemption should be added to the rule for area sources, such that smaller RICE (≤ 250 HP) would be exempt from the new requirements. The commenter (150) believes that this is appropriate because smaller engines create fewer emissions, so the air quality benefit of additional regulation is small in relation to the burden on operators.

The commenter (150) also stated that EPA should exempt SI engines that emit less than 0.5 ton/yr of formaldehyde because the cost per ton of mandatory controls is high while the public benefit is low. The commenter (150) noted that similar exemptions have been allowed in the 40 CFR part 63, subpart HH rules [see §63.764(e)(1)(ii)] and subpart GGGGG rules [see §63.7881(c)(1)], and pointed out that the exemption in subpart HH relates to emissions of benzene which is a known carcinogen that does not degrade as rapidly as formaldehyde. In the alternative, the commenter (150) suggested that such small sources of formaldehyde should only be required to adhere to work practice standards, not numerical emissions limits, thereby providing incentives and rewards to operators who are able to limit formaldehyde emissions.

Response: EPA is required to regulate all engines in the stationary engine source category. The source category includes stationary engines of all sizes at major sources of HAP emissions. As discussed in the memorandum entitled "Analysis of the Types of Engines Used to Estimate the CAA Section 112(k) Area Source Inventory for Stationary Reciprocating Internal Combustion Engines" which is in the docket for this rule, EPA has found that existing stationary emergency engines located at residential, commercial, and institutional facilities were not included in the original Urban Air Toxics Strategy inventory and were not included in the listing of urban area sources and are therefore not included in the source category. In the final rule, EPA has specified that those engines are not subject to subpart ZZZZ. However, with regard to other stationary engines, EPA does not agree with the commenter who said that EPA should treat emissions from smaller engines as de minimis. It is unclear whether a de minimis exemption is even possible under section 112(d) of the Act in these circumstances, see National Lime Ass'n v. EPA, 233 F. 3d 625, 640 (D.C. Cir, 2000), but in any case the commenter did not provide enough specific information to justify EPA making such a de minimis finding in this instance. Given the narrow and specific circumstances delineated by the court in Alabama Power v. Costle, 636 F.2d 323 (D.C. Cir. 1979) for making such a finding, and the lack of specific information from the commenter that these circumstances exist in this instance, we do not make a de minimis finding. However, in the final rule, EPA has attempted to minimize the regulatory burden particularly on smaller sized stationary engines. For stationary engines located at area sources, EPA has flexibility to set non-numerical limits in the form of management practices. EPA is promulgating management practices for all emergency stationary engines located at area sources, and for stationary SI engines smaller than 500 HP located at area sources. These management practices are discussed in more detail in section 7.0. For existing stationary SI engines below 100 HP located at major sources, EPA has determined that it is not feasible within the context of this rulemaking to prescribe or enforce a numerical emission standard because the "application of measurement methodology to this class of engine is not practicable due to technological and economic limitations." This determination is discussed in more detail in the memorandum entitled "MACT Floor and MACT Determination for Existing Stationary Non-Emergency SI RICE <100 HP and Existing Stationary Emergency SI RICE Located at Major Sources and GACT for Existing Stationary SI RICE Located at Area Sources." As a result, existing engines below 100 HP located at major sources will be required to meet work practice standards to meet the maximum achievable control technology requirements for those engines. More information on the work practice standards can be found in the "MACT Floor and MACT Determination for Existing Stationary Non-Emergency SI RICE <100 HP and Existing Stationary Emergency SI RICE Located at Major Sources and GACT for Existing Stationary SI RICE Located at Area Sources" memorandum.

Regarding the possibility of regulation under Title V, all stationary engines at area sources are exempted from Title V permit requirements under parts 70 and 71, as long as the sources do not otherwise have to meet such permit requirements. See 40 CFR § 63.6585(d). EPA understands the concerns of commenters regarding state permit requirements, but we believe that these concerns are best provided to the states in question. In addition, section 112(c)(3) and 112(k) require that EPA regulate categories or subcategories of area sources representing 90 percent of the area source emissions of HAP presenting the greatest threat to public health in urban areas. Stationary engines located at area sources were included in that list of categories, and therefore must be regulated under section 112(c)(3).

2.4 Natural Gas Engines

2.4.1 Comment: One commenter (241) strongly felt that because EPA is basing the proposed rules for natural-gas-fired units on insufficient data and inadequate consideration of costs and benefits, the natural gas engine regulations should be withdrawn and developed through a more thoughtful, data driven, and transparent process. Commenter (241) claims the data for natural gas fired engines EPA is using is the same data previously indicated by EPA (in June 2004 final rulemaking for IC engines NESHAP) to be insufficient for rulemaking for existing natural gas fired engines less than 500 HP.

This commenter (241) continues that the proposed rule has excluded natural gas 4SLB engines less than 50 HP and has based the emissions and service intervals on antiquated technologies. Commenter (241) also takes issue with EPA's statement in Section IV, Subsection B, Paragraph 1a of the proposed rule preamble that there are no existing stationary RICE engines less than 50 HP that are lean burn SI of record, citing a new class of heat pump system available in the U.S, that have as a prime mover under 50 HP lean burn natural gas fueled RICE engines. Further, this commenter (241) sees no option for alternative maintenance intervals for natural gas powered 4SLB engines less than 50 HP in Table 2 of the preamble. Commenter 241 claimed that there are various small engines packaged that have proven service intervals ranging from 6,000 to 10,000 hours, and that the emissions and cost impacts of the oil recycling, filter disposal and other maintenance proposed by EPA were not clear. While the emission requirements for 4SLB engines less than 50 HP in preamble Table 1 generally specify formaldehyde as the target emission, it is unclear to the commenter (241) what test method will be used in the field, and this commenter also felt that the proposal did not define a clear emission target for natural gas 4SLB engines less than 50 HP.

Response: EPA recognizes that it had limited emissions data available for the proposed rulemaking. However, at the time of the proposal, EPA was forced to use the emissions data it did have and propose emission standards based on that data set because that was all it had. Since proposal, EPA has attempted to gather additional engine test reports and has been able to obtain further emissions data to supplement the original database. Different industry groups have also gathered data and in some cases conducted testing programs to collect specific data that they believe was needed to develop a representative data set to base the emission standards on for the final rule. The commenter did not submit any data to show that the emission standards were not appropriate.

EPA did not exclude 4SLB engines less than 50 HP from the proposal. All engines less than 50 HP were in the same subcategory. In the final rule, EPA has promulgated work practice requirements or management practices for all engines at or below 100 HP.

EPA received numerous comments stating that the proposed maintenance intervals were not appropriate. EPA has revised the proposed intervals to be consistent with and representative of current industry practices in the final rule based on the extensive comments received on this issue. EPA has also included in the final rule a provision allowing the use of an oil analysis program to extend the specified frequency for oil changes, which addresses the concern raised by the commenter. EPA clearly specified the test methods that should be used in the rule.

2.4.2 Comment: One commenter (135) requested that natural gas engines not be subject to emission standards. The commenter (135) noted that natural gas is a cleaner burning fuel than diesel, gasoline, and fuel oil. The commenter (135) explained how the proposed rule would affect owner/operators of natural gas engines that are used for irrigation purposes and are widely dispersed in rural areas. These owner/operators could either comply with the proposed rule or convert irrigators to electricity. Complying with the proposed rule would be costly, potentially putting some firms out of business, and result in increased fuel use and motor vehicle traffic (implying increased emissions from those sources) while yielding little benefit considering that they are located in rural areas. The other alternative, converting to electricity, would also be costly and is not even an option in some locations where electricity is not available or the local electric cooperative is already at full line load capacity. The commenter (135) considered both options infeasible and requested that natural gas engines not be subject to emission standards.

Response: EPA is statutorily required to promulgate regulations for all existing stationary engines and is unable to exempt natural gas engines from emission standards. As discussed later in this document, the final rule contains revised requirements compared to the proposal.

2.5 Other

2.5.1 Comment: One commenter (242) said that the rule will require all existing engines to obtain an NSR permit. Exemptions that have existed in NSR programs for minor sources will no longer be available for sources having NESHAP requirements and the commenter (242) said that

EPA has not taken into account the burden associated with obtaining NSR permits for these sources. These costs should be included in EPA's benefit analysis, the commenter (242) said.

Response: The costs of compliance with NSR are not clear and result from operation of those regulations. They are outside the scope of this rulemaking. The decision to regulate stationary engines located at area sources came through operation of section 112(c)(3) and 112(k) of the CAA and was decided in the urban air toxics rule, not this rule.

2.5.2 Comment: One commenter (136) noted that there is no limit on construction date for existing RICE in the proposed rule. The commenter (136) stated that older engines were never designed to comply with these stringent emissions and some are not easily retrofitted with catalysts, if it can be done at all. The commenter (136) added that the expectation for older RICE to meet the MACT Floor or Beyond the MACT Floor will not be possible in many cases, and there is no data in the docket to support that these emission limits are achievable. The commenter (136) believes that industry could be faced with replacing thousands of existing engines that will not be able to comply with the emission limits in this proposed rule.

Response: EPA proposed emission standards for certain existing stationary engines based on the use of add-on controls. In those cases, EPA expects that owners/operators would be able to retrofit their existing engines with readily available control technologies such as oxidation catalyst or NSCR. Based on available information at the time of proposal, there was no indication that the aftertreatment controls that the proposed emission standards were based on would not be feasible to apply to older engines. Oxidation catalyst and NSCR have been used for many years on existing and new stationary SI engines.

The commenter claims that the proposed emission standards that are based on retrofitting engines may not be achievable on older engines. The commenter does not define what is meant by older engines and further does not support the claim that the standards are not feasible. No details are provided as to why the proposed standards are not achievable, in the commenter's opinion.

2.5.3 Comment: One commenter (250) from the propane industry noted that the proposed rule only affects diesel and natural gas-fired RICE. The commenter (250) supported coverage only for natural gas-fired and diesel RICE because most existing propane-fired engines are ≤ 50 HP, and this population is small compared to the number of existing diesel and natural gas-fired engines at this site rating. The commenter (250) stated that the Emissions Database used by EPA lists no significant number of propane-fired engines such that any benefit could be derived through their regulation.

In addition, the commenter (250) indicated that it reviewed the support documents posted to the docket for the rulemaking and determined that there was no cost impact analysis performed for the propane industry nor was there any analysis to determine if any verified technologies exist for compliance with the proposed requirements by propane engines. The commenter (250) believes that had the intent of the proposal been to apply to propane-fired engines, such an analysis would have (and should have) been performed. The commenter (250) added that the propane industry is seeking to expand into the source categories listed under the proposal, but understands that future engines that are developed would need to meet the regulatory requirements of newly constructed engines, as opposed to the existing engines considered under this proposal.

Response: The regulation covers all existing stationary SI engines that are located at area sources of HAP emissions and stationary SI engines less than or equal to 500 HP located at major sources of HAP emissions. EPA is required to address HAP emissions from all these engines and cannot exempt a subgroup of engines like propane-fired stationary engines solely based on the size of these engines and the commenter's claim that there are very few such engines. The final rule contains work or management practice standards for all engines smaller than 100 HP, so existing propane engines are not subject to numeric emission limitations if they are less than 100 HP.

2.5.4 Comment: One commenter (121) said EPA should exempt RICE used in product development, research, and testing operations at both major and area sources. For example, members of the commenter's (121) organization employs engines to test transmissions, subsystems, and powertrain configuration using dynamometer facilities. EPA has traditionally excluded research activities from applicability of MACT standards, the commenter (121) said.

Similarly, commenter 230 recommended modifying 63.6590(a) of the proposed rule to exclude stationary RICE used for research and testing because research engines operate for limited periods of time, and represent an insignificant source of emissions compared to the population of interest to EPA.

Response: EPA does not agree that stationary SI engines used in product development, research, and testing operations should be exempted from subpart ZZZZ. The commenter did not provide any data to show that the emissions and operation from these engines are different and would justify exempting them from the rule.

2.5.5 Comment: One commenter (138) urged EPA to adopt a small producer exemption that would exclude facilities that meet the definition of "marginal well production" as provided for by either the Interstate Oil and Gas Compact Commission (IOGCC) or the federal tax code. The commenter (138) is concerned that the proposed rule will lead to a loss of production and employment in its state (Ohio) during this difficult, recessionary economic time because it will impose additional regulatory costs even on the small engine sizes used in the marginal production context. Citing an IOGCC study (Marginal Wells: Fuel for economic Growth, 2008), the commenter (138) indicated that 83 percent of the oil and 77 percent of the natural gas produced in its state (Ohio) comes from marginal wells (average of 0.43 barrels of oil per day and 5.5 Mcf of natural gas per day). The commenter (138) said that production from such marginal wells is continually at risk of being abandoned prematurely because of the attendant economics – economics that are getting worse with the declining economy, increasing taxes and fees, and more-threatening regulatory climate. The commenter quoted the IOGCC study as saying: "In addition to supplying much-needed energy, marginal wells are important to communities across the country, providing jobs and driving economic activity. In fact, every $1 million directly generated by marginal production results in more than $2 million of activity elsewhere in the economy." The commenter (138) believes that imposing additional regulatory requirements will threaten needed energy resource, jobs, and economic activity.

Response: EPA cannot legally provide the exemption suggested by the commenter.

2.5.6 Comment: Two commenters (147, 189) requested that stationary RICE that are less than 300 HP, located in rural areas, used for agricultural purposes, and operated for a limited number of hrs/yr be exempted from numeric emission limitations and performance test requirements. The commenter (189) operates 74 stationary RICE that are spread out over a large geographic area. However, most of these are part of a single major source and would thus be subject to numeric emission limitations and performance test requirements. The commenter (189) asserted that it would be difficult, time-consuming and expensive to implement the proposed rule for all of these engines. The commenter (189) suggested two alternate methods for providing such an exemption:

- Classify rural, agricultural engines as area sources, or
- Create a separate subcategory of major sources consisting of RICE used for agricultural purposes.

In either case, the commenter (189) suggested imposing O&M requirements on these engines in lieu of numeric emission limitations.

The commenter (189) stated that the economic impact of the proposed rule on the commenter's firm would be extremely high and would significantly outweigh any environmental benefit. The commenter (189) submitted data indicating total HAP emissions from all RICE operated by the commenter to be less than 0.2 tpy. Based on EPA's estimates for performance test costs, the commenter (189) calculated a cost effectiveness for its firm of between $80,000 and $260,000 per ton of HAP reduced assuming all of the HAP emissions were eliminated due to the proposed rule. The commenter (189) therefore requested that rural agricultural RICE be exempted from numeric emission limitations and performance test requirements.

The commenter (189) asked EPA to revise the proposed rule to allow engines located in rural areas, used for agricultural purposes, and operated for limited hours to be subject to the standards for area sources even if these engines are located at, or adjacent to, a major source.

Response: EPA cannot change the definition of a major source, which is defined as "any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants, unless the Administrator establishes a lesser quantity, or in the case of radionuclides, different criteria from those specified in this sentence." EPA cannot change the definition of an area source either, which is defined as "any stationary source of hazardous air pollutants that is not a major source as defined in this part."

Further, EPA is generally required to establish numerical limits for stationary engines located at major sources of HAP emissions and cannot exempt a certain group of engines from being subject to emission standards. With the exception of subcategories for which prescribing or enforcing a numerical emission standard is infeasible as defined in section 112(h) of the CAA, which has not been shown for the subcategory the commenter suggests, section 112 of the CAA requires numerical standards for major sources. EPA has made the finding required by section 112(h) of the CAA for emergency engines and engines below 100 HP, but EPA cannot make that finding based on the record for agricultural engines above 100 HP located at major sources. However, for area sources, EPA may adopt alternatives to numerical limits that include work practice standards. The final rule requires all engines smaller than 500 HP located at area sources to meet management practice standards and does not require any emissions testing for those engines. This significantly impacts and minimizes the compliance burden on affected sources.

2.5.7 Comment: One commenter (269) expressed opposition to the proposed rule. This commenter (269) stated that the proposed rule would affect more equipment than any other stationary source emission standard previously adopted by EPA and is concerned about the impact the proposed rule would have on farming and ranching operations. The commenter (269) explained that many farmers and ranchers have small stationary engines that are run on an as needed basis and require scheduled maintenance to keep operating properly. Under the proposed rule, these small engines used to power generators, pumps, and other production agriculture equipment would be treated no differently than a HAP major source facility. The commenter (269) opined that the proposed rule is not justified or necessary. This commenter (269) stated that a thorough review backed by reliable and accurate information must accompany EPA's cost projections for implementation with the understanding that "one size does not fit all." This commenter (269) suggested that EPA focus on incentive-based programs rather than regulation to achieve emission reductions.

Response: EPA does not agree with the commenter's statement that the proposed rule is not justified or necessary. EPA is obligated by statutory requirements under sections 112(d), 112(c)(3), and 112(k) of the CAA to develop regulations for stationary engines. EPA took into consideration the differences that exist between engines and issued proposed standards and compliance requirements reflective of that. For existing stationary engines located at major sources, EPA must set emission standards that reflect the maximum degree of reduction of HAP that is achievable. For area sources, EPA has more flexibility in that it can consider emission standards that employ GACT or management practices. EPA established subcategories for the proposed rule in order to capture the distinct characteristics of engines and discussed the reasons for establishing those subcategories in supporting memoranda available from the docket. Additionally, EPA established different standards and requirements for the various subcategories, e.g., the proposed emission standards for smaller engines at major sources did not require the use of aftertreatment and EPA proposed management practices for smaller engines at area sources. When establishing the emission standards and requirements for smaller engines, EPA kept in mind the type of industries and applications that typically employ such smaller engines. In the final rule, EPA revised its proposed standards, allowing many more engines at area sources, including all engines below 500 HP at area sources, to meet management practices and requiring emergency engines and engines rated at or below 100 HP located at major sources to meet work practice requirements rather than numerical emission limits.

2.5.8 Comment: One commenter (227) asked what the status is of 4SLB engines greater than 500 HP at major facilities that were exempted from controls in the previous rule.

Response: Existing stationary 4SLB engines greater than 500 HP located at major sources that are subject to 40 CFR part 63, subpart ZZZZ, are still subject to the same requirements that were originally finalized in 2004. EPA is not making any changes to the requirements that apply to existing stationary 4SLB engines greater than 500 HP located at major sources during normal operation at this time.

2.5.9 Comment: Two commenters (179 and 183) wanted clarification on whether the rule affects temporary replacement engines. One commenter (183) stated that EPA should clarify for temporary replacement engines that are considered stationary because that replace permanent engines at stationary sources may meet requirements of the NESHAP either by meeting the otherwise applicable requirements for stationary sources or by meeting the requirements for nonroad engines, including the use of certified engines. Two commenters (179, 183) stated that EPA should clarify in the preamble for temporary portable engines that do not trigger provisions in the definition of nonroad engine are not considered stationary engines and therefore would not be covered by the NESHAP.

Response: If the engine in question meets the definition of a nonroad engine as defined in 40 CFR 1068.30, the engine is not covered by this NESHAP. If the engine does not meet the definition of a nonroad engine in 40 CFR 1068.30, the engine would be subject to the NESHAP. Temporary portable engines that remain in one location for less than 12 consecutive months (or for less than the full season for seasonal sources) are considered nonroad engines and are subject to the requirements for nonroad engines unless they replace permanent engines at stationary sources. Temporary portable engines that remain in one location for more than 1 year (or a full season at seasonal sources) are considered stationary engines. EPA does not agree with the commenters who asked that EPA make a statement in the preamble that temporary portable engines that do not trigger the nonroad engine definition will not be considered stationary engines because they are in fact considered stationary sources. Therefore, this language has not been added.

3.0 Startup, Shutdown, and Malfunction

3.1 Comment: Several commenters (63, 74, 76, 78, 87, 89, 96, 97, 98, 99, 101, 103, 104, 112, 121, 122, 124, 126, 129, 130, 131, 132, 134, 139, 146, 148, 150, 151, 152, 154, 155, 156, 157, 160, 162, 167, 168, 175, 176, 177, 178, 183, 186, 187, 191, 197, 200, 202, 203, 204, 205, 207, 209, 213, 216, 218, 221, 224, 225, 226, 227, 228, 229, 231, 236, 240, 242, 247, 253, 261, 262, 264) expressed serious concern over the proposed emission standards for periods of SSM. The U.S. Court of Appeals for the District Columbia Circuit vacated the SSM exemption in 40 CFR part 63, subpart A on December 19, 2008. The decision requires the Agency to implement standards that apply at all times, including during SSM periods. Numerous commenters thought the quick response to the December 2008 Court decision on the SSM issue is premature and recommended that EPA wait for a final decision before incorporate elements from this case. Numerous commenters are of the opinion that EPA has not provided a technical basis for its establishment of SSM limits and that any SSM limits should be replaced with work practice standards and disagreed with the decision to include limits for SSM periods. In addition, several commenters said that emissions during SSM events cannot be measured and therefore cannot be confirmed and limits are not enforceable. One commenter (148) recommended that EPA require a SSM plan similar to the SSM plan currently required under 40 CFR part 63, subpart ZZZZ. The commenter (148) also pointed out that 40 CFR 63.6650(b) in the existing rule requires operators to operate and maintain their equipment in a manner consistent with good air pollution control practices at all times, including periods of SSM. The commenter (148) believes that this requirement in conjunction with a SSM plan will achieve the same goals as the proposed rules in a much more cost effective and logical manner.

Based on CO baseline data presented by commenters (74, 78), EPA must consider a broader database of uncontrolled engines in determining what CO limits can be achieved during SSM periods. One commenter (78) asked how it can limit the concentration of CO to 40 ppmvd or less during startup and shutdown periods when catalytic control would not be effective, when CO emissions currently range for 160 to 382 ppmvd at 15 percent O_2. Commenter 74 provided similar data and reached the same conclusion as commenter 78.

Many commenters, including commenters 112, 155, 236, 242 and 247 recommended that EPA consider other alternatives to implement during SSM periods, such as possibly requiring work practice standards, which the commenters believe is the most reasonable approach and is justified under the CAA. Commenter 242 believes that work practices standards that minimize the emissions during of SSM periods is the most practical method of keeping HAP emissions from engines as low as possible. Commenter 242 offered to provide additional assistance and input in order to come up with reasonable work practices to include in the final rule. The commenter (155) also recommended that EPA describe the SSM requirements in the rule itself rather than in the GP. Alternatively, the commenter (155) recommended that the GP be revised due to confusing and conflicting requirements.

Several commenters, including commenters 96, 99, 156, and 242 said that there is no method to determine compliance during SSM periods. Commenter 242 said that it will be difficult or impossible to design a test program to describe emissions during SSM events, e.g., the commenter is not sure how a malfunction would be defined considering the unexpected and anomalous nature of the event. Therefore, emissions during these periods cannot be confirmed, commenter 242 said. Similarly, commenters 96 and 99 believe that it is not reasonable to set numerical limits during startup because there are no available or repeatable test methods or procedures for measuring emissions during startup or malfunction, plus there is no prescribed definition of what constitutes startup of an engine, which can vary significantly for a number of reasons such as engine and catalyst type, fuel, climatic conditions, application and load.

Several commenters (63, 96, 104, 129, 139, 150, 162, 178, 191, 197, 242) expressed concern over the feasibility of measuring emissions during SSM events. One commenter (242) said that if EPA retains the SSM limits in the final rule that EPA must provide methodologies and details on how to determine compliance with the emission standards during these SSM events. The commenter (242) has previously stated its objection to SSM limits and favors work practice standards instead. However, if SSM limits are retained, two commenters (76, 242) said that EPA must specify how compliance is determined, e.g., the commenter (242) wondered how does a source determine compliance for SSM events that are short (which the majority of SSM events are) and less (e.g., 1 hour for warm startup) than the performance test length requirement of the average of three 1-hour tests. One commenter (96) said that this methodology (average of three 1-hour tests) is impossible to execute since startups usually take 30 minutes to complete. If EPA used Method 320 (FTIR) for short duration events, EPA should discuss any intent to modify the compliance method of taking the average of three 1-hour tests and state the length of a new tests, the commenter (242) said. The commenter (242) added that FTIR has the capability of taking short-term minute average concentration readings.

One commenter (76) said that the rule should specify that concentration limit should be based on the time period of the startup or malfunction or a 1-hour period, whichever is longer.

Another commenter (242) added that time is needed for catalyst elements to warm up and stabilize before CO and HAP are effectively reduced and uncontrolled or partially controlled emissions cannot comply with the proposed startup emission limits. Regarding malfunctions, the commenter (242) asserted that no assurance can ever be made in terms of emission limit compliance. The malfunction, by nature, is not predictable, unknown and undefined, of unknown frequency, and emissions cannot be predicted, implied or measured, the commenter (242) said and again urged EPA to adopt work practice standards that minimizes emissions during SSM events.

Finally, the commenter (242) noted that Title V operators would not be able to meet their obligation for compliance certification if the proposed SSM limits remain because affected sources would be required to show compliance with limits that have not been technically justified and will lead to implementation issues in the field.

Since the rule offers no means of determining compliance during startup, one commenter (150) stated that clarification is needed on this issue.

One commenter (129) stated that for a source that is not monitoring emissions with a CEMS, it is impossible to determine whether SSM limitations are being met. The commenter (129) added that the monitoring/testing requirements will not allow an operator to make a knowledgeable determination of compliance during SSM using available data.

One commenter (99) said that there are no viable measurement methods available to measure CO, formaldehyde or VOC during transient operation and a review conducted by the commenter of Table 4 in the proposed rule shows the inconsistencies related to transient measurement acceptability with respect to stack gas moisture and flow rate, delays in the actual response of analyzers, issues in obtaining an accurate measurement during a transient test due to an axial diffusion function in long gaseous emissions sample lines, and field gaseous emission measurements require stack traverse as well for the emissions under measurement, per methods 7, 10, 25, etc., which eliminates the possibility of getting an accurate measurement during transient events such as a startup.

One commenter (152) claimed that issuance of numerical limits for SSM based on the emissions of the "best controlled sources prior to full warm up of the catalytic control" fails to consider emissions during malfunction of the engines themselves. The commenter (152) asserts that while EPA appropriately determined that during a control device malfunction, the floor and standard cannot be set assuming operation of the control device, EPA errs in limiting its analysis solely to operation of the controls since emissions can increase as a result of engine malfunctions as well. The commenter (152) noted that its experience is consistent with EPA's statements that emissions during an engine malfunction may increase due to the effects on exhaust temperatures and composition. The commenter (152) concluded that emission limits would need to be based on the emissions level from the best performing sources without control while the engine is malfunctioning. Commenter 96 added that it does not make sense to set any numerical standards during a malfunction of an engine because inherent in the concept of a malfunction is that emissions will be malfunctioning as well. It is also not logical to apply the concept of "best performing" malfunctioning engine, the commenter (96) said. For these reasons, it is unreasonable for EPA to promulgate numerical emission limits for periods of malfunction, in the commenter's (96) opinion. Emission testing for malfunctions would be near impossible to conduct given the sporadic and unpredictable nature of the events, the commenter (121) said. Commenter 154 said that the nature of malfunctions means it is not feasible to predict or simulate emissions that occur during periods of malfunctions.

The commenter (152) asserted that with respect to engines, it is not technologically or economically feasible to apply measurement methodology for the emissions during SSM periods and further, that it is unreasonable for the Agency in the face of the lack of accurate emission measurements to simply set the standard at the level for normal operations (e.g., for sources not using a control device). The commenter (152) stated that this situation is precisely the circumstance in which Congress envisioned that a work practice standard would be established, and urged EPA to adopt a work practice standard applicable to malfunction and startup periods for engines consistent with section 112(h) of the CAA and not to apply the numerical limits for normal operations.

One commenter (157) believes that the startup and malfunction emission standards for RICE using catalytic controls should include maintenance checks and readiness testing, which are typically short in duration. Therefore, the commenter stated that the catalytic controls would not reach the required temperature for effective control.

One commenter (134) stated that EPA solicited comment on the level of specificity needed to define the periods of startup and malfunction. The commenter (134) believes the responses differ based on whether the event is a startup or malfunction. The commenter (134) noted that startup of an engine begins with the start of fuel flow to the engine and ends when the engine has achieved normal operating temperature and air to fuel flows as indicated by the manufacturers' specifications, and while the initiation of a startup is predictable, its conclusion is not time-determined, but operationally-determined. The commenter (134) noted where a catalyst is used to control emissions; startup does not end until the required catalyst bed temperature has been achieved, however, this may happen before the engine air and fuel flows are normal and thus catalyst bed temperature is not the exclusive criterion that defines the end of the startup period. The commenter (134) noted that the start of the malfunction should be defined as when the normal operation emission limit is exceeded and the end of the malfunction should be set as when the normal operation emission limit is restored or the engine is shutdown. The commenter (134) noted that malfunctions often require shutdown to address, but such shutdowns can be delayed because immediate engine shutdown would cause other upsets. Therefore, the commenter (134) believes it would not be reasonable to set any specific time limits on either startup or malfunction periods, because their duration can be a function of operational need. Similarly, one commenter (96) disagreed that it would be appropriate to set a specific limit on the time allowed for startup because not all engines experience the same type of startup and malfunction. The length of startup will depend on many factors including engine type, size, fuel type and duty cycle, plus the frequency of required startups will also vary greatly among engines because some engines are only used for intermittent operation.

Some commenters, including commenters 74, 78, 96 and 99 thought that limiting the engine startup time is a reasonable method to limit emissions. Commenter 99 added that the most effective way to control emissions during startup for engines with catalysts is to limit the amount of time it takes to warm up the exhaust to initialize the catalyzation process and startup time can be easily monitored. The commenter (99) added that the time to be monitored at startup be defined as from the initial engine in-cylinder combustion, corresponding with continuous operation, up to the point that a defined catalyst inlet temperature is reached. The commenter (99) also recommended that owners/operators be able to request additional startup time if necessary in special circumstances, e.g., in extremely cold climates or where sufficient load cannot be reached within 30 minutes. Commenters 74, 78 recommended a limit of 1 hour for startup and 30 minutes for shutdown. The rule should not include a time limit for malfunctions, as the length of time during which an engine will be out of compliance would depend on the type of malfunction, the commenters (74, 78) said. The commenters (74, 78) suggested that each affected source would be required to prepare a SSM plan, which would have to address appropriate actions and time limits for malfunctions. Commenter 112 suggested that for engine startups, the work practice should require loading the engine to normal operating load as soon as practicable so that the catalytic controls are within operating range as soon as practicable. Commenter 96 provided the following language to address the startup issue:

"RICE startup operations, which constitute the time period from engine ignition to the time when the catalyst temperature is sufficient to enable effective catalyst operation, shall be minimized. Startup time shall not exceed 30 minutes or the manufacturer's startup recommendations, unless the Administrator approves a longer time for certain engine classes or approves a longer startup time to address special conditions and requirements (e.g., cold weather installations) in response to a petition from the owner/operator. During initial commissioning of the engine/equipment installation, additional time may be required for the set-up procedures before normal catalyst operation can be expected. Malfunctioning RICE shall be shut down and repaired as soon as practicable based on the engine's application and use."

Commenters (121, 154) do not support setting the same limits for SSM periods as for normal operations. Commenter (121) said that for engines with add-on controls, given that the catalysts have to reach a certain temperature to be effective, emissions during startup would be higher than during normal, steady state operation. The commenter (121) noted that EPA has a separate cold-start test with emission limits different from those required during the Federal Test Procedure. The commenter (121) attached a technical paper that illustrates the increased emissions during startup. Commenter (154) said there is no record support for this option and that any diesel engine could be expected to have different emissions as it starts up. Bag sampling by one industry member indicates CO emissions during startup are significantly higher (as much as double) than during steady state.

Commenters (121, 154) also objected to EPA's proposed second option. Commenter (121) said the data are apparently derived from the best controlled engines not using catalytic controls. The commenter (121) said that emissions data from steady-state operation of uncontrolled engines does not account for the cooler engine and fuel temperature conditions during startup. Nor does the second option properly account for malfunctions.

Two commenters (150, 154) said that EPA has not supported its assertion that emissions should not be different during periods of shutdown compared to normal operations. According the commenter (154), EPA has created no record to substantiate its assertion. The commenter (154) asserts that data would likely reveal variation among RICE shutdown emissions. For example, for RICE where there is a cool down period where the engine operates for a period of time (10 to 15 minutes) at reduced load and revolutions per minute, these conclusions could be wrong. All existing data has been acquired at 100 percent speed and load conditions, +/- 10 percent. Normal operation can cover a wide range of speed and load conditions for which pre- and post-catalyst data do not exist. Without hard data at "off point" conditions, no defensible conclusion can be drawn, which makes EPA's unsupported assertion arbitrary. The commenter (154) believes the best approach is for sources to follow appropriate operational procedures during shutdown periods. EPA should use section 112(h) of the CAA to allow facilities to establish source-appropriate procedures during shutdown, the commenter (154) said.

One commenter (154) stressed that EPA needs to evaluate each source category independently regarding the time required for shutting down equipment in a controlled fashion and the emission control equipment effectiveness during the shutdown period.

After the conclusion of litigation, if EPA pursues SSM limits for this category, it should consider precedents in the mobile source counterparts and the NSPS, according to commenter 121. These engines are already well-controlled through other standards set by EPA, and additional requirements or changes are unnecessary under the RICE MACT, in the commenter's (121) opinion. Another difficulty is defining the exact time period for "startup," the commenter (121) noted. For new engines, the commenter (121) recommends that EPA and engine manufacturers work together to determine whether startup emissions can be addressed in the certification process.

Commenter 154 proposed two options for EPA to address emissions during SSM events, both of which are fully supported by law and could be fully supported through data. Alternative 1 would be to treat SSM emissions as de minimis, using the D.C. Circuit rationale in Alabama Power Co. v. Costle. The commenter (154) noted that catalyst systems do not perform at low temperatures, and the SSM periods vary in duration and intensity, which can significantly impact actual emissions profiles. The commenter (154) provided examples of why an assumption that SSM emissions are identical to normal stable operations emissions is erroneous and a gross over-simplification of unit operations.

Commenter 162 said EPA should explain the justification behind setting CO and formaldehyde emission limits during periods of SSM. The commenter (162) does not see how one can assure compliance with an emission limit during a malfunction and does not know of any test methods that can be conducted during the relatively short periods of startup or shutdown.

The commenter (162) asserted the compliance with SSM plans will ensure emissions are minimized during these times. By imposing emission limits during periods of SSM, RICE owner/operators will have to report deviations for each instance, even if the owner/operators took actions in compliance with their SSM plan, because a reliable compliance demonstration is not available for existing equipment, according to commenter 162.

Five commenters (89, 101, 151, 221, 231) stated that SSM emission limits are unproven and cause compliance uncertainty. The commenters (89, 101, 151, 221, 231) indicated that EPA set the SSM emission limits assuming that emissions during SSM periods are the same as steady state engine operation before the catalyst. According to the commenters (89, 101, 151, 221, 231), HAP emissions during SSM activities have not been studied, but are definitely not stable over hourly averages like the proposed standard assumes. With today's knowledge, the commenters (89, 101, 151, 221, 231) believe that SSM emissions standards are not feasible.

Two commenters (112, 225) stated that operators of facilities with Title V permits may have concerns about the annual compliance certifications since compliance with the standards is unknown during startup and malfunction since emissions are rapidly changing during startup. One of these commenters (112) asserted that the SSM standards are instantaneous standards, not hourly averages, but no one knows if the proposed instantaneous limits can be met without test data. This commenter (112) indicated that compliance certifications for Title V permits may necessitate testing, which is not included in EPA's cost analysis.

The commenter (150) believes that a clarification is needed regarding the co-proposal associated with Table 3 of the preamble (74 FR 9703). The commenter (150) believes that EPA is suggesting an amendment to existing regulations for certain categories of engines in order to set limits during periods of startup and malfunction, but the commenter finds the scope and possible applicability of this co-proposal unclear. If EPA is proposing that standards be relaxed during SSM events, the commenter (150) would support such a concept.

Commenter 240 said that in contrast to other subcategories that allow for higher emission limits during periods of startup and malfunction, EPA requires that emergency CI engines meet the same 40 ppmvd CO at 15 percent O_2 standard at all times. This commenter (240) looked at manufacturer specifications for new engines that show higher CO emissions at lower loads, with decreasing emissions as the engine progresses to higher loads. In addition to lower loads that may occur during a startup or malfunction event, good engineering practice for these engines is not to operate at full loads during normal operations or startup and malfunction.

One commenter (76) noted that the NFPA Code 24 requires emergency diesel fire pump engines to be operated for 30 minutes per week to readiness testing purposes. It will raise difficult questions for the owners/operators of these engines if EPA requires emission limits during startup times, e.g., what should the owner do if the engine is unable to reach the required limits within the 30 minutes startup, the commenter (76) asked. The commenter (76) asked if the owner would be required to run the engine for longer e.g., up to 1 hour in order to reach steady state conditions. Even if the owner does not meet the limits, the owner will still have to conduct the weekly test under NFPA code and replacing emergency diesel fire pumps in a short timeframe is not practical, the commenter (76) said. Therefore, the commenter (76) indicated that it may not be able to comply with both the EPA and NFPA requirements for emergency diesel engines.

Two commenters (103, 154) responded to EPA’s request on how to define a startup and malfunction. One commenter (154) said that EPA’s request reveals the profound lack of foundation that EPA has to propose rulemaking options for regulation of RICE SSM emissions.

The commenter (154) will be pleased to assist EPA in developing a record for a future rulemaking to address SSM and noted that such an effort should also address the health and safety implications of regulating SSM events.

Response: EPA received extensive comments on the proposed requirements applicable to existing stationary engines during SSM. Consistent with the recent Court decision that vacated the exemption in 40 C.F.R. 63.6(f)(1) and (h)(1) for SSM (Sierra Club v. EPA, 551 F.3d 1019), EPA has established standards in this rule that apply at all times. EPA disagrees with those comments suggesting that EPA was premature in proposing standards during periods of startup, shutdown and malfunction. The United States Court of Appeals for the District of Columbia Circuit issued its opinion vacating the SSM exemption in December 2008, and we appropriately accounted for that decision in proposing the rule in February 2009. EPA does not believe it is appropriate to promulgate final rules that are inconsistent with the decision of the D.C. Circuit.

EPA has determined that the emissions from stationary SI engines during startup are significantly different than the emissions during normal operation. During startup, incomplete combustion of the diesel fuel causes variations in the pollutant concentrations and fluctuations in the flow rate of the exhaust gas. Incomplete combustion is due to cold areas of the cylinder walls that cause the temperature to be too low for efficient combustion. As the engine continues to operate, these cold regions begin to heat up and allow for more complete combustion of the diesel fuel and stabilization of the exhaust flow rate and pollutant concentrations. In addition, the engine experiences extreme transient conditions during startup, including variations in speed and load, poor atomization of the fuel injection, which leads to variable engine and engine exhaust temperatures, variable exhaust gas flow rates, and variable diluent pollutant concentration. Note for example the brief time spent at different load conditions as shown in Figure 1 of the attachment to EMA's letter dated February 17, 2009 (EPA-HQ-OAR-2008-0708-0019), which illustrates the transient nature of the engine startup phase. Other factors that cause emissions to be higher during startup, including for engines that are not equipped with oxidation catalyst, are a higher propensity for engine misfire and poorer atomization of the fuel spray during startup. Aftertreatment technologies like oxidation catalysts and NSCR must also reach a threshold temperature in order to reduce emissions effectively. In the February 17, 2009, EMA letter, EMA provided various graphs illustrating sample engine startup profiles and graphs demonstrating the effect of engine exhaust temperature on catalyst efficiency. Figure 6 of the attachment to EMA's letter (EPA-HQ-OAR-2008-0708-0019.1) shows how the CO efficiency is a function of the catalyst inlet temperature.

EPA has evaluated the criteria in section 112(h) of the CAA and carefully considered and reviewed the comments on this issue. EPA has determined that it is not feasible to prescribe a numerical emission standard for stationary SI engines during periods of startup because the application of measurement methodology to these engines is not practicable due to the technological and economic limitations described below.

EPA test methods (e.g., 40 CFR part 60, appendix A, Methods 2, 3A, 4, 10, Method 320, and Method 323) do not respond adequately to the relatively short term and highly variable exhaust gas characteristics occurring during these periods. The innate and substantial changes in the engine operations during startup operations create rapid variations in exhaust gas flow rate as well as changes in both pollutant and diluent gas concentrations. Correlating the exhaust gas flow rates and the gas components concentration data for each fraction of time over the entire period of a startup operation is necessary to apportion the values appropriately and to determine representative average emissions concentrations or total mass emissions rate.

Measuring flow and concentration data in the types of rapidly changing exhaust gas conditions characteristic of stationary SI engines is unachievable with current technologies applicable to stack emissions testing. For example, application of Method 2 to measure stack flow rate requires collecting data for velocity pressure and stack temperature at each of 12 traverse points and a corresponding stack moisture and oxygen concentration (for molecular weight determination). This traverse operation requires about 30 minutes to complete to produce a single value for the test period, which is approximately the same amount of time as the engine startup period. Clearly a single flow rate value would not sufficiently represent the variable flow conditions nor allow appropriate apportioning of the pollutant concentration measurements over that same period for calculating a representative average emissions value. Even if the start-up period is longer than 30 minutes, the stack flow rate test period could not be short enough to represent the short term (e.g., minute-by-minute) result necessary for representative emissions calculations. These findings lead us to conclude that correlating the flow and concentration data as necessary to determine appropriate proportional contributions to the emissions rates or concentrations in calculating representative emissions over these short highly variable conditions with currently available field testing procedures is problematic for stationary SI engines.

Method 323 would also be inadequate for testing stationary SI engines during start-up periods. Method 323 is capable of detecting concentrations on the order of 0.3 ppmv. Method 323 can achieve this minimum detection level with a 24 liter sample (about 60 minutes of sampling time). Start-up time for these engines ranges from a few minutes in warm weather to over 20 minutes in cold weather climates. If one were to conduct Method 323 for these few minute periods representative of start-up, the method detection levels would range from about 1 to 10 ppmv. Further, the method recommends that the target minimum concentration be about 10 times the analytical detection level. This would translate to quantitation levels of 10 to 60 ppmv for these shorter sampling times. Method 323 would not be adequately sensitive to measure compliance with applicable emissions limits on the order of a few ppmv to less than 1 ppmv during a start-up period of a few minutes. One additional factor limiting the applicability of Method 323 to testing during start-up periods is the representativeness of a constant sampling rate, integrated sample for a rapidly changing flow and concentration matrix. The failure of the method to provide a proportionally accurate sample of such flow and concentration changes compromises the results, as well.

In addition, even were it technically feasible to measure emissions during startups for stationary SI engines, the cost of doing so for every startup at every covered engine would impose a substantial economic burden. There are approximately 330,000 existing stationary SI engines that are subject to this rule; the cost for testing every one of these engines during engine startup could be more than $300 million.

EPA is therefore finalizing an operational standard in lieu of a numerical emission limit during periods of startup in accordance with section 112(h) of the CAA. EPA is limited to the information before it, which, of course, includes any information provided by the commenters. See 112(d)(3)(A). In this case, EPA carefully analyzed all of the information before it, including that provided by commenters, and determined that this standard complies with the requirements of sections 112(d) and 112(h). The final rule requires that owners and operators of stationary engines limit the startup time to 30 minutes or less. Engine startup is defined as the time from initial start until applied load and engine and associated equipment reaches steady state or normal operation. For stationary engine with catalytic controls, engine startup means the time from initial start until applied load and engine and associated equipment reaches steady state or normal operation, including the catalyst. Based on information received from engine producers and operators of stationary existing SI engines, EPA believes that limiting the engine startup time to 30 minutes or less is representative of the best controlled engines' operation during startup. EPA expects that this amount of time is consistent with the warm-up time needed and would be sufficient in most cases. EPA believes that 30 minutes is reflective of what the best controlled existing stationary SI engines are currently doing in order to reduce HAP emissions during periods of startup. Therefore, the final rule requires that owners and operators of stationary engines limit the startup time to 30 minutes or less. EPA is also including a requirement in the final rule to minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the otherwise applicable emission standards apply. As with any work practice, CAA section 112(h)(3) and EPA's implementing regulations at 40 CFR 63.6(g) provide that major sources can petition the Administrator for approval of an alternative work practice, which must be at least as stringent as what is required in the regulation.

Regarding shutdown, EPA determined that it was not necessary to establish different standards that would be applicable during shutdown for stationary SI engines. The commenters did not provide any information that shows emissions would be higher during shutdown than during normal operation. In addition, commenters are incorrect that compliance with the standards must be instantaneous. Compliance with these emission standards has always been based on the results of testing that is conducted over a three-hour period; EPA made this more explicit in the final rule published in March 2010. Since the shutdown period for stationary SI engines is typically only a matter of minutes, it is believed that even if a shutdown occurred during the performance test, the engine would still be able to comply with the emission limitation. In a letter dated February 17, 2009 (EPA-HQ-OAR-2008-0708-0019), EMA indicates that HAP emissions will be sufficiently controlled during periods of shutdown. EMA stated in its letter that according to manufacturers, emissions control equipment would most likely continue to reduce emissions as designed throughout the shutdown period. According to EMA, this is because engine emissions control systems and equipment are, during the start of an engine shutdown, at high enough temperatures to control HAP emissions and will continue to be sufficiently high until the engine shuts down. This trend is illustrated in the attachment to EMA's February 17, 2009, letter to EPA, where EMA provided two graphs with sample engine shutdown profiles. Figure 2 of the attachment to EMA's letter (EPA-HQ-OAR-2008-0708-0019.1) shows catalyst temperatures versus minutes during engine shutdown and illustrate stable catalyst temperatures.

In establishing the standards in this rule, EPA has taken into account startup periods and, for the reasons explained above, has established different standards for those periods. With respect to malfunctions, EPA proposed two options for subcategories where the proposed emission standard was based on the use of catalytic controls. The first proposed option was to have the same standards apply during normal operation and malfunctions. The second proposed option was that standards during malfunctions be based on emissions expected from the best controlled sources prior to the full warm-up of the catalytic control. For subcategories where the proposed emission standard was not based on the use of catalytic controls, we proposed the same emission limitations apply during malfunctions and periods of normal operations. EPA is finalizing the first option described above, which is that the same standards apply during normal operation and malfunctions. In the proposed rule, EPA expressed the view that there are different modes of operation for any stationary source, and that these modes generally include startup, normal operations, shutdown, and malfunctions. However, after considering the issue of malfunctions more carefully, EPA believes that malfunctions are distinguishable from startup, shutdown and normal operations. Periods of startup, normal operations, and shutdown are all predictable and routine aspects of a source's operations. However, by contrast, malfunction is defined as a "sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment or a process to operate in a normal or usual manner * * * ''(40 CFR 63.2). EPA has determined that malfunctions should not be viewed as a distinct operating mode and, therefore, any emissions that occur at such times do not need to be factored into development of CAA section 112(d) standards, which, once promulgated, apply at all times. For example, we note that Section 112 uses the concept of "best performing" sources in defining MACT, the level of stringency that major source standards must meet. One commenter expressed the view that it is not logical to apply the concept of "best performing" to a source that is malfunctioning. Indeed, the goal of best performing sources is to operate in such a way as to avoid malfunctions of their units. Similarly, although standards for area sources are not required to be set based on "best performers," we believe that what is "generally available" should not be based on periods in which there is a "failure to operate." Moreover, even if malfunctions were considered a distinct operating mode, we believe it would be impracticable to take malfunctions into account in setting CAA section 112(d) standards for stationary SI engines. As noted above, by definition, malfunctions are sudden and unexpected events and it would be difficult to set a standard that takes into account the myriad different types of malfunctions that can occur across all sources. Moreover, malfunctions can vary in frequency, degree, and duration, further complicating standard setting.

Finally, EPA believes that malfunctions will not cause stationary SI engines to violate the standard that applies during normal operations. Stationary SI engines would in most cases shut down immediately or with very little delay in the event of a malfunction. Because the standard is expressed as the average of three one-hour runs, or a work or management practice, any emissions that occur prior to engine shutdown should not affect a source's ability to comply with the standard. Commenters' concerns regarding compliance certifications should not be a concern for this same reason. This approach will also encourage shutdowns as soon as practicable when a malfunction that affects emissions occurs. In the very unlikely event that a source fails to comply with the applicable CAA section 112(d) standards as a result of a malfunction event, EPA would determine an appropriate response based on, among other things, the good faith efforts of the source to minimize emissions during malfunction periods, including preventative and corrective actions, as well as root cause analyses to ascertain and rectify excess emissions. EPA would also consider whether the source's failure to comply with the CAA section 112(d) standard was, in fact, "sudden, infrequent, not reasonably preventable" and was not instead "caused in part by poor maintenance or careless operation." 40 C.F.R. § 63.2 (definition of malfunction).

EPA does not agree with the commenter who said that EPA should treat SSM emissions as de minimis. It is doubtful whether a de minimis exemption is even possible under section 112(d) of the Act in these circumstances, see National Lime Ass'n v. EPA, 233 F. 3d 625, 640 (D.C. Cir, 2000), but in any case the commenter provides no specific information to justify EPA making such a de minimis finding in this instance. Given the very narrow and specific circumstances delineated by the court in Alabama Power v. Costle, 636 F.2d 323 (D.C. Cir. 1979) for making such a finding, and the lack of specific information from the commenter that these circumstances exist in this instance, we do not make a de minimis finding.

While commenters 74 and 78 do not provide emissions tests to verify the emissions they claim for their engines, EPA notes that, as discussed elsewhere in this document, it has revised its standards for existing stationary SI engines based on a broader database of engines, as suggested by the commenters, at various speed and load conditions, and this will affect the standards in place during periods of shutdown and malfunction.

3.2 Comment: One commenter (99) said that it agrees with EPA that HAP emissions during shutdown are controlled by existing methods and technologies for engines that use catalysts because the exhaust will most likely be at a sufficient temperature for HAP control.

Response: No response is needed.

3.3 Comment: One commenter (134) believes the final rule must allow actions designed to prevent unsafe operations during SSM periods. The commenter (134) believes that by imposing numerical emission limits during startup and malfunction periods, this proposal could discourage sources from taking appropriate actions to respond to non-engine related emergencies since such actions could result in an emission noncompliance on the unit. The commenter (134) requested that the EPA include a provision in the final rule that allows sources to take actions necessary to protect life and property. The commenter (134) requested specific language be included in the final rule that allows an owner/operator of a RICE to take all appropriate actions when required to avoid unsafe conditions. The commenter (134) noted that this principle has been included in past rulemakings, e.g., 40 CFR §63.2450(p) of the Miscellaneous Organic NESHAP, as follows: "opening a safety device or taking other actions is allowed at any time conditions require it to avoid unsafe conditions."

Response: EPA shares the commenters' concerns that engines must be operated safely. As EPA notes above, EPA believes the standard response to malfunction will usually be a fairly rapid shutdown of the engine, and given the fact that compliance is based on the average of three one-hour tests, emissions during malfunction will not likely have a significant effect on compliance. In the highly unlikely event that a source fails to comply with the applicable CAA section 112(d) standards as a result of a malfunction event, EPA would determine an appropriate response based on, among other things, the good faith efforts of the source to minimize emissions during malfunction periods, including preventative and corrective actions, as well as root cause analyses to ascertain and rectify excess emissions. EPA does not think that any of the provisions in the final rule would preclude engine owners and operators from taking actions necessary to protect life and property.

3.4 Comment: One commenter (228) believes that any numeric standards should have averaging times established consistent with the engine manufacturers' averaging time for engine steady state operation. The commenter (228) noted that most engines are designed to operate under relatively steady-state conditions; however it may take some time for the engines to achieve that steady-state of operation. The commenter (228) stated that unless the SSM issues are resolved, EPA will need to ensure that there is an adequate averaging period to encompass both the startup period and the steady state period needed to stabilize engine emissions performance before expecting the engine to be able to demonstrate compliance with a standard based solely upon steady state conditions, which it appears that EPA's emission database represents.

Response: EPA is not finalizing numerical emission standards in the final rule for periods of startup. For the emission standards that are applicable during other operations, EPA has clarified that the standards are based on the average of three 1-hour runs. This provides an adequate averaging period for compliance demonstrations during periods other than startup.

3.5 Comment: One commenter (112) suggested that EPA make it clear that emission limitations do not apply during maintenance activities, such as tuning of the air-to-fuel ratio controller (AFRC) and engine timing adjustments. The commenter (112) believes that EPA can find under CAA section 112(h)(1) that it is infeasible to prescribe or enforce an emission standard for control of HAP during such periods.

Response: The commenter has not provided any data to demonstrate the need for a different emission limitation during maintenance activities. Nonetheless, EPA believes that performance testing during maintenance would not be optimal since operation during maintenance activities may not be sufficiently continuous and lengthy enough for the time needed to conduct the performance testing.

4.0 Emissions

4.1 RICE Emissions Database

4.1.1 Comment: Multiple commenters (57, 78, 90, 96, 97, 103, 118, 124, 126, 130, 131,132, 150, 155, 174, 175, 176, 178, 187, 205, 226, 241, 242, 247) believe that the emissions data for engines is not adequate to conduct an appropriate MACT floor analysis. EPA should collect additional data and redo the MACT floor analysis for gas engines, according to numerous commenters. The commenters (155, 241, 242, 247) believe that the data EPA used to develop the MACT floor is deficient and that certain data should be excluded from the analysis. The commenters (155, 187, 241, 242, 247) also stated that EPA did not consider emissions variability in setting the MACT floor. Commenter (78) stressed than an accurate inventory of engines by size is needed to accurately evaluate the costs, benefits, and feasibility of a proposed regulation. Several commenters offered to work with EPA to address the lack of data and determine where additional data can be supplemented. Some of the deficiencies noted by various commenters are: formaldehyde measurements using CARB Method 430, possible incorrect engine categorization, multiple tests for a single engine used as the basis for the MACT floor, and subcategory specific data deficiencies. These issues are discussed further below.

The commenters (132, 155, 241, 242) said that EPA should not rely on formaldehyde emissions data that was captured using CARB Method 430. It is understood that CARB Method 430 produces unreliable results that should not be used to measure formaldehyde and EPA has acknowledged this is the document EPA-HQ-OAR-2005-0030-0009 and CARB Method 430 data was excluded from HAP emission factors development in EPA-HQ-OAR-2005-0030-0009, commenters 155 and 242 said.

The commenters (155, 242) continued by stating that EPA has included in the MACT floor analysis for rich burn engines, units that should have been classified as lean burn engines based on EPA's definition of a rich burn engine in 40 CFR §63.6675. According to the commenters (155, 242), only 1 of the 13 rich burn engines used in the MACT floor analysis would be defined as rich burn engines. The other engines operate at air-to-fuel ratios consistent with lean burn engines and should be excluded from the rich burn analysis, in the commenters' (155, 242) opinion.

The commenters (155, 242) said that because certain engines have been miscategorized, the ability to set accurate MACT floors has been hindered. Some examples are the 4SLB engine with test ID 20.1 used for the top 12 percent analysis that could possibly be a rich burn engine and test ID 20.2, which appears to be the same engine equipped with NSCR; a technology used for rich burn engines. EPA should further investigate the classification of the engines used for the MACT Floor analysis, several commenters (122, 154, 155, 242) said. (Note that the commenter (155) also said that this engine should be excluded on the basis of being tested with CARB Method 430).

In addition, the commenters (155, 242) stated that EPA has not rationalized the use of test data for engines greater than 500 HP for 4SLB engines between 50 and 500 HP. The commenters (155, 242) said that the analysis for 4SLB is not clear and the commenter is not sure how EPA arrived at the MACT floor for CO. Following EPA's documentation of its analysis, the commenters (155, 242) arrived at an average of 112 ppmvd for CO as opposed to the 95 ppmvd that EPA proposed. Also, there are 6 emission tests that should be excluded based on the use of CARB Method 430. Doing so leaves 3 engines for the analysis, the commenters (155, 242) said, plus these engines are all single-measurement tests. The commenters (155, 242) do not believe that 3 data points is sufficient to identify the average of the best performing 12 percent. The commenters (155, 242) also questioned the results from tests 29.33x and 29.41x and is currently looking into the test reports, which may include data that appear to be outliers.

Commenters 155 and 242 stated that it is inappropriate to use multiple tests of single engines as the basis for MACT floor determinations, e.g., 15 of the 16 tests for 2SLB engines are from a single engine at different operating conditions. The commenters (155, 242) added that this engine is also more representative of a large bore, slow speed engine and more illustrative of a unit above 1,000 HP as opposed to small engine. If the CARB Method 430 test is removed only one test remains in this subcategory, the commenters (155, 242) said. For 4SLB engines, there is only data from 8 engines and taking away tests measured with CARB Method 430 leaves only 3 engines, the commenters (155, 242) said. Two commenters (96, 155) are of the opinion that EPA should set a minimum number of sources necessary to determine the MACT floor, e.g., EPA has in some cases based the MACT floor on only one, two or three engines. Commenter 155 does not believe that several test runs from a single engine is appropriate.

The two commenters (155, 242) stated that the MACT floors should not be based on data using single measurements, when three measurements are a standard requirement for demonstrating compliance. In the absence of multiple measurements, outliers and erroneous errors cannot be caught, according to the commenters (155, 242).

The commenters (96, 155, 242) said that EPA should use data from units of similar size to set standards for sources of the same size, e.g., emissions from a large engine should not be used to set standards for a 100 HP engine unless EPA can demonstrate that such an assumption is justified. The commenters (96, 155, 242) are concerned that the data EPA has used for the MACT floor analysis is not representative of the current population of engines.

One commenter (57) did not believe EPA has a relied on a valid database for the regulation of landfill gas fired SI engines larger than 500 HP. The commenter (57) cited a December 19, 2002 Federal Register notice of proposal for a prior rule that indicated that the MACT floor for landfill gas and digester fire engines is "no emissions reductions" (page 77840, center column), and also indicated that EPA was aware of no HAP emission control technologies which would work for this subcategory. Commenter (57) also cited a February 4, 2002 memorandum from Melanie Taylor of Alpha-Gamma Technologies to Sims Roy of EPA, related to a proposed 2006 rulemaking that indicated (page 2) that for the digester gas and landfill gas subcategory, only 18 emissions tests were available and only one of those was for landfill gas fired engines. Commenter (57) stated that the landfill gas fired engine test was from a 1988 test on only one source, and that this is a rather thin record for setting emissions standards of 177 ppm CO for landfill gas fired engines in excess of 500 HP. Commenter (57) is personally aware of one recently installed (2005) site with 3 engines which will not meet the proposed CO emissions limit, and believed many other existing and currently used engines for this source category will not be able to meet the proposed standard. Commenter (57) states that as EPA has correctly determined, there are no feasible add-on engine controls and no fuel cleaning methods which are applicable to this fuel source.

Similar issues as those discussed for other engines apply to 2SLB engines, commenters 155 and 242 said. The data used to set the floor were based on the average of two tests, where one of the tests were measured with CARB Method 430, the commenters (155, 242) said. Further, the 15 Colorado State University (CSU) data points that were part of the original data set are all single-measurement tests from one engine tested over a range of operating conditions and should be represented as one test, the commenters (155, 242) added. Also, the data gives

EPA an opportunity to evaluate emission variability for a single engine, the commenters (155, 242) said. Finally, and as mentioned before, the 2SLB engine tested at CSU, although 440 HP in size, is more representative of a larger EPA and therefore smaller engines are not represented in EPA's data, according to commenters 155 and 242.

In conclusion, the commenters (155, 242) summarized that it agrees with EPA's previous assertion from the 2004 RICE NESHAP that there are insufficient data to develop standards for natural gas engines less than 500 HP and EPA has not gathered additional data since then or engaged stakeholders in an attempt to obtain more data. Insufficient data and rationale have been used to develop this proposed rule, the commenters (155, 242) said. EPA should develop a more robust and complete database that is representative of the hundreds of thousands of engines it represents, the commenter (155) stated. The commenter (155) is working on gathering data from its members, but as previously stated, such an effort will take time. The commenter (155) provided several tables illustrating the test data that EPA used and opinions on which test results should be deleted for different reasons.

Response: Section 112(d)(3) of the CAA requires EPA to set MACT standards based on the test data that is available to the Agency and this is what EPA did at proposal. EPA recognizes that it had limited emissions test data at the time it developed the proposed rule. However, EPA notes that it used the data that was available at the time of proposal. EPA requested additional test data to supplement the emissions database during the development of previous rules for stationary engines and also in an advance notice of proposed rulemaking for this rule and did not receive any data. EPA again requested additional test data during the comment period for the current engine rulemaking and made an additional effort post-proposal to reach out to industry and other sources in order to supplement the existing emission data set. EPA did receive additional emissions data for stationary SI engines during the post-proposal period for this rulemaking. The additional data include tests for 619 stationary SI engines, ranging in size from 39 HP to 12,000 HP.

The commenters noted that certain test data is not appropriate for use in developing the MACT standards and EPA has reviewed that test data and have removed test data that was collected using the CARB 430 test method. The formaldehyde measurements collected by CARB Method 430 are considered invalid and EPA agrees that it would be inappropriate to use that data.

EPA has reviewed the test data for each of the categories of engines to ensure that the engines are classified correctly and are included in the correct subcategory. In terms of the rich burn engines used for the original proposed MACT Floor analysis, where the commenter believes that only 1 of the 13 tests would be defined as a rich burn engine, EPA disagrees. For example, EPA confirmed with the engine manufacturer that Waukesha engine model 145, which is the engine tested under test IDs 7.10 and 7.11, would have been manufactured as a rich burn engine because during the time period that this engine family was manufactured, Waukesha did not produce any lean burn SI natural gas engine models. This information is included in the docket to the final rulemaking. Also, information reviewed, including Waukesha's Gas Exhaust Emission Levels Dated 10/03, has led EPA to believe that Waukesha engine models 1197 are rich burn engines and were therefore included in the MACT Floor analysis for rich burn engines. These were engines tested under test IDs 7.3, 7.7, 7.8 and 7.12. However, this is no longer a concern since the 13 tests the commenter refers to used CARB Method 430 and data from all 13 tests have been excluded from the final MACT Floor analysis. It is possible that the engine test that the commenter refers to with test ID 20.1 could be a rich burn engine. However, again, CARB Method 430 was used to measure emissions from this test, as the commenter also pointed out, and has been excluded from EPA's data set.

EPA also considered the issue of emissions variability and has included emissions variability into the final emission standards. This is discussed in more detail in the response to comment 5.1.1.1.

EPA acknowledges the commenters' concerns in regards to the use of multiple tests from the same engine and using test data from larger engines to calculate the MACT floor for smaller engines. However, EPA again notes that it used the data that was available at the time of proposal and made the best judgment at the time regarding the use of available test data. EPA has requested additional test data from a number of industry trade groups, and must proceed with setting the MACT standards based on the current test data. For landfill gas engines, EPA has received numerous test reports that were included in the development of the final emission standards for existing landfill and digester gas engines. The landfill and digester gas community was eager to submit test data to EPA and followed-through with the submittal of numerous test reports. Emissions data from the additional test reports EPA received post-proposal was added to EPA's existing dataset and the combination of data generate a complete and full data set. EPA also received test data following the proposed rule for other engine types, including 2SLB, 4SLB and 4SRB engines. In total, EPA received additional emissions test data for more than 600 engines, including landfill and digester gas engines. The emissions test data included test results from engines ranging in size from 39 HP to 12,000 HP at loads between 11 and 100 percent. The additional test data EPA received is available from the docket (EPA-HQ-OAR-2008-0708). This test data was added to EPA's analysis of MACT and GACT for the final rule. In addition, in the final rule, EPA did not use multiple tests from a single engine to represent multiple engines for the purposes of determining the MACT floor. Each engine represented a single data point for the purposes of determining the best performing 12 percent of existing sources, as explained in response to comment 5.1.1.1 and more extensively in the memorandum titled "MACT Floor and MACT Determination for Existing Stationary SI RICE ≤500 HP Located at Major Sources."

4.1.2 Comment: One commenter (188) noted that its review of the database utilized by EPA in the process of developing this proposed rule contains no units manufactured before 1990 with catalytic controls, although EPA did not address it in its preamble. The commenter (188) concluded that EPA cannot demonstrate nor expect that units manufactured before 1990 can be economically retrofitted to comply with these proposed regulations and recommends that any units manufactured before 1990 should, by definition, be exempted from these regulations entirely.

Response: EPA is required to address HAP emissions from all existing stationary engines, not just stationary engines manufactured after the 1990s. EPA disagrees with the commenter that RICE units manufactured before 1990 should be exempt from the regulations. The commenter did not provide any information to support the claim that older engines could not be retrofit with emission controls. Manufacturers of control technology have demonstrated retrofit application of oxidation catalysts on older RICE units. These retrofit applications on older engines have proven to reduce HAP emissions. Therefore, EPA believes it is appropriate to require the use of control technology on units manufactured before 1990.

4.1.3 Comment: Two commenters (265, 268) referred to EPA's Method 10 that went into effect in May of 2006 as being more stringent than previous requirements, and specifies that stratification measurements must be performed on the exhaust stack to ensure that emission sampling is not conducted in areas of the stack that have lower levels of CO. In addition, the commenters (265, 268) reported that the analyzer is used to measure CO must be certified to demonstrate it can pass an interference test to ensure that it is not biased by the presence of other components in the exhaust gas. This commenters (265, 268) stated that the use of source data that pre-dates the use of Method 10 testing requirements may not be as accurate (or reliable) for use in the developing of standards, especially since the proposed rule compliance demonstrations will be required to adhere to the revised 2006 CO testing procedures.

Response: Method 10 has always required interference checks for NO_x, CO_2, and SO_2. The addition to the method was a requirement for the tester to identify any additional compounds present in the gas stream that might be an interference and to demonstrate that these additional compounds did not bias the test results. It is unlikely that there are significant additional interferences present in the exhaust from RICE that would cause a negative bias in the measured CO using Method 10. While measuring emissions from a stratified stack at a single point could significantly affect the results of a particular test, it is equally likely to bias the results high as it is low so that the average result from many tests is unlikely to be biased. Therefore, the overall effect of failing to account for stratification when using Method 10 on the emissions from RICE would be unlikely to bias the results in either direction.

4.1.4 Comment: One commenter (121) reviewed the supporting data and determined that EPA failed to specify the actual RICE units from the Emissions Database comprising the top 12 percent for the various floors. While the database can be queried, in some cases the data entries do not directly correspond to the subcategory name. A query for CO will not produce any results. In other cases, it is impossible to know whether the query results are the correct list of engines relied on by EPA in developing the floor. The commenter (121) gave specific examples of these issues.

Response: All of the data used to calculate the MACT floor could be queried from the Emissions Database; however, EPA agrees that it was difficult to determine the exact data that was used to calculate the MACT floor. EPA has provided more documentation to the final rule to clearly show the data that was used to determine the emission standards. This documentation includes the top 12 percent of engines that are used to establish the floors for the various subcategories. This is shown in the memorandum, "MACT Floor and MACT Determination for Existing Stationary SI RICE ≤500 HP Located at Major Sources." This memorandum includes the steps that were taken to develop the MACT floor for all the subcategories.

4.2 Surrogates

4.2.1 Comment: Several commenters (76, 96, 100, 104, 121, 129, 157, 216, 218, 225, 227, 229, 242) said that an alternative surrogate for HAP is needed for rich burn engines, where EPA has currently determined that formaldehyde is the only option. Commenter 242 indicated that EPA was unable to confidently say that a different pollutant, such as for example, CO, could be used as a surrogate for HAP emissions from rich burn engines. To reach this conclusion, EPA has relied on analyses conducted for other rulemakings and the commenter (242) said that EPA should, at a minimum, include in the docket for this rulemaking specific references to relevant decision documents so that the previous analysis can be reviewed. Commenters 108, 218, 213 and 229 also supported the use of CO. One commenter (76) requested that EPA include in the proposal, the reasons why such engines had limited data and why those engines are restricted in measuring formaldehyde rather than the surrogate parameter such as CO.

As stated earlier, formaldehyde testing using FTIR is complex and expensive and the commenters (104, 225, 242) are concerned that industry testing capacity could be a problem. Identifying an alternative surrogate that is easier and less expensive to measure could simplify compliance, according to the commenter (242) and if EPA makes the analysis for determining that formaldehyde is the only valid surrogate available, the commenter could potentially assist with determining if there are alternative approaches available to FTIR testing.

Commenter 104 recommended that CO or VOC be used a surrogate for formaldehyde because these tests are more economic and feasible. Commenter 96 also said that the proposed formaldehyde standards should be replaced with either VOC or CO emission standards in the final rule. As other commenters have also mentioned, this commenter (96) stated that measuring formaldehyde could be problematic and expensive. The commenter (96) recommended that EPA replace the formaldehyde standards with VOC standards as was done under the SI NSPS and incorporate the definition of VOC from the SI NSPS. Commenter 225 noted that CO is allowed as a surrogate for formaldehyde for lean burn engines in this rule and was proposed as a surrogate for HAP from boilers in 40 CFR part 63, subpart DDDDD, while the Consolidated Engine Rule allows VOC reductions across 4SRB NSCR catalysts to demonstrate formaldehyde reduction. Three commenters (129, 157, 216, 227) supported the use of VOC instead of HAP and commenter 129 asserted that a VOC standard would be equally effective in reducing HAP because such a standard would encompass the HAP that are considered VOC. Two commenters (129, 157) also stated that test procedures for VOC are more cost-effective and capable of providing real-time compliance determinations.

One commenter (100) thinks that total hydrocarbons (THC) should be used instead of formaldehyde. The commenter (100) believes that using formaldehyde as a surrogate for HAP has placed an unnecessary compliance and cost burden of owners and operators of these engines, which significantly affects the sale of these engines. Because 4SLB and CI engines compete with 4SRB engines for sales and since 4SLB and CI engines have in EPA rulemakings been able to demonstrate compliance with NESHAP requirements by meeting CO limits or reductions, 4SRB engines have been disadvantaged because of higher costs associated with testing for formaldehyde. In addition to replacing formaldehyde with THC, EPA should include THC percentage reductions options to add compliance flexibility and noted that the THC percent reduction should not be any more stringent than 40 to 60 percent, which is the level typically seen from rich burn engines with NSCR. The commenter (100) cited papers that conclude that there is a positive correlation between formaldehyde and THC emissions for various engine types, including rich burn engines. These papers were attached to the commenter's (100) letter to EPA. In addition to these sources supporting the replacement of formaldehyde with THC in the final rule, commenter 100 volunteered to work with EPA to develop a test program to obtain additional data from rich burn engines to investigate the relationship between formaldehyde and THC on an engine, currently in the commenter's (100) laboratory, equipped with NSCR to support the recommendation that THC is a suitable surrogate for HAP emission reductions from rich burn engines.

Response: EPA has documented the analysis that determined that CO was not an appropriate surrogate for HAP emissions for 4SRB engines. The documentation is in the docket for the original RICE NESHAP promulgation (EPA-HQ-OAR-2002-0059), which was incorporated into the record for this final rule. EPA received additional information following the proposal from engine manufacturer Waukesha, who conducted a testing program to investigate the correlation between THC and formaldehyde. The objective of the program was to determine if THC would be a valid surrogate for formaldehyde (and consequently HAP) for rich burn engines. Waukesha concluded that the information submitted supports the use of THC as a surrogate for HAP for 4SRB engines. Waukesha also said that "There does not appear to be a good correlation between post-cat CH_2O and either precat-CH_2O or post-cat THC. However, that does not appear to be necessary as virtually complete CH_2O reduction occurs regardless of the fairly broad conditions varied in this test.[4]" In EPA's opinion, this conclusion is not substantial enough to support THC as a surrogate for formaldehyde. For example, results of the program indicated a large range in THC reductions while formaldehyde reductions remained fairly constant.[5] Therefore, EPA believes that THC reductions are not a good indicator of catalyst performance. In fact,

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[4] See page 2 of Email from Robert Stachowicz, Dresser Waukesha to Melanie King, USEPA. Additional Dresser-Waukesha Reciprocating Internal Combustion Engines (RICE) National Emission Standards for Hazardous Air Pollutants (NESHAP) Test Data and Comments. EPA-HQ-OAR-2008-0708-0323.1.

[5] See page 3 of Email from Robert Stachowicz, Dresser Waukesha to Melanie King, USEPA. Additional Dresser-Waukesha Reciprocating Internal Combustion Engines (RICE) National Emission Standards for Hazardous Air Pollutants (NESHAP) Test Data and Comments. EPA-HQ-OAR-2008-0708-0323.2.

Waukesha stated that "The obvious conclusion to be drawn is that, for a properly functioning NSCR catalyst on a 4SRB engine, formaldehyde destruction will normally range from 94-97% across a very wide THC destruction range of 25-85%. Stated another way, the data show conclusively that, for a properly functioning NSCR catalyst on a 4SRB engine, formaldehyde destruction rates are uniformly very high and independent of the numeric THC destruction efficiency.[6]" EPA does not agree that it is not necessary to show a post-catalyst correlation.

Regarding the commenters' concerns about FTIR testing, EPA is promulgating Method 323 for measuring formaldehyde as part of this final rule, which provides sources a lower cost method for compliance testing.

EPA does not disagree that CO and VOC testing would be more economical than formaldehyde testing. However, as stated, EPA previously determined that CO is not an appropriate surrogate for HAP for rich burn engines. In terms of VOC being used as a surrogate for HAP, EPA does not have any emissions data available in order to look at the relationship between VOC and HAP. Nor did commenters provide any emissions data to EPA to substantiate their claims. For the reasons discussed in this response, EPA is finalizing emission standards in terms of formaldehyde for rich burn engines where numerical limits are required.

4.2.2 Comment: One commenter (242) believes that EPA has not taken into account the trade-off that exists between formaldehyde and NO_x emissions and between formaldehyde and CO emissions from rich burn engines and the commenter is uncertain whether rich burn engines that

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[6] See page 4 of Email from Robert Stachowicz, Dresser Waukesha to Melanie King, USEPA. Additional Dresser-Waukesha Reciprocating Internal Combustion Engines (RICE) National Emission Standards for Hazardous Air Pollutants (NESHAP) Test Data and Comments. EPA-HQ-OAR-2008-0708-0323.2.

are tightly controlled for NO_x (e.g., 0.5 or 1.0 g/HP-hr) can meet the proposed formaldehyde limits. The commenter (242) stated that EPA should gather emissions data to investigate whether rich burn engines with NSCR that are optimized for NO_x control can meet the proposed formaldehyde standards, in addition to determining if these engines can maintain low levels of controls over time especially for smaller engines in remote locations where 1) application of NSCR has been limited thus far and 2) because of unmanned facilities limit operator attentiveness to control performance.

Response: The HAP emission standards are based on what is achieved in practice by rich burn engines, based on the test data that EPA has received. The commenter provided no data to support the claim that these rich burn engines will be unable to meet the proposed formaldehyde limit. Therefore, EPA believes that the formaldehyde standards for rich burn engines are appropriate.

4.3 Engine Test Data

4.3.1 Comment: One commenter (141) provided stack test results for several large lean burn SI engines equipped with a CO oxidation catalyst, oxidation catalyst and SCR, or SCR. The data showed CO levels ranging from 18 to 58 ppmvd at 15 percent O_2 for natural gas 4SLB engines.

Response: EPA contacted the commenter and asked if they could provide EPA with the source test reports for the stack test data that were summarized in a table their comment, as EPA could not use the data without having the source test report. The commenter responded that they did not have the resources to provide copies of the documents to EPA. Since EPA did not have the test reports and could not review the data, EPA was unable to use the data submitted by the commenter in the MACT floor analysis.

5.0 Emission Limits

5.1 Major Sources

5.1.1 MACT Floor

5.1.1.1 Comment: Multiple commenters (89, 101, 103, 112, 122, 126, 150, 151, 155, 167, 187, 205, 221, 225, 227, 228, 231, 242, 261) were concerned with how EPA set the MACT floor for the proposed rule. Several commenters, including 155, 205, 227, and 242 said that EPA has not considered variability in setting the MACT floor for the proposed rule. The commenter (155) cited the recent Brick MACT ruling which indicated that "floors may legitimately account for variability [in the best performing sources that are the MACT floor basis] because "each [source] must meet the [specified] standard every day and under all operating conditions." The commenters (155, 242) stated EPA's dataset is not sufficient in covering variability. The commenters (155, 242) expressed that it is willing to work with EPA to resolve the issue, but efforts may be hindered by the limited timeframe for finalizing the rule. It is necessary to collect additional data and conduct a thoughtful and scientifically sound review and analysis process, several commenters said (including commenters 122, 155, and 242).

In terms of a variability analysis, the commenters (155, 242) specifically suggested as one alternative that EPA identify the top 12 percent of engines based on average emissions operating at high load. Then, EPA could use lower load of other non-optimum operating emissions data to assess variability in the best performers, i.e., the MACT floor must be set less stringent than the highest data point for the best performers and lead to a less stringent standard. Alternatively, EPA could use all data in the average calculation meaning that data from all loads would be included, however, this is complicated due to the lack of low load data or data from various operating conditions for most tests. Lack of data is also an issue with the first suggested approach, the commenters (155, 242) said. In any event, the scarcity of data may necessitate additional, focused testing. Both commenters (155 and 242) are willing to work with EPA to resolve this issue.

One commenter (261) noted that the Courts have been critical of EPA's process for setting minimum allowable emission limits. The commenter (261) stated that EPA set the emission limits by averaging the best 12 percent of all performance tests for each subcategory, but did not consider operational variations of the units. The commenter (261) recommended that EPA set emission limits at the emissions level that is actually achieved under the worst reasonably foreseeable circumstances for the best performing 12 percent as allowed by the Courts in the Cement Kiln MACT and Brick Kiln MACT decisions.

The commenter (126) acknowledged the difficulties with obtaining test data for RICE, however EPA cannot rely on the absence of emissions data to justify its proposed limits. The commenter (126) stated that EPA should have issued information collection requests to obtain adequate emission data for promulgating standards.

Multiple commenters (97, 124, 132, 155, 175, 191, 224) suggested that EPA should consider a scenario under which lower temperatures and reduced catalyst efficiencies may occur due to reduced engine speed or load, resulting in lower temperatures and consider an alternative work practice under section 112(h) of the CAA for the situation.

Two commenters (155, 224) noted that the emission standards in the proposed rule apply at all times, but that there is no data or information in the rulemaking docket that supports the proposed limits at low loads or at operating conditions other than high load. The commenters (155, 224) expressed that EPA should provide data and analysis that supports requiring emission limits to be met at all times. The commenter (155) said that it is inaccurate to assume that emission levels observed at one operating condition can be met at a different operation condition, e.g., high load emissions are not the same as low load emissions. The commenter (155) recommended that EPA consider technical and economic feasibility of requiring and enforcing emission limits at operating conditions where measurements are not technologically and/or economically feasible. If emission limits are based on high load emissions data and compliance is validated at high load, operating, design or work practices should be considered as an alternative way to demonstrate compliance under other operating scenarios, the commenter (155) said. Otherwise, the commenter (155) said that EPA needs to undertake a significant effort to add emissions data to the docket to support a standard that applies at all times.

One commenter (155) said that EPA has not gathered data or provided a sound analysis to demonstrate that it is appropriate to set emission standards that apply at all times. EPA should show with an analysis and data that emission standards are achievable at operating conditions other than the MACT floor, commenter 155 said. However, if such a showing is not possible, EPA should consider alternatives under section 112(h) of the CAA to apply during periods other than high load, in commenters 155 and 224's opinion. The commenter (155) said that EPA specifically did not consider emissions over different operating points, e.g., in the 2SLB emissions data from CSU. In that analysis, the commenter (155) indicated that instead of using the 15 available test run results from the one 2SLB engine in order to take into account variability in emissions, EPA looked at these tests as 15 separate tests and when setting the MACT floor used the two best performing, i.e., the best performing 12 percent. (Note that the total number of tests analyzed for this subcategory was 16). The commenter (155) expressed that it is not supportive of this approach.

Again, the commenter (155) stated that it could not locate any information in the docket that is supportive of requiring emission standards to apply at all times and that the lack of data and analysis is a serious oversight on EPA's part. Also, for compliance at all times, the commenter (155) asked what averaging times apply. The commenter (155) noted that there are several other similar questions that need to be answered. In the commenter's (155) opinion, these compliance issues challenge the enforceability of the emission standards and therefore section 112(h) of the CAA applies. The commenter (155) believes that emission standards would still apply at high load and the performance test is performed at high load, but that for other operating conditions, section 112(h) of the CAA would form the basis for alternative compliance demonstrations through work or management practices.

<u>Response</u>: Based on these comments, EPA reviewed all aspects of the MACT floor determination, and redid the MACT floor determinations for the final rule, making changes in several areas. These areas included the methodology for determining variability, the incorporation of additional data received into the MACT floor analysis, and the use of emissions

data directly to determine the MACT floor, rather than through the gloss of the Population Database.

The CAA requires EPA to set MACT standards based on the test data that is available to the Agency and this is what EPA did at proposal. EPA recognized that it had limited emissions test data at the time it was developing the proposed rule. However, EPA had requested additional test data to supplement the emissions database from commenters during the development of previous rules for stationary engines. In addition, EPA requested additional test data during the comment period for the current engine rulemaking. EPA made an additional effort post-proposal to reach out to industry and other sources in order to supplement the existing emission data set. EPA received data for an additional 619 engines during the post-proposal period; this data was incorporated into the MACT floor analysis for this final rule.

The U.S. Court of Appeals for the D.C. Circuit has recognized that EPA may consider variability in estimating the degree of emission reduction achieved by best-performing sources and in setting MACT floors. See *Mossville Envt'l Action Now v. EPA*, 370 F.3d 1232, 1241–42 (D.C. Cir 2004). EPA has included a revised approach to variability in the MACT floor analysis for this final rule. The final emission standards are based on test data collected from stationary engines produced by different engine manufacturers, operating at various loads and other conditions, and located in various types of service and locations. The engines range in size from 39 HP to 12,000 HP. The data includes engines operating at loads from 11-100 percent. To the extent commenters believed further data would have been beneficial to EPA, EPA must make its determinations based on the information available to it. EPA asked for further data, and EPA did receive further data following the proposal, which led to changes in the final regulations. For engines operating at reduced speed or loads resulting in a reduced exhaust temperature, EPA believes that numerical emission requirements are still appropriate and there is no justification to only require work practice standards during these situations. We do not believe that the provisions of section 112(h) of the CAA are met (except as discussed elsewhere with regard to periods of start-up, emergency engines, and engines below 100 HP) because testing is not economically and technologically impractical and the emissions can be readily routed through a conveyance for purposes of emission testing. EPA believes that the final emission standards will reflect the numerous engine models and operating scenarios that can be expected from stationary engines.

EPA is not using the Population Database to determine a percentage of engines that have emission controls installed, as it did at proposal. In recent court cases, in particular the Cement Kiln and Brick MACT cases (*Cement Kiln Recycling Coalition v. EPA,* 255 F.3d 855 and *Sierra Club v. EPA*, 479 F.3d 875, respectively), the court rejected several MACT standards as not meeting the requirements of the statute "to reflect the emissions achieved in practice by the best controlled units." The court in both cases rejected EPA decisions to determine the MACT floor by first determining the technology used by the median source in the top twelve percent of sources, using actual emissions data, and then basing the floor on emissions data from the highest emitter using that technology in the database. EPA argued that this ensured the standards were achievable by all units. The court found that the MACT floor must reflect the emissions actually achieved by the best controlled sources, and sources did not reflect such emissions merely because they shared the same technology. Both cases also fault EPA for relying solely on emissions control technology in determining the floor, and state that other factors also can affect emissions. Indeed, the court found that lower emissions need not be the result of a deliberate emission control strategy. "The Clean Air Act requires the EPA to set MACT floors based upon the ‘average emission limitations achieved, it nowhere suggests that this achievement be the product of a specific intent.”

The Population Database has not been updated since 2000. It contains information regarding whether or not an engine has emission controls, but does not generally contain other types of emission-related information, like engine-out emissions or operational controls, and it does not include any emissions concentration data, which is necessary to determine the MACT floor. EPA determined that it would be more appropriate and more defensible to base the MACT floor analysis directly on the emissions data that EPA has for stationary SI engines.

In order to determine the MACT floor for each subcategory, EPA ranked all of the sources for which it had data based on their emissions and identified the lowest emitting 12 percent of the sources based on the lowest test for each engine. EPA used all of the emissions data for those best performing engines to determine the emission limits for this final rule, accounting for variability. EPA assessed the variability of the best performers by using a statistical formula designed to estimate a MACT floor level that is achieved by the average of the best performing sources if the best performing sources were able to replicate the compliance tests in our data set. Specifically, the MACT floor limit is an upper prediction limit (UPL) calculated with the Student’s t-test using the TINV function in Microsoft Excel. The Student’s t-test has also been used in other EPA rulemakings (e.g., New Source Performance Standards for Hospital/Medical/Infectious Waste Incinerators, Proposed NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters) in accounting for variability. A prediction interval for a future observation is an interval that will, with a specified degree of confidence, contain the next (or some other pre-specified) randomly selected observation from a population. In other words, the prediction interval estimates what future values will be, based upon present or past background samples taken. Given this definition, the UPL represents the value which EPA can expect the mean of 3 future observations (3-run average) to fall below, based upon the results of an independent sample from the same population. In other words, if EPA were to randomly select a future test condition from any of these sources (i.e., average of 3 runs), EPA can be 99 percent confident that the reported level will fall at or below the UPL value. To calculate the UPL, EPA used the average (or sample mean) and sample standard deviation, which are two statistical measures calculated from the sample data. The average is the central value of a data set, and the standard deviation is the common measure of the dispersion of the data set around the average. This approach reasonably ensures that the emission limit selected as the MACT floor adequately represents the level of emissions actually achieved by the average of the units in the top 12 percent, considering ordinary operational variability of those units. Both the analysis of the measured emissions from units representative of the top 12 percent, and the variability analysis, are reasonably designed to provide a meaningful estimate of the average performance, or central tendency, of the best controlled 12 percent of units in a given subcategory.

Regarding the comment asking about the averaging times that apply, EPA has clarified in the final rule that the emission standards are based on the average of three one-hour runs.

5.1.1.2 Comment: Four commenters (132, 155, 175, 242, 247) stated that the majority of stationary engines subject to emission limits under the proposed rule would be forced to install add-on controls even though EPA made the statement that engines subject to emission standards based on an uncontrolled MACT floor are expected to meet the emission limitations without any aftertreatment controls. The commenters (155, 242, 247) do not believe that EPA has considered emission limit achievability or cost impacts of these requirements. The commenters (155, 242,

247) indicated that a high demand for aftertreatment controls could seriously affect market demand, feasibility of implementing add-on controls within the regulatory timeframe, and the cost-benefit analysis. The commenters (155, 242) are concerned that with the large number of engines that in its opinion will be required to install aftertreatment may lead to delays in permitting, delivery of aftertreatment controls, and vendor availability. These delays could result in service interruptions and potential safety concerns, ultimately possibly affecting the delivery of natural gas, the commenters (155, 242) said.

With regards to emission limit achievability, the commenters (155, 242) said that since EPA's analysis uses the average of the best performing source tests plus those tests are at high load, it is clear that these limits will not be achievable for most engines. Based on estimates provided in docket support information and the assumption that roughly half the natural gas engines would require catalytic control, the commenters (155, 242) stated that it is impractical or impossible to implement. The commenters (155, 242) recommended possible solutions to an enormous catalyst demand and compliance dilemma required by the proposed rule, which included obtaining data and analyzing data to arrive at a MACT floor that is more appropriate, compliance by requiring work practice standards rather than emission limits, and consideration of variability in setting the MACT floor.

The commenters (155, 242) conducted a rough estimate of the number of engines (based on very conservative assumptions) that would have to install add-on controls and said that it estimated that the number would be approximately 150,000 natural gas engines. Commenter 242 added that EPA has not indicated the basis for assuming that 80 percent of existing rich burn engines already have catalyst control. According to a survey conducted by the commenter (242), about 50 percent of rich burn engines above 500 HP have catalytic control and virtually no rich burn engines below 500 HP have catalyst control. Overall, about 10 percent of rich burn engines have add-on controls, the commenter (242) said. For that reason, commenter 242 thinks that EPA has overestimated the number of controlled engines. The commenter (242) pointed out that EPA current estimate contradicts the analysis of the Population Database, which indicate that the percentage is 5.6 percent for engines between 50 and 500 HP. There is also the issue of what engines should do when adding a catalyst is not an option or it is an option, but an extremely expensive one or engine replacement has to be considered, the commenter (242) said.

The commenters (132, 155, 242) asked EPA to develop a more complete review for the final RIA that adequately considers costs and compliance implementation issues resulting from requiring a large number of add-on controls and also that the final RIA be transparent. Finally, based on market constraints, the commenters (155, 242) asked that EPA consider the timing and schedule for demonstrating compliance.

Response: EPA notes that the MACT standards are based on levels achieved in practice, not achievable. EPA has in any case revised the final standards to include additional test data that was received during the comment period. In addition, EPA has revised its approach to emission and operational variability into the final emission standards. In the final rule, the following engines have emission standards that are based on the use of add-on controls: 4SLB non-emergency engines 100-500 HP at major sources and 4SLB and 4SRB non-emergency engines larger than 500 HP at area sources. The remaining engines are either subject to emission standards that have been achieved by engines not equipped with add-on controls or are subject to work/management practice standards. The costs and economic impacts of the final rule are discussed in the RIA. The commenters did not provide any information to support the claim that there would not be an adequate supply of catalysts, particularly given the three year lead time provided for meeting the standards.

Based on information submitted by the commenters, EPA revised the estimate of the number of 4SRB engines that are already equipped with NSCR. For the final rule, EPA assumed that 20 percent of engines already have NSCR, as opposed to the 80 percent number assumed for the proposal. The 20 percent estimate is based on information EPA gathered from a number of sources, including different EPA Regional Offices, the RICE Population Database, comments on the proposed rule and meetings with industry, and control technology vendors. This information is available from the rulemaking docket (EPA-HQ-OAR-2008-0708). EPA specifically contacted EPA Regions and MECA to get an estimate of how many existing rich burn engines have emission controls. The information collected generally indicated that a smaller percentage of stationary existing rich burn engines already have add-on controls compared to what EPA estimated at proposal. However, there was also a wide range in estimates EPA reviewed making it difficult to determine a percent of existing stationary rich burn engines with add-on controls that would be nationally representative and appropriate to use to calculate nationwide impacts associated with the final rule. With that said, analyzing the information received from all these sources, EPA believes that 20 percent is representative and reflects the best estimate EPA can develop with the information available.

5.1.1.3 <u>Comment</u>: Four commenters (97, 132, 155, 175, 218, 224, 242) said that EPA has not provided proof that 90 percent reduction is readily achievable for all engines equipped with NSCR or oxidation catalyst. The docket does not contain any documentation supporting the 90 percent reduction, the commenters (155, 242) said. According to the commenter (155), these technologies require specific operating temperatures in order to reach such catalyst efficiencies and at temperatures that are lower, catalyst efficiency rapidly declines. EPA needs to determine the catalyst operating conditions that are necessary to achieve 90 percent reduction, commenter 155 asserted.

The commenters (155, 224, 242) said that the 90 percent reduction contradicts the results from EPA's CSU testing. The CSU testing indicated that the percent reduction from oxidation catalyst control is well below 90 percent for formaldehyde and CO for 2SLB, commenter 155 said and EPA should explain why the percent control is different under this rulemaking. The commenter (155) stated that catalyst inlet data for the 2SLB engine tested at CSU exceed the proposed above-the-floor emission limits. In the 2004 RICE NESHAP, EPA concluded that the lower efficiencies observed at CSU were due to lower exhaust temperatures and EPA also found that with lower temperatures, the catalyst is more susceptible to poisoning, which also affects performance, the commenters (155, 242) said. Commenter 242 indicated that one of its members recently conducted temperature readings on a 1,350 HP Cooper GMVH-6 2SLB slow speed engine, which runs at approximately 300 rpm at 85 to 90 percent load. According to commenter 242, the normal exhaust temperature immediately after the turbocharger was about 600°F. The temperature a few feet away where a potential catalyst would be placed was roughly 430° F, which is too low for efficient CO and formaldehyde removal. The commenters (155, 242) asserted, as noted in other comments by the commenters, that a separate subcategory may be warranted for 2SLB engines that may have lower exhaust gas temperatures impacting effective catalyst control. Commenter 102 made similar comments and suggested that the rule be modified to provide alternate emissions limits for existing 2SLB engines that operate with low exhaust temperatures below 500°F. The commenter (102) stated that the low exhaust temperatures of its engines are what make them unique and will make it difficult and perhaps impossible to achieve the proposed CO limit of 8 ppmvd CO in the exhaust, and the commenter noted that the preamble indicates that oxidation catalysts are the only proven and cost effective control technology for 2SLB engines. All oxidation catalysts have increased destruction efficiency at higher temperatures, so low exhaust temperatures limit the destruction efficiency of the catalyst. The commenter's (102) units exhaust temperatures range between 330 and 500°F and oxidation catalysts have limited effectiveness below 500°F.

Commenter 112 asserted that 2SLB engines often cannot be retrofitted with oxidation catalyst without significant additional modification/replacement of engine components; many older 2SLB engines cannot operate at the back-pressure caused by the catalyst; and 2SLB engines typically operate at slow speeds (i.e., 300 rpm), which causes pulsation and a greater potential for backfire, both of which are destructive to catalysts. The commenter (112) stated that older engines of all types typically consume more oil than new engines, which can also shorten the life expectancy of the catalyst.

Commenter 242 added that it disagrees with EPA's methodology for determining the above-the-floor standards and the end results means that there are emission limits for existing engines that are more stringent than similar size new engines. For example, the commenter (242) said that 2SLB engines above 500 HP at major sources are subject to a 58 percent CO reduction while existing 2SLB engines above 500 HP at area sources have to meet a 90 percent reduction in CO, if the current proposed limits stand. Another example provided by commenter 242 was that existing, new and reconstructed rich burn engines above 500 HP at major sources must reduce formaldehyde by 76 percent or limit formaldehyde by 350 parts per billion by volume, dry basis (ppbvd) while existing rich burn engines between 50 and 500 HP at major sources must under the proposed rule reduce formaldehyde emissions by 90 percent or limit those emissions to 200 ppbvd.

Commenter (218) stated that the application of oxidation catalysts to 2SLB engines will not provide the desired reductions in CO and formaldehydes at all conditions of speed, load and ambient. The scavenging air requirements necessary to meet the current and projected NOx levels lower the engine exhaust gas temperatures sufficiently that a 90 percent catalyst reduction is not possible. The reduction is also highly dependent on whether the engine is turbocharged or naturally aspirated. EPA should consider alternative levels or categories for 2SLB engines with insufficient exhaust temperatures to apply oxidation catalyst technology.

One commenter (102) further suggested the rule should be modified to allow a case-by-case determination of the emission limits for engines with low exhaust temperatures below 500 °F. The commenter (102) attempted to contact 14 catalyst vendors to determine how it could comply with the proposed rule for their units and only 3 vendors responded and indicated a custom oxidation catalyst may be the solution for their units. Thus, based on the engine's operating parameters and the manufacturing capabilities of the catalyst vendors, the solution for each engine may be different; therefore, the commenter (102) believed that requiring all 2SLB engines to meet the same CO emission limit is not reasonable.

Response: EPA received additional emissions data for stationary SI engines post-proposal. For the final rule, EPA has established a percent reduction emission limit only for non-emergency 4SRB and 4SLB engines rated above 500 HP that operate more than 24 hours per year located at area sources. In those cases, EPA based the limit on emissions data that showed percent reductions that had been achieved in practice by stationary SI engines. For non-emergency

4SRB engines, the percent reduction emission limit established in the final rule is 76 percent. The 76 percent formaldehyde control efficiency is based on industry test results.[7] These test results were used to set the final standards for stationary 4SRB engines greater than 500 HP at major sources and the 76 percent formaldehyde control efficiency is consistent with the current requirement for these engines. For non-emergency 4SLB engines, the percent reduction emission limit established in the final rule is 93 percent. The 93 percent CO control efficiency is based on the EPA-sponsored CSU testing conducted in 1999 to supporting the original RICE NESHAP rulemaking. This percent reduction is the average level of reduction achieved for the 4SLB engines tested at CSU, which incorporates variability. The control efficiency of 93 percent for CO for non-emergency 4SLB engines under this final rule is also consistent with the current requirements that apply to stationary 4SRB engines greater than 500 HP at major sources. For 2SLB engines, the final rule does not contain emission limits that are based on the use of add-on emission controls.

5.1.1.4 Comment: Several commenters (51, 63, 96, 108, 116, 130, 141, 172, 176, 202, 204, 213, 228) noted concerns over having limits that are more stringent for existing versus new engines, for smaller versus larger engines, or for area versus major sources. One commenter (96) expressed concern over the stringent emission limits proposed for existing rich burn engines below 500 HP that require compliance to formaldehyde levels much lower than what is required for larger engines, e.g., existing rich burn engines between 50 and 500 at major sources must

[7] Memorandum from Melanie Taylor and Jennifer Snyder, Alpha-Gamma Technologies, Inc. to Sims Roy, EPA OAQPS ESD Combustion Group. January 7, 2004. EPA-HQ-OAR-2002-0059-0665.

under the proposed rule meet at formaldehyde limit of 200 ppbvd (without the option of a percent reduction standard), which is 43 percent lower than required for larger sources. The commenter (96) also noted what it believed to be an inconsistency because the same engines at area sources can meet either a 200 ppbvd formaldehyde limit or a 90 percent formaldehyde reduction. The commenter (96) is of the opinion that smaller engines at major sources and area sources should not be subject to more stringent requirements than large engines. The commenter (96) also felt that the proposed requirements for smaller rich burn engines at major sources and all rich burn engines at area sources are inconsistent with what is proposed to be required for other engine types. For example, the 200 ppbvd formaldehyde limit that is required for these engines is much more stringent than both maintenance practices, which are required for 4SLB engines between 50 and 250 HP, and the 9 ppm CO standard that is required for 4SLB engines above 250 HP. The commenter (96) further noted that even under the best conditions with a 90 percent efficient NSCR that 200 ppbvd may not be achievable and if EPA keeps the formaldehyde standard, EPA should adopt the standards that were finalized for rich burn engines above 500 HP at major sources of 350 ppbvd or a 75/76 percent formaldehyde reduction.

One commenter (51) stated that EPA's proposed rule places more stringent requirements on an engine at an area source than it does on an identical engine at a major source. The commenter (51) explained that the possibility exists that engines that fall into the exempt categories could also be located at area sources of HAP, in which case they would be subject to emission limits under the proposed rule. The commenter (51) believed it made little sense to exempt larger engines at major sources while requiring smaller engines to comply with the rule. The commenter suggested that MACT cover all categories of engines in excess of 500 HP at major sources as well as area sources.

One commenter (228) stated that it is not clear why large (greater than 500 HP) existing 2SLB, 4SLB, emergency RICE, limited use RICE, or RICE combusting landfill gas located at a major source should be exempt from regulation, while similar sources at area sources are regulated. The commenter stated that the same rules should apply to both, and EPA has provided no justification for exempting large existing RICE at major sources of HAP from subpart ZZZZ while requiring area sources to control the same units. The commenter (228) stated that if large units are going to be regulated at area sources, they should be regulated at major sources.

One commenter (141) stated that the proposed rule includes SI engines and landfill/digester gas engines greater than 500 HP located at area sources and does not include the same size engines greater than 500 HP located at major sources and that, given the equipment is the same, the requirements should be the same.

Commenter 63 expressed similar concerns to commenter 96 in terms of the proposed rule having more stringent limits for existing versus new sources and for small versus large sources. For example, commenter 63 cited as an example that the current rule has emissions limitations and operating limitations only for new stationary 4SLB RICE above 250 HP located only at a major source of HAP emissions (Tables 2a and 2b). Further, commenter 63 stated that proposed rule will place emissions limitations and operating limitations on these existing units whether located at a major source (Table 2c of the proposed rule) or at an area source (Table 2d of the proposed rule) and, consequently, existing units at a HAP source are subject to the regulation, but new ones at an area source will not be. Commenter (229) questioned how EPA expects existing engines to comply with an emission limitation standard that is more stringent than a standard for new engines. Commenter 213 is of the opinion that it would be better and more cost-efficient if the new standards are applicable to the new units only similar to what EPA finalized in the 2004 RICE NESHAP and the 2008 SI NSPS/NESHAP.

Commenters 104, 111, 150, 151, and 225 expressed similar concerns in terms of the proposed standards being more stringent for existing sources than for new sources. Certain commenters said that the fact that existing equipment is older and typically less efficient tends to dramatically influence emissions output. Commenter 202 recommended that EPA limit the regulated source category to new or reconstructed engines. Other commenters (116, 141) expressed that the standards for all new/reconstructed engines should not be less stringent than for the same size existing RICE.

The commenter (63) also claims the rule proposes more restrictive emissions limitations and operating limitations for small existing units (less than 500 HP) at major sources while those same existing sources greater than 500 HP are not regulated. The commenter (63) said that for example an existing 600 HP non-emergency 4SLB has no emissions limitation in Table 2c, but an existing 400 HP 4SLB does.

One commenter (204) observed that EPA is proposing more stringent emissions limits for several categories of existing stationary RICE when compared to the limits proposed under the 2004 and 2008 RICE rules, yet EPA fails to articulate a basis for this requirement. The commenter (204) further noted it would seem more reasonable to require additional or more stringent controls on units that are new or are being reconstructed as opposed to requiring expensive retrofits of existing units, some of which are nearing the end of their useful operating life. The commenter (204) also questioned how the EPA can establish different emissions limits for several of these categories when the same RICE emissions database was used for the 2004 and 2008 rules as well as this proposed rule.

Commenter 204 questioned why, in some cases, area source emissions limits are more restrictive than major source emissions limits. For example, an existing four stroke rich burn engine greater than 500 HP at a major source is subject to a 76 percent reduction of formaldehyde or 350 ppmvd. In contrast, the same exact engine at an area source is subject to a 90 percent reduction of formaldehyde or 200 ppmvd. The commenter (204) noted that it is counterintuitive that the EPA would require more onerous emissions compliance limits for existing stationary RICE as well as area sources when compared to new/reconstructed units or units located at major sources.

Response: As discussed in the response to comment 4.1.1, EPA received additional emissions data for stationary SI engines. This new data was incorporated into the MACT floor and MACT analysis, and the emission limits in the final rule are different than the proposed rule. Many of the concerns expressed by the commenters regarding the emission limits are no longer an issue with the final emission limits. For engines at or below 500 HP EPA is not requiring any engines under 100 HP to meet numerical standards and is only requiring 4SLB engines 101 HP to 500 HP to meet standards that are likely to require emission controls. Moreover, the levels required in the final rule are less stringent than the proposed standards that were expected to require controls.

EPA notes that the standards for engines greater than 500 HP at major sources were developed under the 2004 rule and that the standards for new engines at area sources and at or below 500 HP at major sources were developed under the 2008 rule. Neither are the subject of this rule. Due to the Brick MACT decision, which said that EPA could not set MACT floors of no emission reduction, as well as other subsequent court decisions, EPA had to take a different approach in setting standards for the stationary engines regulated in this rule than was taken in earlier regulations. The outcome of the Brick MACT decision and the SSM decision occurred after the previous engine rulemakings and therefore have resulted in standards more stringent for older engines under a different analysis.

5.1.1.5 Comment: One commenter (155) said that EPA should allow alternatives under section 112(h) of the CAA for demonstrating compliance at reduced load and other reduced temperature operating conditions where catalytic control is required. The commenter (155) believes that it is not possible to set a standard based on add-on catalyst control that is applicable at all times. The performance of the catalyst is dependent on the load, engine type, engine make or model, catalyst formulation, catalyst age, and so on, and so therefore, it is infeasible to define a standard as a function of load and temperature, according to the commenter (155). The commenter (155) recommended that EPA consider a work practice standard to be used at reduced load or other reduced temperature conditions where aftertreatment is required to meet the standard. Alternatively, if EPA finalizes a catalyst-based standard that applies at all times, such a standard must be well rationalized and supported with data and a clear presentation of how the analysis was conducted, the commenter (155) said.

Response: EPA agrees that it is appropriate to consider variability in developing the final rule. The final emission standards account for operational variability of the stationary engine. This includes engines operating at low loads and other reduced operating temperatures. EPA has also specified in the final rule that performance tests can be conducted during normal operating conditions. The final standards and other requirements are well explained and detailed documentation of how the analysis was conducted is included in the docket material. EPA does not believe that it would be justified in using the provision in 112(h) to establish work practice standards in lieu of emission limits since it is not technically or economically infeasible to measure emissions during the operating conditions discussed by the commenter.

5.1.1.6 Comment: One commenter (96) stated that EPA has proposed CO standards for 4SLB engines between 50 and 250 HP of 95 ppmvd that are in conflict with the 540 ppmvd, which is required in the SI NSPS.

Response: The emission standards in the NSPS and NESHAP cannot necessarily be compared because they were developed under different statutory sections of the CAA. For major sources, EPA is required to set an emission limit that is no less stringent than the MACT floor. For the final rule, the MACT floor for 4SLB engines 100 HP to 500 HP was determined to be 47 ppm CO, based on the sources for which EPA has data.

5.1.1.7 Comment: One commenter (157) believes the MACT floor numbers of 8 ppmvd for 2SLB and 9 ppmvd for 4SLB give 4SLB engines a 12 percent advantage in achieving the 90 percent reduction. The commenter (108) noted previous NESHAP regulations (2004) required 58 percent reduction of CO emissions for 2SLB and 93 percent reduction for 4SLB, which was based on the approximately 30 years of proven technology associated with 4SLB catalytic converters vs. the emerging (now 5 years) technology with 2SLB catalytic converters. The commenter (108) stated that the net result is that 2SLB engines are subject to a change 32 percent lower in one step from the previous requirement and 4SLB engines are allowed a 3 percent higher level from the previous requirement (the 2004 NESHAP regulations). Therefore, the commenter recommended that the MACT floor number be established for all engines at 9 ppmvd.

Response: EPA does not agree with the commenter that the emission limit for 2SLB engines should be the same as for 4SLB engines. However, as discussed in the response to comment 5.1.1.1, the emission limits in the final rule are different than in the proposal. The limit for 2SLB engines at major sources is 225 ppm CO. The limit for 4SLB engines at major sources is 47 ppm CO. Therefore the concerns expressed by the commenter on the proposed limits are not applicable to the final limits.

5.1.2 Above-the-Floor

5.1.2.1 Comment: Several commenters (97, 112, 132, 155, 175, 241, 242) thought that the data used for EPA's cost effectiveness analysis is flawed and based on limited and erroneous data and assumptions. Based on EPA's analysis, it determined that catalytic controls were cost effective and appropriate for several natural gas engines, but the commenters (155, 242) believe that above-the-floor controls are not justified for natural gas engines based on using more realistic cost information. The commenters (155, 242) provided extensive detailed information supporting their view of EPA's flawed cost data and assumptions. Some of the main points, which the commenters (155, 241, 242) believe indicate that different conclusions are justified and a reanalysis necessary, include the following:

- Cost effectiveness estimates are significantly less than those presented for the 2004 RICE NESHAP and the commenter (155) believes that costs associated with the proposal are considerably underestimated by an order of magnitude or more. The commenter (155) should explain the difference between current cost estimates and the estimates from the 2004 RICE NESHAP;
- The underestimate of costs are mainly caused by underestimating control equipment capital cost, operating and compliance costs, and emission assumptions; and
- Based on target cost effectiveness values and EPA conclusions from a document available from the docket, above-the-floor controls are not cost effective and not warranted for natural gas engines.

The commenters (155, 242) suggested that EPA gather control technology cost data from several vendors and operators and independently validate cost quotes and performance claims to remove any potential conflict of interest from control technology vendor sales objectives. Additional flaws and inaccuracies in EPA's cost data include AFRC costs not included in NSCR capital costs, as well as other associated necessary equipment; and the 20 years catalyst lifetime is not appropriate and 10 years or less would be more realistic. Commenter 242 said that elements that can affect catalyst life include: engine family, exhaust temperature, engine misfires and malfunctions, utilization and frequency of startup and shutdown, percent load and load swing cycles, catalyst cleaning frequency, element design and formulation, lubrication oil consumption and formulation, and fuel quality. The commenters stated that 90 percent reduction in emissions is not supported by data and information in the docket, e.g., EPA's testing at CSU shows levels below 90 percent. According to the commenters, EPA should revise the cost effectiveness analysis using documented control efficiencies and for engines that cannot achieve

90 percent, e.g., large 2SLB engines, control efficiencies should be reflective of those achievable in practice.

Regarding the benefits from using NSCR on rich burn engines, the commenters (155, 242) said that EPA has considered non-HAP reductions such as CO and NO_x emissions, but that it has not included the impact of NSCR on all emissions. The commenters (155, 242) indicated that since rich burn engines are required to operate at a lower air-to-fuel ratio when equipped with NSCR, engine efficiency is decreased and greenhouse gas emissions will increase because more fuel carbon is oxidized leading to more carbon dioxide (CO_2). Methane emissions may also increase, the commenter (155) said because NSCR control efficiency for methane is much lower than for HAP and CO. In addition, the commenters (155, 242) said that ammonia emissions are likely to increase with the use of NSCR, which is something that has been documented in recent studies. The commenters (155, 242) were also of the opinion that CO reductions are typically overestimated.

The commenters (155, 242) said that the estimates it has provided are significantly higher than what EPA estimated for the proposed rule. If EPA conducts a re-estimate of the cost per ton of HAP removed from existing engines that are consistent with the estimates conducted by the commenters (155, 242) and presented in the above tables, the commenters are of the opinion that above-the-floor control cannot be justified for existing 2SLB, 4SLB and 4SRB engines.

<u>Response</u>: In response to these comments on the cost effectiveness calculations for the proposed rule, EPA re-evaluated all aspects of the cost effectiveness calculations. EPA solicited and received additional information from stakeholders regarding the costs of oxidation catalyst and NSCR. This information has been incorporated into the cost effectiveness calculations for

the final rule. EPA is including costs for AFRC in the cost analysis and has adjusted the equipment life to 10 years rather than 20. For the final rule, EPA is also using HAP emission factors specific to each subcategory, rather than using one HAP emission factor for all SI engines. The HAP emission factors EPA is using for the final rule to estimate cost per ton and emissions reductions are from AP-42 and are described in the memorandum titled "Emission Factors for Existing Stationary SI RICE." Finally, EPA used emission reduction percentages that are based on emission reductions actually achieved in practice based on the emissions test data that EPA has.

EPA agrees that rich burn engine efficiency might be affected as a result of operating with NSCR, but expects that any such decrease in efficiency would be negligible. Based on recommendations from commenters, EPA has incorporated a fuel penalty into the control costs used for the final rule. The specific fuel penalty costs EPA incorporated into the control costs for the final rule are included in the memorandum titled "Control Costs for Existing Stationary SI RICE." The commenters did not provide any specific data to document the degree to which ammonia and greenhouse gas emissions will increase as a result of applying NSCR. EPA does not have any information on greenhouse gas emissions increases. It is true that ammonia emissions can increase across the catalyst, however the magnitude is unknown. Information published in the Four Corners Report,[8] states that "If NSCR is used on a large scale, it is believed ammonia emissions would result. However, it is not known if these emissions would be significant." EPA does not have any other information on ammonia emissions to quantify the magnitude of ammonia emissions. However, according to the Four Corners Report,[7]ammonia

[8] Four Corners Air Quality Task Force Report of Mitigation Options. November 1, 2007. EPA-HQ-OAR-2008-0708-0009.

can be minimized by using a well-performing air/fuel ratio controller. The Four Corners Report states: "If a rich burn engine is operated with a properly functioning air/fuel ratio controller plus 3-way catalyst, it will meet emissions requirements without producing a noticeable amount of ammonia." EPA agrees with the findings of the Four Corners Report that with a tightly controlled air.fuel ratio controller, ammonia can be minimized. EPA also expects the ammonia increase to be minimal and would be offset by the substantial reduction in HAP, CO, VOC, and NO_x emissions.

5.1.2.2 Comment: A few commenters (76, 132, 155, 224, 242) said that EPA should define a cost effectiveness threshold for the above-the-floor analysis or identify a cost range and the basis for evaluating peripheral benefits and negative impacts if a specific threshold cannot be defined. Commenters 155, 186, and 242 also provided cost information for various engine subcategories. The commenters (155, 242) also asked that EPA discuss any differences in above-the-floor determinations between this proposed rule and the 2004 RICE NESHAP in terms of what costs are considered acceptable.

One commenter (76) noted that the cost per ton of HAP removed was determined to be too significant and to outweigh the expected HAP reductions from non-emergency 4SLB $50 \leq HP \leq 249$ engines. The commenter (76) asked how EPA defined significant, and what was the basis for this determination. The commenter (76) stated that there was no data available in the preamble or the docket, and that this analysis should be reconsidered because the process that EPA used can be considered arbitrary. One commenter (76) asked how controls were justified and what criteria were used to establish the emission limitations for the non-emergency 4SLB $50 \leq HP \leq 249$ subcategory.

One commenter (76) stated that MACT should be emission limits without add-on controls for non-emergency 4SRB engines 50≤HP≤500 located at major sources. The commenter (76) asked what is "reasonable" cost effectiveness for this subcategory and how was this number quantified. The commenter (76) recommended that CO be used as a surrogate for these types of engines rather than establishing formaldehyde limits.

Commenter 242 said that for the 2004 RICE NESHAP, EPA determined that above-the-floor controls were not cost effective. The cost per ton of HAP removed for lean burn engines for that rulemaking was between $13,000 and $21,000. However, for the current proposal, EPA has developed cost per ton estimates ranging from $5,000 to $33,000 for certain smaller 2SLB, 4SLB, and 4SRB engines, where above-the-floor controls are not required.

The commenters (155, 242) assumed that where above-the-floor controls were not required EPA is saying that the cost effectiveness is not reasonable. The commenters (155, 242) said that EPA considers cost of controls for 2SLB and 4SLB above 250 HP reasonable and based on an extrapolation of the cost per ton figures EPA presented for the proposal, the commenters (155, 242) estimated that the cost per ton of HAP removed from a 250 HP lean burn engines is about $3,600. The commenter (242) added that the rule supporting information states that $2,900 and $3,000 per ton is reasonable for 2SLB and 4SLB engines, respectively. Therefore, the commenters (155, 242) concluded that the cost threshold for lean burn engines is approximately $3,600 per ton of HAP removed.

EPA has determined that cost per ton values for rich burn engines below 50 HP are significant and EPA did not go above-the-floor for this category of engines. This means that EPA is requiring add-on controls for rich burn engines that are above 50 HP, where the cost per ton range is $3,800 to $13,000. Therefore, the commenters (155, 242) said, it seems the cost threshold is between $13,000 and $33,000, since the latter represents the cost per ton for engines less than 50 HP. This indicates that EPA has determined that a higher cost per ton threshold is acceptable for rich burn engines, likely because of peripheral emission benefits the commenters (155, 242) said. However, it is not clear whether EPA has taken into account negative effects from NSCR, such as fuel penalties and a potential increase in greenhouse gas emissions, commenter 242 stated. Commenter 155 added for reference that EPA has indicated that $72,000 per ton for diesel engines is too costly.

The commenters (155, 242) noted that EPA should consider the relative toxicity of HAP from natural gas engines and if the URE for formaldehyde is revised, the relative importance of reducing HAP may be marginalized and the cost effectiveness threshold would be lowered.

Again, the commenters (155, 242) said that EPA should explain the basis for the cost thresholds and what specific criteria were considered in making decisions whether cost effectiveness values are reasonable or not. Commenters 155 and 242 have also previously indicated that they believe EPA has significantly underestimated the costs. Also, as mentioned earlier by commenters (155, 242), EPA should obtain more information on the cost of purchasing, installing, and operating controls, and providing a thorough explanation of how EPA reached its conclusions will assist in determining how much additional effort and information is needed to refine the cost analysis, e.g., if the cost effectiveness for a specific group of engines is significantly higher than the acceptable cost per ton threshold, then further analysis is not needed, but if the cost per ton is close, then additional cost effectiveness analysis may make sense to make sure adequate data has been reviewed and appropriate assumptions have been made.

Response: EPA cannot define a specific cost per ton threshold that would be acceptable across the board. EPA does not think it is appropriate to discuss differences in the above-the-floor determinations in terms of which costs are justified and which are not between this rule and the 2004 RICE NESHAP. Although consistency is preferable, it is not necessarily appropriate to make a comparison since the rules were developed at different times and under different conditions, cover different engines, and are based on different information and data. Note also that cost is not the only consideration in EPA's determinations, but that EPA also considers other factors such as the benefits of reducing other non-HAP pollutants and non-air quality health and environmental impacts, and energy requirements. Therefore, EPA does not believe it would be appropriate to define a threshold that would be considered acceptable in all cases based solely on cost. The memorandum "Cost per Ton of HAP Reduced for Existing Stationary RICE" presents the cost per ton numbers for all engines and explains how these numbers were quantified. EPA's decision for requiring emission standards under the final rule for certain engines is not arbitrary and EPA clearly presents the rationale and justification for the final limits in the the above-the-floor analysis in the memorandum titled "MACT Floor and MACT Determination for Existing Stationary SI RICE ≤500 HP Located at Major Sources" and the GACT analysis in the memorandum titled "MACT Floor and MACT Determination for Existing Stationary Non-Emergency SI RICE <100 HP and Existing Stationary Emergency SI RICE Located at Major Sources and GACT for Existing Stationary SI RICE Located at Area Sources."

5.1.3 Subcategories

5.1.3.1 Comment: Numerous commenters (112, 131, 132, 155, 156, 224, 242) thought that it might be necessary to establish additional subcategories or possible exemptions depending on the results of a re-analysis of the MACT floor.

For example, the commenters (112, 131, 155, 242) said that certain 2SLB engines cannot reach the exhaust temperature necessary for effective catalyst performance and based on the proposed emission standards these engines would have to be replaced. Commenters 112 and 242 said that existing 2SLB slow speed engines should either be exempted from the rule or be subject to only work practice standards. Commenter 112 asserted that controls on large bore, slow speed 2SLB engines are particularly problematic for the following reasons:

- The catalyst requires a temperature of at least 550°F to work properly. The temperature of the exhaust for 2SLB engines runs cooler than the temperature of the exhaust for 4SRB. The commenter (112) submitted a list of 20 models of 2SLB engines with exhaust temperatures less than 550°F.
- The exhaust temperature drops off sharply when the load is reduced, affecting the efficiency of the catalyst for 2SLB engines where the exhaust temperature at full load is over 550 F. The commenter (112) submitted a list of 38 models of 2SLB engines with exhaust temperatures greater than 550 F.
- The 2SLB engines cannot be operated with more than a few inches of back pressure. A catalyst increases back pressure to the exhaust and would have to be designed accordingly.
- Fouling of catalysts on 2SLB engines is much greater than for 4SLB or 4SRB engines due to units backfiring routinely, which either coats the catalyst or destroys it. Consequently, the catalyst will require frequent washing or replacement, which in turn

results in additional performance tests, and additional notifications under 40 CFR part 63, subpart A, thereby greatly increasing the operating cost of the controls.

The commenter (112) attached to its comments a Case Study for retrofit of ten large 2SLB engines with oxidation catalysts. In the case study, the catalysts were designed for 58 percent reduction of CO because, as operator in the Case Study explained, a new catalyst may get approximately 90-percent reduction of CO but only for a few hours because oil masking begins immediately upon startup; within a few days, the efficiency is reduced below 70 percent and within approximately 3 months of continuous operation must be cleaned or replaced to ensure the control efficiency is kept at least 58 percent. The commenter (112) asserted that high reduction efficiency for catalysts on these types of engines is impossible to maintain long term. As a result, the commenter (112) believes that the rule would effectively require widespread replacement of the existing engines with newer models to meet the standards, which increases the cost of emissions reductions to nearly $250,000 per ton. The commenter (112) stated that replacement of these engines is both impractical and wasteful of valuable natural resources. The commenter (112) recommended that existing 2SLB engines be exempt from the standards.

Commenter (156) noted that existing 2SLB slow speed engines used to drive natural gas compressors are typically found in older producing gas fields, compressor stations, and gas plants; they are usually greater than 500 HP and are often more than 30 years old. The commenter (156) indicated that the engine and compressor are usually built with an integral design, meaning the engine cannot be replaced independently of the compressor; they usually operate at around 300 rpm and have characteristically low exhaust temperatures. The commenter (156) noted that this information can be found in the report of EPA's study at CSU (EPA-454/R-00-36a). According to the commenter (156), low exhaust gas temperatures mean that oxidation catalysts operate inefficiently, and in EPA's study achieved CO control at best of about 65 percent and formaldehyde control around 40 percent. The commenter (156) indicated that the cost to retrofit these engines is several orders of magnitude above what EPA used in the cost estimate for this rule (see Section 13.3), and even then will not achieve 90 percent control of CO as proposed. Thus, the commenter (156) believes that the only practical option is to replace these engines, which would be especially expensive since many are fit to integral compressors. With many of these engines located at older producing fields, this expense could be cost prohibitive, severely impacting field life economics, according to commenter 156.

As a solution to this problem, the commenter (156) asked EPA to give serious consideration to solutions offered by commenter 242 and that is adopting work practice standards in lieu of emissions standards for rural area sources and creating engine subcategories for engines with unique operating limitations that includes existing 2SLB slow speed engines. The commenter (156) believes that exempting existing 2SLB engines at area sources or adopting work practice standards specific to this engine type [as allowed under CAA sections 112(d)(5) and 112(h)] would resolve this issue in most all cases. Commenter 132 agrees that EPA should establish an additional subcategory for 2SLB for some of the same reasons as discussed above.

Commenters 155 and 242 provided another example of engine types that would have difficulties meeting the proposed standard and those are air compressors commonly used in the natural gas transmission industry. According to the commenter (155), this type of engine has variable operation and operates for a brief time when operating. The engines used for this purpose are typically 4SRB engines above 100 HP and most compressor stations are located at major sources (consequently these engines would be subject to emission standards that require add-on controls), commenter 155 said. The commenters (155, 242) said that testing is not practical on these units because the unit will not operate at a steady load and for a period long enough to conduct a test. If the engine does not operate long enough exhaust temperatures are not likely to be sufficiently hot for catalyst function and cyclic load would challenge the air-to-fuel ratio controller, according to the commenters (155, 242). For these reasons, the commenter (155) believes it is technically clear why emission standards and measurements are not feasible and a subcategory may be needed for these types of engines. Both commenters 155 and 242 believe that a subcategory is necessary for cyclic duty operations. Examples of cyclical duty applications include air compressors, emergency generators, pumps, and cranes, commenter 242 said. Commenters 131 and 132 agreed that a separate subcategory representing cyclic engines is appropriate.

Other examples of engines possibly in need of separate subcategorization are units with limited run time, e.g., fire pumps or engines that operate infrequently based on demand, the commenter (155) said. The commenters (155, 242) thought a subcategory for these engines, i.e., limited use may be appropriate either because add-on controls might be necessary on a unit that rarely if ever operates to meet an emission standard or if the engine was subject to maintenance practices, the frequency of maintenance would require maintenance on an engine that has not be operated. Commenter 242 specifically suggested that a subcategory be created for intermittently used engines that operate less than 500 hrs/yr. Commenter 242 also believes that a subcategory should be established for emergency engines and these engines should only be subject to work practice standards.

Response: EPA agrees with the commenters to some extent regarding the issues related to 2SLB engine operation and the use of oxidation catalyst. However, EPA has also reviewed information that appears to indicate 2SLB engines can operate successfully with oxidation catalyst and achieve substantial reductions.[9,10,11,12] Nonetheless, EPA is finalizing numerical emission standards for existing stationary 2SLB engines at major sources that are expected to be met without the use of emission control aftertreatment. As discussed in the memorandum titled "MACT Floor and MACT Determination for Existing Stationary SI RICE ≤500 HP Located at Major Sources," EPA determined that the MACT floor for existing stationary 2SLB engines greater than or equal to 100 HP and less than or equal to 500 HP is 225 ppmvd of CO at 15 percent O_2. EPA considered requiring oxidation catalyst, because EPA does believe the technology is feasible, but did not believe the costs justified going above-the-floor for this group of engines. The estimates of the cost per ton of HAP reduced were based on updated cost information, which was significantly increased to account for all necessary components and to reflect costs representative of oxidation catalyst costs for 2SLB engines. Cost per ton numbers used in considering the oxidation catalyst above-the-floor option for these engines were also calculated assuming a lower HAP control efficiency, i.e., 43 percent, compared to what EPA used at proposal. Even though oxidation catalyst could reduce HAP by more than 43 percent, EPA believes that this percentage is more reflective of expected in-use average reductions and is in fact based on the average HAP reduction observed during EPA's 1999 CSU testing of a 2SLB

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[9] Article by Glen Sharkowicz and Bruce Chrisman. Development of Catalyst Friendly Lubricating Oil for Two-Stroke Lean-Burn Gas Engines. EPA-HQ-OAR-2008-0708-0471.

[10] Development and Field Validation Testing of an Oxidizing Catalytic Converter and a Compatible Lube Oil for Two Stroke, Lean Burn Gas Engines. EPA-HQ-OAR-2008-0708-0490.

[11] Article by Bruce Chrisman and Diane Slaughter. Staying Ahead of Exhaust Emission Regulations. June 2009. EPA-HQ-OAR-2008-0708-0494.

[12] Email from Bruce Chrisman, Cameron's Compression Engines to Tanya Parise, EC/R. 2SLB Engine Information. October 22, 2009. EPA-HQ-OAR-2008-0708-0500.

engine equipped with oxidation catalyst. For existing 2SLB engines at area sources, EPA is finalizing management practices, which were determined to be generally available. No other options beyond management practices were determined to be justified for existing stationary non-emergency 2SLB engines EPA is requiring management practices. EPA believes that the requirements EPA is finalizing for existing stationary 2SLB engines resolves the commenters' concerns related to 2SLB engines and aftertreatment since oxidation catalyst is not expected to be necessary in order to demonstrate compliance with the final requirements under this rule.

In response to concerns regarding variable load, for engines operating at reduced speed or loads resulting in a reduced exhaust temperature, EPA believes that numerical emission requirements are appropriate and there is no justification to only require work practice standards during these situations. EPA's emission standards are based on emissions data from a engines operating across loads from 11 to 100 percent. EPA's standard-setting approach also incorporates a statistical formula, which accounts for emissions variability. Note that with regard to 4SRB engines, only stationary existing non-emergency engines greater than 500 HP at area sources that are operated more than 24 hours per calendar year will most likely need aftertreatment, which means that variable load 4SRB engines between 100 HP and 500 HP at compressor stations at major sources will not have the issue of insufficient exhaust temperature for catalyst function. Existing non-emergency 4SRB engines greater than or equal to 100 HP and less than or equal to 500 HP are subject to a numerical emission limit, but the limit is at a level that would expected to be met without add-on controls.

In response to the request for a subcategory of limited use engines, EPA does not believe such a subcategory is generally necessary, but is providing subcateogries for 4SLB and 4SRB engines greater than 500 HP located at area sources that operate less than or equal to 24 hours per year. EPA provides responses regarding this issue in section 6.1 of this document. EPA does not believe that a subcategory is justified solely based on what the commenters consider limited operation. The maintenance/management practices EPA is requiring under the final rule are specified as time intervals based on actual engine operating hours. Therefore, any management/maintenance practices that might apply to an engine operated infrequently would only be required based on actual operating time or annually, which would not constitute a burdensome requirement.

Consistent with the proposed rule, EPA is retaining a subcategory for emergency engines in the final rule. EPA agrees with commenters that a subcategory for emergency engines is necessary to capture the different characteristics of these engines.

5.1.3.2 Comment: One commenter (242) noted that a subcategory is justified for engines located on offshore platforms and in cold weather regions. According to commenter 242, due to space constraints on platforms, installation of add-on controls is expensive and/or impossible. In extreme cold weather it is difficult and sometimes impossible to maintain the exhaust hot enough for catalyst operation, particularly for emergency, limited use and intermittently used engines, the commenter (242) said. For these reasons, commenter 242 believes that it is reasonable that EPA create subcategories for non-continental areas/offshore platforms and for cold weather regions, i.e., less than 0°F as was done in 40 CFR part 60, subpart KKKK for stationary combustion turbines. The commenter (242) recommended that these special category engines only be subject to work practice standards.

Response: The EPA does not agree that it would not be feasible to install add-on controls on offshore platforms. Catalyst manufacturers have had many experiences with installing controls in situations where space is a concern, for example in mobile source engines. Regarding engines located in cold weather regions, the commenter did not submit any data to show that the emission limitations could not be achieved by these engines. A subcategory for turbines located north of the Arctic Circle was created in subpart KKKK because the emission controls that are inherent to the turbines themselves did not operate as well in the cold weather, not because post-combustion controls such as oxidation catalyst were not feasible in these areas.

5.1.3.3 Comment: One commenter (242) said that EPA has not considered fuel quality in determining appropriate subcategories for this rule and thinks that a separate subcategory is necessary for sulfur-containing fuels should be included. Sulfur in fuels can lead to the exhaust containing sulfur that impacts catalyst performance and reliability, the commenter (242). According to the commenter (242), fuel such as wellhead gas and other gases that contain hydrogen sulfide cannot use add-on controls due to catalyst poisoning. There are options to deal with this issue such as pre-treating the fuel, obtaining sulfur resistant catalysts, and replacing the catalyst on a more frequent basis. However, the commenter (242) said, such options may not be technically feasible and if feasible, would have costs well above reasonable cost effectiveness thresholds. The commenter (242) compared the issue to the issues related to landfill and digester gas that contain siloxanes, which because of the silicon-based compounds present in the fuel lead to catalyst inoperability. For these reasons, the commenter (242) asked that EPA create a subcategory for engines operating on non-pipeline gas (i.e., gas containing sulfur compounds) similar to what was done for landfill and digester gas fired engines. These engines should not be subject to above-the-floor controls, in the commenter's (242) opinion.

Response: The commenter did not provide any information to support the claim that a separate subcategory is needed for sulfur-containing fuels. As discussed in the response to comment 6.9.5 on the NSPS for stationary SI engines (EPA Docket EPA-HQ-OAR-2005-0030-0249), there is information available that shows that there are aftertreatment control devices available which can operate efficiently with the presence of up to 500 ppm sulfur. Manufacturers of SI mobile source engines, like cars and trucks, successfully used catalysts on vehicles for many years when the sulfur content of gasoline was unregulated.

5.1.3.4 Comment: One commenter (76) asked why EPA established a cutoff for non-emergency SI lean burn at 250 HP rather than at 300 HP. The commenter (76) stated that there was no data available in the preamble or the docket, and that this analysis should be reconsidered because the process that EPA used can be considered arbitrary.

Response: The cutoff of 250 HP for non-emergency 4SLB engines was not arbitrary and was based on information EPA gathered for and decisions made for the SI NSPS and NESHAP finalized in 2008 for new engines. For example, see EPA's discussion on this issue in response to comment 5.2 in EPA's response to comments document for that rule.[13] EPA also discussed

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[13] Memorandum from Jaime Pagán, EPA Energy Strategies Group to EPA Docket EPA-HQ-OAR-2005-0030. Response to Public Comments on Proposed Standards of Performance for Stationary Spark Ignition Internal Combustion Engines and National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. EPA Docket EPA-HQ-OAR-2005-0030-0249.

the appropriateness of the 250 HP cutoff in supporting documentation[14] and in the preamble to that proposed rule (see 71 FR 33804). In the final rule, EPA has promulgated a single standard for all 4SLB engines rated from 100-500 HP located at major sources, which is equal to the MACT floor for those engines.

5.2 Area Sources

5.2.1 Comment: Four commenters (76, 96, 156, 216) do not believe that the emission standards for larger existing engines located at area sources should be more stringent than the same engines located at major sources. One commenter (76) asked how EPA determined what baseline was used to establish "reasonable" to justify GACT to be based on the same emission controls as MACT for area sources. Commenter 156 does not believe that EPA has presented adequate justification for this apparent discrepancy. Per 63.6590(b)(3), existing larger engines at major sources have no HAP requirements, the commenter (96) said. The commenter (96) was specifically referring to the proposed standards for existing 4SLB engines above 250 HP located at area sources and existing landfill and digester gas engines above 500 HP located at area sources. See areas marked "g" in the 4SLB and landfill/digester gas charts provided in the commenter's (96) letter.

One commenter (253) disagreed in the assessment that "costs associated with implementing HAP-reducing technologies are reasonable and justified, and there is no reason why GACT should be any different than MACT for larger engines located at area sources" (74

[14] Memorandum from Jennifer Snyder and Tanya Parise, Alpha-Gamma Technologies, Inc. to Jaime Pagán, EPA Energy Strategies Group. Subcategorization of Stationary Reciprocating Internal Combustion Engines ≤500 HP. May 15, 2006. EPA-HQ-OAR-2008-0708-0012.

FR 9710). The commenter (253) believes that GACT by definition is a lesser degree of control than MACT, which requires a minimum level of emission control that is based upon the emissions achieved by the best-performing sources within a category or subcategory. The commenter (253) stated that EPA is not required to consider the MACT floor as a minimum standard for area sources, but may instead elect to promulgate standards or requirements for area sources which provide for the use of GACT or management practices by such sources to reduce emissions of HAP. The commenter (253) stated that EPA must consider not only the economic impacts and whether the methods, practices, and techniques are commercially available and appropriate for application by the sources in the category, but also the technical capabilities of the firms to operate and maintain the emissions controls systems. The commenter (253) pointed out that unlike engines located at major sources, which are often large industrial facilities, many engines at area sources are owned and operated by small businesses with little or no experience dealing with complex regulatory issues and with minimal technical and financial resources. The commenter (253) believes that EPA should reevaluate its GACT determinations for engines above 500 HP at area sources, and believes that management practices rather than emission limitations and add-on controls may be more appropriate for larger engines at area sources.

Response: EPA has reviewed its proposed requirements for existing SI engines at area sources based on comments received on the proposed rule. For existing non-emergency 4SRB and 4SLB stationary SI RICE greater than 500 HP that operate more than 24 hours per year at area sources, EPA determined for the final rule that it is appropriate to set numerical emission limits that EPA expects would be met using emission control technologies. The emissions reductions associated with these requirements are substantial and the costs and economic impacts are reasonable. The estimated HAP reduction resulting from controlling these engines is 4,700 tpy. The total annual cost estimated for existing non-emergency 4SRB and 4SLB engines greater than 500 HP at area sources is approximately $150 million. The capital cost for controlling these engines is estimated at around $310 million. The control technologies that would be expected to be used, i.e., NSCR for 4SRB engines and oxidation catalyst for 4SLB engines, are generally available for these area source engines. Both technologies have been on the market for decades and are well-proven aftertreatment controls that are readable accessible and available. The aftertreatment control systems can be purchased through several different catalyst vendors and the location of a site would not preclude an owner from acquiring controls. The control systems are equally available to major and area sources and EPA does not see any reason why being located at an area sources would prevent such systems from being obtained.

For the remaining existing stationary SI RICE at area sources, the final rule requires management practices. EPA received comments and supporting information indicating that EPA had underestimated the cost of emission controls and overestimated how many engines were already using these controls. EPA reevaluated the cost impacts associated with establishing numeric emission limitations for these engines and determined that the cost impacts would be unreasonable given the expected emission impacts both with and without the expectation of use of emission control technologies. For example, for 4SRB engines, the annual cost per ton of HAP reduced, assuming the engine will have to install emission controls to meet the emission limit, is estimated to be $762,000 for a 50 HP engine and $167,000 for a 250 HP engine. For 2SLB and 4SLB engines at 250 HP, the annual cost per ton of HAP reduced is estimated to be $224,000 and $55,000, respectively, assuming the engines will have to install emission controls to meet the emission limit. The annual cost per ton of HAP reduced would be $128,000 for a

500 HP 2SLB engine, respectively. According to engine operators, engines that operate on landfill gas are predominantly 4SLB. This is consistent with the landfill gas emissions data set that EPA used for the final rule. According to EPA's landfill and digester gas dataset, which consists of 176 engines, the typical engine size for landfill gas-to-energy projects is between 1,000 and 2,000 HP. Aftertreatment controls could in theory be applied to landfill and digester gas fired engines. However, siloxanes found in landfill and digester gas fuel foul the catalyst. Fouling of the catalyst causes the control device's ability to reduce HAP to decline rapidly. Efforts have been made to pre-treat the fuel in order to remove impurities, but EPA is not aware of any technologies that are proven at this point. Therefore, because of feasibility issues in applying aftertreatment controls to engines operating on landfill and digester gas fuels, EPA is finalizing management practices for all landfill and digester gas engines.

Engine owners/operators have indicated that most of these smaller area source engines are not equipped with the control technologies required to meet these limits. Based on this information, EPA determined that management practices for these stationary SI RICE located at area sources of HAP are generally available and cost effective is promulgating management practices for these engines in the final rule. Additional information regarding this determination can be found in the memorandum titled, "MACT Floor and MACT Determination for Existing Stationary Non-Emergency SI RICE <100 HP and Existing Stationary Emergency SI RICE Located at Major Sources and GACT for Existing Stationary SI RICE Located at Area Sources," which is available from the rulemaking docket.

5.3 Emergency Engines

5.3.1 Comment: Several commenters (36, 48, 74, 77, 79, 81, 86, 88, 90, 96, 97, 99, 112, 118, 119, 121, 139, 140, 155, 157, 160, 161, 162, 167, 171, 173, 175, 176, 181, 196, 201, 209, 213, 216, 220, 223, 224, 227, 229, 247, 249, 253, 256) expressed concern with the proposed limits for emergency engines. Numerous commenters stated that EPA should adopt management practices for emergency engines and not require emission limits from these engines. Emergency engines need special consideration, according to the commenter (155) due to minimal operation, and commenters 121 and 154 said that EPA should apply section 112(h) of the CAA because of this limited operation. Several commenters recommended that emergency engines be subject to only work practice standards that limit the number of hours allowed for operation during non-emergency events.

For many existing engines in the field, add-on control technology is not feasible and not compatible with the engine and will cause potential performance problems as well as compromising functionality, commenter 121 said. Commenter 154 said that the numeric emission limits are not appropriate for emergency engines, because they cannot be met by most emergency engines as shown by available emissions test data on emergency engines. If EPA keeps emission limits for emergency engines, the commenter (155) thinks that EPA needs to provide justification as to the basis for such limits. Commenter 96 said that it is unreasonable to require existing emergency engines to meet numerical limits based on the best performing 12 percent of sources, which consequentially leads to 88 percent of the engines not being able to meet the limits without installing some form of controls. EPA correctly concluded that add-on controls are inappropriate and too costly for emergency engines, some commenters said, including commenters 96 and 253, but the actual rule imposes limits not achievable in many cases without add-on controls, therefore forcing emergency engines to add emissions controls or be replaced, which was not the Agency's intent. Commenter 96 provided in its comments various charts for different engine categories of where it has shaded several areas where it believes that EPA should replace limits with operational hour limits. See areas marked "b" in the charts provided on pages 10, 12, 14, and 18, for diesel, 4SLB, rich burn, and landfill gas engines, respectively, of commenter 96's comments.

Commenter 99 said that if EPA decides to go final with emission standards for emergency engines, the standards must be such that all properly maintained emergency engines can comply. As discussed above, as proposed, emergency engines cannot comply with the standards by altering operating characteristics and the commenter 99 explained that there are no "knobs" available to "turn down" HAP emissions. The commenter (99) expressed that if EPA finalizes the proposed standard for emergency engines it would obsolete many engines in this group leading to loss of reliable emergency power, which would be unacceptable to the public, will jeopardize public safety, will directly interfere with existing building codes, and a lead to a high cost to industry in lost production during emergencies.

Two commenters (121, 162) said the proposed emission standards for existing emergency RICE are overly stringent. Commenter 121 added the proposed standards do not reflect what existing engines in this subcategory achieve in practice. The limits are significantly lower than the emission limits established for new engines in the 2008 NSPS and in some cases, they appear to be more stringent than standards established for comparable future nonroad engines, the commenter (121) said. The proposed standards also lack the flexibility of the nonroad programs, which typically provide for a selection of engine families and/or emission averaging and trading and engine certification, the commenter (121) added.

Without seeing which engines are in the specific floors, one commenter (121) was unable to perform an effective assessment of whether the proposed MACT limits appropriately reflect the average of the top 12 percent. However, test data from several existing emergency engines in the commenters' (121) industry (automotive manufacturing) indicated they are unlikely to meet the proposed limits because they either pre-date or were produced to meet the established non-road engine standards or similar standards that are less stringent than those proposed. The commenter (121) said it is likely that these engines will have to be replaced.

Commenter (121) said that despite EPA's claims that the agency is not requiring performance tests of emergency engines, major sources with existing emergency engines appear to have an implicit testing requirement to demonstrate that they comply with concentration limits. Such testing could significantly increase the time the typical emergency engine would be used in year and impose additional environmental impact and costs. The commenter (121) said EPA needs to resolve the conflict between the preamble and the regulatory language and replace the emission limits for emergency engines with work practices. Commenter (154) raised similar concerns about the apparent requirement for performance testing of emergency RICE due to ambiguous rule language and said it should be clarified to explicitly state that such testing is not required. Commenter (74) said the rule would require not only initial performance testing, but testing every 3 years. Because engine operation for performance testing would likely exceed typical operation for operational testing and maintenance, these testing requirements would result in increased operation of the engine with a corresponding significant increase in operating costs and emissions of other pollutants such as NO_x.

If EPA regulated emergency generators, the numerical limit for emergency engines rated greater than 500 HP must be eliminated, according to one commenter (81). It is not reasonable for EPA to propose emissions limits for equipment and then state it does not require or expect owners of regulated equipment to test equipment to assure that it meets the those limits. This puts the regulated community in a precarious position, and it may cause owners to test their engines rather than risk a regulatory inspection that discovers that their equipment is not meeting required emission limits.

One commenter (121) said EPA does not identify which engines were used for the proposed floor limit for existing SI emergency engines greater than 500 HP at area sources and concluded that GACT work practices are more appropriate for these engines. Assuming that EPA relied on the same data as used for emergency SI engines ranging from 50 to 500 HP, the commenter (121) is concerned that the floor limit does not reflect the average achieved in practice by the best performing emergency engines greater than 500 HP. Given the flexibility GACT provides and the limit use of emergency engines, the commenter (121) recommends EPA establish work practices and harmonize those requirements for these engines at major sources.

One commenter (121) said a mandate for add-on controls would impose significant costs on engines that are run only an average of 26 hrs/yr. Commenter 48 pointed out that the proposed rule was too expensive and of limited benefit noting that emergency engines only run during emergencies. Instead, EPA should set management practices such as requirements to perform and record routine maintenance, retain copies of the engine manufacturer's approved maintenance schedule or similar maintenance schedule, and mirror those requirements for engines located at major sources, according to commenter 121.

One commenter (81) also disputed the rationale that established a numeric limit that EPA expects all emergency engines can meet without installing after treatment controls and, therefore, provides no additional environmental benefit. The commenter (81) concluded that EPA should exempt all emergency engines at area sources. Other commenters (119) pointed to the minimal environmental benefit of regulating emergency engines and the unreasonable administrative burden of regulating such sources.

One commenter (81) noted that the proposed limit is based on 100 percent load, which would seldom occur in the real world. This means the test limit would bear little relation to real operating conditions. In addition, testing may put the communication system at risk while the tests are being performed. Because few generators are likely installed to handle 100 percent loads, owners would likely have to use temporary load banks to meet test conditions. It may be necessary to disconnect the emergency engine from the network to test under load bank conditions, and the ability of the engine to respond effectively to an emergency situation will be reduced.

One commenter (81) added that if add-on controls are required to meet the limit, the short operating periods of emergency units would not trigger the usefulness of add-on controls.

One commenter (121) said EPA should allow owners or operators the option to follow either the engine manufacturers' recommended maintenance schedules or the specific maintenance requirements proposed by EPA and that this provision apply to engines at either area sources or major sources.

One commenter (201) stated that EPA's reasoning used to apply the MACT for engines at major sources as GACT for larger engines at area sources was deeply inconsistent in the case of large emergency engines at area sources. The commenter (201) pointed out that EPA decided not to require after-treatment controls for emergency engines under 500 HP located at major sources because of the low average annual operating time (50 hrs/yr), but did not make the same decision for larger emergency engines at area sources despite the same low average annual operating times. The commenter stated that setting the GACT for large emergency engines at area sources the same as the MACT for non-emergency engines could not be justified given the high cost of the controls (estimated by the commenter (201) to be $4,000 to $20,000 per engine) and the low average annual operating time (estimated by the commenter (201) to be 25 to 50 hrs/yr). The commenter (201) recommended that EPA eliminate numeric emission standards for emergency engines greater than 500 HP located at area sources and instead use the management practices and associated recordkeeping requirements proposed for small emergency engines located at area sources.

One commenter (223) stated that EPA generators located at area sources should not be subject to emission standards under 40 CFR part 63, subpart ZZZZ. The commenter (223) stated that EPA is not required to promulgate emission standards for source categories located at area sources. The commenter (223) acknowledged the D.C. Court of Appeals ruling (Sierra Club v. EPA, 479 F.3d 875, 883 (2007)) on the NESHAP for Brick and Structural Clay Manufacturing and Clay Ceramics Manufacturing (which was vacated). The D.C. Court of Appeals ruling concluded that EPA's use of work practice standards instead of emissions floors for certain subcategories of ceramic kilns located at major sources was not permitted under section 112(h) of the CAA and that EPA's failure to set emissions reductions floors for certain major source brick kiln that do not use pollution control technology violated section 112(d)(3) of the CAA. This commenter (223) stated that for area sources under section 112(d)(5) of the CAA, EPA is allowed to promulgate alternative standards for "categories and subcategories of area sources….the Administrator may, in lieu of the authorities provided in [sections 112(d)(2) and (f) of the CAA, which provide, among other things, for the promulgation of emission standards for each category or subcategory of major sources and area sources,] elect to promulgate standards or requirements applicable to sources in such categories or subcategories which provide for the use of generally available control technologies [("GACT")] or management practices by such sources to reduce emissions of hazardous air pollutants" (emphasis added). The commenter (223) stated that consistent with the Court's finding in Sierra Club v. EPA, which applied to major sources only, EPA is not required under section 112 of the CAA to promulgate standards for listed source categories located at area sources, and emergency generators located at area sources should not be subject to emissions standards.

This commenter (223) further stated that it believes it is appropriate to subcategorize emergency generators located at area sources under 40 CFR part 63, subpart ZZZZ. The commenter (223) cited section 112(d) of the CAA as stating that "[t]he Administrator may distinguish among classes, types, and sizes of sources within a category or subcategory in establishing…standards" as support. This commenter (223) believes that significant operational and economic circumstances governing emergency generators warrant the promulgation of a standard for these generators based on management practices rather than emission limits. The commenter (223) listed the following circumstances as support for its position:

- Unlike non-emergency engines, emergency generators are only used during emergency situations (provided examples).
- Because emergency generators are only used during unforeseen and typically infrequent emergency situations, their annual emissions are meaningfully lower than those from non-emergency engines. Noted that the annual NO_x emission from the four emergency generators at its West Chester facility, for example, are capped by permit, ensuring that such emissions remain below 7.63 tons NO_x on an annual basis.

- Emergency generators located at area sources are not subject to air quality permitting in many cases. The application of an emission standard under 40 CFR part 63, subpart ZZZZ could change a state's current permitting approach toward emergency generators. State or interstate permitting authorities may establish more stringent Title V permitting requirements than mandated by the CAA, and therefore subject area sources to Title V permitting requirements. Furthermore, even in States that elect not to impose Title V permitting requirements on these sources, the mere fact that a source is subject to the NESHAP program could trigger State-level construction and operating permit requirements that otherwise would not apply.
- It is economically infeasible for large emergency generators located at area sources to meet the applicable emission standards in the proposed rule. Table 2b of the proposed rule indicates that owners and operators of area source emergency generators greater than 500 HP are required to limit the concentration of CO in the unit's exhaust to 40 ppmvd or less at 15 percent O_2 (including during periods of startup or malfunction). 74 FR 9723. Most of these generators would not be able to meet this standard without installing costly add-on control devices. The commenter's (223) generators would need to add-on diesel oxidation catalyst technology that would be resistant to damage from mechanical or thermal shock and metallurgic erosion typically caused by engines. The cost of reducing CO emissions to 40 ppmvd using diesel oxidation catalyst technology for the commenter's four emergency generators (whose combined emissions are limited to 7.63 tons) would be approximately $33,000 per ton removed. Most facilities do not have the ability to account for the additional costs of installing and operating emissions control equipment as typical costs of doing business as they typically comprise of facilities that

rely on emergency generators for critical systems during emergencies and are not involved in manufacturing-based operations (e.g., hospital, commercial office buildings, and data centers).

Based on the aforementioned circumstances, the commenter (223) concluded that EPA failed to recognize that facilities that depend on emergency generators to provide power for critical systems during emergencies would be burdened by having to comply with the proposed emission standards applicable to emergency generators greater than 500 HP, unlike their counterparts in the manufacturing/industrial sector. This commenter (223) asserted that, as with other engines that EPA concluded GACT to be management practices, these engines should also be subcategorized and GACT should be management practices.

Finally, this commenter (223) expressed that EPA failed to evaluate existing emergency RICE located at area sources in determining the basis and level of the proposed emission standards. The commenter (223) opined that if EPA had evaluated emergency RICE as a subcategory of engines at area sources (rather than by engine size and selected industry-type, without considering the costs of compliance specific to emergency engines), EPA would not have been able to have identified an appropriate emission standard for emergency RICE at area sources.

One commenter (76) supported using an equivalent MACT floor for emergency SI and CI engines between 50 and 500 HP using catalyst type control technology. The commenter (76) noted that the determination of the emission limit assumed that SI emergency and SI non-emergency engines are similar in operation and emissions. The commenter (76) also noted that the limits are based on limited data and no formal request for information was made. In addition, the commenter (76) noted that for engines operating less than 100 hours will require extensive testing to establish startup and shutdown emissions. The commenter (76) supported the determination of emission limits without add-on controls for emergency CI engines between 50 and 500 HP located at major sources.

Response: : EPA reviewed the information submitted by the commenters and determined that it would be appropriate to require management practices for all emergency stationary SI engines at area sources. Because these engines are typically used only a few number of hours per year, the costs of emission control are not warranted when compared to the emission reductions that would be achieved. The proposed numeric emission levels are not GACT for emergency engines at area sources. Such engines rarely if ever use the type of emission controls that might have been necessary for many engines to meet the numeric standard, and such engines are rarely if ever subjected to emissions testing. Therefore, EPA determined that GACT for all stationary emergency engines at area sources is the use of management practices.

EPA also analyzed the types of engines that were included in the area source category listing for stationary RICE. As a result of this analysis, EPA determined that emissions from existing stationary emergency engines located at residential, commercial, and institutional facilities that are area sources of HAP were not included in the 1990 baseline emissions inventory that was used as the basis for the listing of source categories needed to ensure that 90 percent of area source emissions are regulated. Existing stationary emergency engines located at residential, commercial, and institutional facilities that are area sources are therefore not subject to this regulation.

For stationary emergency engines at major sources, EPA determined that it is not feasible to prescribe or enforce an emission standard because the application of measurement methodology to this class of engines is impracticable due to technological and economic limitations. A more detailed discussion of this determination can be found in the memorandum entitled "MACT Floor and MACT Determination for Existing Stationary Non-Emergency SI RICE <100 HP and Existing Stationary Emergency SI RICE Located at Major Sources and GACT for Existing Stationary SI RICE Located at Area Sources." EPA determined that it is impracticable to test stationary SI emergency engines using the test procedures specified in subpart ZZZZ because using these procedures would increase the required number of hours of operation beyond the routinely scheduled reliability testing and maintenance operation, thereby increasing emissions. While emergency engines have periods of operation for scheduled maintenance and reliability testing, those periods are usually several hours shorter than the number of hours that would be required to run the necessary emissions tests under subpart ZZZZ. CARB conducted a survey of stationary emergency engines in 2002[15] to determine the average number of hours that stationary emergency engines operate. The average hours of operation for maintenance and testing were 22 hours per year, which is less than two hours per month. For the engines that CARB surveyed, 86 percent operated less than 30 hours/year for testing and maintenance. Thirty percent operated less than 10 hours/year. National Fire Protection Association (NFPA) codes require that stationary engines that are used for emergency purposes are run 30 minutes per week (27 hours per year) for maintenance and testing purposes. It is impracticable to test emergency stationary engines as a result of emergency operation because emergencies are unplanned events and implementation of the procedures specified in subpart ZZZZ require advance planning before tests are conducted. In an emergency, the owner/operator

[15] California Air Resources Board Staff Report: Initial Statement of Reasons for Proposed Rulemaking. Airborne Toxic Control Measure for Stationary Compression Ignition Engines. Stationary Source Division, Emissions Assessment Branch. September 2003.

does not have the advance planning time necessary to implement subpart ZZZZ. In addition, it would be costly to test existing stationary SI emergency engines at major sources.

EPA expects that these changes from the proposed rule address the concerns expressed by the commenters about the requirements for stationary emergency engines. Regarding the comments pertaining to performance testing for emergency engines, EPA did not intend for the rule to require performance testing for emergency engines. The final rule does not contain any performance testing requirements for emergency engines.

5.3.2 Comment: One commenter (96) pointed out that there are no standards for emergency engines above 500 HP at major sources, but that emergency engines less than 500 HP and emergency engines above 500 HP at area sources have emissions requirements. The commenter (96) asserted that any standards or work practices applicable to emergency engines should be consistent across size classes and should not include emission standards during startup operations.

Response: This rulemaking and the one developed in 2004 for stationary engines above 500 HP at major sources were developed at different times. While EPA has attempted, to the degree possible and justified, to maintain consistency across rulemakings affecting the same or similar engines, recent court decisions regarding the way that MACT floors are determined and the startup/shutdown/malfunction exemptions in NESHAP have affected the way EPA develops and sets standards since the standards for stationary emergency engines above 500 HP at major sources were promulgated in 2004. For stationary emergency engines at area sources and less than 500 HP at major sources, EPA is statutorily required to set requirements. As discussed in the response to comment 5.3.1, stationary emergency engines have to meet management or work practice requirements in the final rule.

5.4 Small Engines

5.4.1 Comment: Several commenters (96, 157, 216, 262) expressed opposition to EPA's proposal to have emission standards apply to small engines. Three commenters (96, 157, 216) said that EPA should not finalize emission limits for engines less than 100 HP. One commenter (157) supported EPA's proposed no compliance requirements beyond complying with the manufacturer's instructions and no testing requirements for these engines. One commenter (96) argued that stationary engines that are less than 100 HP should be exempted from numerical HAP emission standards for some of the same reasons as those discussed by the commenter on the issue of emergency engine standards. In the commenter's (96) opinion, it is not cost effective to install add-on controls on small engines or to purchase a new engine. The majority of engines in this size range are operated for intermittent household or other infrequent use and emissions are naturally limited, the commenter (96) said, and low emissions do not justify the costs associated with requiring a numerical HAP limit. As stated, commenter 96 is opposed to numerical emission limits for engines less than 100 HP and provided in its comments charts for different engine categories of where it has shaded several areas where it believes that EPA should replace limits with manufacturer's engine maintenance. See areas marked "c," "d" and "f" in the charts provided on pages 10, 12, 14, and 18, for diesel, 4SLB, rich burn, and landfill gas engines, respectively, of commenter 96's comments. Finally, commenter 96 added that a 2 ppmvd limit for formaldehyde is not achievable by diesel engines with a catalyst operating at 90 percent efficiency, catalysts are not cost effective for small engines, and 2 ppmvd is difficult to measure in lab conditions and impracticable in field measurements.

One commenter (262) stated that because of how EPA conducted its MACT floor analysis, small engines may be forced to install add-on controls because the MACT floor was determined by the best 12 percent of engines. The commenter (228) is concerned that the proposed standards for RICE less than 50 HP will not meet the District of Columbia Circuit's test for "work practice standards" set forth in the Sierra Club v. EPA (Brick Indus.), 479 F.3d 875 (D.C. Cir. 2007), which allows work practice standards "only if measuring emission levels is technologically or economically impracticable." The commenter (228) stated that emissions measurement likely meets these standards, but does not believe that measurement is economically practicable for a small unit as the cost of measurement will likely exceed the value of the unit itself. The commenter (228) urged EPA to exclude small sources from the category.

Response: EPA has reanalyzed its proposed standards based on the information and data presented and EPA concludes that it is not feasible within the context of this rulemaking to prescribe emission limitations for existing stationary SI engines smaller than 100 HP located at major sources, because the measurement of emissions from these engines is not practicable due to technological and economic limitations. In order to measure the emissions from these engines on a ppmvd at 15 percent O_2 basis, the following test methods are required: EPA Method 1 or 1A for selection of sampling ports; EPA Method 3, 3A, or 3B for determining the O_2 concentration; EPA Method 4 for measuring the moisture content, EPA Method 10 or ASTM D6522-00 (2005) for measuring the CO concentration; and EPA Method 320 or 323 or ASTM Method D6348-03 for measuring the formaldehyde concentration.. These test methods require the sample point to be a certain distance between the engine and the exhaust. Because engines below 100 HP often have exhaust pipes with very small diameters and lengths, stack testing using these methods could require a modification or extension of the exhaust pipe to accomplish the test. The cost to do the testing ranges from approximately $1,000-$2,000 depending on the method used. The cumulative cost of testing existing stationary non-emergency engines below 100 HP at major sources would be high. EPA estimates that there are more than 67,000 of these engines and to test these engines could cost as much as $135 million. Given the cost of the testing itself, the physical adjustments necessary to accomplish the test, and the particular circumstances pertaining to stationary engines below 100 HP, we believe that the application of measurement methodology to this class of engines is not practicable due to technological and economic limitations. Therefore, EPA is promulgating work practice standards for these engines. Additional detail regarding this analysis can be found in the memorandum entitled "MACT Floor and MACT Determination for Existing Stationary Non-Emergency SI RICE <100 HP and Existing Stationary Emergency SI RICE Located at Major Sources and GACT for Existing Stationary SI RICE Located at Area Sources."

5.4.2 Comment: One commenter (76) asked how EPA established standards for less than 50 HP engines. The commenter (76) believes there is very limited data for these engines. The commenter (76) believes that the emission standards in Tables 1 and 2 in the preamble should be less than 100 HP instead of less than 50 HP engines. The commenter (76) further said that the proposed MACT floor for engines less than 50 HP is based on limited data and asked what is the percentage of these engines in the U.S. The commenter (76) asked if test data for this determination is available in the docket.

Response: EPA explained in the preamble to the proposed rule and in supporting documentation available from the rulemaking docket how the standards were developed for small engines less than 50 HP. See page 9706 of the proposed rule Federal Register notice and memoranda titled "Above-the-Floor Determination for Stationary RICE" and "Subcategorization and MACT Floor Determination for Stationary Reciprocating Internal Combustion Engines ≤500 HP at Major Sources" in Docket Number EPA-HQ-OAR-2008-0708. EPA has acknowledged that it had limited emissions data at the time of proposal; however, having limited data available does not exempt EPA from developing requirements. During the subcategorization determination for the final rule, EPA determined that a cutoff of 100 HP was the appropriate size to distinguish small existing stationary engines. EPA documents this in the memorandum "MACT Floor and MACT Determination for Existing Stationary SI RICE ≤500 HP Located at Major Sources." The percentage of existing stationary engines that are less than 50 HP (or 100 HP) can be found in the memorandum titled "Impacts Associated with NESHAP for Existing Stationary SI RICE" available from the rulemaking docket.

5.5 Landfill/Digester Gas Engines

5.5.1 Comment: Several comments (57, 58, 83, 96, 99, 142, 149, 160, 191, 202, 206, 213, 260, 262, 265, 268) provided input on the proposed provisions for landfill and digester gas engines. A few commenters (96, 99, 265, 268) noted EPA's assertion in the preamble to the proposed rule regarding the feasibility of applying aftertreatment controls to landfill and digester gas fired engines where siloxanes in the fuel can foul fuel systems, combustion chambers, and post-combustion catalysts and agreed with that. The commenter (96) said that in its experience, the most effective way of controlling HAP emissions from landfill and digester fueled sources is to control the fouling of the fuel system and combustion chamber by following manufacturer's maintenance requirements. The commenter (96) recommended that landfill and digester gas engines should initially be required to be maintained according to the engine manufacturer's maintenance practices and upon reconstruction be subject to the VOC standards for landfill and digester gas engines under the SI NSPS. If these engines will be subject to standard prior to reconstruction, something the commenter (96) does not recommend, the standard should be equal to the VOC reconstruction standard in the SI NSPS or less stringent. The commenter (96) also said that it is most appropriate in this case to use VOC over CO to maintain consistency. Commenter 99 also agreed that VOC should be used instead of CO for these sources. Commenter 99 added that landfill and digester gas engines deserve special consideration since these engines serve an important function of converting waste gases into useable energy, which reduces greenhouse gas emissions among other things.

A few commenters (57, 83, 121, 206, 262) questioned the need for emission limits for landfill and digester gas engines. One commenter (57) stated that for existing and proposed landfill and digester gas fired engines at area sources, where MACT does not apply but GACT applies, EPA should very carefully document the need for the regulation and the ability of existing technologies to meet the proposed standard. Commenter 57 believes EPA should eliminate the regulation of both new and existing landfill gas fired and digester gas fired engines unless a well documented and significant list of sources can be shown to meet the proposed standard.

Commenter 121 said EPA's proposed emission limits for existing engines burning landfill/digester gas are flawed, and work practices are more appropriate for engines in this subcategory at major and area sources. EPA's proposed limit is significantly more stringent than the NSPS limit. Given that the NSPS was promulgated in 2006, the commenter (121) fails to see how the floor data can support a limit that is 30 percent higher than the NSPS. The MACT floor memo does not explain whether the CO data for the landfill/digester gas floor is in the Emissions Database or whether there is a separate database. There is no information on whether the engines included in the "latest information" are manufactured prior to 2006. The commenter (121) was unable to replicate EPA's floor analysis, and cannot confirm whether the floor reflects the average of the top performing sources in the subcategory.

One commenter (213) said that it supports keeping the subcategory of landfill and digester gas engines and the provision that allows these engines that are less than 500 HP to certify compliance with the NESHAP by following O&M requirements (e.g., change oil and filters every 500 hrs, etc.) The commenter (213) requested that this provision be provided for all landfill and digester gas engines regardless of size.

Commenter (57) stated that if the proposed rule is promulgated as written, it is likely to cause the closure of most or all existing landfill gas fired engine facilities and the cessation of installation of new such facilities because the currently available engine technology cannot meet the 177 ppm CO standard. According to the commenter (57) this would be a great shame, as landfill gas energy production is an important method of landfill gas control and (referring to EPA's Landfill Methane Outreach Program) one which the EPA has devoted considerable time and money to promote.

Commenter 83 had similar concerns and stated that if EPA proceeds with the proposed NESHAP for landfill gas-powered RICE, it will be inconsistent with the efforts of Federal and State agencies to reduce GHG emissions, and promote renewable energy and distributed generation requirements. This commenter (83) expressed that landfill and digester gas have always been used as a significant source of additional renewable energy to reduce GHG emissions and displace dependence on fossil fuels. Examples provided by the commenter include: (1) EPA's Landfill Methane Outreach Program, (2) California Executive Order S-06-06, signed by Governor Schwarzenegger in April 2006, sets a target for maintaining and enhancing bio-energy production (including the use of landfill and digester gas) in California—mandates the state meet a 20 percent target within the established state goals for renewable generation for 2010 and 2020; and (3) California's recently enacted AB-32, which directs the state to reduce its GHG emissions to 1990 levels by the year 2020. This commenter (83) also provided that the California Climate Action Team has identified landfill gas as a significant source of potential additional renewable energy that could be used to displace our nation's dependence on non-renewable energy sources, and the California Integrated Waste Management Board is actively engaged in identifying ways that such projects can be expanded and enhanced. The commenter (83) argued that any action to restrict or discourage use of landfill or digester gas to energy projects would be inconsistent with California's multiple and integrated efforts to increase the use of renewable fuels.

One commenter (83) stated that the landfill NESHAP finalized in 2003 addressed HAP emissions from engines using landfill gas. That rule determined that GACT for area source (non-NSPS/EG) landfills was no control. This commenter (83) believed that the issue of toxic emissions from landfills already has been resolved and that there is no need for EPA to further address the issue in the proposed rule. The commenter (83) further stated that EPA has recognized in its revised AP-42 guidance for landfills that toxics in landfill gas have been decreasing with time, suggesting that there is no reason to reconsider the determinations already made in the landfill NESHAP.

One commenter (83) opined that subjecting landfill and digester gas-fired RICE to the proposed new requirements would eliminate numerous and necessary energy projects. This commenter (83) stated that the proposed rule appears to include an exemption for landfill and digester gas-fired RICE located at major sources, but does not exempt stationary RICE located at area sources. The commenter (83) recommended that the exemption be extended to engines at area sources. The commenter (83) opined that, without such an exemption from the rule, since the proposed rule is for existing RICE, the rule would force existing renewable energy projects to shut down, resulting in flaring of landfill and digester gas.

One commenter (83) justified exemption of landfill and digester gas fired RICE from the proposed rule for the following reasons: (1) Traditional fuel sources (e.g., commercial natural gas) differ from non-traditional fuel sources such as renewable landfill and digester gas; (2) impurities (e.g., siloxanes, sulfur compounds) in the landfill gas vary from site-to-site and can affect RICE emissions; (3) setting standards at the emission levels in the NESHAP, which appear only to be attainable with landfill gas RICE under best-case scenarios, EPA would be preventing the beneficial use of landfill gas as a renewable resource. This commenter (83) stated that regulating landfill and digester gas fired RICE under the proposed rule would discourage investment in landfill gas-to-energy technologies from lenders who will not fund a project without a guarantee that an engine will consistently and reliably meet the standards prescribed by the proposed rule. Currently, the commenter (83) reports that it has been unable to identify any engine manufacturer who will warranty their engines will consistently and reliable meet the standards prescribed by the proposed rule.

Because of the importance of encouraging the use of landfill gas as a renewable green energy fuel, the commenter (121) urges EPA to impose maintenance standards on all landfill gas engines regardless of the HP rating or whether the engine is located at a major or area source. EPA should not prevent engines from combusting landfill gas because they are incapable of complying with an emission limit. If EPA does impose a limit, it should harmonize it with the recently promulgated NSPS, 40 CFR 60 subpart JJJJ. The commenter (121) supports maintenance standards for this subcategory of engines and recommends that the owner or operator have the option to follow the engine manufacturer's approved maintenance schedule or follow the maintenance schedule specified in the proposed rule.

One commenter (206) expressed concern that the proposed RICE NESHAP would be imposing standards on landfill gas RICE that would discourage continued operation of existing renewable energy facilities that utilize landfill gas RICE. The commenter (206) believed that the excessive compliance obligations associated with the proposal would result in landfill gas to energy projects ceasing operations, thereby eliminating a significant opportunity for the continued reduction of GHGs through the offset of fossil fuels. This commenter (206) asserted that this result would be inconsistent with the pending Climate Change and Energy legislation.[16]

One commenter (262) stated that EPA has not provided data to justify a CO standard of 177 ppmvd, because technology does not exist to reduce emissions of landfill gas RICE of the type that would be affected, because the proposed rule would require expensive emissions monitoring and source testing, and, overall, the proposed rule would reduce the production of

[16] American Clean Energy and Security Act of 2009, HR 2454, 2009.

electricity from a reliable, affordable, dispatchable, high capacity factor renewable resource. The commenter (259) stated the proposed rule could require Continuous Emissions Monitoring System (CEMS) at a cost of $15,000, and require annual source testing at such facilities at a cost of $20,000. The commenter (259) stated that these additional costs would limit the viability of renewable landfill gas-to-energy plants and increase costs to consumers. The commenter (259) proposed that EPA can make either of two potential changes to the proposed rule: set a GACT instead of a MACT standard for landfill gas RICE; or the agency can extend the exemption from CO regulations available for landfill gas RICE at major sources to the same engines at area sources.

One commenter (202) supported the proposed provision that would allow landfill and digester fueled engines less than 500 HP to certify compliance by following prescribed operation limitations and maintenance practices and recommends that this provision be applied to all engines of this category regardless of their size because there are no viable controls for engines that combust landfill or digester gas. This commenter (202) stated that landfill and digester gases contain impurities that can foul add-on catalyst controls rendering them inoperable.

One commenter (58) stated that in regards to the proposed emission limits of 177 ppm CO for landfill gas fired engines, the EPA should consider only recently permitted engines when considering what is achievable by current technology, because the emission rates for CO have increased in recent years as manufacturers have been required to lower the NOx emissions. The commenter (58) worried that if EPA bases the possible CO emissions on older units, the newer, currently available units will not be able to meet those limits because they have been designed for lower NO_x requirements.

One commenter (160) representing the interests of nearly all publicly owned treatment works agencies nationwide provided support for the use of CO as surrogate for HAP, which it opined will simplify compliance and reduce costs for utilities. However, this commenter (160) felt that the CO emissions limits are too stringent for existing RICE, especially for those engines that use landfill or digester gas and those that are used for emergency situations. The commenter (160) stated that low emissions levels may be an appropriate requirement for new engines, but the cost to retrofit existing digester gas engines and install emissions controls has not been justified in the proposed rule. The commenter (160) suggested that EPA conduct a more-detailed analysis for digester gas engines. This commenter (160) stated that new emissions controls on existing engines are likely to cost millions of dollars for each utility and opined that utilities should be encouraged to continue using their existing digester gas engines, rather than face a situation where it is more cost-effective to purchase power from an electric utility and to waste a valuable fuel source by flaring the digester gas. Because of the technical problems associated with emissions controls for wastewater utilities (acknowledged by the EPA), EPA should either raise the CO emissions limits or substitute an operation limitations and maintenance practices standard for all existing digester gas RICE, as EPA has proposed for the area source RICE subcategory landfill/digester gas ($50\leq$ HP ≤ 500). The commenter (160) supports this maintenance and inspection standards and would support an identical or similar requirements for other subcategories of digester gas engines.

One commenter (206) referred EPA to other information available for landfill gas RICE from Best Available Control Technology (BACT) determinations, AP-42, and NSPS rulemakings that show that CO emission limits that have been achieved in practice for the top performing sources are in excess of the proposed MACT floor for landfill gas-fired RICE. The commenter (206) cited detailed information from the following sources:

- "Stationary Spark Ignition Engines Using Landfill and Digester Gas" (Test results show that engine-out CO levels in the United States range from about 1.8 to about 2.5 g/HP-hr, which is also consistent with permit limits (Parise, T., Adams, L. Alpha-Gamma Technologies, Inc., Stationary Spark Ignition Engines Using Landfill and Digester Gas, Memorandum to Jamie Pagan, EPA Energy Strategies Group, December 11, 2007.)
- "Summary of State/Local Requirements Internal Combustion Engines" (Provides a summary of SCAQMD concentration limits for biogas engines which lists the current CO concentration limit of 2000 ppmvd (at 15 percent O_2) and a CO limit of 250 ppmvd [at 15 percent O_2] effective July 1, 2012 [contingent upon the outcome of the mandated 2010 technology review that will evaluate the feasibility of the 250 ppmvd limit]). (Nelson, B. EC/R Incorporated, Summary of State/Local Requirements for Stationary Internal Combustion Engines, Memorandum to Jamie Pagan, EPA OAQPS/SPPD/ESG, July 18, 2008.)
- "Revisiting BACT for Lean Burn Landfill Gas Fired Internal Combustion Engines," Frazier, R., Allen, C. White Paper, BAAQMD, February 26, 2009. (The BAAQMD concluded that the BACT CO limits achieved in practice within California as well as other states was between 2.1 and 3.02 g/HP-hr. The CO limits established by BAAQMD in the White Paper range from 2.1 to 2.5 g/HP-hr and may float up tot not to exceed emission limits between 3.0 and 4.2 g/HP-hr.)
- Background Information Document for Updating AP-42 Section 2.4 for Estimating Emissions from Municipal Solid Waste Landfills, September 2008. Eastern Research

Group, Inc., Prepared for Susan Thorneloe of the United States Environmental Protection Agency. (The emission factors in the Background Information Document are consistent with the Memorandum identified in the preceding bullet.)

- Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (NSPS, 40 CFR part 60, subpart JJJJ). (Requires landfill/digester gas engines manufactured after the applicable dates to meet a CO emission limit of either 5.0 g/HP-hr or 610 ppmvd [at 15 percent O_2]; states that "trying to control the CO in these engines beyond 5.0 g/HP-hr may cause instability and could affect the ability of the engine to reduce NO_x levels.").
- RACT/BACT/LAER Clearinghouse (RBLC). (RBLC Database entries with the BACT as the basis for the CO emission limit ranged between 2.0 and 3.0 g/HP-hr. The commenter (206) considers the 2.0 g/HP-hr to be an outlier as most of the BACT emission limits in the RBLC Database for CO were 2.75 g/HP-hr.)

The commenter (206), asserted that, according to the RIA for this rule, EPA determined that the MACT floor for stationary landfill/digester gas greater than or equal to 50 HP is the level achievable by existing landfill and digester gas engines operating without add-on controls. The commenter (206) stated that the logic of establishing the MACT floor for existing engines by considering recent test data and performance, and not emission (or permitted) limitations, is inconsistent with section 112(d)(3)(A) of the CAA. An "emission limitation," according to the commenter (206) is not an achieved emission rate from a stack test, but a "requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions" (See section 302(k) of the CAA).

The commenter (206) also reported that the MACT floor calculation for landfill and digester gas engines was not reproducible. The commenter (206) stated that the December 11, 2007 memorandum that provides the data for 18 landfill RICE sources includes 9 sources with identified CO emissions in g/HP-hr emissions. The lowest figure is 1.74 g/HP (the remaining facilities show CO g/HP-hr values of 1.77, 1.95, 1.83, 2.44, 1.87, 1.9, 1.9, 2.36, 1.76, 1.99, 2.173, 2.154, 2.030, 2.358, 2.26, 2.18, 2.33, 2.19, 2.392, and 1.74). The second table has six additional sources identified, with four of the sources having CO emissions identified in g/HP-hr of 1.76, 3.728, 7.027, 3.728, and 7.121). Based on EPA methodologies for converting concentration based limits to output based limits, the emission limitation of 177 ppmvd (at 15 percent O_2) is equivalent to approximately 1.44 g/HP-hr. Accordingly, the commenter stated that none of the stack test results used by EPA to establish the MACT floor can be achieved in practice, based on the stack test results, which were expressed in g/HP-hr. This commenter (206) further stated that, in examining Attachments 1 and 2 of the December 11, 2007 memorandum, three sites have emission limits expressed in terms of ppm concentration. Test results from four landfill gas-fired engines at the three sites indentify CO ppm concentrations of 228.6 ppm, 215.7, 560 ppmv and 568 ppmv. Once again, the commenter (206) stated that none of the sites achieved the proposed MACT floor standard of 177 ppmvd (at 15 percent O_2) in practice. The commenter (206) reported that the remaining stack tests for two facilities express results in lb/hr that could not be converted without examination of the underlying stack tests or additional data.

Other commenters (265, 268) reported that the concentration (and mass emission rates) of CO that is emitted from landfill gas-fueled RICE does not remain constant with time. These emissions increase with increased equipment operating hours, even with the most stringent maintenance schedule. The commenters (265, 268) believed that EPA's limited set of data used to establish the RICE CO emission limit of 177 ppmvd corrected to 15 percent O_2 (equivalent to a mass emission rate of approximately 0.7 g/HP-hr for the operation of CAT G3516 engine and 1.5 g/HP-hr for the operation of the CAT G3520 engine) was insufficient to develop a full understanding of CO emissions from existing landfill gas fueled RICE. The commenters (265, 268) pointed out specific CO emission variations, which exist as a function of fuel quality or engine operating hours, evident in the data set use by EPA to develop the proposed emission standard. The commenters (265, 268) stated that it has been operating landfill gas fueled RICE for over 15 years and has been required to perform numerous compliance/performance tests on this equipment (which is maintained to manufacturer's specifications and industry standards). Comparing EPA's proposed standard of 177 ppmvd corrected to 15 percent O2 , CO emission test results from its facilities and others, the commenter reported the following:

- CAT G3516 and CAT G3520C RICE CO emission compliance results: None of the presented values demonstrate compliance with the proposed CO emission concentration limit.
- Jenbacher RICE CO emission compliance test results: Only one of the 11 test results presented for this equipment appears to demonstrate compliance with the proposed CO emission concentration limit.

The commenters (265, 268) opined that the results of the 52 area source tests assembled by EPA are an extremely limited set of data that does not accurately represent the levels of CO emissions that are exhausted from landfill gas-fueled RICE (and therefore inappropriate for standard development process). Attachment 2 of both of their letters included CO emission rate data by engine and HP rating. Innovative Energy Systems provided more comprehensive data that included the same data provided by Landfill Energy Systems. As indicated later in this document, when these commenters (265, 268) compared EPA's proposed RICE CO emission concentration limit of 177 ppmvd corrected to 15 percent O_2, most of the compliance test CO emission concentrations did not meet EPA's proposed standard for landfill gas-fueled RICE.

A few commenters (83, 206) expressed concern with the data used to set the standards for landfill and digester gas engines. One commenter (83) expressed that the data used in the proposed rule to develop the landfill and digester gas-fired engine emission limits did not meet the transparency and technical requirements of the Data Quality Act (Public Law 106-554 section 515). The commenter (83) stated that the data did not appear to be consistent with the information developed by the Bay Area Air Quality Management District (BAAQMD) as part of its revised BACT standard for landfill gas RICE (included as an attachment to the comment letter). The commenter (83) reported that for engine categories other than landfill and digester gas-fired engines, EPA at least provided data that identified the number of tests reviewed or the number of tests used to set the MACT floor. This commenter (83) stated that without this data, reviewers cannot properly analyze the proposed rule and its effects and it requested that this data be made available before a final rulemaking covering landfill and digester gas RICE is promulgated.

The commenter (83) recommended that the EPA review the work of the BAAQMD regarding landfill gas-fired RICE (attached to its comment letter) when establishing BACT for RICE. The document states that RICE using landfill gas as fuel "generally perform at their best after overhaul events and that combustion performance tends to deteriorate as siloxane deposits form throughout the combustion surfaces. Notwithstanding this, source test histories are not extensive enough to show consistent trends demonstrating this deterioration, although there is ample evidence that significant variation exists around the Bay Area." This document also finds that "BACT for NOx and CO should be paired standards, and no longer evaluated separately." The commenter (83) stated that the document concludes that CO limits for landfill gas-fired RICE should be as high as 3.4 to 3.9 g/HP-hr (over 2 times the proposed NESHAP). The commenter (83) opined that EPA's information that landfill gas RICE can meet the proposed NESHAP limit is not reflective of actual conditions.

Similarly, commenter 206 said that quality, objectivity, and reliability of the data used to establish emissions limits for landfill gas fired engines is unknown, and EPA has relied on an insufficient quantity of CO and HAP data for purposes of establishing a MACT floor for landfill gas-fired engines. The commenter (206) requested that, in order for EPA to comply with the March 9, 2009 Presidential Memorandum and its own data quality guidelines, and in order to comply with the proper MACT floor setting process under the CAA, EPA should defer publication of the new CO emission limit for landfill gas-fired RICE until such time that high quality data seta are available to support accurate, reliable and unbiased factors. The commenter (206) provided the following as support for its position:

- The information EPA relied upon to establish the MACT floor for landfill gas-fired engines was not readily apparent from a review of the Emissions Database contained in the docket for the proposed rule (EPA-HQ-OAR-2002-0059). The database only contains information from a single test report in 1988 that does not address CO emissions. This commenter (206) concluded that EPA appeared to rely on information developed under Docket No. EPA-HQ-OAR-2005-0030, including a December 11, 2007 memorandum that utilizes test results from engines at 18 landfills and concludes that no further controls are required for the landfill-gas-fired RICE. The commenter (206) opined that there was an insufficient number of landfill gas-fired engines and sites considered for the MACT floor, and the test results used were heavily-biased California sites, and was not directly referenced in the proposed rulemaking. The commenter (206) argued that with the EPA being required to set an emission limit based on the emission limits associated with the top 12 percent of performing sources, it is important for the dataset to be representative and reliable.

- Based on a review of the EPA Landfill Methane Outreach Program database, approximately 276 landfill gas fired engine projects are currently operational in the United States. (http://www.epa.gov/lmop/proj/index.hem#1) and setting a MACT floor based on 18 sets of engine data is contrary to the Information Quality Act and EPA guidelines, as well as the CAA. This commenter (206) stated that at least 37 landfill gas-fired engine facilities were identified in the EPA 2002 Emissions Database.
- In regards to transparency and quality of the data used to establish the MACT floor for landfill gas-fired engines, the information provided in the January 21, 2009 and December 11, 2007 memoranda and the Emission Database is insufficient and it is impossible to assess whether the data is representative. It is unclear from the January memorandum what information EPA relied on from the "recently obtained test reports" in establishing the MACT floor (contrary to EPA guidelines under the Information Quality Act).

Two commenters (265, 268) stated that control requirements for existing and new stationary RICE, which combust landfill gas, with a site rating of more than 500 brake HP located at major sources of HAP are less stringent than those promulgated and proposed for new and existing stationary RICE, which combusts landfill gas, with a site rating of more than 500 brake HP located at area sources of HAP. The commenters (265, 268) requested that control requirements for existing stationary RICE, which combust landfill gas, with a site rating of more than 500 brake HP located at area sources of HAP consider the applicability of GACT or management practices and not be more stringent than those established for new stationary RICE located at area sources of HAP (i.e., a CO emission rate limit of 5.0 g/HP-hr).

Three commenters (142, 149, 260) expressed concern over the requirements for landfill and digester gas engines. One commenter (260) was concerned over the seemingly inconsistent requirements that apply to landfill and digester gas engines. The commenter (206) requested that the "limited requirements" for certain existing landfill gas RICE within the current and proposed NESHAP RICE apply universally to existing landfill gas RICE. The commenter (206) explained that the proposed NESHAP RICE includes a specific change to 40 CFR part 63.6590(b)(3) that would allow for continued "limited requirements" for existing landfill gas RICE with a site rating of more than 500 HP located at major sources of HAP, but that this does not translate to other landfill gas-fired engines (e.g., existing landfill gas RICE at area sources of HAP and RICE with a site rating less than or equal to 500 HP located at major sources of HAP remain subject to the full requirements of NESHAP RICE). This inconsistency of handling landfill gas RICE appears again in 40 CFR part 63.6602 which requires compliance with the emission limitation (of 177 ppmvd CO or less at 15 percent O_2) within Table 2c of the proposed rule for existing RICE with a site rating of equal to or less than 500 HP located at a major source of HAP. However, 40 CFR part 63.6603 requires existing stationary RICE located at an area source of HAP to comply with the limitations at Table 2d of the proposed rule. Table 2d of the proposed rule imposes management practices for landfill gas engines greater than 50 HP and less than or equal to 500 HP. The same Table 2d of the proposed rule also includes a limit for CO in the stationary RICE exhaust of 177 ppmvd or less (at 15 percent O_2). The commenter (206) asserted that, in one instance, the proposed rule appears more stringent for area sources, and in the other instance the proposed rule appears less stringent for area sources. The commenter (206) requested that the EPA require all existing landfill gas-fired RICE to comply with the same "limited requirements" currently applicable to existing landfill gas-fired RICE (See 40 CFR part 63.6590(b)(3)).

One commenter (149) urged EPA to clarify that the proposed rule does not apply to CI engines that burn landfill and/or digester gas at major sources and requests that the requirements for CI engines greater than 500 HP that burn landfill and/or digester gas at area sources be removed. The commenter (149) provided that it has 27 non-emergency CI engines ranging from 520 to 3,174 HP that each combust 10 percent more of digester gas on an annual basis located at four of New York City's 14 water pollution control plants. Based on commenter 149's assessment, these engines that are currently classified as major sources as defined in 42 U.S.C. §7412(a)(1) would appear not to trigger the proposed rule. The commenter (149) requests clarification on whether the proposed rule governs these engines. The commenter (149) requested that EPA modify the final rule to state clearly that it does not apply to digester gas engines greater than 500 HP at major sources. The commenter (149) stated that if its interpretation is incorrect, the commenter believed the proposal did not provide adequate notice of EPA's intention to apply emissions limits to these alternative fuel engines and that the rule must be republished with a regulatory analysis that includes the costs and benefits of applying emissions standards to digester gas engines (with adequate notice for wastewater utilities and other entities that use digester gas to power engines). The commenter (149) argued that compliance costs of strict emissions limits on digester gas engines would be so expensive that the rule would result in a disincentive for digester gas use and would increase pressure on natural gas supplies and flaring of digester gas.

The commenter (149) asked that EPA consider the following:

- Emission control costs in New York City are greater than the benchmark control costs presented by EPA (provided that the design and construction costs associated with the installation of an emission control system for a 2,000 KW engine generator would be in the range of $1.5 million and that for them, the costs associated with the installation of emission control systems at all their facilities could be as high as $40 million).
- The proposed rulemaking would be inconsistent with other national incentives that encourage the use of landfill and/or digester gas for power generation for cities to be sustainable. For example, in February 2009, the American Recovery and Reinvestment Act of 2009 allocated an additional $1.6 billion of new Clean Renewable Energy Bonds first authorized by the Energy Policy Act of 2005 to promote the use of alternative energy including anaerobic digester and landfill gas.
- The proposed rulemaking is inconsistent with the national goals of reducing GHG emissions since it could be a disincentive for reducing the practice of flaring landfill and/or digester gas instead using these gases for energy generation, and would encourage the purchase of power from electric utilities and rely on limited non-renewable and more polluting sources of fuel (e.g., coal and residual oil).

One commenter (142) noted that the current RICE NESHAP includes an exemption for existing stationary RICE at major sources that combust landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis. The commenter (142) described the consequences if this exemption is not extended to engines at area sources, noting that most municipal solid waste landfills in the U.S. are classified as area sources. Currently, collected landfill gas is used as a renewable energy source to fuel RICE. If these RICE are subject to the operational and economic impacts imposed by the proposed rule, they would likely opt to destroy the collected landfill gas through flaring to meet NSPS subpart WWW rather than re-using the landfill gas for renewable power generation. The commenter (142) noted that this could force the shutdown of such renewable energy projects with no resultant benefit at a time when the demand for renewable energy is growing. The commenter (142) requested that EPA extend the current exemption to landfill/digester gas RICE at area sources as a means of promoting the use of landfill gas as a renewable energy source.

Two commenters (265, 268) recommended the following amendment to §66.6590(b)(3) of the proposed rule:

> (b)(3) …an existing stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that combusts landfill gas…equivalent to 10 percent or more of the gross heat input on an annual basis, does not have to meet the requirements of this subpart or of subpart A of this part.

One commenter (142) questioned whether the data used to determine the emission limit for landfill/digester gas engines above 500 HP provide an adequate and accurate representation of engines currently operating at landfill gas-to-energy facilities. The commenter (142) provided data for his fleet of 51 RICE indicating mean emissions of 276 ppmvd CO and a median measurement of 278 ppmvd CO based on 93 discreet measurements of various engines conducted over the past eight years. The commenter (142) stated that none of these engines achieved the proposed standard of 177 ppmvd CO. The commenter (142) noted that, if the proposed limit accurately represented existing landfill/digester gas RICE in operation, some portion of the commenter's (142) fleet would be expected to meet the proposed limit, which is not the case. The commenter (142) recommended that EPA gather additional emissions data and re-evaluate the proposed emission limit.

Similarly, commenter 213 asserted that the 177 ppmvd limit for CO is too stringent and that most engines operate around 1,000 ppm or more of CO. Reaching 177 ppm would require add-on controls, plus would necessitate the cleaning of the gas to remove impurities, according to the commenter.

One commenter (191) stated that the database does not support, nor will newer landfill/digester gas engines be able to meet, the 177 ppmvd of CO limit. Recent tests on the commenter's (191) new landfill fired gas engines show CO emissions of 411 ppm, more than twice the limit. The commenter (191) also noted that the assumption of 90 percent catalyst control of formaldehyde or CO as a surrogate for HAP has been associated with previous rulemaking and explain test data deviations from 90 percent control and the contradiction to previous testing. The commenter (191) added that the emphasis on reducing NOx emissions in recent years have resulted in an increase in CO emissions from landfill and digester gas fired engines. As a result these RICE may not be able to make the 177 ppmvd CO limit. The commenter (191) feels that efforts to lower the CO emissions in these engines would result in an increase in NO_x emissions and notes that EPA has stated previously that catalytic oxidation does not work on such systems due to fouling of the catalyst by siloxanes in the raw fuel gas.

Response: For existing stationary landfill and digester gas engines located at area sources, EPA cannot exempt such engines from regulation because stationary internal combustion engines were identified as a source category needed under section 112(k) of the CAA. EPA proposed management practices for existing stationary landfill and digester gas engines greater than or equal to 50 HP and less than or equal to 500 HP located at area sources. EPA is retaining management practices for these engines in the final rule, as well as engines below 50 HP. For existing stationary landfill and digester gas engines greater than 500 HP at area sources, EPA proposed a CO concentration standard of 177 ppmvd at 15 percent O_2. Based on an evaluation of generally available control technologies and management practices for these engines following the proposal, EPA is finalizing management practices for this group of engines. EPA has determined that for all existing stationary non-emergency landfill and digester gas engines at area sources management practices represent what is generally available among such engines to reduce HAP, and the practices will ensure that emissions are minimized and engines are properly operated. Specifically, existing stationary non-emergency landfill and digester gas engines at area sources must change the oil and filter every 1,440 hours of operation or annually, whichever comes first, except that sources can extend the period for changing the oil if the oil is part of an oil analysis program, inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary. These specific management practices were developed based on input from different stationary engine operators (including landfill and digester gas engine operators) and engine manufacturers. A complete discussion of the analysis for landfill and digester gas engines at area sources can be found in the memorandum titled “MACT Floor and MACT Determination for Existing Stationary Non-Emergency SI RICE <100 HP and Existing Stationary Emergency SI RICE Located at Major Sources and GACT for Existing Stationary SI RICE Located at Area Sources,” which is available from the rulemaking docket (EPA-HQ-OAR-2008-0708).

For existing stationary landfill and digester gas engines greater than or equal to 50 HP and less than or equal to 500 HP located at major sources, EPA proposed a CO concentration limit of 177 ppmvd at 15 percent O_2. EPA is required to establish emission standards for stationary engines located at major sources of HAP emissions based on the average emission limit achieved by the best performing 12 percent of engines. Section 112 of the CAA requires EPA to regulate all stationary sources in the source category located at major sources. EPA cannot exempt subcategories of engines located at major sources from being subject to emission standards, which commenters appear to be suggesting by stating that landfill and digester gas engines deserve special consideration. Nor can EPA promulgate "no control floors" as was done in the first RICE MACT for stationary landfill and digester gas engines greater than 500 HP located at major sources. Recent court cases, in particular the "Brick MACT" case, have ruled such "no control floors" to be inconsistent with section 112(d) of the CAA. EPA therefore had to take a different approach in setting standards for existing stationary landfill and digester gas engines than was taken in earlier regulations. Moreover, EPA cannot promulgate work practice standards for existing stationary landfill and digester gas engines located at major sources because there is no evidence that the requirements for promulgating work practice standards under section 112(h) of the CAA have been met.

EPA must therefore finalize a numerical emission limit for landfill and digester gas engines greater than or equal to 100 HP and less than or equal to 500 HP located at major sources. Following the proposed rule, EPA received additional test data for landfill and digester gas engines. EPA received emissions data for more than 150 engines and this data was incorporated into the MACT floor analysis for this final rule. As discussed in response to comment 5.1.1.1, EPA followed a revised approach in establishing the emission standards for the final rule. In order to determine the MACT floor for existing non-emergency landfill and digester gas engines greater than or equal to 100 HP and less than or equal to 500 HP, EPA ranked the emissions of landfill and digester gas engines based on their emissions and identified the lowest emitting 12 percent (or 21 engines) based on the lowest test for each engine. EPA used all of the emissions data for those best performing 21 landfill and digester engines to determine the emission limits for this final rule, accounting for variability. EPA assessed the variability of the best performers by using a statistical formula (UPL) designed to estimate a MACT floor level that is achieved by the average of the best performing sources if the best performing sources were able to replicate the compliance tests in our data set. Again, details of this approach were discussed in response to comment 5.1.1.1 and this approach reasonably ensures that the emission limit selected as the MACT floor adequately represents the level of emissions actually achieved by the average of the units in the top 12 percent, considering ordinary operational variability of those units. Both the analysis of the measured emissions from units representative of the top 12 percent, and the variability analysis, are reasonably designed to provide a meaningful estimate of the average performance, or central tendency, of the best controlled 12 percent of units in a given subcategory. Following this approach, EPA determined that the final emission limit is 177 ppmvd of CO at 15 percent O_2. Details on the MACT floor analysis, including the tests in EPA's dataset, can be found in the memorandum titled "MACT Floor and MACT Determination for Existing Stationary SI RICE ≤500 HP Located at Major Sources," which is available from the rulemaking docket (EPA-HQ-OAR-2008-0708). EPA believes that the final emission standards will reflect the numerous engine models and operating scenarios that can be expected from stationary engines.

In response to concerns from industry regarding the inclusion of emissions data from older units in EPA's dataset, EPA is required by the CAA to set MACT standards based on the test data that is available to the Agency. EPA noted earlier in this response that it received a substantial amount of additional emissions data following the proposal, which has been incorporated into EPA's dataset. The dataset is based on test results obtained from a variety of facilities across the United States for different engine makes, models and sizes primarily tested within the last decade. If commenters believed data from recently permitted units would have been more representative, commenters should have submitted test data to EPA for inclusion in the final dataset. EPA must make its determinations based on the information available to it and must base the final standard on actual data.

The data at proposal may have been from facilities located in a particular area of the country, but it represented what EPA had available at the time and therefore was used to developed the proposed emission standards. The newly gathered emissions data expands on EPA's dataset for landfill and digester gas engines and EPA's dataset now includes test results from facilities in several different states, including New York, Maine, Vermont, Florida, North Carolina, Florida, Texas, California, Ohio and Illinois.

Regarding comments that the standards are not achievable for existing engines, EPA notes that court cases have made clear that the appropriate criterion for determining the MACT floor under section 112(d) of the CAA is the emission levels that have been achieved by the best controlled sources. The test results indicate that all of the engines in the top 12 percent have achieved emission levels below the standard, as have an additional 7 engines in the subcategory. Engine settings can be adjusted to meet the emission standard. In any case, EPA believes that most existing landfill and digester gas engines are located at area sources, as well as being greater than 500 HP.

EPA cannot defer publication of requirements for existing stationary landfill and digester gas engines less than or equal to 500 HP located at major sources and for existing stationary landfill and digester gas engines located at area sources. EPA believes the dataset for landfill and digester gas engines, which consists of emissions tests for 176 engines, is comprehensive and representative. EPA cannot delay promulgation of the final rule and must finalize requirements for these engines due to a court-ordered schedule requiring EPA to promulgate the regulation by August 10, 2010.

In reply to comments indicating that EPA should set any potential emission standard in terms of VOC and not CO, EPA believes that a standard that is in terms of CO, where EPA is finalizing a numerical emission limit, is appropriate for landfill and digester gas engines. EPA has previously determined that CO is an appropriate surrogate for HAP and believes that decision is still valid. Commenters did not provide any compelling evidence as to why the standard should be in terms of VOC and not CO, .e.g., no information was submitted to dismiss CO as a valid surrogate for HAP. Further, EPA does not agree that landfill and digester gas engines that are reconstructed should be subject to VOC standards currently required under 40 CFR part 60, subpart JJJJ (SI NSPS). The SI NSPS was developed at a different time and under different statutory requirements.

Further, EPA is not trying to discourage landfill and digester gas-to-energy projects. EPA is required to promulgate standards for stationary engines under section 112 of the CAA and EPA does not believe that this rule will be inconsistent with efforts to reduce greenhouse gas emissions.

In response to concerns regarding a numerical emission limit for stationary emergency landfill and digester gas engines, EPA has specified in the final rule that the numerical emission limit that applies to landfill and digester gas engines at major sources only applies to non-emergency engines. For all emergency engines, EPA is finalizing work or management practices.

In response to comments that EPA's analysis at the time of proposal lacked transparency, EPA has made an effort to be as clear as possible in materials developed to support the final rulemaking. EPA has presented the basis for regulatory decisions, and included all emissions data used to develop the final standard. All information used to support the final rulemaking is available from Docket Number EPA-HQ-OAR-2008-0708, however, note that some information may exist in prior dockets that are cited in the preamble to the final rule and include Docket Numbers EPA-HQ-OAR-2002-0059, EPA-HQ-OAR-2005-0029 and EPA-HQ-OAR-2005-0030.

Regarding the request for clarification regarding CI landfill and digester gas engines, the final rule applies to all existing stationary landfill and digester gas engines that are less than or equal to 500 HP and located at major sources and to all existing stationary landfill and digester gas engines located at area sources, including those that may be compression ignition engines. Existing landfill and digester gas engines greater than 500 HP located at major sources were already subject to the RICE NESHAP finalized in 2004 and are regulated as landfill and digester gas engines, not CI engines.

5.6 Format of Standards and Other Issues Related to Standards

5.6.1 Comment: One commenter (242) said that there may be a large number of remotely located natural gas engines that are unmanned and there are issues related to air-to-fuel ratio controllers as far as continuous operational reliability and dependability are concerned. The 4-Corners KSU study indicated that the following issues may exist:

- Several remotely located engines will need a battery to be installed to power the AFRC and an alternator or solar panel to keep the battery charged;
- It may be necessary to modify fuel and air handling systems to accommodate the control system;
- There may be issues in reaching the precise air-to-fuel ratio on older engines;
- In the beginning, frequent site visits are necessary to inspect and review technology performance such as the air-to-fuel ratio set point;
- Fuel quality and variability issues;
- Frequent site visits and system checks are required to ensure continuous operation and to assess any problems; and
- Issues with test trailers accessing facilities located in difficult to access remote areas.

The commenter (242) expressed that EPA should take into account the costs associated with the above issues in assessing the cost effectiveness for engines in rural area sources.

The commenter (242) cited a 2008 study where semi-continuous NO_x and CO monitoring was installed on different rich burn engines with NSCR. Preliminary results suggested that NSCR systems are not able to demonstrate long-term consistent simultaneous control of NO_x and CO to below 500 ppm, according to the commenter (242) with levels not being consistent from day-to-day or even within a few hours and the NSCR was not consistently able to reach 90 percent control during routine operation. This creates additional problems with respect to a standard applicable at all times, the commenter (242) said.

Response: EPA is finalizing management practices for the majority of existing stationary 4SRB engines located at area sources. Only existing non-emergency 4SRB engines at area sources that are greater than 500 HP that operate more than 24 hours per year will be subject to numerical emission limitations, which are expected to necessitate the use of NSCR and air-fuel-ratio controllers. Existing 4SRB engines greater than 500 HP at area sources that operate more than 24 hours per year must either meet a formaldehyde concentration standard of 2.7 ppmvd at 15 percent O_2 or reduce formaldehyde by 76 percent or more. Of the total population of affected 4SRB engines at area sources, only 7 percent are estimated to be greater than 500 HP and subject to numerical emission limitations. The remaining 93 percent of 4SRB engines at area sources will be subject management practices. (EPA discussed the specific management practices that will be required of existing stationary 4SRB engines less than or equal to 500 HP located at area sources in response to comment 7.2.1). An even smaller percentage is estimated by industry who in a paper[17] submitted to EPA indicated that only about 3 percent of 4SRB engines located at area sources are greater than 500 HP. Therefore, the majority of existing stationary 4SRB engines at located at area sources will not run into the potential issues related to the operation of air-to-fuel ratio controllers or the long-term emissions reductions from using NSCR because these engines are subject to management practices. EPA does not believe that the issues the commenter indicated may exist will be significant and in the event that a remote site may for

[17] Support for Use of Management Practices in the National Emission Standards for Hazardous Air Pollutants Standards for Reciprocating Internal Combustion Engines at Area Sources in Rural Locations Prepared by David W. Heinold, CCM AECOM Environment. Prepared on behalf of American Petroleum Institute. November 2009. EPA-HQ-OAR-2008-0708-0300.

example need a battery to power the AFRC and an alternator or solar panel to keep the battery charge, the cost of this would not be significant. In the Four Corners Report the commenter cites, the cost for an alternator and battery or solar panel and battery is estimated at $350. EPA does not believe that this cost will put remotely located sites at a disadvantage. EPA does not believe that the impacts will be significantly greater for an engine in a remote area than in a non-remote area. Further, in a paper submitted to EPA by API supporting management practices for engines at area sources in rural locations[12], API stated that "Oil and gas industry RICE are predominantly located in remote areas. Engines less than 500 HP are typically used for wellsite compression, while those greater than 500 HP are typically found at compressor stations and natural gas processing plants" (page 1 of API's paper). Since engines greater than 500 HP are typically found at compressor stations and natural gas processing plants, EPA believes that the potential problems the commenter mentions in terms of potentially not having electricity or being staffed, may be less of an issue. This may be more of a concern for engines used for wellsite compression, but since these are typically less than 500 HP, this is not an issue since EPA is requiring management practices for 4SRB engines below 500 HP. EPA believes that the the changes made to the proposed rule in terms of requiring management practices for most existing stationary SI engines at area sources resolves the commenter's main concerns.

EPA is not certain which study the commenter is referring to when it mentioned semi-continuous NO_x and CO monitoring and the commenter did not provide the study or data to EPA. Therefore, EPA is not able to fully address this comment. EPA proposed a 200 ppbvd formaldehyde concentration or a 90 percent formaldehyde reduction for non-emergency 4SRB greater than or equal to 50 HP at area sources, but is, as stated, promulgating management practices for most engines at area sources. Where EPA is requiring standards based on levels expected with aftertreatment, the final formaldehyde concentration standard is noticeably higher than what was proposed. Also, the formaldehyde reduction requirement EPA is finalizing is considerably lower than proposed, at 76 percent.

5.6.2 Comment: Two commenters (96, 112) questioned the fact that some of the limits in the proposed rule for existing engines are more stringent than limits that apply to new engines. Older or existing engines are typically less advanced, have less available control options to reduce emissions, and are often times limited by physical space or engineering constraints, the commenter (96) said. Therefore, it is not possible to retrofit existing engines to the levels commensurate with that of new engines and certainly not to levels that are well below new engines, the commenters (96 and 112) expressed. For example, the NSPS requires new 4SLB engines above 250 HP to meet a CO limit of 270 ppmvd, while the proposed NESHAP requires existing engines to meet a CO limit of 9 ppmvd, the commenter (96) noted. Also, the standard applicable to new diesel emergency engines above 500 HP is simply notification requirements, while existing diesel emergency engines between 300 and 500 HP must meet a 40 ppmvd CO limit. The commenter (96) is of the opinion that such emission limits are inherently infeasible and impractical for existing engines when the limits for new engines can be two order of magnitude or greater.

Commenter 112 particularly questioned the appropriateness of the 200 ppbvd formaldehyde limit proposed for existing 4SRB engines above 50 HP located at both major sources and area sources. The commenter (112) reported an investigation using FTIR testing that was performed by a member company in his organization on numerous makes and models of small rich burn engines to determine if the 200 ppbvd is achievable with AFRC and NSCR controls. The commenter (112) indicated that the investigation found that reducing formaldehyde emissions by 90 percent is achievable, but meeting 200 ppbvd was not.

The commenter (112) indicated that a catalyst manufacturer and major supplier of aftermarket controls to the oil and gas industry typically guarantees the catalysts at 90-percent control or 0.04 g/HP-hr for formaldehyde for small rich burn engines, though the guarantee can vary slightly depending on the make and model of the engine and the catalyst. The commenter (112) stated that 200 ppbvd is equivalent to 0.001 g/HP-hr, which is approximately 40 times more stringent than what catalyst manufacturers are willing to guarantee under optimal temperature and fuel conditions.

The commenter (112) stated that data on controlled engines at member companies in his organization indicate that emissions are typically 6-10 ppmvd. The commenter (112) noted that meeting the proposed numerical standard would require an additional 98 percent reduction for this group of existing engines, which the commenter believes would be infeasible considering current control technologies.

The commenter (112) suggested that the numeric value for existing rich burn engines should be no more stringent than the most stringent numeric value for new sources (rich burn or lean burn) under 40 CFR part 63, subpart ZZZZ, which is 12 ppm or 0.048 g/HP-hr.

Response: EPA is aware that some of the proposed emission standards for existing stationary SI engines were more stringent than what is currently applicable to new stationary SI engines. EPA responded to similar concerns for existing CI engines in the responses to comments[18] when that

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[18] Memorandum from Melanie King, Energy Strategies Group to EPA Docket EPA-HQ-OAR-2008-0708. Response to Public Comments on Proposed National Emission Standards for Hazardous Air Pollutants for Existing Stationary Reciprocating Internal Combustion Engines

rule was finalized in early 2010. However, EPA is required to address HAP emissions from all existing stationary engines at major sources and based on the Brick MACT decision, EPA can no longer set floors of no emission reduction and must finalize numerical emission standards for engines located at major sources. EPA was not obligated to follow this approach during the 2004 NESHAP and the provisions finalized under the NSPS regulations were developed under different statutory requirements and focused on criteria pollutants, not HAP. Furthermore, EPA must set limits based on the data available at the time of the rulemaking. EPA acknowledged that it had limited data available at the time of the proposed rule. Nevertheless EPA had to propose requirements even with a limited dataset.

As discussed in response to comment 5.1.1.1, EPA received a substantial amount of new emissions data following the proposed rule. For rich burn engines, EPA has emissions data for 57 engines, which EPA analyzed for the final rule and established the final standards based on that data. For existing stationary non-emergency 4SRB engines greater than or equal to 100 HP and less than or equal to 500 HP at major sources, EPA is finalizing a formaldehyde concentration standard for 10.3 ppmvd at 15 percent O_2. This standard incorporates emissions variability and is based on test data collected from stationary engines produced by different engine manufacturers, engines of different sizes, operating at various loads and other conditions, and located in various types of service. EPA discussed in response to comments in sections 5.1.1 and 5.1.2 the approach for setting these standards and described the MACT floor, MACT and GACT analysis in the memoranda titled "MACT Floor and MACT Determination for Existing Stationary SI RICE ≤500 HP Located at Major Sources" and "MACT Floor and MACT

Located at Area Sources of Hazardous Air Pollutant Emissions or Have a Site Rating Less Than or Equal to 500 Brake HP Located at Major Sources of Hazardous Air Pollutant Emissions. EPA-HQ-OAR-2008-0708-0367.

Determination for Existing Stationary Non-Emergency SI RICE <100 HP and Existing Stationary Emergency SI RICE Located at Major Sources and GACT for Existing Stationary SI RICE Located at Area Sources," which are in the docket.

5.6.3 Comment: Two commenters (96, 150) said that EPA should include the flexibility in the final rule of allowing all sources subject to emission standards the option of meeting either the concentration limit or the percent reduction standard. According to commenter 96, including such flexibility is necessary due to the large span in model year engines, emission characteristics and location conditions, and it may be more feasible to meet one compliance option over the other or even impossible to meet one of the options.

One commenter (99) asserted that where the percent reduction is available, it is generally attainable, but at a high cost. However, the numerical values proposed by EPA are not achievable, the commenter (99) said.

Response: There is only one subcategory for which EPA did not provide a percent reduction option despite the fact that the standard is expected to require emission control technology. That is the subcategory of 4SLB engines rated at 100 HP to 500 HP located at major sources. The MACT floor for that subcategory is at a level that would likely require emission control technology. EPA did not allow a percent reduction option for that subcategory because a source could meet a percentage reduction level, but not meet the emission level required by the MACT floor. For all other subcategories that were expected to comply with the rule by applying add-on control technology, EPA provided the option of meeting either a concentration standard or a percent reduction requirement, e.g., non-emergency 4SRB and 4SLB engines greater than 500

HP at area sources that operate more than 24 hours per year. Including an option to meet a percent reduction does not make sense for sources that are not expected to apply add-on controls, and furthermore, EPA would not know what that percentage would be if the standard was based on levels achievable without aftertreatment. EPA does not agree with the commenters that the emission standards are not achievable. The final standards are based on emissions data from existing stationary SI engines.

5.7 Technology

5.7.1 Comment: One commenter (199) commended the EPA for its continuing efforts to develop and implement effective emission control standards for major sources of air pollution such as this category of engines.

The commenter (199) agreed with EPA's analysis that NSCR is a cost effective means to reduce HAP and NO_x from existing stationary rich burn engines. The commenter stated that these technologies have been retrofitted on thousands of rich burn engines and have been verified by the CA ARB for use on large SI off-road engines. The commenter (199) noted that these verified technologies are also applicable to stationary rich burn engines.

The commenter (199) recommended that EPA also consider the benefits of using selective catalytic reduction (SCR) to reduce both HAP and NO_x emissions from stationary SI engines. The commenter (199) noted that one member company has installed over 400 SCR systems worldwide for stationary engines with varying fuel combinations.

Response: EPA acknowledges the information regarding applicable control technology that is currently available to apply to existing stationary engines that the commenter provided. EPA generally agrees with the commenter that the technologies identified can be used by at least some existing stationary engines. EPA for the most part also concurs with the commenter's assertions regarding the capabilities of the control technologies discussed as far as which pollutants they reduce and the effectiveness. EPA did not specifically consider SCR because this rulemaking focuses on reducing HAP emissions and SCR alone does not reduce emissions of HAP. In order for an SCR to reduce HAP, an oxidation catalyst would have to be part of the aftertreatment package. With that said EPA notes that it does not mandate any specific control technology in the final rule. Owners are free to select whichever control technology they feel is appropriate as long as they demonstrate compliance with the emission standards.

5.7.2 Comment: One commenter (108) stated that the experience period for 2SLB engines with oxidizing catalysts is less than 5 years. The commenter (108) noted that Ajax has worked with oil manufacturers to identify suitable oil that does not contaminate the oxidation catalyst. Therefore the commenter (108) suggested that the EPA recognize this as an emerging technology and not make the requirements more stringent for 2SLB engines using this technology than the requirements for 4SLB engines.

Response: For 2SLB engines at major sources, EPA determined for the final rule that it would not be appropriate to go beyond the MACT floor and establish standards based on oxidation catalyst control. For 2SLB engines at area sources, the final rule establishes management practices. Thus, EPA does not expect that the requirement of the final rule would generally require the installation of oxidation catalysts on 2SLB engines.

6.0 Exemptions/Special Allowances

6.1 Limited Use Engines

6.1.1 Comment: Multiple commenters (78, 97, 107, 110, 126, 129, 130, 139, 150, 162, 168, 170, 177, 178, 179, 183, 191, 197, 202, 207, 216, 227, 236, 247, 253) wanted EPA to expand the definition of limited use engines. Several commenters (162, 168, 236) said that a limited use category should be included in this rulemaking for area source engines and engines less than 500 HP, as was included in the rule for engines greater than 500 HP located at major facilities.

Commenters 97, 168 and 236 thought that limited use engines should be exempt from performance testing. According to commenters 97, 168 and 236, limited use engines should only be required to track and report hours of operation.

Commenter 168 asked that limited use be defined as 250 hrs/yr. Commenters 126, 150, 162, 197, 216, 236 and 247 asked EPA to provide 300 hrs/yr for limited use engines. If 300 hrs/yr is not provided, commenter 162 requested clarification that readiness testing and maintenance are excluded from the annual hours of operation. This will allow companies to perform the necessary maintenance and testing requirements without worry of exceeding the 100 hour limit, which could be easily exceeded if a malfunction or repair required diagnosis and/or engine tuning, the commenter (162) said.

Two commenters (177, 253) asked that limited use be defined as 500 hrs/yr. The current rule defines limited use as "any stationary RICE that operates less than 100 hrs/yr." The commenter believes that because of the low capacity factor (approximately 5.7 percent for an engine that operates 500 hrs/yr), the emissions are inherently low and would not pose a significant health hazard to the public. Similarly, commenter 168 said that its limited use engines, which are predominantly CI engines are inherently low-emitting and would not pose a significant health hazard to the public. Given the short periods of time the commenter's units operate (startup engines for large combustion turbines), imposing emission limits is impractical. Therefore, startup engines should either be included in the definition of emergency stationary RICE, or limited-use RICE should continue to be exempt from emission limitations and additional requirements, according to commenter 162.

Two commenters (126, 247) stated that if EPA declines to exempt the current limited use category to include all limited use engines, then EPA should establish a new subcategory of limited use RICE that are used in electric grid security. The commenters (126, 247) noted there are 500 such engines that operate less than 300 hrs/yr that are used to support the integrity and voltage of various electric utility transmission and distribution grids. The commenter (126) stated that these engines are similar to emergency engines, except they are used to respond to sags in voltage on remote portions of the utility's grid. The commenters (126, 247) noted that the proposed rule would require retrofitting of these engines with catalytic converters, but believes these retrofits in many cases are impractical.

One commenter (226) noted that it was incredulous to require significant regulation for small engines, but determine that larger limited use engines require no regulation. The commenter (226) stated that the Regulatory Flexibility Act requires EPA to consider less burdensome alternatives, and this should be done for the final rule.

One commenter (110) recommended that EPA include a de minimis usage threshold of 50 hours/year, below which, equipment will be exempt from the requirements of the proposed rule. The commenter (110) is concerned that the proposed rule will require a significant investment of resources for testing, personnel training, recordkeeping and reporting relative to the hours of usage for emergency standby generators or other limited use engines that are operated only for exercise or testing for 1 to 2 hours per month or less. The commenter (110) believes that the benefits are insignificant relative to the compliance cost, instead, could have the unintended consequence of generating more emissions as a result of the travel to conduct testing.

One commenter (78) said the cost effectiveness of adding control devices to low-use engines should be evaluated regardless of the size of the engine. The costs associated with the installation and maintenance of a control device on a low use unit can be quite high per ton of pollutant abated.

One commenter (129) supported the creation of a subcategory of limited use RICE, such as those with a 10 percent capacity factor or less. The commenter (129) indicated that numerous RICE at natural gas utility companies have operating characteristics equivalent to emergency generators, generally RICE that operate only under unusual conditions such as extreme cold days or when normal gas supplies are disrupted. The commenter (129) stated that these systems are in place to insure gas is available to customers, particularly residential heating customers, during severe weather emergencies. Although they do not meet the definition of emergency equipment, the commenter (129) believes that their purpose, emissions, and operational use are essentially identical to that experienced by conventional emergency generators. The commenter (129) asserted that while emergency generators are spared post-combustion controls and testing, a similar engine used to insure the ability of residential heat during extreme winter conditions will be subject to onerous emissions limitations requiring post-combustion controls that would result in reduced dependability and significant cost increases.

The commenter (129) stated that there is a high cost per ton of HAP removed associated with installing an oxidation catalyst on low capacity factor engines. The commenter (129) noted that these limited use engines resemble emergency RICE in their operation, but fall outside that category because they are used during rare periods of high demand that are not defined as emergencies. The commenter (129) added that the infrequent use of such engines makes the application of pollution controls more difficult and costly than at "normal" RICE.
believes that EPA's rationale for proposing installation of an oxidation catalyst on engines greater than 300 HP also supports creation of a subcategory of limited use RICE.

One commenter (202) recommended that an exemption for engines at an area source that is only used for backup purposes as long as the hours in any particular year do not exceed 500 hours. The commenter (202) explained that it has four engines, each greater than 500 HP, that are maintained as backup units to ensure no digester gas build-up when the combustion turbines are off line.

One commenter (107) proposed that EPA extend the exemption for limited use stationary engines that is currently available for engines above 500 HP at major sources to include existing engines at area sources that are above 300 HP. The commenter (107) noted that most of these engines are located at retail stores or office buildings where there are no other significant sources of HAP emissions and that the majority run less than 100 hrs/yr for backup power, peaking power, and maintenance combined. Additionally, the commenter (107) noted the proposed rule allows for an exemption for limited RICE rated greater than 500 HP at major sources, and the rule for area sources should not be more stringent than for units at major sources.

One commenter (139) strongly supported the creation of a subcategory of limited use RICE, such as those with a 10 percent capacity factor or less. The commenter (139) believed that EPA's rationale for proposing the installation of an oxidation catalyst on engines greater than 300 HP also supported the creation of a subcategory of limited use RICE, because in the proposed rule, EPA evaluates oxidation catalysts on a cost per ton HAP removal basis and concludes that the cost per ton increases as the size of the engine decreases. Similarly, the commenter (139) noted, there is a high cost per ton HAP removal associated with installing an oxidation catalyst on low capacity factor engines. The commenter (139) further noted that these limited use engines most closely resemble emergency RICE in their operation, but fall outside of that category because they do not meet the definition for emergency engines. Additionally, the infrequent use of limited use engines makes the application of pollution controls more difficult and costly.

One commenter (78) said EPA should consider the distinction between baseload and peaking operation in developing the final regulation. Peaking engines typically operate far fewer hours each year than baseload engines (the commenter's (78) peaking engines have capacity factors of 11 to 28 percent, which is typical). Retrofit requirements for engines in peaking operation will be far less cost effective because of the lower emissions benefits received.

Another commenter (191) noted that many CI/diesel "peaker" units are not utilized simply in peak shaving, but more frequently act as "emergency" generation to stabilize the grid when requested by the regional electric Independent System Operator. The commenter (191) disagreed with EPA's assumption of 1,000 hrs/yr operation times for peakers and provided data about their operating hours of peakers. Over the last 15 years, the commenter's (191) 55 peaking units have averaged 40 operating hrs/yr. The maximum annual operating hours for any one site has been 269 hours in a year and the minimum 1 hour. The commenter (191) noted that in this circumstance the cost or emissions controls per ton of pollutant reduced becomes an order of magnitude greater and that EPA should lower the number of operating hours for which controls are not required to 300 per year.

One commenter (130) requested that EPA expand the exemption for limited-use engines to include those used for rice irrigation. The commenter (130) specifically requested that the exemption be extended to area source engines that are less than or equal to 300 HP and that operate for 1,500 hours or less per year and provide that such engines only need to maintain records of annual operating hours to demonstrate that they comply with the limited-use exemption. To support the requested exemption, the commenter (130) noted that engines used for rice irrigation have a low capacity factor and are located in predominantly rural areas, thus presenting no significant health hazard to the public. Furthermore, the commenter (130) pointed out that EPA assumed the limited-use exemption would apply to engines used for electric power peak shaving that operate only during peak energy use periods, typically in the summer months. The commenter (130) asserted that, similarly, the use and operation of rice irrigation engines are different compared to typical engines because they are operated during limited periods of seasonal use and are mostly located in fields in rural areas.

Response: EPA did not propose a category consisting of existing stationary limited use engines less than or equal to 500 HP located at major sources or existing limited use engines located at area sources. EPA did include a limited use category in the 2004 RICE NESHAP for existing and new stationary engines greater than 500 HP at major sources, defined as any stationary engine that operates less than 100 hours per year. However, that was a different rulemaking. It appears that some commenters might be commenting on that previous rule, which is not the subject of this action and EPA is not taking comment on requirements promulgated in 2004. EPA will revisit the 2004 regulation when the 8-year residual risk review must be conducted in 2012.

EPA is required to address HAP emissions from all existing stationary engines less than or equal to 500 HP at major sources and existing stationary engines at area sources. Due to the Brick MACT decision, EPA can no longer set floors of no emission reduction for limited use engines at major sources, or any other engines for that matter, as was done in the 2004 RICE NESHAP that regulated existing and new stationary engines greater than 500 HP at major sources.

Various commenters requested that EPA establish a subcategory of limited use engines that would be allowed to operate up to 500 hrs/yr or a 10 percent capacity factor. Commenters argue that based on an engine's limited annual operation that the emissions from the unit are not significant. EPA does not agree with this claim. EPA considered the input and recommendations by commenters on establishing a subcategory of limited use engines, but EPA disagrees that such a subcategory is justified for existing stationary engines less than or equal to 500 HP located at major sources and existing stationary engines located at area sources. EPA expects that engines that operate up to 500 hours per year or more would be able to meet the same emission standards that apply to other stationary engines that may be operated more frequently. EPA does not see any reasons precluding these limited use engines from applying aftertreatment controls, in those cases where addition control measures are needed to meet the final emission standards. EPA also points out that for many stationary engines at major sources, the final standards are not based on the use of add-on controls and many engines are expected to be able to meet these standards without aftertreatment. Limited use engines are expected to exhibit the same or similar exhaust emissions profile as other stationary engines. In addition, commenters provided strong opinions on creating a limited use subcategory of 500 hours or 10 percent capacity factor in the final rule, but did not give EPA adequate and persuasive information supporting their opinions. There are an estimated 98,000 stationary SI non-emergency engines less than 500 HP located at a major source of HAP. The total emissions from these engines if they operated 500 hours each are estimated to be 850 tons of HAP and 32,000 tons of NOx, so EPA does not agree that emissions from engines running 500 hours a year are insignificant. The majority of engines at area sources are subject to management practices in the final rule, so there is no need to create a distinction for limited use engines where the engines are only subject to management practices. For the area source engines that are subject to numeric emission limitations, which are the 4SLB and 4SRB non-emergency engines greater than 500 HP, EPA determined that it would be appropriate to establish a distinction for engines that are used 24 hours or less per year. For these engines, EPA determined that the cost of emission controls are not justified given the small amount of reductions that would be achieved due to the limited yearly operation.

6.1.2 Comment: A few commenters (88, 126, 129, 197, 247) were concerned about requirements that might apply to engines that startup turbines. Three commenters (126, 197, 247) suggested that RICE used to startup combustion turbines be exempt from the proposed rule, or deemed to fall under the “emergency” definition in 40 CFR §63.6675. The commenter (197) explained that turbine RICE only run for a few minutes to get the unit started and the total fuel consumption is not significant. The commenter (197) opined that the installation of expensive control equipment on RICE that has limited used does not make sense as the actual emissions for the RICE would be insignificant compared to the combustion turbine (burns more fuel oil in one minute of operation that the RICE would burn all year).

Two commenters (88, 129) stated that EPA should not require post-combustion controls or emissions monitoring on engines serving gas turbine power facilities. The commenters (88, 129) supported this exemption because post-combustion controls will result in reduced dependability and significant cost increases, with little change in actual emissions since these engines rarely run long enough for such controls to reach minimum operating temperatures. Two commenters (88, 129) noted that every major power plant in the United States is required to have black start capability, which typically involves a small combustion turbine (CT) equipped with a diesel engine used for startup of the CT. According to the commenter (129), the diesel starting engine, rated less than 500 HP, generally operates less than 10 minutes per CT start. The commenter (129) indicated that the majority of black start units only operate during emergencies or unusually high demand days, and that a review of the commenter's company's operating data determined that seven black start units in the system averaged 32 starts per year (which equates to less than 6 hours of operation per year, although some limited additional operation may occur as a result of routine maintenance and readiness testing).

Commenter 88 stated that some engines serving electric sector facilities that play a role in maintaining reliable electric power supply and delivery, such as distribution company service buildings, customer call centers, and information technology data centers have similar concerns. The commenter (88) reported that these emergency engines typically operate less than 200 hrs/yr and have low permitted capacity factors. The commenter (88) opined that emergency power at these facilities is critical to public safety and national security and should therefore not be subject to numerical emission limits, but to management practices instead.

Response: In the final rule EPA has required that stationary engines used to startup combustion turbines meet work practice standards. EPA finds that the short time of operation for these engines (10-15 minutes per start) makes application of measurement methodology for these engines using the required procedures, which require continuous hours of operation, impracticable. Requiring numerical emission standards for these engines would actually require substantially longer operation than would occur normally in use, leading to greater emissions and greater costs. EPA also agrees with the commenters that it would not be appropriate to set emission limits that are based on the use of aftertreatment control for stationary engines that are used to startup combustion turbines. Catalyst control would not be effective for these engines due to their short time of operation (10-15 minutes per start).

6.1.3 Comment: One commenter (127) expressed that it felt that it is unnecessary to limit the use of half of the 100 hours EPA has determined to be an acceptable cap for non-emergency generators under §63.6640 of the proposed rule. The commenter (127) requested that EPA remove the requirement limiting non-emergency operations to 50 hours for non-maintenance or testing purposes. The commenter (127) said that removing the requirement would make it easier for plant maintenance and recordkeeping purposes by allowing flexibility to use the hours (up to 100) for non-emergency use without having to make the distinction of separately tracking and limiting the use of some of those hours.

Response: EPA disagrees with the commenter. EPA has already included flexibility in that stationary emergency engines can maintain their classification as an emergency unit, but are allowed to operate for non-emergency purposes of up to 50 hours per year as long as such operation is not used to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity. If an emergency engine is operated differently than described, it would be classified as a non-emergency engine and would be subject to different emission standards and compliance requirements. Therefore, EPA must require that operation by emergency engines is tracked and documented to ensure the requirements of the rule are being met. As EPA discussed in the preamble to the proposed rule (74 FR 9712), it is not expected that the recordkeeping requirements associated with emergency engine operation will be a significant burden, plus many stationary emergency engines may already be recording this information. Finally, these requirements are consistent with those finalized for new SI and CI stationary engines.

6.1.4 Comment: One commenter (77) finds the limit of 100 hours in the definition of limited use RICE at 40 CFR 63.6675 to be unduly restrictive. The commenter (77) believes that 100 hours is very close to the amount of time that could be consumed by just the routine "maintenance checks and readiness testing" for similar emergency units.

The commenter (77) noted that the electric utility industry has various blackstart, startup, peaking, and other units that are depended on for grid reliability, and a portion of these units are important for the reliable and safe operation of nuclear and other power plants. According to the commenter (77), some of the latter units provide the capability to restore power to an electric generating facility (of whatever type) that has lost all station power and must rely on itself to restore power and operation of the facility. The commenter (77) added that these units also provide for safety when other station power has failed, which is very important to the nuclear power industry. The commenter (77) stated that some of these RICE may also be able to provide power to the electrical grid, but all of them operate at historically very low capacity factors because of the high cost of operation. The commenter (77) believes that a 3-year average capacity factor of 5.7 percent is a more appropriate limit than 100 hrs/yr. The commenter (77) noted that the 5.7 percent value is more in line with the restriction of 500 hours placed on emergency generators by the State of Ohio. The commenter (77) added that additional controls on this category of units would be extremely cost ineffective due to the low capacity factors and actual tons of emissions that would be reduced. The commenter (77) conceded that the definition of limited use RICE was not a subject of this rulemaking, but believes that it is appropriate to modify the definition since it is used to exempt some facilities from the present proposed rule at 40 CFR 63.6590(b)(3).

Response: The 100 hrs/yr the commenters are referring to with respect to limited use engines is a provision that EPA included in the original RICE NESHAP affecting stationary engines above 500 HP located at major sources that was finalized in 2004. EPA is not taking comment on aspects of that rule at this time. The engines relevant to this proposed rulemaking are existing stationary engines less than or equal to 500 HP located at major sources and existing stationary engines located at area sources. A limited use category of 100 hours per yearwas not proposed for these engines, nor will one be included in the final rule. See EPA's response to comment 6.2.1 on this issue.

Because EPA is revising 40 CFR part 63, subpart ZZZZ to add requirements for existing stationary engines less than or equal to 500 HP located at major sources and existing stationary engines located at area sources, it was necessary to modify section 63.6590(b)(3) of the proposed rule amendments in order to continue to exempt existing limited use stationary engines greater than 500 HP located at major sources. However, in terms of limited use engines, that section does not exempt any different or additional existing engines that were not already exempted from the original 40 CFR part 63, subpart ZZZZ promulgated in 2004.

6.2 Other Engines

6.2.1 Comment: One commenter (225) noted that there is no limit on construction date for existing RICE in the proposed rule. The commenter (225) stated that older engines were never designed to comply with these stringent emissions and some are not easily retrofitted with catalysts, if it can be done at all. The commenter (225) added that the expectation for old RICE to meet the MACT Floor or beyond-the-floor will be extremely challenging, and there is no data in the docket supporting whether the proposed emission limits are even possible. The commenter (225) believes that industry could be faced with replacing thousands of existing engines (most in rural areas) in order to meet the stringent standards in this proposed rule.

Response: The commenter has not provided sufficient information to support the claim that existing engines cannot be retrofit with catalysts. EPA believes that older engines can use oxidation catalysts and is aware of installations of oxidation catalyst on older engines, both stationary and nonroad. Also, emission limits for many engines in the final rule do not rely on engines having to be retrofitted, but the expectation is that many engines can meet the final emission standards without installing aftertreatment. In fact, for several categories, particularly emergency engines and engines less than 100 HP, EPA is not finalizing numerical emission limits, but is instead adopting work practices, or use restrictions, instead.

6.2.2 Comment: One commenter (130) requested that generators used for residential purposes be exempted from the proposed rule. The commenter (130) stated that doing so would significantly lower the true economic impacts of the proposed rule.

Response: In response to this comment, EPA analyzed the types of engines that were included in the area source category listing for stationary RICE. As a result of this analysis, EPA determined that emissions from existing stationary emergency engines located at residential, commercial, and institutional facilities that are area sources of HAP were not included in the 1990 baseline emissions inventory that was used as the basis for the listing of source categories needed to ensure that 90 percent of area source emissions are regulated. Therefore, EPA determined that these stationary engines will not be subject to this area source standard.

6.2.3 Comment: One commenter (230) recommended that EPA allow state and local air agencies to determine appropriate exemptions from air permitting requirements, including Title V operating permit programs. The commenter cited several examples of state exemptions by engine type, size of engine and number of operating hours. The commenter noted that the proposed rule would require emergency engines to be incorporated into the Title V permit if located at a Title V source. The commenter also stated that states that allow Title V and minor source exemptions for area source RICE not regulated by EPA would no longer apply. The commenter believes the restrictions of hours and fuel types are adequate to limit HAP emissions. The commenter also noted that by EPA not proposing a permanent deferral for Title V area source permit applications, facilities subject to the proposed regulation will have to submit Title V area source applications, which the commenter believes will not enhance compliance and be unnecessarily burdensome.

Response: The provisions in 40 CFR 63.6585(d) indicate that area sources subject to 40 CFR part 63, subpart ZZZZ, would not be subject to permits under 40 CFR parts 70 or 71 solely because of this rule. That provision will apply to the existing stationary engines covered in this rulemaking, including existing stationary emergency engines that the commenter is concerned about. In addition, residential, institutional, and commercial existing stationary emergency engines at area sources are not subject to the final rule.

6.2.4 Comment: One commenter (230) asked EPA to consider adding a provision to the rule that allows implementation of the relevant standards based on technological or economic feasibility similar to the 40 CFR 63 GP for reconstruction.

Response: The requirements in the rule have already been determined to be technologically and economically feasible. Furthermore, affected sources have three years to comply with the rule. Therefore, EPA does not agree that the provision suggested by the commenter is necessary.

7.0 Management Practices

7.1 General Comments

7.1.1 Comment: One commenter (183) indicated that EPA did not contemplate the maintenance challenges for existing small (less than 50 HP) SI and CI RICE units located in remote unmanned locations. The commenter (183) stated that in Alaska remote locations, frequent visits for oil and filter changes every 200 hours and 500 hour belt inspections are impractical and unsafe. The commenter (183) noted that maintenance has been addressed by installation of large fuel tanks, winterization or expansion of the cooling systems, retrofit of oil reservoirs with 55 gallon reservoirs, and the use of synthetic oils. The commenter (183) proposed that the rule be revised to exempt these types of remote unmanned sites from the maintenance interval requirements, or at least increase the maintenance intervals to an annual basis.

Commenter 175 was also concerned about requiring specific maintenance activities for engines located in remote, unmanned area sources. The commenter (175) also pointed out that its members are developing and promoting new technologies to reduce CO_2 emissions. Some of this new micro distributed energy covers engines less than 30 HP and it appears that these engines could be swept in under the proposed operations and maintenance standard for less than 50 HP engines located at area sources. The commenter (175) said that it particularly worried that the proposed oil and filter replacement standards for such small engines would be overly burdensome, unnecessary and would persuade potential customers to instead install electric air conditioning and furnaces with a much larger carbon footprint and pollutant emissions measured from the source of the power generation (often coal-based) to the end use consumer. This will undermine efforts to reduce the carbon footprint of the commenter's (175) members' customers. The commenter (175) asked that EPA exempt area source engines less than 30 HP.

Response: EPA cannot exempt area source engines less than 30 HP from the rule. EPA has, however, provided some flexibility for management practices. Sources have the ability to utilize an oil analysis program to extend the oil change frequency. Sources that may have special considerations, for example those in extreme cold weather locations, have the option to work with State permitting authorities pursuant to EPA's regulations at 40 CFR subpart E ("Approval of State Programs and Delegation of Federal Authorities") for approval of alternative management practices.

7.2 Specific Requirements

7.2.1 Comment: Numerous commenters (64, 66, 68, 75, 76, 89, 97, 101, 103, 104, 108, 111, 112, 130, 131, 132, 136, 148, 150, 151, 154, 155, 159, 174, 176, 179, 183, 187, 204, 221, 224, 225, 227, 228, 230, 231, 241, 242, 253, 261, 262, 264) did not agree with the specific management practices that EPA has proposed in the rule or recommended different maintenance practices. According to the commenters (103, 112, 131, 155, 179, 183, 224, 225, 241, 242), the maintenance frequency in the proposed rule exceeds current practices or is not supported in the proposed rule. Several commenters agreed that management practices are appropriate for the proper operation of the engines and is a reasonable means to reduce HAP emissions, however, did not agree with the specific maintenance practices proposed by EPA. Numerous commenters recommended that EPA allow owners/operators to follow engine manufacturers' recommended practices or the owners/operators own site-specific maintenance plan.

One commenter (155) states that the proposed rule requires oil changes every 200 hours and replacement of spark plugs every 500 hours for rich burn engines less than 50 HP. The commenters (155, 242) stated that such frequencies far exceed accepted practice and EPA has not presented the basis for these frequencies. EPA, in the commenters' (155, 242) opinion, has not presented evidence that the proposed maintenance procedures are appropriate and the commenters asserted that EPA should consider other alternative practices or adopt a more reasonable frequency for conducting maintenance.

Another commenter (225) in the oil and gas production industry asserted that there is no support in the proposed rule that there is a relationship between the frequent maintenance activities proposed and reduced emissions.

One commenter (103) stated that while oil changes, spark plug changes, and belts and hoses checks are essential in maintaining engine reliability, the commenter did not understand the basis for the short-term intervals proposed for these maintenance practices. The commenter (103) assumes that EPA has tied the affected SI engines to the diesel and mobile source engine categories, and has applied similar maintenance practice strategies under the assumption that they will result in optimal emissions. The commenter (103) enclosed and summarized maintenance requirements for four makes of SI RICE commonly used in the natural gas compression industry (Ajax, Cummins, Waukesha, and Caterpillar) and summarized these recommendations, which vary widely, but are all less frequent (some much less frequent) than the proposed frequencies. The commenter (103) specifically said that air filters should be changed based on the differential pressure across the filter, per the manufacturer's recommendations, rather than operating hours, to save on the environmental waste of discarding perfectly good filters.

One commenter (112) pointed out that operators have a direct interest in maintaining engine oil, hoses, and belts, so the engine runs reliably, but the appropriate frequency for these maintenance practices are specific to engine design and are not “one size fits all.”

One commenter (204) said that for certain existing stationary RICE located at area sources, the EPA has proposed specific maintenance schedules in lieu of actual emissions limits. For example, for nonemergency two stroke lean-burn engines greater than 50 HP but less than 250 HP, the EPA would require that these engines change oil and filters every 500 hours, replace spark plugs every 1,000 hours; and inspect all hoses and belts every 500 hours and replace as necessary. The commenter (204) believed that the EPA has failed to provide a reasonable basis for these maintenance schedules and that the schedules exceed what is necessary for the effective, efficient, long-term operation of these engines.

Ten commenters (89, 101, 103, 104, 150, 151, 155, 221, 231, 242, 264) recommended that EPA revise fixed maintenance (one-size-fits-all) requirements to maintenance plans.

The commenters (89, 101, 151, 221, 231, 261) stated that, while fixed maintenance intervals work well for new mass produced engines similar to those in automobiles, they are inappropriate for the wide variety of existing engines used in the oil and gas, agriculture, and power generation industries across the nation. The commenters (89, 101, 151, 221, 231, 261) pointed out that EPA allows the use of operator-defined maintenance plans that are “consistent with good air pollution control practice for minimizing emissions” to be used in other portions of this same rule, and asserted that EPA should allow the use of operator-defined maintenance plans to greatly reduce cost and allow operators to optimize maintenance for each type of engine.

One of these commenters (221) added that current industry engine maintenance programs are driven by tried-and-true practices and since these practices effectively keep the engines running, they allow the products of the members of the commenter's organization to go to market. The commenter (221) stated that additional, burdensome, frequent, and time-consuming maintenance requirements will cause the members of the commenter's organization to more-frequently shut down engines and thus shut down production.

The commenters (155, 242) said that if EPA keeps the management practices as proposed, the frequencies associated with conducting engine maintenance should be revised to be commensurate with today's practices. The commenter (155) believes the maintenance practices, as proposed, are significantly burdensome and lack basis. According to the commenters (155, 242), EPA should replace the maintenance hour intervals with company recommended performance-based maintenance practices to be documented in an operator-defined maintenance plan consistent with requirements in 40 CFR part 60, subpart JJJJ.

Two commenters (155, 242) recommended that EPA allow owner and operator-defined management practices, in addition to the specific management practices required by the rule. EPA has previously adopted a similar approach, e.g., in 40 CFR part 60, subpart JJJJ. In the commenters' (155, 242) opinion, owners and operators of engines are knowledgeable in the operation of their engines and are best-suited for determining what practices are appropriate for their specific engines. Commenter 242 believed that owner and operator-defined maintenance practices will be more cost effective, lead to more consistent and stable combustion efficiency, and lower emissions.

The commenters (155, 242) requested that, if EPA does not allow operator-defined maintenance practices, and if EPA cannot define a more appropriate maintenance frequency, EPA should enlist the assistance and input of industry to determine appropriate management practices. The commenter (155) believes that soliciting the participation from stakeholders on this matter will ensure management practices that are consistent with reasonable engine practices. In general, it seems that the majority of comments received on this issue are in favor of adopting engine manufacturer's maintenance recommendations and not the specific maintenance requirements and frequencies that would be applicable to all engines across the board.

The commenter (103) appreciates the proposal of maintenance practices as an alternative to emissions limitations as GACT for small SI engines, but suggested the following alternatives to the proposed maintenance requirements:

- Maintenance practices should be aligned with current industry preventative maintenance schedules. The final rule should require owners/operators to comply with the oil change, spark plug, and belt/hoses requirements on a schedule dictated by the company's internal preventative maintenance schedules ensuring that the engine is operating at optimal conditions. These schedules would then be enforceable by the EPA under the final ruling and would require all of the maintenance practices to be conducted on these intervals.
- As an alternative to aligning maintenance practices with existing preventative maintenance schedules, the commenter (103) suggested that the EPA consider operator-defined maintenance plans, which offer a solution to the issue regarding the different requirements for various engine make and models. These operator-defined maintenance plans should be formal documentation that is fully enforceable under the final rule by the EPA as well as state regulatory agencies. The commenter (103) also noted that operator-defined maintenance plans are the current strategy employed by the SI NSPS, 40 CFR

part 60, subpart JJJJ. The commenter (103) believes that since this has been deemed appropriate for new sources, and it should also be deemed appropriate for existing sources

Another commenter (150) in the oil and gas industry agreed that the docket fails to demonstrate that the proposed requirements are reasonable or that they meet a cost/benefit test. The commenter (150) indicated that EPA should allow operators to engage in alternative practices so as to take into account the use of better, more efficient equipment as well as individual operators' historical experience as to what operating and maintenance practices best fit their particular operations and facilities. The commenter (150) noted that allowing operators to develop their own maintenance practices would be consistent with the SI NSPS (40 CRF part 60, subpart JJJJ). At a minimum, the commenter (150) believes that prescribed frequencies in the rule, if retained, must be revised to be consistent with current reasonable practices. In addition, the comment (150) stated that if maintenance frequency is defined in the rule, it should be specified in terms of operating hours.

One commenter (264) supported EPA's proposal to require non-emergency RICE at major sources to properly operate and maintain their stationary RICE and aftertreatment control device. However, the commenter (264) has experienced situations where manufacturers' emission-related instructions are inferior to operating experience and that, for old equipment, it may be impossible to obtain manufacturer recommendations. The commenter (264) recommended that the option of operating according to a maintenance plan developed by the owner/operator for the engine be allowed.

Seven commenters (76, 96, 99, 111, 130, 154, 242) recommended that EPA specify that the engine manufacturer's prescribed requirements can be used to demonstrate compliance.

The commenters (96, 99) thought that there is a better way to make sure owners and operators maintain and run their engines appropriately and that would be to follow the recommendations of the engine manufacturer. Engine manufacturer's instructions and recommendations are specifically designed to ensure the engine is properly maintained and operated. Commenter 76 asserted that there are so many engine designs installed that the engine manufacturer is best-suited to determine the appropriate maintenance practices and schedules.

Commenter 154 said that the Table 2d instructions of the proposed rule may not be specifically-designed to ensure proper engine maintenance and operation and may void the warranties provided by manufacturers. The commenter (154) recommended that EPA specify that the engine manufacturer's requirements be prescribed to demonstrate compliance. According to the commenter (154), in the absence of appropriate specifications, EPA should indicate that the current requirements listed in Table 2d of the proposed rule must be followed.

Another commenter (111) in the oil and gas production industry noted that EPA proposed its maintenance intervals with the expressed purpose "to ensure that emission control systems are working properly." In the commenter's (111) opinion, the manufacturers' O&M manuals are both appropriate and sufficient to address this goal. The commenter (111) stated that manufacturer O&M procedures are typically conservative and driven by the equipment-specific design.

One commenter (130) stated that rice irrigation engines may need to be operated beyond the proposed maintenance schedules during periods of flooding of rice fields and that relying on manufacturer's suggested maintenance schedules would be more practical and appropriate. In some cases, warranty violations may occur if engines are maintained according to the proposed stringent schedules, according to commenter 130.

Four commenters (99, 112, 204, 225) provided specific input on the proposed rule oil change and air filter requirements (including frequency).

Commenter 112 noted that many operators use an oil testing program to determine oil life to reduce maintenance cost and used oil generated, while maintaining high engine reliability. The commenter (112) believes that EPA has failed to justify why recommended oil changes are included as a maintenance practice when oil changes have little to no effect on engine emissions.

One commenter (204) noted that the vast majority of their applicable engines use a synthetic lubricant that does not need to be changed unless it is contaminated. This lubricant does not degrade over time and, in some instances, can be utilized in engines for over 30,000 operating hours without requiring changing. The commenter's (204) operating companies have in place sampling programs to ensure that the engine lubricant has not degraded and been contaminated. Air filters are regularly checked by determining the differential pressure across the filter to determine if a change is needed. The commenter (204) stated that by maximizing the useful life of oil and filters while maintaining a responsible maintenance schedule reduces costs and waste generation - a win-win proposition versus the proposed maintenance schedule that will increase the environmental impact from waste generation and the additional startup after maintenance of these engines as well as the costs of compliance for regulated entities.

One commenter (225) stated that most of the engine manufacturers for the engines in the oil and gas industry recommend oil changes on a monthly schedule. The commenter (225) also indicated that it is common practice to periodically sample and test the engine oil to see if the oil properties are sufficient to extend this time period between oil changes. According to the commenter (225), this testing has shown in many cases that the oil change interval can be extended without any detrimental effects on the engine, which allows industry to maximize efficiencies, minimize oil usage, reduce waste, and streamline operations with no negative impacts to the engine or emissions.

One commenter (112) expressed that inspection of hoses and belts has no impact on HAP emissions. Commenter 51 expressed that, generally, it agreed that performing maintenance on engines will help to reduce HAP emissions, but that while inspecting belts and hoses is an important part of general engine maintenance (and most sources likely conduct regular inspections of their engines), such inspections have no effect on emissions and should be removed from the proposed rule.

EPA received the most information on the proposed frequency of changing the oil and filter. Many commenters indicated that the oil quality is often monitored through an oil testing program. Other commenters stated that several engines use a synthetic lubricant, which does not degrade as compared to other oil and can be use for extended periods of time without having to be replaced. Additional commenters indicating varying appropriate periods of oil and filter changes, including every 250 hours to 4,000 hours.

Response: EPA proposed to require specific management practices for certain engines, primarily for smaller existing stationary engines at area sources where EPA thought that add-on controls were not GACT. EPA indicated at proposal that the management practices specified in the proposal reflected GACT and that such practices would provide a reasonable level of control, while at the same time ensuring that the burden on particularly small businesses and individual owners and operators would be minimized. EPA asked for comment on the proposed management practices and received comments on the proposal from industry.

EPA agrees with the commenters that it is difficult to adopt a set of management practices that are appropriate for all types of stationary engines. Regardless, EPA must promulgate emission standards pursuant to section 112(d) of the CAA for all engines at area sources covered by the final rule. EPA still believes that a management practice approach reflects GACT for emergency engines and smaller engines at area sources. These management practices represent what is generally available among such engines to reduce HAP, and the practices will ensure that emissions are minimized and engines are properly operated. EPA does not agree with the commenters that it would be appropriate to simply specify that owners and operators follow the manufacturers recommended maintenance practices for the engine. EPA cannot delegate to manufacturers the final decision regarding the proper management practices required by section 112(d) of the CAA; nor can EPA allow management practices to change from engine to engine based on the views of multiple manufacturers. To address the comments that there may be special and unique operating situations where the management practices in the rule may not be appropriate, for example engines using a synthetic lubricant, EPA notes that owners/operators may work with state permitting authorities pursuant to 40 CFR subpart E (''Approval of State Programs and Delegation of Federal Authorities'') for approval of alternative management practices for their engines. Subpart E implements section 112(l) of the CAA, which authorizes EPA to approve alternative state/local/tribal HAP standards or programs when such requirements are demonstrated to be no less stringent than EPA promulgated standards.

The management practices EPA proposed for stationary engines greater than 50 HP included changing the oil and filter every 500 hours, replacing the spark plugs every 1,000 hours, and inspecting all hoses and belts every 500 hours and replacing as necessary. For engines less than 50 HP, EPA proposed to require that these engines change the oil and filter every 200 hours, replace spark plugs every 500 hours, and inspect all hoses and belts every 500 hours and replace as necessary.

According to the additional recommended maintenance procedures that EPA reviewed after the proposal for different engine makes and models, EPA agrees that there is a wide range of recommended maintenance procedures. Based on the different suggested maintenance recommendations EPA has reviewed, maintenance requirements appear to vary depending on whether the engine is used for standby, intermittent, or continuous operation. Maintenance is also dependent on the engine application, design, and model. Taking into consideration the information received from commenters on the proposed maintenance practices for oil and filter changes and carefully reviewing engine manufacturer recommended maintenance procedures, EPA has determined that for stationary non-emergency 4SLB and 4SRB engines, GACT will require the oil and filter to be changed every 1,440 hours of operation or annually, whichever comes first, which reflects the management practices that are generally available. Maintaining the oil is one of the most important activities operators can perform to minimize emissions and to ensure proper operation and performance. The specific oil change interval of every 1,440 hours of operation is based on recommendations received on the proposed rule and more specifically information received after the rule as a result of EPA's effort to gain more knowledge on existing maintenance practices from Exterran, JW Power Company, and CSI (EJC).[9] These groups have extensive engine operation and preventative maintenance experience and indicated that a maintenance interval of every 1,440 hours of operation represent current industry practices. The maintenance interval in the final rule for non-emergency 4SLB and 4SRB engines is also supported by other engine operators, specifically INGAA, whose member companies operate more than 6,000 stationary SI engines along natural gas pipelines. The API, an organization representing more than 400 companies in the oil and natural gas industry who operate thousands of engines, also concurred with these management practice recommendations. Therefore, EPA finds that these management practices and intervals are common practice and generally available and appropriate for the final rule. A maintenance interval of every 1,440 hours of engine usage will ensure that the components remain in proper condition and continue to perform the necessary functions to support proper engine operation, reduce HAP, and minimize emissions. EPA believes that the proposed levels of conducting maintenance were beyond current practice and would force unnecessary early replacement of the oil, filter and spark plugs, plus more frequent unneeded inspection intervals. The proposed rule would have required a significant number of oil changes per year. For example, for engines operating close to full-time, 17 oil changes would have been necessary per year. Based on comments received on the specific maintenance practices EPA proposed and additional information received post-proposal noted in the previous paragraph of this response, the proposed maintenance intervals were too frequent and inconsistent with current industry practice.

For stationary non-emergency 2SLB engines, GACT will require the oil and filter to be changed every 4,320 hours of operation or annually. Two stroke lean burn engines have a longer maintenance interval than 4-stroke engines because 2SLB engines do not have combustion blow-by gases entering the crankcase due to the engine configuration and therefore do not have as much oil contamination from the combustion blow-by gases. The 2SLB engines also operate at lower speeds and temperatures than 4-stroke engines, consequently the spark plug does not fire as frequently and fires at lower temperatures than 4-stroke engines. Therefore, 2SLB engines should have longer maintenance practice intervals than 4-stroke engines and consequently EPA has determined that the proper interval for stationary non-emergency 2SLB engines is every 4,320 hours of engine operation or annually, whichever comes first. The specific maintenance interval of every 4,320 hours of operation is based on comments received on the proposed rule and specific information received post-proposal from Exterran, JW Power Company, and CSI (EJC).[19] These recommendations are supported by INGAA and API, and EPA agrees that these intervals are more appropriate for the standard based on generally available management practices.

For stationary emergency engines, the final rule requires the oil and filter to be changed every 500 hours of operation or annually, whichever comes first. The changing of oil and the oil filter for stationary emergency engines is more frequent on an hourly basis than for non-emergency engines because of the nature of operation of these engines, which is for emergency use, with small amounts of additional run time for testing and maintenance, and thus requires less hourly use over the same period of time, and oil quality is reduced over time even during periods when the engine is not used.

EPA also determined that it would be appropriate to include the option to use an oil analysis program in the final rule. EPA is including an alternative in the final rule for monitoring the quality of the oil through an oil analysis program. Sources have the option to use an oil change analysis program to extend the oil change frequencies. The analysis program must measure the total acid number (TAN), viscosity, and water content. If the TAN increases by more than 3.0 milligrams potassium hydroxide per gram from TAN of the oil when new, if the viscosity has changed by more than 20 percent from when the oil was new, or if the percent

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[19] Memorandum from Rebecca Rentz, Bracewell and Giuliani to Melanie King, EPA. Spark Ignited (SI) Recommended Management Practices. January 27, 2010. EPA-HQ-OAR-2008-0708-0354.1.

water content (by volume) is greater than 0.5, the oil must be changed prior to further operation of the engine.

EPA does not agree with the comments that inspecting belts and hoses has no impact on emissions. Ensuring that the engine is properly operated and maintained will help minimize the HAP emissions from the engine. Properly maintained belts and hoses allow the engine to operate at maximum efficiency. Hoses are generally used to move coolant through the engine to prevent the engine from overheating. Overheating of the engine can cause a malfunction in the combustion process, and may also burn the engine oil in the combustion chamber. Both of these conditions may increase pollutant emissions from the engine. Belts are commonly used for electrical generation and engine timing, and if worn or broken can cause damage to the engine and increase emissions. Therefore, EPA has required management practices that reflect GACT and that, in EPA's view, will ensure the proper operation and maintenance of the engine.

7.2.2 Comment: Several commenters (77, 118, 119, 129, 157, 205, 240) supported EPA's use of maintenance and work practices standards and certain commenters said the management practices in Table 2d of the proposed rule (40 CFR 63 subpart ZZZZ) are consistent with the proper maintenance of engines, and that the management practices in the proposed RICE NESHAP are sufficient to ensure that the engines are properly maintained.

One commenter (77) supported proposed 40 CFR 63.6625(e), which the commenter interprets as allowing owners/operators that must demonstrate compliance with a written maintenance plan the flexibility to operate and maintain their units according to either a plan written by the manufacturers or themselves "consistent with good air pollution control practice for minimizing emissions."

Response: No response is necessary.

7.2.3 Comment: One commenter (218) said that most of the 2SLB engines it manufactures require oil injected into the power cylinder for the critical purpose of lubricating the piston skirt. There is developing technology for catalyst friendly oils that do not affect or contaminate the catalyst. The commenter (218) added that any emission level claims include any contribution from the combustion of this oil. The commenter (218) recommended that there be no restriction of the burning of this very small amount of lube oil in the combustion chamber of a 2SLB engine.

Response: EPA does not believe that any of the requirements in the final rule would restrict the operation of 2SLB engines as described by the commenter.

8.0 Parameter Monitoring

8.1 Comment: A few commenters (104, 126, 150, 155, 176, 220, 224, 242) had different remarks regarding parameter monitoring in the proposed rule. Three commenters (155, 220, 224) wanted EPA to clarify whether parameter monitoring is required for any existing engines under the proposal. According to the commenter (155), the preamble and regulatory language contain conflicting information and the commenter is uncertain if EPA intended to require parameter monitoring for area sources. The commenters (155, 242) said that Table 6 of the proposed rule does not required parameter monitoring for area sources, but that the preamble talks about such monitoring for larger area source engines. This should be clarified, commenters 155 and 242 said.

Several commenters (128, 155, 176 and 242) are strongly against parameter monitoring for area source engines and three commenters (155, 176, 242) are of the opinion that EPA should take into account limitations that exist for these engines that may be located at unmanned facilities. In addition, area sources may not have electricity, which will be problematic in terms of continuous temperature monitoring, the commenters (155, 242) said. Monthly pressure drop readings may also be an issue, the commenters (155, 242) said. Parameter monitoring will add significant technical challenges and cost burden, according to the commenters (155, 242). EPA has failed to consider all factors, but if EPA decides to require area source parameter monitoring, analysis supporting that decision must be presented and justified, two commenters (155, 242) asserted.

One commenter (128) expressed that it supports all of commenter (155) comment, but additionally noted in its comments that many of the area sources located in West Virginia are unmanned and in remote areas, where it may be difficult or impossible to conduct continuous monitoring of certain parameters.

Two commenters (104, 150) noted that most oil and natural gas facilities are located in remote, rural areas, sometimes many hours from the home or field offices, and that many do not have access to electricity to monitor and record these parameters. The commenters (104, 150) believe that the proposed requirement is unreasonable and costly, and requested that the requirement be removed for engines located at area sources.

One commenter (97) believes that EPA should not require parameter monitoring for area source engines. The commenter stated that the proposed rule should consider engine location and other site limitations if area source parameter monitoring is required.

Response: Parametric monitoring is required for existing non-emergency engines that are larger than 500 HP. EPA does not agree that parameter monitoring is not appropriate for area source engines. Parametric monitoring is appropriate for these engines because the parameters serve as surrogates of the catalyst performance. The pressure drop across the catalyst can indicate if the catalyst is damaged or fouled, in which case, catalyst performance would decrease.

EPA disagrees with the commenters' views that affordable, long-lasting, off-the-grid systems to measure and record temperatures and pressure differential at unmanned, remote locations do not exist. One instrument packager and vendor suggested use of his firm's off-the-shelf, battery-operated components. Stand-alone temperature measurements could be made and recorded using a single channel data logger ($129), a temperature sensor ($40), and a copy of software ($99), while stand-alone pressure differential measurements could be made and recorded using a multi-channel data logger ($485), a differential pressure sensor ($220), and a copy of software ($89). As the battery life for such systems is over 14 months and the data loggers can hold over 43,000 data points – more than 14 months of 15 minute readings – each system could operate unattended for more than a year. Assuming that an average source has 4 engines, equipment costs for a stand-alone temperature system would be under $200 per point, while equipment costs for a stand-alone pressure differential system would be under $370 per point. Of course, these equipment costs could be further reduced by consolidating the number of data loggers. Given that off-the-shelf equipment is available and that plant personnel are expected to visit each remote site at least once per year, when the data loggers could be downloaded or swapped out, we find no barriers for measuring and recording 15-minute temperature and pressure differential data at remote sites.

8.2 Comment: A few commenters (112, 126, 150, 155, 176, 224, 227) suggested that EPA clarify in the final rule that during months when the engine does not operate, engine operation is limited, or the engine operates at reduced load, pressure drop measurements are not required. For example, the commenters (112, 155) thought that an engine that has been idle should not be started up solely to conduct a monthly pressure drop measurement. According to a few commenters, including commenters 155 and 224, there has been implementation issues with regards to monthly pressure drop monitoring since the 2004 RICE NESHAP was issued. The commenters (112, 155) said that without clarifying this requirement, owners/operators may be required to start an engine only to conduct a pressure drop measurement or be forced to artificially load the engine to 90 percent of rated load, which may not be possible. In the alternative, an owner/operator has to submit an alternative monitoring request to EPA for approval. The commenter (155) believes this is an unnecessary burden. The commenter (155) noted that it has asked EPA for guidance on this issue, but that the guidance that EPA provided in the form of a question and answer document (available at: http://www.epa.gov/ttn/atw/rice/riceq_a9-30-05.pdf), did not sufficiently address the issue of pressure drop monitoring. The commenter (155) had a number of specific recommendations that include the provision that if an engine does not operate during a specific month, does not reach 100 percent load +/- 10 percent, or has limited operation and is shutdown prior to the owner/operator completing the pressure drop measurement, the owner/operator should not be required to startup the engine solely to record the pressure drop. The commenter (155) also recommended that the owner/operator should record the pressure drop as soon as practical after the engine is started again.

Similarly, one commenter (112) also asked EPA to clarify that temperature and pressure readings are only required when the engine is operating after startup. The commenter (112) noted that Tables 1b & 2b, item 1.b of the proposed rule, require the operator to maintain the temperature above a set point. However, the commenter (112) pointed out that when an engine is first started, there will be an unavoidable but short period of time (approximately 15 minutes) when the exhaust temperature is less than 450 F. The commenter (112) requested clarification that this startup period will be allowed without resulting in a noncompliance situation.

One commenter (150) stated that EPA should provide exceptions to the monitoring requirements for idle or broken engines inasmuch as a given engine may not always be operating. The commenter (150) believes that the rules should be clear that no reporting is required for a particular period if, during that period, the engine did not operate.

One commenter (224) requested that EPA clarify the requirements for re-establishing the baseline pressure drop and for conducting catalyst replacement tests.

Response: EPA reiterates its existing policy that a company is not required to increase the load for the sole purpose of measuring pressure drop across the compressor stations, nor is it required to start an engine that is idle or broken for the sole purpose of measuring pressure drop. However, a company is required to measure the pressure drop once the load is increased to the target window, or when operations exceed 30 days (regardless of load), and to document the time periods when the RICE is operated below the target window in its required reporting.

8.3 Comment: Two commenters (112, 150) noted that when a catalyst must be cleaned or changed, the proposed rules require a 60-day notice prior to the retest. The commenters (112, 150) requested clarification as to the operating values for the pressure drop across the catalyst that are to be used during this period, and added that it would appear impossible to operate the engine without generating a deviation during this period. The commenters (112, 150) recommended that EPA allow the use of an alternative test using a portable analyzer in this situation.

Response: The rule does require a 60-day notice prior to testing, however the owner/operator does not have to wait until after the catalyst is cleaned or changed to submit the notice. The test should be done as soon as possible after the catalyst is changed. Testing using a portable analyzer is already allowed by the rule.

8.4 Comment: Several commenters (98, 126, 129, 157, 216, 220, 247) disagreed that owners/operators should conduct parameter monitoring continuously. Two commenters (98, 129) stated that intervals for monitoring and recording temperature readings for catalysts should be reduced. The commenters (98, 129) asserted that measuring and recording catalyst temperature should only be required when the engine is operating. Commenter (98) believes that it is unnecessary to install continuous temperature monitoring equipment for recordkeeping purposes and that the requirements should be revised so that temperature is recorded each day that the unit is operated – it would then be at the operator's discretion to decide to install continuous temperature monitoring equipment. The commenter (98) suggested that following revisions to the monitoring requirements, using as the basis of the revisions the language of the proposal preamble:

"Owners and operators of existing stationary non-emergency 2SLB, 4SLB, 4SRB, and CI RICE that are greater than 500 HP and are located at a major/area source must ~~continuously~~ monitor and record catalyst inlet temperature <u>at least once every 24-hour period the engine is operated</u> if an oxidation catalyst or NSCR is being used on the engine. The pressure drop across the catalyst must also be measured monthly. If an oxidation catalyst is not being used on the engine, the owner or operator must continuously monitor and record the operating parameters (if any) approved by the Administrator."

Commenter (220) said EPA should not impose parameter monitoring requirements where there is minimal engine operation.

Two commenters (126, 247) recommended that the inlet temperature testing be conducted during performance testing to verify that the inlet temperature is within the allowable range during normal operations.

<u>Response</u>: EPA does not agree that the catalyst inlet temperature should not be monitored continuously. The temperature is an important determinate of catalytic activity and resulting emissions reduction. The continuous catalyst inlet temperature monitoring will help to demonstrate that the emission limitations are being achieved on a continuous basis. The rule already requires the catalyst inlet temperature to be testing during performance testing to verify that it is within the allowable range.

9.0 Compliance

9.1 Test Procedures

9.1.1 Comment: Several commenters (97, 112, 155, 224, 227, 242) recommended that EPA allow sequential pre and post-catalyst testing instead of simultaneous testing for engines complying with the percent reduction option. FTIR testing is expensive and will be a significant burden, but if sequential pre and post-catalyst testing is allowed the cost can be minimized. According to commenters (155, 242), most owners/operators will choose to comply with the percent reduction standard and not the concentration standard. Commenter 242 noted that this is because the level of the ppmv standards is very stringent and is exacerbated by the high percent efficiency that EPA has assumed. The commenters (155, 242) suggested that EPA allow sequential pre and post-catalyst testing for formaldehyde and CO percent reduction, while also prescribing practical quality assurance measures (e.g., engine load monitoring) to make sure that the sequential measurements before and after the catalytic control device are conducted at similar engine operation.

Response: EPA does not believe the use of sequential pre and post-catalyst testing is appropriate for measuring percent reduction for a compliance standard. There are too many variables in the operation of an engine and the generated emissions to ensure that the percent reduction was being achieved. Changes in load, temperature, or fuel type can change during the test, which also affects the emissions.

9.1.2 Comment: Several commenters (112, 132, 148, 150, 155, 186, 242) noted concerns regarding the testing requirements with respect to load, specifically regarding the requirement to test at high load. However, 90 percent efficiency may not be achievable at reduced load, according to the commenter (242) and compliance at all load conditions and SSM periods cannot be certified by the responsible official if the performance during off-load conditions is unknown. The commenter (242) recommended that EPA consider the broader use of management practices, which will lead to less engines requiring performance testing.

Commenters 132 and 242 is in favor of test requirements at the highest load that is achievable in practice +/- 10 percent and this test condition should also limit the emission standard applicability to an hourly average period and normal operating condition(s). One commenter (155) said that it is supportive of performance testing at full load or the highest load that is achievable in order to demonstrate compliance, but that it suggests that EPA specifically adds language to the NESHAP to be consistent with the NSPS requirements, which include allowing the performance test to be conducted at the maximum load achieved in practice, e.g., if greater than 90 percent load is unattainable. Three commenter (145, 155, 242) recommended that EPA add the language "or the maximum load achieved in practice" to §63.6610(d)(5) of the proposed rule. Commenters 97 and 224 had a similar suggestion. Commenter 230 recommended the text:

"The test must be conducted at any load condition within plus or minus 10 percent; if the test cannot be conducted within this range, then the RICE cannot be operated at a load greater than 10 percent of the load during the most recent performance test that complies with the emission limitations specified within this subpart."

The commenter (230) indicated that it is not capable of achieving 100 percent load +/- 10 percent.

Two commenters (150, 186) stated that engines should be allowed to be tested at maximum attainable load without need for an Alternative Testing Protocol obtained from the Administrator on a case-by-case basis. The commenters (150, 186) noted that the proposal requires testing at 100 percent load ± 10 percent, but does not specify whether it refers to full load for the engine rated at sea level or the site rating. The commenter (150) believes that because many engines physically cannot be operated at maximum rated HP for various reasons, the rule should contain some allowance to test at lower loads without requiring special approval on a case-by-case basis. The commenter (150) stated that the proposal retains high-load performance test requirements, but suggests that emission limits would apply at all loads including shutdown, while different limits for startup and malfunction. The commenter (150) believes that clarification is needed in this regard. Commenter (186) recommended that EPA include some allowance to test at lower loads without requiring operators to apply for and receive special approval from the administrator on a case-by-case basis.

The commenter (155) also recommended that EPA indicate in the rule that the emission standards only apply at high load and that requirements for demonstrating compliance at other operating conditions should be shown with other alternatives. For demonstrating compliance and conditions other than high load, the commenter (155) believes that EPA should allow engines to use work practices. Requiring work practices would ensure that the engine is operating and performing as well as possible during periods other than high load and are appropriate since requiring emission standards is not technically and economically feasible, according to the commenter (155). The commenter (155) again mentioned that if EPA keeps emission standards that apply at all operating conditions, then data and a thorough analysis should be conducted and made evident and transparent in the rulemaking docket to support that decision. The commenter (155) reiterated how combustion chemistry does not support requiring the same emission standards at high and lower load, e.g., the commenter pointed to the testing conducted at CSU that was used to develop the 2004 RICE NESHAP. Finally, the commenter (155) added that the rule should address how cyclic operation and engines with a short run time should be addressed in terms of demonstrating compliance. Air compressors and other engines may need a separate subcategory that is allowed to demonstrate compliance using work practices and not emission standards, in the commenter's (155) opinion.

One commenter (112) asked that EPA allow engine testing at the maximum attainable load without requiring application for and receipt of special approval from the Administrator on a case-by-case basis. The commenter (112) noted that as proposed, engines tests must be conducted at load conditions of 100 +/- 10 percent, but the proposal does not specify whether that is 100 percent of full load for the engine rated at sea level or 100 percent of the site rating. The commenter (112) stated that many engines cannot physically be operated at the maximum rated HP due to gas field pressure, compressor restrictions, gathering system limitations, etc.

Another commenter (148) stated that many of the engines in the oil and gas industry are oversized for various reasons, such as the need to accommodate potential increases in future production, a decrease in the HP needed due to decreasing gas volumes being processed, or use of a larger engine than needed because it is available and it is not economical to purchase a smaller engine. The commenter (148) indicated that for these reasons it is not uncommon for an engine in the oil and gas field to operate at 60 to 80 percent load during the majority of its lifetime. The commenter (148) added that there are many instances when an engine cannot operate at full load due to gas pressure in the system, the size of the compressor that the engine is powering, site elevation, temperature, etc. The commenter (148) asserted that requiring the engine to be tested at 90 to 110 percent load is not always representative of actual operating conditions and could introduce situations where compliance with this requirement is not achievable.

Response: EPA revised the emission standards to include additional data collected at loads less than 90 percent to capture the variability in stationary engine operation that can affect the HAP emissions. Since the emission limitations are based on operation over a range of loads, EPA believes that it would be appropriate to allow performance testing to be conducted at normal operation rather than during high load. In the final rule, EPA has included language specifying that performance testing can be conducted at normal operating conditions to demonstrate compliance with the emission standards. In addition, EPA has lowered the percent reduction requirements, and revised the consequent specified emission levels, to take into account operation at varying levels of operation, consistent with the testing that was used to develop the 2004 NESHAP. EPA believes this satisfies the commenters' concerns on this issue.

9.1.3 Comment: One commenter (96) asked that EPA include in-use measurement allowances in the final rule. The commenter (96) said that EPA will need to include adequate measurement allowances to account for the relative accuracy and variability of in-use measurement systems when compared with laboratory-based CVS emissions measurement systems, like is being done for in-use NTE testing for mobile sources, in order to make sure those in-use tests are fairly comparable to any certification tests related to the engines at issue.

Response: EPA does not believe the inclusion of in-use measurement allowances is necessary or appropriate for the final rule. EPA believes that the QA/QC requirements that have been developed for the approved test methods and procedures are sufficient measures to ensure that the engines are meeting the requirements.

9.1.4 Comment: One commenter (76) indicated that it had provided significant comments in February 2009 on EPA's Continuous Parameter Monitoring Systems proposal and believes that extensive revisions are needed of Performance Specifications 17 and 4. The commenter (76) asked that EPA review these procedures to determine their appropriateness for even larger engines and suggested that EPA remove the reference to 40 CFR 63.6(a)(2) from Table 8 of the proposed rule, i.e., change "Yes" to "No" for this paragraph of the General Provisions.

Response: EPA does not agree with the commenter that the reference to 40 CFR 63.8(a)(2) should be "no". The commenter did not provide any information to support the claim that the Performance Specifications and 40 CFR 63.8(a)(2) are not appropriate for stationary engines. In response to this comment, EPA reviewed the proposed Performance Specification and determined that it is appropriate for stationary engines, including spark ignition engines. In order to clearly indicate the requirements from the Performance Specification that should be followed for the stationary engines subject to this NESHAP, EPA has included the Performance Specification requirements in 40 CFR part 63 subpart ZZZZ.

9.1.5 Comment: A few commenters (76, 188, 191) expressed concern over the cost of testing stationary engines, especially rich burn engines. One commenter (188) noted that in the proposed rule EPA chose to require an initial performance test only for stationary RICE located at area sources that are subject to numerical emission standards; however, if the engine is rebuilt or overhauled it must be re-tested to demonstrate that it meets emissions standards. Vendor estimates to comply with this requirement ranged from $40,000 to $50,000 to stack test one unit to demonstrate compliance with the requirement for 90 percent formaldehyde reduction. The commenter (188) felt that such costs are grossly out of proportion to the perceived benefit and that it would be very constructive if the EPA and stakeholders developed more economically practicable methodologies for monitoring relevant HAP from operations utilizing stationary RICE. The commenter (188) suggested that in cases where catalytic aftertreatment of stationary engine exhaust is warranted for HAP control, a potential regulatory alternative is to make catalytic converter vendors responsible (by warranty) for the performance of their products in lieu of expensive stack testing to as required for automotive catalysts.

One commenter (76) noted that it currently tests three 4SRB engines greater than 3,000 HP annually for formaldehyde. The commenter (76) stated that the performance test and sampling costs for these annual tests is approximately $35,000. The commenter (76) pointed out that EPA concluded that sources could test for CO/O_2 for $500 to $1,000 per engine using a rented portable analyzer with the necessary calibration gases. The commenter (76) stated that it would seem reasonable and economical to test engines greater than 100 HP with portable analyzers, however it is not reasonable or economical to do formaldehyde testing on 4SRB engines 1/10th the size, but 10 times the population.

One commenter (191) stated that there are issues with the formaldehyde test protocol and for small engines (less than 50 HP) the cost of the formaldehyde test may surpass the cost of a new engine that size. The commenter (191) suggested that CO as a surrogate is preferable to formaldehyde testing.

Response: In the final rule, EPA is promulgating Method 323, which provides a lower-cost alternative for measuring formaldehyde. Performance testing is necessary to show that the emission limits in the rule are being met and EPA does not believe that the testing requirements in the rule are overly burdensome. For engines smaller than 500 HP, the rule requires an initial test only. EPA does not agree with the commenter who suggested that EPA rely on vendor guarantees in order to demonstrate compliance from sources using catalytic aftertreatment. For the engines that are subject to emission standards that necessitate the use of aftertreatment EPA believes it is appropriate and reasonable to require performance testing.

9.1.6 Comment: Three commenters (76, 154, 188) supported the exemption of emergency and/or small engines from performance testing requirements. One commenter (188) noted that for smaller units at area sources, subject to numerical emission standards, it is unreasonable and not cost justified to require testing for such small emission units that in many cases only run a limited number of hrs/yr and produce negligible HAP emissions. The commenter (188) recommended that in the event EPA still believes testing is warranted for area sources, alternate, lower cost testing methodologies, i.e. grab samples of stack gas before and after the catalyst, should be allowed.

Response: EPA agrees with the commenters that testing should not be required for emergency and small engines. The proposed rule specified that stationary emergency engines and stationary engines less than 100 HP were not subject to performance testing. EPA believed at proposal that it would not be reasonable to subject emergency engines at area sources to performance testing. In the final rule, stationary engines less than 100 HP and stationary emergency engines are subject to work practices or management practices, for which emissions performance testing are unnecessary and not required. EPA does believe that testing is warranted for stationary non-emergency 4SLB and 4SRB engines at area sources that are larger than 500 HP and operated more than 24 hours per calendar year. EPA does not believe that the costs for such testing are unreasonable and has specified that portable analyzers can be used for testing of CO, which reduces the cost of testing.

9.1.7 Comment: Two commenters (193, 267) recommended adding a provision in the emissions testing protocol to allow for initial and subsequent emission testing to be performed on a single engine when a facility has multiple equivalent engines. The commenter (267) stated that the district operates and maintains over 2,000 miles of canals, 60 pumping stations, and 2,200 water control structures. It (267) reported that the district pump stations have multiple engines consisting of the same manufacturer, model, manufactured date, approximate operating hours, HP rating and maintenance program. The commenter (267) opined that it is not cost effective to perform formal testing on multiple engines if it can be demonstrated through contemporaneous screening of each engine that the worst case engine was selected. The commenter recommended the following insert:

"If a facility has multiple equivalent engines, the owner or operator can perform screening of each engine for the targeted pollutant using the applicable EPA Test Method. The formal testing must be performed on each engine until the readings are stable."

Response: For existing engines, EPA disagrees with the commenter that the performance of a compliance test on a single engine can be used to show compliance for the equivalent engines located at the same facility. EPA cannot be certain that the engines have been operated identically, have had the same operational, deterioration, and malfunction experiences, and have undergone the same maintenance, all of which could affect the emissions. Therefore, EPA does not believe that it is appropriate to allow the use of the test on a single existing engine to show compliance for other engines that are the same make and model. EPA has attempted to have as little testing as is necessary to ensure that engines are meeting the standard.

9.2 Test Methods

9.2.1 Comment: A few commenters (97, 155, 224) support the CO test methods in the proposed rule, which include EPA Method 10, FTIR methods Method 320 and ASTM Method D6348-03, and ASTM Method D6522-00 (2005) using a portable analyzer. Two commenters (124, 132) also expressed that they support ASTM Method D6522. Commenter 242 also supports the use of EPA Method 10 and ASTM D6522 for CO testing. Commenters 124, 132, 155 and 242 said that EPA should also specify that alternative methods approved by the Administrator are allowed for portable analyzers and recommended the following specific language to be added to footnote a in Table 4 of the proposed rule:

"Alternative portable analyzer methods approved by the Administrator or delegated authority are also acceptable."

Response: Table 8 of the rule allows for the use of alternative test provisions as specified in §63.7(f) of the GP. This provision allows the owner or operator to petition the Administrator of their intention to use an alternative test method at least 60 days before the performance test is scheduled to begin. Therefore, EPA does not believe that the suggested footnote is needed to be added to Table 4 of the final rule.

9.2.2 Comment: Two commenters (155, 224) were of the opinion that EPA should allow FTIR test methods in the final rule as acceptable methods for measuring CO percent reduction. The FTIR methods are already included for measuring concentration and the commenter (155) does not see why those methods should not also be included for percent reduction.

Response: EPA agrees that it is acceptable to measure the percent reduction of CO using the allowable FTIR methods and has specified that this is allowable in Table 4 of the final rule.

9.2.3 Comment: Many commenters (97, 112, 130, 132, 136, 150, 155, 186, 204, 213, 224, 225, 241, 242) thought that EPA should reconsider whether EPA Method 323 could be included in the final rule or if there is another viable alternative to EPA Method 320. EPA Method 323 was published in the Federal Register on January 14, 2003 as a proposed test method to measuring formaldehyde from natural gas stationary combustion sources, but the method was never finalized. However, the commenters (155, 242) said that the method has been used on a consistent basis to measure formaldehyde from gas engines for compliance and other purposes. EPA Region 8 has test results that indicate potential issues related to the reliability of EPA Method 323 and therefore method was therefore not included in this proposed rule. (The commenters (155, 242) said that they believe that testing errors may have been a factor in the anomalous results from EPA Region 8. The commenters (155, 242) have reviewed some of the test reports in question and noted potential calculation or testing errors.) The FTIR method, which is the single formaldehyde test method in the proposal, compared to Method 323 is more complex and often more expensive, according to two commenters (155, 242). In addition, several commenters (112, 136, 155, 186, 204, 242) have concerns about whether there will be a sufficient amount of available testing companies to meet the performance testing demands of the rule. For these reasons, several of the commenters said that EPA should look back at Method 323 as a viable method and at the same time consider other alternatives for measuring formaldehyde. Commenter 150 and 225 believe that alternatives related to measurement feasibility must be considered, or an easier-to-measure surrogate for formaldehyde must be identified. After EPA proposed to remove Method 323 as a compliance test method, the Agency received test data comparing Method 323 to EPA Method 320. This information is available in the docket as Document ID Number EPA-HQ-OAR-2008-0708-0467.1.

Response: EPA Method 323 was first proposed as part of the NESHAP for Stationary Combustion Turbines published January 14, 2003, (68 FR 1888) for measuring formaldehyde emissions from natural gas-fired sources. However, the method was not included in the final Stationary Combustion Turbine NESHAP due to reliability concerns and EPA never promulgated EPA Method 323 as a final standard in 40 CFR part 63, appendix A. Despite this, many sources chose to use the method for compliance testing and as EPA reviewed the results from the method two issues emerged. A few testers seemed to produce results with the method that were consistently biased low, and occasionally testers were unable to meet the performance requirement for collecting duplicate samples whose results agreed within ± 20 percent. Because EPA was unable to resolve these technical issues with the method, EPA found it appropriate to propose to remove the method from 40 CFR part 63, subpart ZZZZ.

After EPA proposed to remove Method 323 as a compliance test method, the Agency received test data comparing Method 323 to EPA Method 320. These comparison tests were run on five different engines with samples collected concurrently from co-located sampling systems. The results from the two methods showed good agreement and there was no evidence of bias in the results from Method 323. Also, during the comparison testing, there were no problems meeting the quality assurance requirement in Method 323 for agreement between duplicate samples. A careful review of the earlier data where some testers using Method 323 were consistently producing biased results showed that these testers did not always perform the method correctly. Based on the results of the comparison testing, EPA believes that when competent testers perform Method 323 according to all of its requirements, the method will produce accurate and consistent results and it is appropriate to allow sources the option to use Method 323 to demonstrate compliance with the formaldehyde emission limits in 40 CFR part 63 subpart ZZZZ. Therefore, we are adding Method 323 to Appendix A of Part 63 in the final rule.

9.2.4 <u>Comment</u>: Seven commenters (104, 112, 130, 132, 136, 155, 225, 242) believe that CAA section 112(h) alternatives are necessary for measuring formaldehyde emissions from rich burn engines because testing will not be accessible due to FTIR test van access to remote locations, cost, and commercial availability. Otherwise, an alternative surrogate for formaldehyde should be established, the commenters (155, 242) said. The commenters (155, 242) estimated that about 80,000 rich burn engines will be have to conduct initial performance testing when the rule becomes effective based on population numbers EPA has provided in the docket. Based on this number and assuming that FTIR test van can test 150 engines per year, approximately 540 FTIR testing vans and personnel would be required, which the commenters (155, 242) do not believe are available. According to one commenter (155), quality testing personnel is about 10 percent of that number (540 x 10 percent = 54) and the commenter speculated that there is minimal incentive for new FTIR testing personnel to join the market since the engines are only subject to initial testing. Another commenter (242) estimated that even less industry expertise is available and said that less than 5 percent of the 540 FTIR testing vans anticipated to be required would be available. The commenters (155, 242) both also think that short-term demand for one-time testing may lead to unqualified testing companies entering the market. To solve these issues, the commenter (155) recommended that EPA implement more GACT management practices instead of emission limits for area source engines. The commenters (155, 242) expressed that section 112(h) of the CAA alternatives (e.g., work practices) triggered by emissions measurement infeasibility must be considered, a simpler surrogate than formaldehyde for HAP emissions must be identified, and/or current issues preventing the inclusion of Method 323 in the final rule should be resolved.

Commenter (112) asserted that requiring Method 320 exclusively poses the following significant implementation problems:

- Many emissions testing contractors do not have FTIR technology nor qualified technical personnel to operate the equipment and interpret results. A significant increase in demand for FTIR analysis would result in a serious shortage of qualified and sufficiently equipped testing firms.

- Simultaneous pre-catalyst and post-catalyst testing would require two complete FTIR systems to determine destruction efficiency across the catalyst.
- Engines located in remote areas, only accessible by dirt roads with difficult terrain, could be impassible for trailers large enough to conduct testing. FTIR instruments have delicate optics, often making it necessary to drive no more than 5 miles per hour down rough dirt roads. Increased drive times would significantly increase the cost of the test.
- The cost of EPA Method 323 testing runs $1000 to $2,500 per test. FTIR testing is estimated at $4,000 to $4,500 per test ($8000 for pre- and post-catalyst). Increased costs will put a serious strain on both the gas industry and the stack testing industry. The number of additional tests for engines as small as 100 HP at remote area sites is enormous and unreasonable, with little or no benefit to the environment.

Response: As discussed in the response to comment 9.2.3, EPA is promulgating Method 323 for formaldehyde as part of this final rule. This provides an alternative compliance method to FTIR testing. This addresses the concerns expressed by the commenters. Also note that the final rule requires more than 90 percent of engines located at area sources to meet management practice standards, which means that those engines will not have to do performance testing.

9.2.5 Comment: One commenter (155) supports EPA's decision in not using data measured with CARB Method 430 in the above-the-floor analysis. This commenter (155) and commenters 97 and 228 agree that the method is non-quantitative and deficient and EPA should make sure that no CARB Method 430 data is included in formaldehyde data used for the rulemaking. According to the commenter (155), CARB Method 430 tests are subject to a low bias for sources where NO_x is present (e.g., natural gas engines) because NO_x reacts and depletes the impinger solution. The MACT floor analysis includes formaldehyde data obtained used CARB Method 430, the commenter (155) said, although EPA has generally said that CARB Method 430 data should be invalidated and eliminated from any analysis. EPA should explain why it has selectively chosen to use some CARB Method 430 data or eliminate CARB Method 430 entirely from any data used for the rulemaking.

Response: The proposed rule did include CARB Method 430 test data that was used to calculate the MACT floor and above-the-floor standards. Since that time, EPA has received numerous comments regarding the low bias of formaldehyde results due to the reaction of NO_x and the 2,4-dinitrophenyl hydrazine (DNPH) impinger solution. Because of this possible interference, EPA has removed all formaldehyde test data that was performed using the CARB 430 test method. EPA agrees that it is inappropriate to use any CARB Method 430 data. The final standards do not rely on any test data captured by CARB Method 430.

9.2.6 Comment: Three commenters (121, 149, 150) stated that EPA should allow alternatives to performance testing. One commenter (121) said EPA should allow sources the option to use test results from other non-EPA test methods to demonstrate compliance as long as the data was gathered using an approved procedure. The commenter (121) said that its members (automotive manufacturing) indicated that the cost per sample run using Methods 1, 3, 4, and 10 could easily exceed $10,000, excluding costs to prepare for the sampling (i.e., scaffolding, stack extensions, etc.). In addition to these cost considerations, as a practical matter, there would be significant difficulty in performing these EPA test methods on engine exhaust. To reduce the compliance burden, the commenter (121) suggested that EPA replace the emission limits with percent reduction and allow owners and operators to use portable analyzers for all performance testing, given the familiarity with this equipment and the significantly lower cost of this equipment.

One commenter (150) stated that EPA should allow the use of portable analyzers (rather than EPA protocol testing) to assess CO emissions after catalyst replacement and overhaul/rebuild and for the 8,760-hour/3-year test. The commenter (150) indicated that this would be in keeping with state agency practice for sources that require periodic emission tests as part of their monitoring schedules.

Response: EPA has already addressed the commenters' concerns. The NESHAP allows the use or portable analyzers to show compliance with the CO emission standards. The method ASTM D6522-00 is a portable analyzer method.

9.3 Frequency

9.3.1 Comment: One commenter (155) said that engines greater than 500 HP located at major sources that were rich burn engines had to conduct an initial performance test plus parameter monitoring and performance testing after catalyst replacement under the 2004 RICE NESHAP. The commenter (155) said that no subsequent testing was required for these engines, however, under the current proposal, engines greater than 500 HP at major sources are subject to periodic test requirements, which will include test requirements for rich burn engines affected by the 2004

RICE NESHAP. The commenter (155) expressed that EPA should reconsider this requirement and either clarify that additional testing is not required for existing rich burn engines between 500 and 5,000 HP or provide an explanation and justification that supports adding new test requirements.

Response: EPA did not intend to require additional periodic test requirements for rich burn engines greater than 500 HP at major sources and in the proposed rule. The same testing requirements in the 2004 RICE NESHAP still apply to these engines. This has been clarified in Table 3 in the final rule.

9.3.2 Comment: A few commenters (104, 150, 155) were unclear on the requirements related to when a catalyst is replaced. One commenter (155) said that EPA should clarify in the final rule that after a catalyst has been changed when the owner/operator conducts a performance test that this test fulfills the periodic test requirement. In other words, the schedule to perform future tests should be reset when the catalyst change test is completed, the commenter (155) said. The commenter (155) additionally noted that the rule does not specify the timing to conduct a performance test after a catalyst has been replaced. It was recommended that 63.6640(b) of the proposed rule be revised to indicate that 180 days is allowed to conduct this test, by commenter (155). Alternatively, the commenter (155) suggested that EPA revise 63.6610(a) to indicate that 180 days applies to both initial testing and after a catalyst change.

The commenter (155) also wanted EPA to clarify that temporary catalysts used during washing or cleaning should not trigger a catalyst change test. According to the commenter (155), the original catalyst may be cleaned offsite by a catalyst vendor and in a the meantime a temporary catalyst is used. The commenter (155) said that an appropriate time period should be allowed to operate the temporary catalyst without having to conduct testing and recommended that sources be given 45 days to operate an engine with a temporary catalyst without conducting a test as long as the original catalyst is reinstalled following cleaning.

One commenter (104) noted that proposed 40 CFR 63.6640 requires that when the catalyst is replaced, the operator must reestablish the values of the operating parameters measured during the initial performance test and then conduct a performance test to verify compliance and asked what the need for the initial test is as it may not be accurate.

One commenter (150) stated that EPA should clarify the requirements regarding what testing is required after catalyst replacement. The commenter (150) believes that there is no need for a complete performance test after a catalyst is changed.

Response: As the commenters noted, the rule does not specify a time for conducting a performance test after a catalyst change. However, the performance test after a catalyst change should be conducted as soon as possible to demonstrate that the engine is still in compliance with the applicable standards. It should be noted that the owner/operator must notify the EPA Regional office or the delegated authority 60 days prior to performing the test. The owner/operator may seek an adjustment to the 60 day notification requirement from the EPA Regional office or delegated authority if the owner wishes to conduct a performance test as soon as possible following the catalyst change. The performance test after a catalyst change can be used to satisfy the performance testing requirement. However, a request to waive the performance testing requirement must be submitted to the EPA Regional office or delegated authority indicating that the catalyst change performance test will be used to satisfy the requirements for the required testing requirement under the rule.

In regards to the issue of whether a performance test is required when a temporary or "loaner" catalyst is being used while the primary catalyst is being washed or cleaned, EPA believes that this should be addressed on a site-specific basis and is dependent on additional information such as the type of "loaner" catalyst, the length of time the "loaner" catalyst is used, and the compliance history of the engine. After the primary catalyst has been washed or cleaned, a performance test may be required if the delegated agency has decided that the initial performance test is no longer representative of the performance of the affected source. EPA believes that routine washing of the catalyst is unlikely to cause the initial test to no longer be representative. However, this determination of whether a retest is required should be made by the delegated agency on a case-by-case basis.

9.3.3 Comment: Two commenters (112, 242) expressed similar concerns regarding the test requirements for engines that are rebuilt or overhauled. One commenter (242) said that EPA should clarify in the final rule that additional performance tests are not required for engines between 100 and 500 HP after a rebuild or overhaul or alternatively explain and justify the cost and benefits of requiring such testing. According to the commenter (242), the preamble and rule text contain conflicting information on this topic and EPA must clarify this in the final rule.

One commenter (112) asked that EPA allow alternative test procedures under certain conditions. The commenter (112) noted that while EPA stated in the proposal preamble that engines 110 to 500 HP do not require subsequent tests, an additional test must be carried out if the engine is rebuilt or overhauled. The commenter (112) indicated that based on the applicable definition, compressor engines may undergo an overhaul as often as every 2 to 3 years. The commenter (112) believes that requiring a reference test method each time an engine is overhauled is excessive and unnecessary.

The commenter (112) indicated that State agencies accept portable analyzer data with short duration runs (i.e., 6 minutes) as an acceptable means to facilitate measuring emissions from sources that require periodic emission tests. The commenter (112) added that these State agencies typically require the use of an approved protocol to ensure consistency and to provide a minimum level of quality assurance during the testing process. The commenter (112) asserted that EPA should allow the use of portable analyzer tests, using a State approved protocol for the State in which the engine is operating rather than the EPA Reference Method Performance Tests in the following circumstances:

- Engine rebuild or overhaul,
- Replacement of O_2 sensor (which occurs every 3 months),
- Catalyst washing or replacement,
- Re-establishment of benchmark pressure drop.

The commenter (112) believes that if EPA intends to require performance tests in these situations, the increased cost should be captured in EPA's economic analysis. The commenter (112) added that EPA should reevaluate the frequency of testing that is required above that of annual performance testing.

Response: EPA believes that it is appropriate to require testing for stationary engines that have been rebuilt or overhauled even though the engines may only normally be required to conduct an initial performance test and no subsequent testing. The rebuilding or overhaul of the engine may change the combustion characteristics of the engine. EPA does not believe that these performance tests after an engine is overhauled or rebuilt are excessive or unnecessary. The required testing will ensure that the rebuilt or overhauled engine still meet the applicable emission limits, therefore ensuring compliance with the applicable standards.

EPA has incorporated portable test methods that meet the QA/QC criteria of comparable EPA test methods. The rule does allow the petition of alternative test methods under 40 CFR §63.7(f) of the GP. This provision would allow the owner or operator to use an alternative test method from that specified in the standard provided that the owner notifies the Administrator of the intention to use an alternative test method at least 60 days before the performance test is scheduled to begin, uses Method 301 in appendix A of this part to validate the alternative test method, and submits the results of the Method 301 validation process along with the notification of intention and the justification for not using the specified test method.

In response to EPA including the costs of these tests for rebuilding or overhauling of engines, catalyst washing and replacement, or re-establishment of benchmark pressure drop, EPA does not believe that these additional testing costs need to be included because the analysis presented in the rule shows the costs in the year 2013, or the first full year after implementation of the rule, and it is unlikely these costs will be incurred in that year. For the replacement of the O_2 sensor, EPA does not require testing and therefore the testing costs were not included in the economic analysis.

9.3.4 Comment: One commenter (76) asked that EPA modify 63.6612(b) of the proposed rule to allow past performance tests conducted in the last 5 years to be used instead of the 2 years that this paragraph currently requires. The commenter (76) believes that testing conducted in the last

5 years is representative of current emissions in many cases and the commenter thinks that it is appropriate for EPA to allow such tests to be used to demonstrate compliance.

Another commenter (116) had a similar request that for areas sources that are subject to new testing requirements, this could be modified to allow tests that are not older than 3 years, since the promulgated rule will allow 3 years for compliance. The commenter (116) asserted that there are so many engines that will be required to be tested that it is reasonable to allow facilities more time to accomplish the testing before the compliance deadline.

Response: EPA believes that the requirements in §63.6612(b) of the rule are appropriate. Performance tests older than 2 years may not be representative of the current emissions from the engine. Maintenance of the engine requires replacement of parts that may affect the combustion characteristics of the engine, which in turn will affect the emissions of the engine. In addition, EPA believes that the 2-year limit of performance test reports will also allow sufficient time for the sources to perform any applicable testing at their facility before the compliance deadline.

9.3.5 Comment: Several commenters (87, 98, 112, 126, 139, 186, 197, 216, 227, 229, 236, 247) expressed that they disagreed with the testing requirements in the proposed rule. Multiple commenters (87, 112, 126, 139, 157, 186, 236) took issue with the testing requirements for non-emergency stationary RICE greater than 500 HP of every 8,760 hours of operation or 3 years. Two commenters (112, 186) indicated that strict adherence to a test schedule based on operating hours is difficult to manage in large fleets of engines due to availability of testing personnel, equipment breakdowns, weather conditions, safety considerations, etc. Consequently, the tests would necessarily be conducted more frequently than annually to ensure completion of tests for the entire fleet within the operating hour time limit. Two commenters (112, 186) suggested that reduced test frequency should be allowed when two consecutive tests demonstrate compliance with emissions limitations (such as is allowed in the footnote to Table 6 of the proposed rule). The commenters (112, 186) added that upon any non-compliance with emissions limitations, the test frequency could revert to the original schedule. The commenter (112) also suggested that EPA should consider a reduced testing frequency, 3 years, for any engine in compliance for two consecutive performance tests, regardless of operating hours.

Two commenters (236, 247) stated that EPA's proposed frequency of performance tests (every 3 years) is excessive and recommends that frequency of performance testing be based on hours of operation. The commenter (236) noted that some engines are run very infrequently over their entire service life.

Two commenters (126, 197) suggested that the frequency of performance tests be based on hours of operation. The commenter (197) asserted that many RICE have low dispatching hours and the required performance testing would contribute to a significant amount of their operating time. The commenter (197) recommended that limited use RICE should not be required to demonstrate that the control equipment is functional more than once.

One commenter (87) stated that the requirement to test every 3 years for units that do not run very often is unreasonable. The commenter (87) added that based on actual run time (including peak shavers) for 14 stationary RICE that would be subject to this testing requirement, the average 3 year cumulative run time was 105 hours, and without peak shavers, 37 hours. Further, the commenter (87) stated that most generator engines are not equipped with easy-access test ports and would have to be modified for testing, the cost of which have not been captured in this rule. The commenter (87) recommended that provisions for testing units that are not run frequently should be considered.

One commenter (139) stated there is limited or no benefit for requiring owner and operators of non-emergency, limited use RICE greater than 500 HP to perform time-consuming and expensive tests every 3 years. The proposed rule would require owners and operators of all existing stationary non-emergency RICE greater than 500 HP to conduct an initial performance test and subsequent tests every 8,760 hours of operation or every three years, whichever comes first. For some RICE, operation would be required simply to conduct the testing, which is unreasonable. The commenter (139) urged EPA to revise the proposed rule so that subsequent testing of these engines is only required every 8,760 hours of operation.

Commenter (227) said the proposed requirement for area sources to conduct an unnecessary and burdensome initial performance test should be replaced by an engine tune-up procedure, which would be adequate given the limited operation of the emergency engines.

Commenter (216) said EPA should revise the proposed rule and limit performance testing requirements to non-emergency 2SLB and 4SLB engines greater than 250 HP and CI engines greater than 300 HP located at major sources.

Commenter (229) believed that requiring a performance test for existing area source RICE greater than 500 HP (when the same engines at a major source facility are not required to be tested) seems completely unreasonable. Commenter (229) adds that the engines would be required to operate for the performance test when they would normally not be operating, creating emissions that would normally not be produced, and questioned the benefit of this, and asked what EPA would require the source to do if the test results were above the emission standard.

Commenter (229) noted that while EPA is stipulating that performance testing of existing engines is not required for major source facilities in the proposed rule, because an emission limitation is being proposed, this does not preclude state agencies from specifying performance test requirements as a compliance demonstration condition in Title V Permits . Accordingly, commenter (229) reiterated that appropriate work practice standards are the practical requirement for all existing emergency engines at major and area source facilities in lieu of any emission limitation standards.

One commenter (98) argued that performance test requirements for non-emergency RICE greater than 100 HP at major sources are too broad in scope and must be revised to exclude limited use units in order to avoid the need to operate these units for the sole purpose of generating emissions data. The commenter (98) stated that the proposed language imposes initial performance test requirements on 2SLB and 4SLB engines 100≥HP≤250 and on CI engines 100≥HP≤300 even though these engines are not required to install aftertreatment controls and emission standards are based on emissions from uncontrolled units.

One commenter (98) argued that performance test requirements for non-emergency RICE greater than 500 HP at major and area sources are required too frequently. The commenter (98) asserted that many RICE in this category operate infrequently (less than 20 percent annual utilization) and consequently requiring a performance test every 3 years is too frequent. The commenter (98) noted that RICE in this category are required to monitor catalyst pressure drop and catalyst temperature to assure proper operation of the control device, which approach is similar to the Compliance Assurance Monitoring (CAM) Plan established in 40 CFR part 64. The commenter (98) believes that the required monitoring indicates proper performance of the control device, so frequent performance tests for these units are unnecessary and redundant. The commenter recommended that the proposed rule language in 40 CFR 63.6615 be revised as follows:

"Owners and operators of existing stationary non-emergency or non-limited use RICE that are greater than 500 HP and located at major/area sources must conduct an initial performance test and must test every 8,760 hours of operation or ~~3~~ 5 years, whichever comes first, to demonstrate that they are achieving the required emission standards through required monitoring of after-treatment control device(s). In the event that monitored parameters do not comply with specified after-treatment control equipment pressure drop and temperature criteria, corrective action or a performance test must be conducted to demonstrate that the emissions source is achieving the required emission standards. If corrective action involves modifications to the after-treatment control device which changes monitored parameters, a performance test must be conducted within 180 days of first operation of RICE after modification to the after-treatment control device occurred."

One commenter (157) believes these requirements are redundant and burdensome because many RICE in this category operate infrequently and are already subject to continuous monitoring of the catalyst pressure drop and catalyst temperature to assure proper operation of the control device. Therefore, the commenter (157) requested that the proposed rule only require subsequent testing of these units every 8,760 hours of operation.

Response: EPA believes that the test frequency for stationary non-emergency existing 4SLB and 4SRB engines greater than 500 HP located at area sources and operated more than 24 hours per year is appropriate to ensure compliance with the applicable standards. As stated in the preamble to the proposed rule, additional testing on a regular basis is appropriate and not excessive for these engines because of their size and operating time. At most, these engines would be required to test yearly, which would actually be less than what is required for most of the engines subject to the 2004 RICE NESHAP. EPA believes that three years is an appropriate time between tests for larger engines to ensure that the emission standards are met on an ongoing basis. The option for reducing test frequency that the commenters cited in Table 6 allows for reducing from semiannual to annual testing; this proposal did not include any semiannual testing. The testing requirements are based on actual hours of operation. Regarding the comment that most generators are not equipped with easy access ports, the commenter did not submit any information to substantiate this claim. EPA does not agree that an engine tune-up would be an adequate replacement for an initial performance test as the tune-up would not provide any indication of what the emissions from the engine are. EPA has not required any performance testing for emergency engines at area sources. For stationary non-emergency SI engines at major sources larger than 100 HP, the final rule requires a performance test, which EPA has determined is necessary to adequately demonstrate that the engine is meeting the emission limitation. Emergency engines at major sources do not have emission limitations in the final rule, which addresses the concern expressed by the commenter regarding state agencies requiring testing to meet the emission limitations for these engines in the proposed rule.

9.3.6 Comment: One commenter (264) supports EPA's proposal to exclude existing non-emergency RICE located at major sources that are less than 100 HP and existing stationary emergency RICE located at major sources from the requirement to conduct performance testing. The commenter (264) expressed that it did not believe it was feasible to perform the testing base on size and potential configuration of equipment. This commenter (264) also supported EPA's proposal to exclude existing stationary RICE located at area sources that are subject to management standards from the requirement to conduct performance testing. The commenter (264) expressed that, based on the fact that these RICE are area sources of HAP and are for smaller-sized equipment, the maintenance standards, in its opinion, are an adequate means of ensuring emissions are minimized.

Response: No response is needed.

9.3.7 Comment: One commenter (142) stated that, because landfill/digester gas RICE are typically operated 24 hours per day and 7 days per week, the proposed emission testing frequency would trigger testing approximately every 13 to 14 months considering typical downtimes experienced by these engines. The commenter (142) asserted that this requirement would result in a significant economic burden to sources operating landfill/digester gas RICE outweighing the value of periodic testing as a means of compliance assurance and creating a barrier to the utilization of landfill gas as a renewable energy source.

Response: In the final rule, EPA did not promulgate requirements to conduct performance testing beyond the initial compliance test for landfill and digester gas engines. The only engines that have period compliance testing requirements in the final rule are 4SLB and 4SRB non-emergency engines greater than 500 HP at area sources of HAP that are operated more than 24 hours per year. Landfill and digester gas engines at area sources have management practices rather than numeric emission limitations and are not required to conduct performance testing.

9.4 Other

9.4.1 Comment: Several commenters (227, 229, 230, 253) expressed concern regarding potential performance testing for smaller engines. One commenter (227) said that while there is a proposed formaldehyde limit for existing stationary non-emergency RICE less than 100 HP at major sources and existing stationary emergency RICE at major sources, there are no testing requirements. These engines have maintenance and operating requirements to ensure compliance, based on manufacturer's written emission-related instructions. Since testing is not required, the commenter (227) requested that EPA remove the emission standards for these RICE.

One commenter (253) stated that there does not appear to be language in the proposed rule that would exempt emergency engines from this requirement.

Commenter 229 noted that in Table 1, it appears that for all engines (emergency and non-emergency) less than 50 HP at a major source facility, EPA is proposing an emission limitation standard of 2 ppmvd formaldehyde. Commenter (229) questioned the purpose of this emission limit since EPA states that it does not expect any existing CI engines in this category to be operating at major source facilities, and if SI or CI engines less than 50 HP are operating at major source facilities, EPA is not stipulating a performance test for a compliance demonstration. Commenter 229 continued stating that this does not preclude state agencies from specifying performance test requirements or some other needless requirements as a compliance demonstration condition in Title V Permits. Commenter (229) therefore recommends that EPA exercise its de minimis authority under the CAA to exempt existing engines less than 50 HP from the RICE NESHAP regulations for major and area sources since HAP emissions from these sources will be negligible and any regulatory requirements will be unwarranted.

One commenter (230) recommended that EPA modify Table 4 to exclude small RICE from performance testing requirements. The commenter (230) stated that the rationale used for excluding performance testing for small stationary and emergency engines because of cost should be applied to the same engines at major sources. The commenter (230) does not believe there is a useful benefit in performance testing of small (less than 50 HP) RICE located at major or area sources.

Response: In the final rule, EPA has determined that engines below 100 HP and emergency engines will be subject to work standards or management practices, and are not subject to testing. These engines do not have any numerical emission limitation. Regarding the comments that these engines should be exempted under de minimis, EPA does not believe that there is sufficient justification for a de minimis finding for these engines.

9.4.2 Comment: Two commenters (157, 216) said EPA should allow performance test to be done during periods of planned operation. The commenters (157, 216) said this change would avoid unnecessary emissions produced just for the purposes of testing.

Response: EPA agrees that it is unreasonable to startup an engine solely for the purpose of conducting a performance test and believes it is appropriate to incorporate flexibility when an engine is non-operational. In the final rule, EPA has included language in the performance testing section that allows stationary engines that are non-operational to conduct performance testing when the engine is started up again. This is consistent with how EPA treats engines that must conduct monthly pressure drop readings (see EPA's response to Question 22 in http://www.epa.gov/ttn/atw/rice/riceq_a_9-30-05.pdf) and does not require engines to be started up solely to record the pressure drop.

9.4.3 Comment: One commenter (157) believes that EPA should revise the proposed initial performance test requirement for non-emergency 2SLB and 4SLB engines with a site rating between 100 HP and 250 HP, and CI engines with a site rating between 100 HP and 300 HP, because the proposed requirements conflict with EPA's decision that such engines should not have to install controls. The commenter (157) states if one of these engines fails to meet the proposed emissions limit during the initial compliance test, then the owner is out of compliance unless the owner/operator reduces emissions from the engine, which will likely mandate the installation of controls. The commenter (157) noted that this is contrary to EPA's determination that the cost of applying control to these engines is "too significant to outweigh the expected HAP reductions from these units." Therefore, the commenter (157) believes that performance testing requirements should be limited to non-emergency 2SLB and 4SLB engines greater than 250 HP and CI engines greater than 300 HP located at major sources.

Response: Based on additional data received in the post-proposal period, EPA revised the MACT floor determination for these engines. The emission limitations for these engines in the final rule are higher than those at proposal. Therefore, EPA expects that the limits will be met without the use of add-on controls for many of these engines. For those engines that are required to use aftertreatment, this is the result of Congress's mandate that standards be determined by reviewing the emissions of the best controlled sources. This means that some engines whose uncontrolled emissions are high will need aftertreatment to meet the standard. EPA does not agree that performance testing should not be required for non-emergency engines; the testing is necessary to show that the engine is complying with the emission limitation and these engines are not subject to the special provisions that EPA has provided for engines used solely in emergency circumstances.

9.4.4 Comment: Two commenters (193, 230) said that EPA should allow owners to use engine manufacturer information to demonstrate compliance with the rule. One commenter (230) asked that EPA allow the use of manufacturers testing data on all models of RICE below 300 HP instead of requiring performance testing. Commenter 193 stated that EPA should provide owners and operators of existing stationary RICE with a streamlined compliance demonstration option whenever they are able to obtain documentation from the engine manufacturer that attest to an engine's compliance with the emission limits of this proposed rule. The commenter (193) encouraged EPA to construct a compliance option in the final rule for existing source RICE less than 500 HP, much like the compliance option it created in its January 2008 final rule (73 FR 3596) and afford owners and operators the compliance option of obtaining certification documentation from engine manufacturers that attest to an engine's compliance with the emission limits of this proposed rule. The commenter (193) noted that this alternative compliance option could apply if entities operate and maintain the certified stationary engine and control device according to the manufacturer's emission-related written instructions, and the owner or operator keeps records of conducted maintenance to demonstrate compliance. Under this compliance option, no performance testing would be required of the owners or operators.

Response: EPA is not allowing owners of existing stationary engines to use manufacturer's test data or any other information in lieu of conducting performance testing. EPA needs the assurance that each engine subject to performance testing is actually meeting the applicable emission standard. Manufacturer's test data may be indicative of the engine performance when the engine is brand new, but may not be representative of the engine exhaust emissions after years in the field. Other factors that may affect the engine exhaust emissions include location, climate, fuel, controls, and how the engine has been operated and maintained over the years. The provisions the commenter is referring to in the January 2008 final rule on page 73 FR 3596 are for new stationary engines subject to the SI NSPS. For existing engines, EPA has no assurance that just because data from the manufacturer on the same model engine indicates that the engine is capable of meeting the emission standards when new, that the engine actually will after years of use in the field and EPA therefore believes that performance testing is justified and necessary.

10.0 Recordkeeping, Reporting and Notifications

10.1 Comment: Numerous commenters (97, 103, 104, 112, 126, 150, 155, 158, 224, 241, 230, 242, 247) expressed concern over the proposed recordkeeping and reporting requirements.

One commenter (155) indicated that for the 2008 RICE NESHAP EPA acknowledged that the 40 CFR part 63 GP requirements were burdensome in certain cases and limited these requirements for new area source and small major source engines. Three commenters (155, 224, 247) believe that EPA should make similar allowances for engines under this rulemaking and should not broadly apply the 40 CFR part 63 GP requirements to all existing engines.

Commenters 112, 155, and 241 are of the opinion that fewer requirements from the 40 CFR part 63 GP should apply to area sources and smaller engines and said that EPA should exempt existing area source engines from 40 CFR part 63 GP requirements. Commenter 112 believes that at minimum, EPA should consider the cost and benefit of subjecting 40 CFR part 63 GP on area sources. Commenter 155 suggested that EPA review the requirements from the 2008 RICE NESHAP and consider harmonizing the requirements in order to avoid implementation issues and adopt requirements that are similar for existing and new units.

Commenter 241 stated under the proposed rule existing engines would have significantly more reporting and recordkeeping burden than new engines, and that requirements for new and existing engines should be complementary to avoid different implementation requirements.

Commenter 242 suggested that EPA conduct additional analysis on costs and benefits associated with applying 40 CFR part 63 GP requirements and noted, like commenter 155, that the requirements for existing sources are more burdensome than those for new sources that comply with the NSPS. Two commenters (112, 242) specifically commented that it did not believe the hour estimate for emergency engines is accurate at 1 hr/yr and thought recordkeeping would take at least 15 minutes per occurrence, or at a minimum, at least once per month (3 hrs/yr). The commenters (112, 242) further expressed that they did not believe EPA has accounted for the costs associated with overhead and profit in its emergency engines analysis.

Commenters 112 and 242 also stated that it is not evident that EPA has considered any recordkeeping for engines requiring maintenance and that, based on its experience, significant recordkeeping is necessary for maintenance and SSM requirements. The commenters (112, 242) estimated that it would take 2 hrs/month and 1 hr/month for maintenance and SSM recordkeeping, respectively. In terms of reporting costs, the commenter (242) expressed that it does not look like EPA considered the 167 percent overhead allowance, which would increase the reporting costs.

The commenters (112, 242) added that EPA estimated 14 hours for reporting, but the commenter expressed that this is not sufficient time to become familiarized with the very complex rulemaking, which the commenters estimated would take about 40 hours. Commenter 112 stated that EPA did not include the 167 percent overhead allowance in this calculation. Further, in terms of annual training, commenters 112 and 242 think this will take 8 hrs/yr. Considering the cumulative effect of notification, recordkeeping and reporting associated with the rule, the commenter (242) believes the rule will have an unprecedented impact on the regulated community and State agencies that will be implementing the rule. Commenters 155 and 242 said that EPA has not recognized the extensive recordkeeping and reporting requirements in the 40 CFR part 63 GP and the commenters listed several requirements from the GP as examples of onerous and burdensome requirements (e.g., initial notification of applicability, various notifications including the notification of performance test, compliance reports, reporting related to SSM, various records required such as records of SSM, records of maintenance, records of monitoring). Based on the assumption that the average environmental professional will be responsible for 10 controlled engines, the commenter (112) estimated that 19,800 environmental professionals will need to be trained at an initial cost of $58 million and annual cost of $12 million for refresher training, which does not include the cost for those professionals to educate field personnel about the requirements for which they are ultimately responsible.

One commenter (126) believes the requirement for owners and operators to develop a maintenance plan that specifies how the management practices will be met provides little benefit to anyone. If the manufacturer's maintenance plan requirements are met, then the commenter (126) suggested that there be no maintenance plan and that the owner operator keep appropriate records to demonstrate that it has met those requirements.

Commenter 242 reported that the 40 CFR part 63 GP requirements are currently being reviewed as a result of the litigation concerning SSM. The commenter (242) said that the applicability of 40 CFR 63.7(e)(1), shown in Table 8 of the rule, adds significant confusion and the commenter believes it is inconsistent with the requirements of the rule. It is unclear whether a source needs to be in compliance outside of normal operating conditions because the section with these requirements says "as applies" and the commenter (242) urged EPA to clearly spell out all rule requirements.

One commenter (158) stated that the management practices and recordkeeping requirements are not practical for low-use equipment because logs could need to be retained for years, even decades. For example, if a facility uses a 60 HP diesel-powered welder ten times per year for one hour per use, the proposed regulation would require that operating hours be recorded for 50 years in order to conduct scheduled maintenance. The commenter (158) stated that this is impractical and creates an unjustified compliance risk.

One commenter (104) noted that the proposed 40 CFR 63.6665 section includes additional 40 CFR part 63 GP that apply to this rulemaking. The commenter (104) believes that these requirements increase the complexity of the rule on small businesses that operate engines at oil and gas facilities, especially those entities that have never been regulated before. The commenter (104) asked how EPA plans to simplify the process for these entities.

One commenter (230) stated that the additional recordkeeping and reporting requirements in Table 2d for uncontrolled RICE are unnecessary if a comprehensive planned maintenance program is utilized. The commenter believes that the oil and filter change management practices in Table 2d of the proposed rule may cause an inadvertent recordkeeping violation. The commenter recommends that the schedule should conform to an engine specific planned maintenance program, or the values in Table 2d of the proposed rule should provide an allowance for exceeding the recommended values during an emergency situation.

Response: EPA believes the recordkeeping and reporting requirements are appropriate and justified in order to provide EPA with sufficient information to show that sources are in compliance with the rule. EPA does not believe that the requirements have to be the same for new and existing engines. In many cases, new engines are certified to achieve the emission limitations by the engine manufacturer and therefore EPA determined that these engines could have fewer recordkeeping and reporting requirements than what is in the part 63 General Provisions. EPA does not agree with the commenters that said that an estimate of one hour per year for recording emergency operation was not accurate. EPA did not include costs for recordkeeping for engine maintenance because EPA assumed that engine owners/operators would already be keeping these records even without this regulation. EPA believes that the costs estimated for recordkeeping and training are accurate. In terms of the cost of training and the impact of the rule on small businesses, EPA plans to provide implementation materials to assist affected facilities in complying with the final rule, which should decrease the amount of time needed to become familiar with the rule.

In response to the comment regarding the 167 percent overhead allowance, EPA incorporated the 167 percent overhead and profit allowance in determining the labor rates, which means that the overhead allowance was included in the costs associated with emergency engines.

EPA documented this in the proposed rule impacts memo. However, EPA believes the way that this was written up in the proposed rule impacts memo may have been confusing and makes it seem as if 167 percent was added to the $68/hr rate, which is not the case. EPA has clarified this in the final rule impacts memo and believes this resolves the concern on this issue.

EPA does not agree with the commenter that developing a maintenance plan will provide little benefit. It is important that sources have a written plan spelling out the maintenance to be conducted on their stationary SI engines. This plan can certainly be based on the manufacturer's recommended maintenance.

Regarding the comment that the applicability of 40 CFR 63.7(e)(1) shown in Table 8 is confusing, EPA is currently conducting a review of the part 63 General Provisions as a result of the court decision on startup, shutdown, and malfunction. EPA will revise the General Provisions as appropriate.

Regarding the comment that the recordkeeping requirements are not practical for low-use equipment, 40 CFR 63.10(b) specifies that records only need to be kept for five years after the date of the maintenance. Therefore, it will not be necessary for the records to be kept for 50 years. EPA has specified in the final rule that the maintenance should be conducted at yearly intervals at a minimum. EPA has also specified that sources may petition for different maintenance requirements. Any exceedances of the maintenance requirements that occur during emergencies will be handled on a case-by-case basis.

10.2 <u>Comment</u>: Several commenters (76, 81, 103, 104, 118, 119, 129, 136, 148, 150, 157, 225, 240) suggested alternatives to requiring owners and operators having to maintain records on-site.

Several commenters (76, 81, 118, 136, 148, 240) suggested that EPA clarify that necessary records be kept in a central location and not on-site as currently required in 63.6655(e). Commenter (76) recommended that §63.6660(c) be modified to allow records to be kept off-site at a central location for 5 years. According to the commenter (81), this is consistent with EPA and other Federal government efforts (e.g., electronic reporting). Commenter 119 echoed these concerns and specifically requested that the final rule allow records to be maintained at an off-site location for engines located at area sources of HAP.

One commenter (103), in the natural gas compression industry, noted that the vast majority of smaller HP engines are located at unmanned facilities in remote locations where maintaining records on-site would be quite burdensome and unreliable. The commenter (103) requested that EPA consider allowing records to be kept on-site, or at a nearby field office.

Similarly, two other commenters (104, 150) in the oil and gas industry noted that most oil and gas facilities are in remote, rural areas, sometimes many hours from the home or field offices, so that there is no practical way to keep records on-site. These commenters (104, 150) requested that the requirement for on-site records be removed for oil and gas facilities, or that such records be allowed to be kept at the nearest manned field or home office.

Another commenter (225), in the oil and gas industry also recommended that the requirement for maintenance records be expanded to include local field offices. This commenter (225) noted that, in some cases, maintenance may be conducted by a third-party contractor and recommended that retention of the records by a third party be allowed.

One commenter (103) expressed that the proposed rule requires records to be kept on site unless a waiver is obtained. The commenter (103) believes that EPA and the states who will ultimately enforce the rule, do not have sufficient manpower to provide the thousands of waivers that will be requested and re-requested every time an engine is relocated. The commenter (103) asserted that a provision for keeping records at a field office should be written into the rule from the beginning because it is an unnecessary burden to require special waivers on items that are not only common place, but also the norm.

Response: EPA agrees with the commenters that it would appropriate to allow records to be kept off-site at a central location. EPA has incorporated this requirement in the final rule.

10.3 Comment: One commenter (112) in the natural gas industry asked that EPA change the initial notification date from "commence construction" to the date of on-site construction. The commenter (112) stated that "commence construction" was defined as the date the engine was ordered for consistency with the "entered into a contractual obligation" concept, which makes sense when discussing the applicability of the regulation or the construction of a major facility (i.e., a refinery, chemical plant or electrical generation facility). However, the commenter (112) believes that the initial notification requirements, in this case, should be revised so that the notification schedule is based on the date that the engine is sited rather than the date that the engine is ordered because often an engine is ordered without knowing at which site the unit will be installed. Commenter 150 expressed the same concerns. The commenter (112) noted that if the initial notification date is based on "commence construction," the notification for these engines would contain only the engine make and model with no site location or date of installation, and the limited information provided would be of little use to the regulatory agencies receiving the notice. In addition, a subsequent notification would be required when the final location is determined to provide the balance of information required, which the commenter

(112) believes is onerous. The commenter (112) added that, for operators that have sites in multiple states, the notification would need to go to multiple states because even the state has not yet been identified.

Response: The engines that are the subject of this rulemaking are existing engines that have already been constructed. The initial notification date for these engines is not tied to the date of construction and will be 120 days after the effective date of the final rule

10.4 Comment: A few commenters (81, 129, 216) said the proposed recordkeeping requirements are unnecessarily rigid for emergency generators. The commenter (81) reported that it operates numerous remote, unoccupied, and often unmanned locations. Such areas are not easily accessed for the creation and maintenance of rigidly-defined documentation. The commenter requested that, should the recordkeeping requirements become too burdensome, it may become necessary to remove the use of emergency generators for use as needed backup power, potentially disrupting communications.

Commenter (216) said EPA should reduce the proposed recordkeeping and reporting requirements for emergency engines. Most emergency RICE start automatically, and much of the equipment may be at remote locations. The requirement to record the purpose of all run events is a burden that will require additional manpower.

Response: EPA does not agree that the recordkeeping requirements that were proposed for owners and operators of existing stationary emergency engines are too burdensome. EPA is finalizing requirements for emergency engines that do not require the application of aftertreatment controls. EPA developed distinct subcategories for emergency and non-emergency engines to account for different characteristics between these types of stationary engines. The analysis that was conducted leading to the final requirements for emergency and non-emergency engines is based on those differences. Therefore, in order to demonstrate that an engine is truly an emergency engine as defined in the final rule, there must be some recordkeeping and documentation associated with the operation of the engine to confirm that the engine is operating according to the definition of an emergency engine and subsequently entitled to meet the less stringent standards. In the case the emergency engine is operated in a non-emergency manner, the more stringent standards that apply to non-emergency engines would apply. EPA believes that keeping track of the hours of operation and the purpose of operation is necessary in order to ensure that the engines are meeting the applicable standards.

10.5 <u>Comment</u>: One commenter (162) said that semiannual compliance status reporting is overly onerous for emergency and limited-use stationary RICE at are sources. The commenter (162) described the specific burden his company would face. The commenter (162) particularly objected to filing reports for RICE that do not even have emission limitations. The commenter (162) requested that semiannual compliance reports be waived for area sources, or at least, for area sources with RICE that do not have emissions limitations.

<u>Response</u>: EPA agrees with the commenter that semiannual compliance reporting, and other types of reporting required under the General Provisions of 40 CFR part 63 are not appropriate for area sources that are not subject to numerical emission standards. EPA believes that recording information and maintaining records will provide EPA with assurance that facilities

are meeting the work/management practices and other requirements applicable to their existing stationary engines. Further, EPA believes it is appropriate extend the same approach to any sources that are not subject to numerical emission standards, including existing stationary SI engines less than 100 HP and existing stationary emergency SI engines. Therefore, in the final rule, EPA has specified in 63.6645(a)(5) that these engines do not have to meet the notification requirements of the General Provisions that are specified in 63.6645(a).

10.6 Comment: One commenter (103) stated that records of air filter change dates should only be required, if applicable, since not all engines contain air filters.

Response: EPA agrees with the commenter.

10.7 Comment: Several commenters (103, 104, 130, 150, 175, 227, 230, 255) provided comments on the requirement to maintain records of fuel consumption rates and/or the use of fuel and hour meters.

Two commenters (103, 104) opined that having to install a fuel meter would impose a significant cost to owners and operators. On a similar topic, commenter 157 stated that the installation of the non-resettable hour meters requires a substantial monetary investment in either a computerized monitoring system or additional labor and requested that the reporting and recordkeeping requirements for existing engines should be the same reporting and recordkeeping requirements for new units.

One commenter (103) requested that EPA drop the requirement to maintain records of fuel consumption rates. The commenter (103) stated that the majority of the smaller HP engines operate on wellhead gas with a wide variety of gas constituents and Low Heating Value (LHV), and are not equipped with fuel meters or gas chromatographs to record the constituents of the fuel. The commenter (103) believes that it could prove to be a significant cost if fuel meters are required, and without a fuel meter, a field technician would have to calculate fuel consumption rates using engine technical data curves.

Another commenter (104) in the oil and gas industry noted that the proposal preamble indicates that existing engines at area sources that are subject to management practices are required to record fuel consumption and hour data shown on hour meters. In Oklahoma, natural gas produced from the well is used to run the engines at the facility, and there are no meters installed to record fuel consumption. Operators typically use the manufacturer's data to calculate fuel usage for small engines like pump jacks. The commenter (104) indicated that hour meters are not installed on these types of engines. This commenter (104) also stated that EPA has not specified the frequency that this data is to be kept, i.e., hourly, weekly, monthly, etc. The commenter (104) believes that the requirement to install a fuel meter will only increase capital, maintenance, and replacement costs without any environmental benefit, and that the proposed requirement will be unnecessarily costly and burdensome on small businesses and those companies that operate marginal crude oil and natural gas wells that operate on the lower edge of profitability. The commenter (104) requested that EPA remove these requirements for engines less than 500 HP that are located at area sources.

One commenter (255) expressed that EPA should not apply the NESHAP meter requirement to existing emergency RICE which operate infrequently. The commenter (255) stated that the 100 hour per year limit (for which the meter requirement was established for) can be exceeded by petition or if state or local requirements mandate operation for more than 100 hrs/yr, in which case no petition is necessary. The commenter (255) requested that the requirement to install a non-resettable hour meter not be imposed on existing RICE that are dedicated to emergency service. If it is necessary to record and report the annual operation of such engines, the commenter (255) suggested that the operator be permitted to use other methods. This commenter (255) opined that the cost of installing a meter on existing RICE dedicated to emergency service is unwarranted given the prospective limited operation of such engines. Commenter 230 suggested the use of an operating log book and tracking fuel usage. The fuel usage could be calculated from consumption rates at minimum load and tracked as a rolling 12-month period.

One commenter (130) stated that not all engines used for agricultural purposes have hour meters. The commenter (130) noted that this could be problematic during a field inspection and suggested allowing owners/operators to use their estimates of operating time for the purposes of conducting scheduled maintenance.

One commenter (175) recommended that EPA establish a 100 hrs/yr threshold under which recordkeeping would apply.

Response: EPA believes the commenters may have misunderstood the requirements in the proposed rule. The only engines that are required to keep track of their fuel consumption are new landfill and digester gas engines, which are not the subject of this rulemaking. EPA does not agree that existing emergency engines should not be required to install nonresettable hour meters. These meters will provide incontrovertible documentation of the total hours of operation for these engines, which would not be the case if fuel usage information is used. In response to commenter 130, the commenter did not explain why it would be problematic for agricultural engines to install hour meters or why this would be problematic during field inspections.

10.8 Comment: One commenter (103) in the natural gas compression industry noted that the proposed rule states that SSM records need to be kept for 5 years even if the facility is relocated or sold. The commenter (103) stated that in the case of rental equipment, the owner (lessor) typically has some records such as maintenance logs, and the operator (the lessee) has other records such as operational logs and testing results; when the engine driven package (the facility) is returned to the lessor, the records are rarely transferred to the lessor, yet the compliance period for the lessor as "Owner" has not ended. The commenter (103) also pointed out that the next lessee takes over as partial "Owner and Operator" with incomplete history. The commenter stated that since the requirements follow the RICE (for example performance testing frequencies), all of the parties are dependent on each other for historical records. The commenter (103) asserted that EPA should consider these dynamics when finalizing the rule.

Response: This rule applies to both the owner and the operator, regardless as to whether the operator is an agent of the owner or merely a lessee. Because both the owner and operator are liable under the rule, the rental agreement should address who will conduct emissions testing or employ management practices for the specific engine, and who will create records, who will hold them for the statutory period and who will report.

10.9 Comment: One commenter (104) noted that proposed 40 CFR 63.6640 requires each instance in which an operator did not meet each emission or operating limitation to be reported.

The commenter (104) questioned whether EPA really wants to know every instance an operator runs over an oil/filter or spark plug change or inspecting belts/hoses by 1 hour. The commenter (104) believes this reporting effort will be burdensome and costly and provide no environmental benefit. The commenter (104) requested that EPA remove this requirement when there is no specified emission limit for engines located at an area source.

Another commenter (150) also believes that the proposed reporting requirements are overbroad for operating requirements. The commenter (150) indicated that recordkeeping and reporting should be reserved for the most significant activities.

Response: EPA believes that the reporting of failures to meet emission or operating limitations benefits the environment. This type of reporting provides information to the enforcing agency about the typical operation of the engine and therefore will help the enforcing agency better understand and identify problems and determine the compliance status of the affected source. The instances when the affected source does not meet the applicable emission or operating limitations are considered deviations and must be reported. These requirements are consistent with language in the General Provisions of 40 CFR part 63 and are appropriate for stationary engines subject to NESHAP.

10.10 Comment: One commenter (104) noted that proposed 40 CFR 63.6645 requires existing stationary engines located at area sources to submit all notifications in accordance with 40 CFR 63.9 (b) through (e), (g), and (h), which requires multiple notifications including a 120-day initial startup notification, a 60-day notification of an upcoming performance test, and notifications of compliance status. The commenter (104) stated that many states already have permitting or other processes in place whereby the state is "notified" that a facility is beginning operations, conducting performance tests, and showing compliance. The commenter (104) asserted that additional, duplicative notifications to EPA are burdensome and costly and provide no environmental benefit. The commenter (104) requested that the notification requirements be removed for engines less than 500 HP that are located at area sources.

Response: In most instances the State or local agency will be the delegated authority for ensuring compliance with the NESHAP and will receive the rule notifications. Moreover, even in cases where it is not, the requirement of sending two notifications where two different entities are regulating the engine, is neither overly burdensome or unnecessary. Therefore, EPA disagrees that the reporting efforts are duplicative, burdensome and costly. EPA has retained the reporting requirements as proposed.

10.11 Comment: One commenter (134) believes that the proposed reporting and recordkeeping requirements are confusing and contraindicated for RICE at area sources. The commenter (134) noted that the proposed §63.6665 identifies which RICE will be exempt from complying with any of the requirements of the 40 CFR part 63 GP and includes a new or reconstructed RICE located at an area source. The commenter (134) stated that all other RICE located at area sources, whether subject to numerical standards or work practices, must comply with numerous GP requirements, such as developing and maintaining an SSM plan, keeping records of SSM events and actions taken during periods of SSM, periodic reporting of any SSM events linked to exceedances and immediate reporting of any malfunction, records of any startup or shutdown that causes exceedances. The commenter (134) stated that these SSM requirements are just a few of the numerous requirements listed in Table 8 of the proposed rule. The commenter (134) stated while EPA has exempted existing RICE that are not subject to any numerical emission standards from complying with some notifications, we fail to understand, and EPA has not explained, why these RICE should be subjected to the onerous SSM recording and reporting requirements. The commenter (134) stated that it is unclear how RICE subject to work practice requirements will be able to record accurately the "duration" of a startup, shutdown or even a malfunction when there is no real technical ability to do so. The commenter (134) recommended that, for the "immediate reporting" requirements of §63.10(d)(5)(ii), these reports be incorporated into otherwise required periodic reports as provided for in other NESHAP for RICE subject to work practices at area sources.

Response: New or reconstructed stationary RICE located at area sources do not have to comply with the part 63 General Provisions because they comply with subpart ZZZZ by complying with 40 CFR part 60 subpart IIII or JJJJ as applicable, and therefore are subject to the 40 CFR part 60 General Provisions. EPA does not agree with the commenter that the requirements in the part 63 General Provisions are too burdensome. The recordkeeping and reporting requirements in the General Provisions allow EPA to determine whether sources are complying with subpart ZZZZ. The commenter did not provide any information to support the claim that it is not technically feasible to record the duration of startup, shutdowns, and malfunctions.

10.12 Comment: One commenter (150) stated that the requirement to keep records of all maintenance activities would be onerous and unnecessary in practice. The commenter (150) recommended that the requirement be amended to require only records of key maintenance activities such as oil and filter changes, spark plug replacement, overhaul, and rebuild, or associated activities that require an engine to be brought off-line.

Response: EPA disagrees and does not believe that keeping records of maintenance performed on the engine is an onerous activity. In many cases maintenance records are already being kept and it is in the best interest of the owner and operator to maintain such documentation to ensure that the engine is properly taken care of.

10.13 Comment: One commenter (174) asked that, for engines used for agricultural purposes, recordkeeping only be required of affected engines located in non-attainment areas. The commenter (174) stated that the public health impacts from agricultural engines located in rural areas would be lower than the impacts from engines located in urban, and particularly non-attainment areas.

Response: EPA must address emissions from existing stationary engines in all areas. The determination of whether an area is in attainment or non-attainment with the National Ambient Air Quality Standards (NAAQS) applies only to the few criteria pollutants for which these standards have been established. Section 112 of the CAA pertains to HAP and only one hazardous air pollutant listed in section 112 of the CAA (lead) is subject to NAAQS. Therefore, the NAAQS attainment status of the engine location is not an appropriate distinction for reporting requirements in this NESHAP.

10.14 Comment: Two commenters (265, 268) noted that management practices are not specified for landfill gas fired RICE above 500 HP in Table 2d that is referenced in §63.6655(e) as follows:

"(e) If you own or operate an existing stationary RICE . . . located at an area source of HAP emissions subject to management practices as shown in Table 2d to this subpart, you must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operate and maintain the stationary RICE and aftertreatment control device (if any) according to your own maintenance plan."

The commenters pointed out that in the existing rule at 63.6655(c), the following requirement is included: "If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must keep records of your daily fuel usage monitors."

Response: EPA is not clear on what the commenters are suggesting. It appears that the commenters are comparing the proposed requirements that apply to existing stationary landfill gas engines less than or equal to 500 HP at major sources and existing stationary landfill gas engines at area sources to the requirements that currently already apply for stationary landfill gas engines greater than 500 HP. The commenters seem to be pointing out that the management practices in Table 2d of the proposed rule are not consistent with the current requirements in 40 CFR 63.6655(c).

Table 2d of the proposed rule includes emission and operating limitations for existing stationary engines at area sources that are being addressed in this rulemaking. As item 12 in the proposed Table 2d indicates, existing landfill gas engines greater than 500 HP at area sources are subject to an emission limitation. Existing landfill gas engines less than or equal to 500 HP at area sources are subject to maintenance practices as described in item 11. EPA discussed in the language of the proposed preamble the justification for the emission and operating limitations for landfill and digester gas engines. EPA notes that this rulemaking addresses a different set of stationary engines that had previously not been regulated under a NESHAP. The NESHAP that currently applies only addresses emissions from existing landfill gas engines above 500 HP at major sources, and does not cover smaller existing engines and existing engines at area sources. The provision in the 63.6655(c) of the current NESHAP that was promulgated in 2004 that the commenters are referring to do not apply to existing landfill gas engines addressed in this rulemaking because EPA is not including a fuel consumption threshold for these engines. The commenters did not provide any rationale as to why they were requesting a change, if the commenters were even suggesting that EPA should make the 63.6655(c) provision applicable to all landfill gas engines.

11.0 Docket Materials/Transparent Regulatory Process

11.1 Comment: Several commenters (76, 112, 130, 150, 155, 224, 242) thought the docket for the proposed rulemaking is inadequate and relies on outdated information, and that information in the docket is not always appropriately cited in order to provide a transparent and clear picture of how EPA developed the proposed rule. EPA has not met its objective in providing rulemaking transparency, the commenters (155, 224, 242) said. For example, the PSR database, which is the basis for population estimates, is not available in the docket because it is not a

public product, commenters 155, 224, 242 said. Therefore, the commenters (155, 224, 242) were unable to review and verify the information regarding the number and types of engines.
The commenters (155, 242) said that the use of proprietary data is in conflict with the idea of transparency outlined by the Administrator and the short comment period did not allow for a FOIA request to be submitted. EPA should document and fully disclose all relevant calculations, equations, and assumptions related to the PSR database and any spreadsheets used to support assumptions should also be provided in the docket, the commenters (155, 242) said. One commenter (76) noted that was no discussion in the preamble regarding the population database that discusses how and when the database was populated. Similarly, test reports used by EPA to set the standards were not in the docket either, the commenter (155) said. For instance, commenter 242 said that the docket is missing EPA's own 1999 study of a rebuilt and retrofitted for lean burn operation a Cooper Bessemer GMV-4TF (EPA-454/R-00-036a), which clearly demonstrates that 2SLB engines cannot meet the proposed requirements. Commenters 155 and 242 added that the docket relies in large parts upon old data from other rules. For example, such as the Emissions Database, which contains data primarily from the 1990's and control cost information gathered in 2003, commenters 112, 150, and 155 said. The commenters (155, 242) could not find evidence of a more recent data gathering effort and information and assumptions were adopted from older rulemakings without revisions to current levels.

Commenter 242 said that EPA has not been adequate in supporting or justifying its MACT floor and above-the-floor decisions. The commenter (242) noted that in the 2004 RICE NESHAP, EPA made the statement that there was not sufficient information for engines less than 500 HP and therefore a regulation was postponed. However, the commenter (242) said, it appears that EPA has reversed this determination without supplementing with any new data and is using a decade old database as the basis for setting standards. The commenter (242) stated that the docket is lacking in providing data and information supporting the MACT floor and above-the-floor analysis for natural gas 2SLB, 4SLB and 4SRB engines. The commenter (242) agrees with EPA's decision in 2004 that sufficient data was not available for small engines and the fact that additional data has not been collected since then means the database is still deficient. Therefore, the commenter (242) said, emissions and costs data is necessary to be collected in order to defend the final MACT floor and above-the-floor decisions.

One commenter (224) stated that documents from previous rulemakings that were used in the development of the proposed rule were not appropriately cited in the docket and that this oversight hinders commenters' ability to review and comprehend EPA's analysis. The commenter (224) was specifically concerned with documents related to the cost analysis. The commenter (224) noted that a robust docket should be developed in order to support regulatory transparency.

The commenter (150) also believes that EPA has failed to give proper consideration to urban vs. rural area regulatory distinctions and that the docket lacks support for the conclusion that emissions from remote area sources cause adverse human health effects (which is used as the basis for the proposal to require catalysts on certain engines even in rural areas). The commenter (150) indicated that the docket reference for capital equipment and operating and maintenance costs for controls is flawed in that EPA has failed to address and consider guaranteed life, expected life, catalyst replacement cost, tuning or maintenance recommendations, and potential costs related to retrofit applications versus new equipment. The commenter (150) also stated that limitations related to fuel quality limitations have not been properly considered.

One commenter (130) cited the following examples of EPA's failure to comply with the new administration's goals of science-based decision-making and transparent rulemaking:

- Failure to conduct risk-based analyses for area sources;
- Failure to consider the difference between urban and rural area sources;
- Lack of transparency in cost-effectiveness determinations (e.g., based calculations on cost estimates from one vendor);
- Failure to provide supporting data for proposed emission limits; and
- Reversal of EPA's previous assertion that the database developed for the 2004 RICE MACT contained insufficient data to regulate engines less than 500 HP by using the same database to develop the proposed rule, which includes emission standards for such engines.

The commenters (155, 242) expressed that it was in general difficult to understand EPA's basis for regulatory decisions and in some cases information necessary to follow EPA's analysis was not traceable. The commenter (155) stated that it was hindered in its review and indicated that it was not capable of providing complete input to EPA because of it. The commenter (155) believes EPA should obtain additional data, perform new analyses, and clearly present the analysis and supporting documentation in the docket for the regulated community to review. The commenters (155, 242) said that EPA has not met its goal of providing a transparent regulatory process.

<u>Response</u>: The docket to the proposed rulemaking contained the information that was available to EPA at the time of the proposal development and that EPA used to support the proposed rule. While some of the information in the docket may be several years old, it was the best

information EPA had on hand at that time. In response to comments related to the use of older stationary engine test reports, EPA has repeatedly asked industry to provide emissions test data for different rulemakings over the last several years; however, the response and submittal of actual test data for stationary engines was minimal prior to the proposed rule. Since the publication of the proposal, EPA has received new test data for engines above and below 500 HP. EPA has incorporated the new test data into its final MACT floors.

EPA does not agree that information in the docket was not appropriately cited and EPA purposely tried to minimize duplication by referring to materials developed for previous rulemakings affecting the same and similar engines. EPA recognizes that commenters may not clearly have understood the analysis that was performed for the proposed rulemaking. EPA tried to answer any questions that were received post-proposal from industry and other affected stakeholders. For the final rulemaking, EPA has made an effort to be as clear as possible in support memoranda, preamble language, and other background materials, in order to provide at transparent rulemaking process. By clearly explaining rationale and assumptions, EPA believes the final rule is clear as far as the basis for regulatory decisions is concerned.

Specifically, for the final rule, EPA has provided the original PSR figures that EPA used to develop population estimates. EPA has also clearly described in supporting documentation how the affected number of engines was estimated for the final rule. Both of these materials are available from the final rulemaking docket and commenters will be able to review and verify the information related to the stationary engine population. For more information on the population of engines affected by the final rule and the impacts associated with the final rule requirements, please refer to the memoranda entitled “Existing Population of Stationary RICE” and “Impacts Associated with NESHAP for Existing Stationary SI RICE.” EPA does not agree that it should have conducted risk-based analyses for area sources. Section 112(d) rulemaking is intended to be technology based, with only certain provisions, not applicable here, dealing with risk. EPA explains its rationale for regulating area source SI engines in rural areas in section 2.0 of this document. EPA did provide the data to support the emission limitations via the RICE Emissions Database that is publicly available on EPA's website.

EPA has in supporting documents to the final rule made a significant effort in clearly describing the basis and information used for the final rule. EPA believes that the docket to the final rule contains the information necessary, and the information is presented in such a manner that it clearly illustrates the process for arriving at final decisions and provides a transparent rulemaking process.

12.0 Rule Impacts

12.1 Economic Impacts

12.1.1 Comment: Several commenters (81, 89, 93, 97, 101, 103, 104, 111, 112, 121, 126, 130, 132, 136, 140, 150, 151, 155, 176, 186, 187, 203, 204, 205, 207, 216, 220, 221, 224, 231, 241, 242, 249, 251, 261) expressed that the costs are not representative of actual costs of implementing the rule and numerous commenters said that the proposed rule will have a significant financial impact on their sources. According to the commenters (155, 242), EPA has underestimated the cost impacts of the rule by an order of magnitude or more. Numerous commenters indicated that EPA has used old, faulty, and inappropriate data on the cost of controls, testing, recordkeeping and reporting to estimate the economic impacts of the rule.

Commenters 89, 101, 151, 221, and 231 indicated that EPA estimated the initial capital cost in this rule for control equipment to be \$528 million and the annual cost to be \$345 million, but that industry estimates the capital cost to be a factor of 10 higher and the annual cost to be a factor of 4 higher. Using a revised number of affected engines and EPA's per-engine capital costs (which commenter 112 believes are low), the commenter (112) calculated total capital cost for controls of \$892 million, as compared to \$528 million estimated by EPA. The commenter (112) believes this difference is mostly attributable to the much higher number of 4SRB engines that it believes will be affected and requested that EPA examine this discrepancy to determine if the original estimate of 4SRB engines requiring controls is accurate. Commenter 151 asserted that EPA assumed that 80 percent of 4SRB engines are already controlled using NSCR, but only a tiny fraction of such engines below 500 HP are currently controlled. Commenter 112 does not believe that EPA's assumption that 50 percent of all 4SRB engines are already controlled with NSCR and 5.7 percent of all 4SLB engines are already controlled with oxidation catalyst. The commenter (112) believes that this estimate is close for engines greater than 500 HP, but that few, if any, engines less that 500 HP are equipped with catalyst.

The commenters (89, 101, 151, 221, 231) asserted that the following factors in EPA's analysis resulted in a low estimate:

- Not all existing engines requiring controls can simply add catalyst to the exhaust, so some engines must be replaced. (Commenter 151 added that this is primarily true of 2SLB engines.)
- EPA estimated performance tests to cost \$250 to \$500 each when the cost for many engines is approximately \$8,000. Commenter 151 added that even 4SLB engine stack tests using portable analyzers for CO cost more than \$250 to \$500 due to the 3 hr/engine

test time. One commenter (104) did not believe that that re-testing costs have been included if an oxidation catalyst or NSCR is replaced because of routine replacement or failure, and requested that these costs be included.

- EPA falsely assumes proposed maintenance requirements add no cost to industry.
- The administrative burdens of the rule are underestimated or left out entirely.
- Two commenters (112, 221) said EPA has overlooked potential costs in lost revenue resulting from shutting down engines used throughout the industry to operate pump jacks and to compress gas to booster stations and to consumers. Shut downs of engines will be required initially when retrofitting with controls and more routinely as a result of the burdensome, frequent, and time consuming maintenance requirements.

Commenters 155 and 242 said that EPA should gather current information on the cost of controls and redo the cost calculations. The commenters (155, 242) provided specific examples of where they believe EPA has used inappropriate cost information in other comments in this RTC document, but the following also lists some main assertions: (Commenter 241 noted some of the same concerns in its comments).

- EPA should present all costs associated with the rule in 2013 dollars and not in 2007 dollars.
- The models used to estimate the capital and annual costs of add-on controls underestimate the costs and not all equipment components have been included.
- The population breakdown by engine type (i.e., 2SLB, 4SLB, etc.) is inaccurate. EPA has overestimated the number of 4SLB engines less than 500 HP and that in fact most engines are rich burn engines in that size range. Therefore, costs have been underestimated and a revised population breakdown will lead to increased costs since

add-on controls are required for rich burn engines down to 50 HP as opposed to 250 HP for 4SLB engines. Also, EPA's analysis assumes that only engines subject to above-the-floor standards will need add-on controls, but in the commenters' (155, 242) opinion, all engines subject to an emission limit will be installing add-on controls in order to demonstrate compliance. Consequently, costs will be higher.

- The commenters (155, 242) noted that EPA assumed that about 80 percent of rich burn and diesel engines less than 500 HP are emergency, but that they disagree with this assumption. The commenters (155, 242) believe that the percentage is too high for natural gas engines.
- EPA's testing cost assumptions are too low and based on portable analyzer testing. Testing for formaldehyde will be conducted by FTIR, which is significantly more expensive than the $1,000 per engine testing cost EPA has estimated. Testing using FTIR is on the order of $5,000 per engine or more. Because the majority of engines affected are rich burn engines, the costs are underestimated by EPA. The commenters (155, 242) do not necessarily agree with EPA's assumptions regarding engines being co-located at sources and the assumption that the $1,000 will cover testing for all engines at a facility. The commenters (155, 242) also said that they did not know whether the costs of subsequent testing (i.e., every 3 years of 8,760 hours, whichever comes first) have been included in the cost analysis, which the commenters thought should be.
- Replacement costs may be incurred for 2SLB engines with lower exhaust temperatures since add-on controls may not be feasible.
- Efficient HAP, CO and NO_x control is highly dependent on engine operation and exhaust gas temperature and 90 percent reduction cannot be assumed. Actual CO reductions and

possible increases in GHG and ammonia emissions should be taken into account during a revised cost impact analysis.

- Certain emission factors used for calculation purposes appear to be erroneous and should be revisited to confirm their appropriateness. For example, EPA used the same NO_x emission factor for 2SLB, 4SLB, 4SRB and diesel engines and CO emission factors are in units of lb/hr rather than lb/HP-hr. For engines below 500 HP, the emission factor based on data from engines less than 500 HP should be used (i.e., 4.78×10^{-4} lb/HP-hr). For rich burn engines, the AP-42 emission factor of 2.89×10^{-4} lb/HP-hr for HAP should be used.
- Two commenters (104, 155) said that not all existing engines have hour meters.
- Costs have not been considered for recordkeeping and reporting for small engines, or for area source engines and non-emergency SI engines, which must meet maintenance schedules in Table 2d of the proposed rule. Also, documentation is necessary for engines with add-on controls and that conduct testing. According to the commenter (104), EPA states there are no reporting requirements for engines less than 100 HP, emergency engines, and engines that are not subject to any numerical emission standards; however, 40 CFR 63.6640 requires reporting of each instance in which an operator did not meet each emission limitation or operating limitation, which would apply to those instances when operators run over an oil/filter or spark plug change or inspection of belts/hoses. The commenter (104) requested that these costs be included. In addition, the commenter (104) requested that the cost of submitting information to both EPA (which enforces the engine standards because they have not been delegated to the State) and the State (which permits subject engines) be included in the analysis.

Similarly to the specific concerns listed above, commenters 112 and 186 believe that EPA has underestimated the total cost of this rule by underestimating the number of engines requiring the addition of catalyst; assuming that catalysts can simply be added to effectively control existing engines; overlooking the significant cost of field installation; and underestimating the complexity of and administrative/operational burdens added by this rule. The commenter (112) stated that the cost effectiveness of controls in $/ton are particularly concerning, because only the annual control cost of the catalyst and associated HAP reductions appear to have been considered and not all the additional costs after controls are added to an engine (i.e. performance testing, SSM and maintenance recordkeeping, reporting, lost production/revenue, etc.). The commenter (112) requested that EPA re-evaluate the economic analysis to include deficiencies in the cost estimates.

Several commenters (90, 118, 146, 178, 184) provided comments about the economic impact of the rule on emergency units. One commenter (90) stated that overall the cost per ton of HAP or CO removal would be excessive for emergency CI engines since emissions were well below a ton/yr and the units use is very limited and intermittent.

More specifically, one commenter (146) estimated only 2 of 14 emergency units at two of their major sources may be able to be retrofitted at a cost of $65,000 each. The others would need to be replaced at a cost of $1,350,000 plus an additional $110,000 each for source testing. The commenter's (146) 9 area source RICE units that would be subject to a NESHAP emission standard would need to be replaced at $720,000 each. These costs would be for only 20 to 40 hrs/yr of operation and thus resulting in minimal emissions reductions. Another commenter (178) noted that engine manufacturers do not recommend the use of after treatment devices for emergency engines, and that EPA appeared to support that position in the Regulatory Impact

Analysis, which states that cost per ton removal of HAP ranged from $1 million to $2.8 million for engines larger than 500 HP and from $3.7 million to $8.7 million for engines between 50 and 500 HP.

One commenter (184) provided calculations of worst and nominal cases emissions and cost per ton removal of CO to justify exemption of combustion turbine peaking unit devices. The worst case estimate was 0.13 tons of CO removed at a cost of $107,692 per ton and 0.016 tons CO removed for the nominal case at a cost of $875,000 per ton.

Four commenters (103, 186, 203, 204) believed that the true costs of the proposed rule are underestimated, especially 4SRB engines noted by commenter 103. One commenter (186) stated that the true costs of the rule are not fully understood and that the actual costs are much higher than EPA estimates and recommended that EPA re-evaluate the economic analysis to include more accurate cost estimates. The commenter (186) stated that the cost effectiveness of controls in $/ton are particularly concerning, since only the annual control cost of the catalyst and associated HAP reductions seem to be considered, but all of the other costs that this rule adds when an engine is controlled (i.e., performance testing, startup, shutdown and maintenance, recordkeeping, reporting, etc.) seem to be ignored. The commenter (103) added that the cost effective threshold should be based on current accepted science and not an arbitrary HP threshold intended to regulate a given percentage of engines. The commenter (103) also provided specific comments on the control cost analysis performed by EPA, which are summarized in section 13.3.

One commenter (204) believed, based on individual experience, that EPA had underestimated the actual cost estimates for several of the required emissions controls under the proposed rule, for example, the actual cost of the Continuous Parametric Monitoring System (CPMS), which is required to continuously monitor catalyst inlet temperatures, was grossly underestimated. The commenter (204) noted that under the regulatory impact analysis, EPA estimated a cost to install a CPMS for a large engine at $531; however, their installation of a CPMS on a 4SRB RICE to comply with the 2004 rule resulted in the expenditure of nearly $150,000 (approximately $95,000 for labor costs and $50,000 for materials).

The commenter (204) also asserted that the EPA did not use accurate cost equations for determining the cost impacts of RICE add-on control technologies. For NSCR, the cost equation used by EPA was $19.70 x HP + $1,799, resulting in an estimated cost of compliance for a 500 HP engine of $11,649. The commenter (204) believed that this cost estimate is grossly underestimated, especially for the retrofitting of existing engines, believing the cost is closer to $100,000 per engine when accounting for the actual NSCR installation, AFRC, modifications to the existing exhaust system and labor for the installation. In addition, depending on the configuration of the equipment, new supports and a foundation might also be necessary for the add-on controls.

While reducing HAP is an important goal, one commenter (204) believed that the overbroad approach taken by EPA in subjecting all the RICE equipment in question to the requirements proposed, regardless of whether the equipment is located in urban or rural areas, particularly when considering the Congressional intent of reducing HAP in urban areas given the potential risks to public health, and the imposition of costs in excess of $528 million to reduce 13,000 tons of HAP a year (i.e., a cost of $40,615 per ton) should be carefully scrutinized.

Another commenter (136) indicated that EPA’s estimates are low for the capital and operating costs associated with the use of catalytic control, and are based on pricing data from one vendor and a limited number of data points. The commenter (136) asserted that EPA’s capital estimate and annual operating cost estimate for catalytic controls are each low by an order of magnitude of 2 to 3. The commenter (136) also stated that because beyond-the-floor standards (which require catalytic controls) are based on the cost per ton of HAP removed and EPA significantly underestimated capital and operating costs of catalytic controls, EPA must reanalyze the proposed rule with better cost data to determine when catalysts are economically practical.

One commenter (81) said EPA's cost estimates are based on a number of incorrect assumptions for emergency generators. The commenter (81) said EPA does not appear to consider any costs associated with testing emergency engines, even though owners may deem it prudent to test to confirm they are meeting the standard rather than risk an enforcement action if the unit does not meet the standard. Testing to comply with the 100 percent load requirement will require owners to purchase or rent load banks to meet the conditions contemplated in the standard, which can cost up to $10,000 per site. The load bank costs alone could add up to as much as $973 million. In addition, equipment modifications (sample ports) would be necessary to test emissions, and EPA has not included these costs in its calculations.

One commenter (121) said the cost information contained in the docket for test costs is not representative of the sampling costs required to comply with the standards as proposed. Members of the commenter's (121) organization indicated that the cost per sample run using Methods 1, 3, 4, and 10 could easily exceed $10,000, excluding costs to prepare for the sampling (i.e., scaffolding, stack extensions, etc.). In addition to these cost considerations, as a practical matter, there would be significant difficulty in performing these EPA test methods on engine exhaust.

According to one commenter (81), if aftertreatment is required to meet the emergency engine numerical limitations, that cost must be considered. Because many emergency engines are likely located in older buildings where space is limited, installation of controls could necessitate some reconfiguration of the building, at substantial costs with minimal environmental benefit.

One commenter (140) said the primary impact of the proposed rule on the company is the requirement to conduct an initial performance test on each engine with an emission limit. Using EPA cost numbers, the company would spend at least $47,600 to test its units. However, because the RICE are spread over such a large area (500 square miles), the testing costs would be as much as $200,000 due to logistics, travel costs, additional labor for travel, access to remote areas, etc. Additional costs would be incurred if add-on controls were needed to meet the emission limits and due to O&M requirements, recordkeeping, and reporting requirements imposed by the rule.

One commenter (111) asserted that the industry-specific cost estimates for Crude Petroleum & NG Production (Table 4-5 in the February 2009 supporting document) are underestimated by 1 to 2 orders of magnitude. The commenter (111) noted that this document estimated total nationwide capital costs for this industry sector at $3.77 million and annual costs at $7.23 million, but the commenter's estimates for the State of Michigan alone are $34.8 million (capital cost) and $15.1 million (annual cost). The commenter (111) enclosed a table showing its organization's estimate of costs per engine and total costs for the industry in Michigan (see section 13.3). The commenter (111) stated that while EPA's cost analysis shows some omissions, it appears that most of the cost discrepancy is due to an underestimation of the number of oil and gas production RICE that would be subject to the rule. The commenter (111) added that because approximately 98 percent of natural gas production facilities in Michigan are located in rural areas, approximately 98 percent of the cost would be rural.

One commenter (103) submitted extensive comments regarding annual costs. Regarding direct annual costs, the commenter (103) stated that for all HP classes, the EPA assumed the direct annual costs associated with maintenance to be $260 per year, which the commenter (103) believes is considerably low compared to the actual cost of compliance for engines in the natural gas compression industry. The commenter (103) identified the following as some of the major issues that it claimed were not accounted for or inadequately accounted for by the EPA:

- The required emissions tests for engines over 500 HP would cost $3,375 for a test with formaldehyde as the surrogate and $2,200 for a test requiring CO as the surrogate, with higher costs if a percent reduction method is used for compliance (due to the cost for equipment to simultaneously test pre- and post-control emissions). The commenter (103) based these estimates on the ability to test an engine in ¾ of a day, which represents an average of some individual tests and some tests where multiple engines were tested as a group. The commenter (103) noted that EPA assumed $1,000 per test using a portable analyzer and made the assumption that all engines will be tested as part of a group (which the commenter believes is incorrect).
- Catalyst elements need to be washed every year and replaced on an average of every 3 years. Because most engines in the natural gas compression industry cannot be shut down long enough to allow the element to be shipped off for washing and returned, the commenter (103) believes that a rotation of elements will likely be used. The commenter (103) asserted that the cost to remove, ship, and clean an element should be included in the direct annual costs. Furthermore, if an element is changed, the commenter believes that the engine will have to be retested per proposed 40 CFR 63.6640(b). The commenter (103) stated that EPA should clarify in the final rule what circumstances do not require a

re-test (for example equivalent replacement catalyst element in same housing). The commenter (103) believes that, as written, the language of proposed 40 CFR 63.6640(b) strongly implies that each engine must be retested when the catalyst is changed, which will result in engines being tested every year regardless of the HP of the engine. The commenter (103) asserted, therefore, that it must be assumed for purposes annual costs that all engines requiring catalytic controls will be subject to annual compliance testing.

- In addition to the labor costs for the maintenance technician to remove and re-install elements for washing or replacement, there are often associated direct costs such as cranes on larger engines, and replacement parts such as gaskets and seals.
- Engines must be shut down and restarted prior to maintenance activities. There are often two personnel involved (an operator and a maintenance technician), and in the case of rental compression, these often represent two different companies. The commenter (103) added that many companies require on-site safety reviews prior to work being started, and equipment has to be secured to isolate energy (lock-out, tag out) and allowed to cool down (especially exhaust) prior to working on the equipment.
- Down time for maintenance activities has an associated loss in revenue for the operator of the engine that should be accounted for. The commenter (103) did not quantify or include the downtime in the annual cost estimates, but these are discussed below as "hidden costs."
- All of the other equipment associated with the installation of the control system has some required maintenance and some parts will occasionally fail. Many, such as batteries, have a finite life much shorter than the proposed capital recovery period of 10 years and

will require routine replacement. This equipment includes thermocouples, AFR control boards, wiring, fuel valves, batteries, and alternators.

- In addition to the maintenance and testing of individual equipment, there will be informal emissions tests performed using portable analyzers. Although these tests do not follow EPA protocol, they give the maintenance technician a good indication as to the overall performance of the engine and the control equipment and are necessary to ensure continuous compliance.

Regarding indirect annual costs, the commenter (103) stated that the administrative burden for recordkeeping, reporting, and monitoring associated with the rule is much larger than assumed by the EPA. According to the commenter (103), every engine in the gas compression industry will be subject to one of several rules, all with different requirements that must not only be performed, but also documented. The commenter (103) also noted that the status of the engines will change periodically as the engines are relocated to different sites (major versus area source). The commenter asserted that all of these requirements combine to add a significant cost per engine for administrative costs in the range of \$300 to \$1,800 per engine per year.

Regarding total annual costs, the commenter (103) submitted cost information that indicated that the average total annual costs were 8 to 27 times higher than those estimated by EPA and noted that the numbers do not include lost revenue or additional fuel use, which are described below as "hidden costs."

The commenter (103) said that the HAP emission factor used for natural gas engines (6.88×10^{-4} lb/HP-hr, which equates to about 0.31 g/HP-hr) is close to accurate for lean burn engines, but not for rich burn engines which have significantly lower emissions rates for HAP. Thus, the commenter (103) believes that the factor used by the EPA overstates the reduction benefit because it is 3 to 4 times higher than manufacturer's data and the factors in AP-42 for formaldehyde (which accounts for 60 to 75 percent of the total HAP in natural gas-fired RICE). The commenter (103) estimated that the cost per ton of HAP removed ranges from $8,200 to $92,400 based on using the commenter's estimated total annual costs, a run time of 98 percent or 8,585 hrs/yr, and a 90 percent reduction of AP-42 emissions factors for all HAP across catalytic controls.

Commenter 103 submitted extensive comments regarding annual costs also identified two additional "hidden costs" that are associated with compliance of the rule, both of which have an impact on the cost of energy: (1) the cost associated with lost revenue when engines must be shut down, and (2) the cost associated with increased fuel burn at catalytic set points.

The commenter (103) claimed the following causes of additional shutdowns associated with the proposed rule:

- Initial installation of controls. Some engines will be able to be retrofitted while not in use, but many will have to be shut down for the purpose of installing the controls.
- Additional downtime associated with the maintenance frequencies proposed by the rule for smaller engines.
- Additional downtime associated with catalyst cleaning and replacement.
- Additional downtime associated with maintenance, repair, and replacement of various devices such as fuel valves, AFR control boards, sensors, thermocouples, etc.

The commenter (103) noted that in the case of a single engine installation, the cost of downtime is 100 percent of the revenue, which far exceeds the cost of the actual maintenance. According to the commenter (103), for the natural gas compression industry this cost is in the range of $30 to $90 per day per HP, based on lost natural gas production at $6.00 per MMBtu.

At this rate, the commenter (103) estimated that it would cost the energy industry $159 million for just the HP owned by the commenter's member companies (5.3 million HP), based on half of these member companies' fleet HP requiring a 24-hour shutdown for the initial retrofit. The commenter (103) stated that additional downtime associated with maintenance will add a similar magnitude of cost on an annual basis.

The commenter (103) also stated that there is a cost associated with additional fuel burned from operating a 4SRB engine at a catalytic set point which is richer than normal operation. According to the commenter (103), the manufacturer's data for a 145 HP Caterpillar G3306 NA estimates the increase in brake specific fuel consumption (BSFC) to be 5 percent. The commenter (103) estimated an annual cost of $53 million (at $6.00 per MMBtu) for just the HP owned by the member companies, assuming that 50 percent of this overall fleet is affected in a similar manner.

Because of these claimed "hidden costs," the commenter (103) recommended that EPA contact trade organizations that represent small, independent operators to determine if compliance with the rule will be overly burdensome on these companies that have limited human and capital resources.

One commenter (150) stated that if the GP of 40 CFR part 63 are to be applied to engines that are the subject of this rulemaking, EPA should gather information on costs and complete a cost/benefit analysis for reporting and recordkeeping.

One commenter (251) expressed that the proposed rule would put an incredible strain on not-for-profit entities, or hospitals, specifically. The commenter (251) reported that all of its hospitals are operating with negative margins and the cost of the proposed rule would pull resources from direct patient care.

Commenter (249) contended that EPA's proposed controls are cost prohibitive. This commenter (249) stated that the EPA should prepare a generic $/ton BACT analysis regarding the proposed controls that will be needed to meet proposed emission limits, and claimed that this analysis will clearly show that the $/ton costs are prohibitive.

Commenter (249) noted that EPA is proposing to limit formaldehyde emissions to as low as 2 ppmvd for emergency SI engines. Commenter (249) claimed that costs to meet these rigid limits will be prohibitive and will impact emergency engines used throughout the United States at all kinds of facilities that provide vital safety requirements.

Commenter (249) presented example cost quote and BACT analysis. Commenter's (249) BACT analysis was prepared to reduce formaldehyde by 90 percent (from an emission rate of 4.26×10^{-4} lb/hr to 4.26×10^{-5} lb/hr) using EPA recommended guidelines for a 0.5 MW (670 HP) engine. In commenter's (249) analysis the cost effectiveness is calculated to be $109,639,280/ton (assuming 10 year amortization rate) for reducing formaldehyde base on 100 hrs/yr of operation. By comparison, commenter (249) claimed that in most areas of the country, BACT is considered reasonable if the costs are approximately $5,000 to $10,000/ton depending on the pollutant. Commenter (249) noted that additional costs would be incurred for construction, maintenance and upkeep costs.

Commenter (220) claimed that EPA has proposed compliance requirements that are more stringent than GACT requirements or management practices and that EPA has decided to institute MACT. However, even under MACT EPA can consider cost and energy impacts. The commenter (220) disagreed with EPA's conclusion in the RIA that the rule will not likely have a significant impact on the supply, distribution, or use of energy. The commenter (220) said that the proposed standards could have a very detrimental impact on energy reliability, and many units may have to be shut down due to the cost of compliance.

One commenter (261) believes that economic impact estimate by EPA is extremely low. The commenter (261) noted that EPA estimated the initial capital cost for control equipment to be $528 million and the annual cost to be $345 million. The commenter (261) stated that the industry believes that the capital cost is a factor of 10 higher and the annual cost to be a factor of 4 higher. The commenter (261) gave the following reasons for EPA’s low estimate:

- Not all existing engines requiring controls can simply add a catalyst, some engines must be replaced;
- EPA estimated the performance test to cost $250-500 when the cost for many engines is approximately $8,000;
- EPA falsely assumed the proposed maintenance requirements adds no cost to the industry; and
- The administrative burdens of the rule were underestimated or left out entirely.

One commenter (112) provided an estimate of the total cost of the proposed rule. The commenter (112) indicated that cost of controls reflects the affected engine count provided by EPA and the assumptions discussed in his comments on each component cost, but does not attempt to recalculate the capital or annual cost/engine. In comparing costs, the commenter (112) noted that its estimated costs exceed the EPA estimated costs by almost 2 billion dollars.

The commenter (112) believes that the examples included in its discussion of various component costs are indicative of a pattern of underestimation of the cost of this proposed regulation to the Oil and Gas industry. The commenter (112) asserted that the significant difference in estimated costs underscores the importance of re-evaluating the proposed regulation for SI engines to ensure that the final rule accomplishes EPA's goals while not resulting in undue and onerous regulation for industry, especially in order to continue with operation of marginal locations.

The commenter (112) also stated that this cost summary does not correct all of the deficiencies that the commenter believes are present in the impact analysis, such as costs for catalyst control capital and annual costs, control maintenance costs, and maintenance work practice costs. In addition, the commenter's (112) cost summary does not attempt to assign cost estimates to lost production, which the commenter believes would have to be estimated on a per-well or pipeline basis taking into account estimated engine down time due to adding controls and performing additional maintenance and the production of individual wells and/or pipeline throughput. The commenter (112) believes that these unaccounted for costs may be significantly greater than his cost corrections summarized above.

One commenter (242) said, as also noted in earlier comments by this commenter and others, that EPA has not considered the high demand of catalysts that will be the result of this rulemaking. The impacts of a large demand of catalysts should be included in EPA's cost analysis to determine the effect based on vendor and catalyst availability, precious metal markets, and potential replacement costs, commenter (242) said.

Two commenters (104, 112) stated that EPA estimates of the cost of performance testing (based on performing test using a portable analyzer and discounts for testing multiple engines at every site) at $500 for engines less than 500 HP and $250 for engines greater than 500 HP. While the commenter (112) conceded that performance testing using portable testing equipment is less expensive for CO testing for lean burn and CI engines, the commenter believes $500/$250 per test is an extremely low estimate. Commenters 104 and 112 stated that an FTIR test for formaldehyde (three 1-hour runs) may cost as much as $4,000 per test. The commenter (112) added that two tests (i.e., pre- and post-catalyst) are required to calculate a percent reduction across the catalyst, which results in an estimated cost for a performance test for one rich burn engine with NSCR of $8,000 per test. The commenter (112) stated that based on the number of affected non-emergency engines, industry expects to perform 46,947 initial tests for formaldehyde and 65,240 tests for CO for a total cost of $440.8 million in 2013, as compared to EPA's estimate of $77 million.

The commenter (112) also estimated that annual cost for subsequent performance testing of SI engines greater than 500 HP, which is required every 8,760 hours or 3 years, whichever comes first. The commenter (112) estimated that 75 percent of SI engines greater than 500 HP are in the oil and gas industry, where they typically have very high run time and will have to be tested every year, and the other 25 percent of the engines in other industries will be tested every 3 years. Based on these assumptions, the commenter (112) estimated that the engines in the oil and gas industry would have annual testing costs of $44.6 million, the engines in other industries would have annual costs of $4.9 million, and the total annual cost of testing would be $49.5 million per year.

<ins>Response</ins>: EPA used the information it had available at the time of proposal to estimate the cost impacts associated with the rule. This information included cost data obtained for the development of previous stationary engine rulemakings, which EPA believed it would be appropriate to use for this rulemaking. As indicated clearly in this comment summary, several members of industry believe that EPA has underestimated the costs associated with the rule and

used non-representative cost information. EPA points out, however, that some groups[20] have indicated to EPA that the costs used, specifically those costs associated with aftertreatment controls are reasonable. EPA would also like to make the point that it has been requesting information on all facets related to stationary engines for years through various rulemakings and direct contact with members of industry and other affected stakeholders. Therefore, anyone interested in submitting information to EPA for consideration in this rulemaking or any other rulemaking has had ample opportunity to supply EPA with relevant cost information on controls, testing, recordkeeping and reporting reflective of today's costs. Commenters also criticize EPA's population estimate and again, EPA has on numerous occasions asked industry to provide breakdown estimates of the population of stationary engines in the U.S., but has been told that the estimates that EPA has from PSR is the best source of available information. If industry has had information available on the population of stationary engines that EPA could have used, EPA was not aware of that because such estimates were not provided to the Agency. For the final rule, EPA did supplement the population dataset with information from the USDA on the number of stationary SI engines used for agricultural purposes.

Based on the significant number of comments received on the proposed rule costs, EPA believed it was appropriate to revisit the cost analysis and assumptions for the final rule. EPA has obtained additional and newer cost data and made an attempt to address the specific areas of concern commenters have pointed out that would benefit from more current and detailed cost inputs. EPA addresses comments related to the cost of controls in response to comment 12.3.1.

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[20] Email from Antonio Santos, MECA (Manufacturers of Emission Controls Association) to Tanya Parise, EC/R. MECA Cost of Aftertreatment. January 21, 2010. EPA-HQ-OAR-2008-0708-0380.

EPA has also described in detail the cost data and basis for assumptions in the memorandum "Control Costs for Existing Stationary SI RICE" available from the docket and asks commenters to refer to that document for the complete analysis. The revised capital and annual cost of controls are substantially higher than what was used for the proposal. For example, for a 300 HP rich burn engine, the capital control cost increased by an order of magnitude of above 1.5. The annual control costs increased by an order of magnitude of close to 4. EPA believes data and assumptions used to develop control costs for the final rule are accurate and representative of the current cost of controls.

During the time of proposal, EPA looked at various sources of information in order to determine the number of existing 4SRB engines already equipped with aftertreatment controls. EPA reviewed State regulations and made a determination based on the applicability of the regulation on existing stationary rich burn engines and the applicable limit (typically NO_x) whether such regulation would necessitate aftertreatment. EPA also compared that to information from a survey conducted in California related to the revisions implemented for South Coast AQMD's Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines because the survey collected various information including types of engines and which controls are currently being used. Based on the information reviewed, EPA estimated for proposal that 80 percent of existing rich burn engines are already equipped with NSCR. However, EPA notes that it was an estimate and certainly the percentage may fluctuate between State to State. Based on feedback on this assumption, EPA has made a reassessment for the final rule concerning how many existing rich burn engines already have aftertreatment. EPA agrees with commenters that the estimate of 80 percent was too high. As discussed in response to comment 5.1.1.2, EPA has gathered information from a number of different sources and has determined for purposes of estimating impacts associated with the final rule, that an estimate of 20 percent is more appropriate to represent the number of already-controlled 4SRB engines.

Regarding existing stationary 2SLB engines, EPA is finalizing emission standards for 2SLB engines greater than or equal to 100 HP and less than or equal to 500 HP that have been met historically without oxidation catalyst. For existing 2SLB engines less than 100 HP and existing 2SLB engines at area sources, EPA is requiring maintenance/management practices. Based on updated cost of controls, EPA determined that aftertreatment was not justified for 2SLB engines. EPA discussed how it conducted a re-analysis of the control of controls for 2SLB (and 4SLB and 4SRB) engines in response to comment 12.3.1. The data and methodology use for derive control costs are also presented in material[21] available from the docket. EPA also discussed in response to comment 12.3.1 the range of control efficiencies that can be expected from 2SLB engines. EPA does not necessarily agree that 90 percent reduction is not achievable, particularly for CO and NO_x. Nevertheless, for purposes of estimating the cost per ton of a potential add-on control option for 2SLB engines, EPA assumed a 43 and 65 percent control efficiency for HAP and CO, respectively, based on results seen at CSU. However, emissions data from the 4SLB engines tested at CSU shows an average CO reduction of 93 percent. For the final rule, for existing non-emergency 4SLB engines greater than 500 HP at area sources, EPA is requiring a 47 ppmvd at 15 percent O_2 CO concentration standard or a 93 percent CO control efficiency. To estimate HAP reductions associated with this requirement, EPA agrees that it is not appropriate to assume a constant 90 percent reduction. Instead, for purposes of

[21] Memorandum from Bradley Nelson, EC/R to Melanie King, EPA. Control Costs for Existing Stationary SI RICE. June 29, 2010.

estimating emissions reductions for 4SLB engines, EPA has assumed a 71 percent HAP control efficiency, which was the average reduction observed for formaldehyde at CSU. Emissions data for 4SRB engines indicate an average NO_x reduction of 97 percent, which is what EPA used to estimate the NO_x reductions associated with the requirement for existing non-emergency 4SRB engines at area sources. These engines are subject to a 2.7 ppmvd formaldehyde standard at 15 percent O_2 or a 76 percent formaldehyde control efficiency. The 76 percent control efficiency is also based on the average level of reduction observed during testing. To estimate CO reduction from rich burn engines, EPA did not assume 90 percent, but used the average level of 49 percent seen during testing. Based on evidence in the docket, EPA believes that final standards that incorporate pollutant reduction efficiencies are appropriate and justified as well as the percent reduction efficiencies used to estimate impacts.

As far as emission factors are concerned, EPA again notes that it used what it believed to be the best information available at the time of proposal. EPA agrees that there is a possibility that more appropriate emissions data could have been used to estimate baseline emissions and reductions, but EPA disagrees that some of the emission factors were erroneous. One can argue the appropriateness of using lb/hr versus lb/HP-hr and EPA is not certain whether one is more suitable than the other, however, EPA used lb/hr emission factors for the original 2004 RICE NESHAP. EPA also used the same NO_x emission factor for all engines under the 2004 RICE NESHAP. With that said, EPA reviewed the emission factors used at proposal considering the input provided by commenters. Regarding emission factors, for the final rule, EPA is using emission factors for HAP, VOC, CO, and NO_x in consistent units, i.e., lb/HP-hr. EPA agrees with the commenters that it would be appropriate to use the AP-42 emission factor for 4SRB engines. EPA does not believe it is appropriate to use the HAP emission factor developed for natural gas engines below 500 HP (i.e., 4.78×10^{-4} lb/HP-hr) because the regulation addresses larger engines as well, that is existing stationary SI engines above 500 HP at area sources. Nor does EPA it is appropriate to use the same HAP emission factor for 2SLB and 4SLB engines, but believes a HAP emission factor that incorporates the differences between these two engine types is more appropriate. Therefore, for the final rule, EPA is using information from AP-42[22] to derive emission factors in lb/HP-hr for 2SLB and 4SLB engines as well. EPA summed the individual HAP for each engine type to determine the emission factor in units of lb/MMBtu. EPA then converted the emission factor to lb/HP-hr using the conversion factor 0.002546 MMBtu/HP-hr and an engine efficiency of 34 percent. For the final rule, EPA is using a HAP emission factor of 5.96×10^{-4}, 5.41×10^{-4}, and 2.43×10^{-4} lb/HP-hr, for 2SLB, 4SLB, and 4SRB, respectively. EPA also agrees that it is appropriate to distinguish between engine types in order to develop representative emission factors for CO and NO_x too. The derivation of emission factors is presented in a memorandum available from the docket titled "Emission Factors for Existing Stationary SI RICE."

EPA does not believe the testing costs used for the proposed rule were significantly unreasonable. Those costs were based on information available at the time, based on what testing firms have indicated to EPA. A cost of $1,000 is considered reasonable to EPA to test for CO at a site and for the purposes of estimating impacts, EPA has assumed that two engines can be tested for this cost ($500/engine). For FTIR/Method 320 or Method 323 testing, EPA has assumed a cost of $2,000, where with a multiple engine discount, EPA is assuming that two

[22] AP 42, Fifth Edition, Volume I Chapter 3: Stationary Internal Combustion Sources Natural Gas-fired Reciprocating Engines. Supplement F, August 2000. http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf

engines can be tested for this cost (or $1,000/engine). EPA notes that this is an estimate and that testing costs can vary across the country.

EPA disagrees that its assumption that maintenance requirements add no cost to industry is false and EPA does not agree that following maintenance/management practices will be a time consuming activity. The management practices EPA is requiring under the final rule are based on industry practice and normal maintenance procedures currently followed by stationary SI engine operators. It is in the best interest of owners that their engines are well-maintained and kept in proper condition. EPA believes engine operators would continue to follow maintenance procedures to keep their engines in proper working condition and would allocate funds for that purpose, in the absence of the rule. Therefore, EPA does not believe there will be any increased cost. In the event that engine owners and operators might expend additional effort as a result of the final rule in order to maintain their engines, such effort is expected to have a minimal effect on the cost, plus maintaining the engine properly might lead to a longer engine life and might even result in cost savings, which could offset the potential small increased cost owners and operators might experience.

EPA does not agree that it used old, faulty, and inappropriate data to estimate the recordkeeping and reporting costs of the rule. EPA used information available at the time of proposal to develop the best estimate possible of the administrative burden associated with the rule. For the final rule, EPA is accounting for labor associated with recording the hours of operation for emergency SI engines and for engines tracking maintenance activities conducted on the engine. EPA estimated costs for keeping records that the work or management practices are being met, which includes keeping track of oil and filter change dates and, inspection and replacement dates for spark plugs, hoses, and belts, and records of other emission-related repairs and maintenance performed. EPA does not anticipate these recordkeeping requirements to be burdensome and expect minimal additional effort in terms of labor hours for owners/operators beyond what they are currently doing. In terms of reporting costs, EPA is accounting for activities required under the General Provisions, which include various notifications applicable to certain engines and additional reporting requirements like compliance reports that other engines must submit. More details on EPA's estimate of testing, monitoring recordkeeping, and reporting costs are presented in the memorandum "Impacts Associated with NESHAP for Existing Stationary SI RICE" and in the RIA for the final rule.

For the final rule, EPA estimated a total national capital cost of $406 million, with a total national annual cost of $261 million in year 2013 (the first year this final rule is implemented). EPA estimated that HAP emissions will be reduced by 6,000 tpy beginning in the year 2013.

12.1.2 Comment: One commenter (242) said that EPA has not provided supporting information showing how it determined cost impacts for remotely and inaccessible rural engines. EPA has not considered the unique costs and requirements for engines located in rural areas where there may be issues like limited or poor accessibility and lack of electricity, the commenter (242) said and urged EPA to conduct a separate analysis of the impacts for rural remote area sources engines. In terms of the MACT floor, it is important that the analysis is conducted correctly to accurately reflect potential impacts for these sources, the commenter (242) said. Specifically, one commenter (104) said that EPA proposes that operators monitor the pressure drop across the catalyst and the temperature of the exhaust so they meet the proposed operating limitations for rich burn engines. Because many oil and gas facilities are located in remote, rural areas and do not have electricity to monitor or record these parameters, the commenter (104) requested that the cost for running electricity to a facility be included in the analysis.

Response: EPA does not expect the cost impacts will be significantly greater for an engine in a rural area than in urban area. In terms of monitoring requirements to record the pressure drop and temperature associated with catalyst operation, recording these parameters are important to ensure proper functioning of the aftertreatment device. Lack of electricity at remote sites is not expected to be an issue because battery-operated equipment is available and affordable to measure and record temperature and pressure differential. Therefore, not having electricity is not a technical or economical obstacle and EPA does not believe costs will be greater for rural areas. It will not be necessary for sources in remote locations to run electricity solely to comply with monitoring requirements. EPA provides more cost details on such equipment in response to comment 8.1.

12.1.3 Comment: One commenter (242) said that EPA should develop an estimate of the costs for implementing NESHAP requirements for existing area sources within synthetic minor permits. Sources have in the past opted to install controls beyond what is required in order to avoid Title V thresholds and to become synthetic minors for HAP. This is a problem because the proposed rule would apply many onerous provisions that were previously avoided, including more stringent emission limits, and will become a disadvantage for those sources that chose to over-control their engines in the past.

Response: EPA has made several revisions to the proposed requirements and is finalizing a rule that in many cases significantly reduces the burden on existing stationary engines located at area sources. Therefore, EPA does not believe the final rule places many onerous or inappropriate provisions on the existing stationary engines the commenter is referring to.

12.1.4 Comment: Two commenters (112, 220) were concerned with how the rule would economically affect their engines. One commenter (112) stated that the proposed amendment to the NESHAP for RICE is a regulation that will have a major operational and financial impact on the member companies in his organization, which operate thousands of engines continually throughout the year. The commenter (112) stressed that the operating and capital costs associated with compliance with this proposed regulation will be borne by the member companies and are expected to have a significant impact on the profitability of individual producing sites. The commenter (112) believes that marginal operating locations will likely become uneconomical due to additional costs of compliance with this rule, and gas and oil production will likely be impaired in locations that are not marginal. The commenter (112) added that engines that operate pump jacks, recover natural gas from wells, and transmit gas via pipelines will have to be temporarily shut down to retrofit controls and more routinely for additional proposed maintenance requirements. The commenter (112) noted that all of this is being proposed at a time when this country endeavors to become more energy independent.

One commenter (220) provided an extensive discussion of the structure of the power generating structure of the Illinois Municipal Electric Agency. The commenter (220) provided this information to illustrate how vital these units are to the member municipalities, which are typically located in rural areas, have small populations, and are facing very tight budgets. The commenter (220) said the proposed rule will have drastic impacts on these communities.

Response: EPA has attempted to minimize the burden on small businesses and individual owners and operators, and is finalizing management practices for most of the existing stationary engines located in area sources, which includes rural engines. However, EPA is required to address and develop regulations for all existing stationary engines less than or equal to 500 HP at major sources and existing stationary engines located at area sources.

12.1.5 Comment: Three commenters (101, 104, 177) were concerned how the proposed rule would impact small business. Two commenters (101, 104) believe that the proposed rule will have an adverse impact on small businesses. One of these commenters (101) stated that over 80 percent of America's oil wells and approximately 74 percent of America's natural gas wells are marginal wells, and that the overwhelmingly majority of these wells are operated by small businesses. The commenter (101) indicated that these wells require numerous engines to continue to operate and the current regulatory proposal would put many, if not most, of these wells at risk. The commenter (101) believes that the proposed regulations fail to consider the implications of the regulations on the small businesses that would be compelled to meet them.

The second commenter (104) noted that despite the low production rates, approximately 19 percent of U.S. oil production and 8 percent of the natural gas produced in the lower 48 states comes from marginal wells. The commenter (104) indicated that most of these wells are located in older oil and gas producing regions like Oklahoma, Texas, and Appalachia. The commenter (104) said that marginal wells operate at the edge of profitability and are particularly sensitive to any increases in cost that might lead to their premature plugging and abandonment. According to the commenter (104) most marginal wells are operated by small businesses, which are non-integrated companies that receive basically all of their revenues from production at the wellhead – thus, even the slightest increase in costs may have a disproportionate impact on their business as compared to large, integrated oil companies. The commenter (104) believes that special care must be taken to ensure that any increased regulatory costs are justified in light of the potential threat to these essential resources. The commenter (104) added that the negative impacts of the rule on small businesses that operate marginal wells are fundamentally inconsistent with efforts to protect national security by increasing domestic energy production. The commenter (104) requested that EPA reevaluate the impacts of the proposed action on the nation's energy sources, supply, distribution, use, and the cost and benefit to the oil and gas industry in accordance with Executive Orders 12866 and 13211.

One commenter (177) believes that the SSM limits could significantly impact small businesses and force them into noncompliance during startup, shutdown, or malfunction conditions. The sources will become subject to noncompliance penalties and other enforcement risks even though the engines have been operating in the same way for more than a decade. The commenter recommended that EPA suspend the SSM rulemaking and convene a Small Business Advocacy Review (SBAR) Panel on SSM under section 609(b) of the Regulatory Flexibility Act (RFA).

<u>Response</u>: To the extent that it could, EPA did consider costs to small businesses in determining the requirements in the final rule. EPA cannot consider cost when determining the MACT floor, but it can and did consider cost when evaluating whether to go beyond the floor and also

evaluating GACT for area sources. As discussed in the RIA for the final rule, EPA analyzed the impacts of the rule on small businesses and determined that it will not have a significant economic impact on a substantial number of small entities. See Section 6 of the RIA.

The commenters did not provide any information to demonstrate why the proposed SSM requirements would have a more significant impact on small businesses than on other sources. Regardless, EPA in the final rule has specified work practices for startup that these sources can comply with that should not have a significant negative impact on these sources. As discussed in section 3.0, EPA has made changes in the final rule to the SSM requirements that were proposed, and EPA believes these changes will address the commenter's concerns regarding the impacts of SSM on small entities.

12.1.6 Comment: One commenter (104) believes that EPA estimates that a total of 180,291 SI engines at area sources will be impacted by the rule is inaccurate and the commenter believes that a greater number of facilities will be impacted. The commenter (104) stated that in Oklahoma there are approximately 122,000 oil and gas wells, and estimated that as many as 67,000 facilities will have at least one engine that will be subject to the proposed rule. The commenter (104) requested that EPA re-evaluate the cost impacts to operators of oil and gas production facilities.

Response: The impacts EPA estimated are based on population numbers that EPA developed from information available from the PSR database. The information from PSR is the best available information related to the number of engines in the United States. EPA has contacted industry on several occasions to obtain other estimates of the number of existing stationary engines; however, EPA has been told repeatedly that PSR is the best source of information and that industry does not have any better estimates of the national population of stationary engines. EPA described in a memorandum developed prior to the proposal how it arrived at the estimated number of stationary engines that would be affected by the rule. That document is available from the rulemaking docket at http://www.regulations.gov as Document ID Number EPA-HQ-OAR-2008-0708-0014. For the final rule, EPA has also made the PSR information that EPA used to develop the population estimates available and can be found in the docket as well. Based on the estimate for Oklahoma that the commenter provided, it seems that the number of engines in that State may be high compared to the total number of engines that EPA has estimated. However, EPA would be need similar estimates from each and every State in order to account for the total number of engines in the country. EPA would also need to determine the accuracy of estimate of the number of engines and to determine if the commenter over counted by, for example, including nonroad engines or engines that are otherwise not regulated (e.g. new engines) under the rule. EPA believes that it has used the best possible estimate of total stationary engines in the United States in order to develop impacts associated with the final rule.

12.1.7 Comment: Two commenters (147, 194) expressed that the proposed rule would have a significant impact on agricultural sources. One commenter (194), on behalf of the agricultural industry in their state, stated that, because of the retroactive nature of the proposed rulemaking, it places a burden on agricultural operators without having viewed the costs of testing and other compliance measures for existing engines and lacks both economic and environmental justification. The commenter (194) stated that the operational use of engines used in the powering of irrigation and lift pump facilities has not been factored into EPA's evaluation nor has data been submitted that supports a need beyond the normal replacement cycle of engines that is naturally occurring due to wear and tear of existing operating engines. The commenter (194) argued that the costs associated with requiring retroactive compliance does not recognize that the normal replacement process for such engines will produce the same reduction in emissions due to new engine performance standards being present when these existing engines are replaced without putting a burden on both the owners of the engines and on the regulatory agencies responsible for administering the programs.

One commenter (147) stated that the economic impact of the proposed rule on the agriculture industry would be extremely high and would significantly outweigh any environmental benefit. The commenter (147) submitted data indicating total HAP emissions from all RICE operated by the Florida sugar industry to be less than 2 tpy. Based on EPA's estimates for performance test costs, the commenter (147) calculated a cost effectiveness for this industry of $271,500 per ton of HAP reduced assuming all of the HAP emissions were eliminated due to the proposed rule. The commenter (147) therefore requested that rural, agricultural RICE be exempted from numeric emission limitations and performance test requirements.

Response: EPA does not agree that it would be appropriate to wait until these engines are replaced to require emissions reductions. Stationary engines can in some cases operate for decades before they are replaced. EPA determined that the costs of the rule are justified considering the emissions reductions that will be achieved. The commenter did not provide any information to support the contention that stationary agricultural engines are significantly different enough from other applications to warrant a separate subcategory, or that standards would be different even if there were such a subcategory. EPA notes that in the final rule it has required management practices, not numerical emission limits, for all engines 500 HP and below located at area sources and has only required MACT standards at the MACT floor for engines at major sources, after determining the standards were justified for those engines, considering costs and other factors. EPA also notes that according to data received from the United States Department of Agriculture (USDA)[23], the majority of engines used in agricultural applications are rated below 300 HP. For example, natural gas, propane, and gasoline agricultural engines below 300 HP represent more than 80 percent of the total population of agricultural SI engines, according to the USDA National Agricultural Statistics Service.

12.1.8 Comment: One commenter (207) stated that EPA has underestimated the cost of the proposed rule for nuclear power plants. According the commenter (207), components installed in nuclear applications are subject to a variety of quality assurance requirements, specifications, and code requirements, and none of the current catalytic converter manufacturers are qualified to nuclear safety related standards. Further, commenter (207) claims that the cost of producing catalytic converters to nuclear safety related standards, estimated at $0.85 million, is expected to be 5 to 10 times the cost of commercial applications, that installation costs associated with additional piping, supports, fire protection, heating/ventilation/air conditioning, etc., are estimated to be $2 to 4 million per RICE, and the cost of providing additional structures to protect this equipment is estimated at $3 to 5 million per RICE. Commenter (207) estimates that with approximately 250 emergency RICE currently installed at nuclear power plants, the total

[23] Email from Greg Zwicke, USDA to Melanie King, EPA. USDA National Agricultural Statistics Service. April, 7 2010. EPA-HQ-OAR-2008-0708-0495.

cost would exceed $2 billion. Commenter (207) believes that this large cost is not justified by the insignificant amount of emission reduction that would result from adoption of the proposed rule. Similarly, Commenter 216 estimated that the cost of making modifications to existing emergency diesel generators configurations at nuclear power plants to result in capital costs that are 5 to 10 times greater due to additional NRC testing and evaluation requirements than would be the case at a non-nuclear regulated emergency diesel generators.

Commenter (216) found the proposed rule to be a monetarily significant rule for regulated entities, thus adding a burden to their customers while yielding a minimal impact on emissions reductions. The cost and NRC conflicts and duplications within the proposed rule create significant concerns for nuclear facilities. The commenter (216) is concerned about safety conflicts with the NRC and the financial burden that would be imposed on nuclear facilities.

Response: The EPA does not agree that the rule will have an unreasonable burden on engines used at nuclear power plants. For stationary emergency engines at nuclear power plants that are area sources of HAP or are less than 500 HP and at major sources of HAP, the final rule requires the engines to meet management practices rather than the emission limitations that were proposed. Therefore, these engines will not incur the cost of aftertreatment controls for their emissions, so there will be no concerns with having to operate these engines with catalyst control and the engines will not have to be modified. Emergency engines at nuclear power plants that are major sources of HAP and are greater than 500 HP are not the subject of this rulemaking.

12.2 Environmental/Health Impacts

12.2.1 Comment: Two comments (140, 147) believe the proposed rule will have little environmental benefit. Specifically, one commenter (140) noted that the HAP and formaldehyde emissions associated with RICE owned and operated by the company are very low. Since, EPA anticipates that all of these units could meet the standard without installing additional controls, there would be no environmental benefit. If controls are required, they are still only applied to low level emission sources. The cost effectiveness of any modifications or add-on controls for these engines would be extremely high.

The commenter (140) said the RICE operated by the company are scattered throughout approximately 322,000 acres, resulting in an average engine density of approximately one engine per 4,000 acres (6 square miles). For the most part, these engines are very remote any residences or population areas, according to commenter 140. Therefore, there would minimal or no health related improvements associated with imposing emission limits or control equipment on these engines, according to commenters 140 and 147. The commenter (147) noted that the engines operated for agricultural purposes typically are spread over a large geographic area that is in a remote location with respect to residences or population areas and, in most cases, are below 300 HP. The commenter (147) pointed out that EPA acknowledged in the preamble to the proposed rule that it expects all engines below 300 HP to meet the proposed emission standards without any additional control. Therefore, the proposed rule imposes new, costly regulatory burdens without providing any environmental benefit. For this reason, the commenter (147) requested that rural, agricultural RICE be exempted from numeric emission limitations and performance test requirements (see comment above in section 6.4).

Response: EPA disagrees with the comment that the rule will have little environmental benefit. The rule will reduce emissions of HAP as well as CO, VOC, and NOx. EPA described the health effects of the HAP emitted from stationary diesel engines in the preamble to the original promulgation of subpart ZZZZ (69 FR 33474). These HAP emissions are known to cause or contribute significantly to air pollution which may reasonable be anticipated to endanger public health or welfare. The Regulatory Impact Analysis (RIA) for the final rule indicates that we expect $510 million to $1.2 billion in benefits nationwide associated with implementation of the rule due to reductions in PM precursor emissions that occur as a co-benefit of the HAP control requirements.

EPA has determined that management practices are appropriate for small stationary engines at area sources as well as stationary emergency engines at area sources, which reduces the impact of the rule on those engines.

12.2.2 Comment: One commenter (71) supports the proposed rule as issued by EPA in the Federal Register on March 5, 2009, in order to improve Reservation air quality and to help improve regional haze in nearby Class I areas. The commenter (71) also supports the EPA's decision to help reduce greenhouse gas emissions through this rule.

Response: EPA notes that this rulemaking is for HAP emissions and is not focused on reducing greenhouse gas emissions.

12.2.3 Comment: Two commenters (146, 178) noted that from a life-cycle perspective, HAP emissions reductions attributable to replacement of emergency units (that are not recommended to have aftertreatment devices installed by their manufacturers) would be dwarfed by the carbon and HAP emissions that would result from manufacturing, transporting, and installing new replacement units that would be used for so few hrs/yr.

Response: EPA is not requiring the replacement of existing emergency engines in the rule. The commenter did not provide any information to explain why the emergency engines could not be retrofit with emission controls and would have to be replaced. In any case, the final rule does not require any numerical emission limits for emergency engines and requires only work or management practices. Therefore, EPA is unable to fully respond to this comment.

12.2.4 Comment: One commenter (140) provided a profile of the phosphate fertilizer company's engine population, including emission estimates based on actual engine operating hours and AP-42 emission factors. As shown, HAP emissions are estimated at less than 0.5 pounds per hour (lb/hr) (based on organic HAP emissions). The commenter (140) concluded that these emissions are not significant compared to the HAP threshold for major source facilities.

Response: No response is necessary.

12.3 Cost of Controls

12.3.1 Comment: Several commenters (78, 103, 104, 111, 112, 150, 156, 216, 220, 225, 227) indicated concerns with EPA's estimate of the cost of controls, specifically that such costs have been underestimated. Commenter 156 indicated that controlling 2SLB slow speed engines with catalytic controls would be several orders of magnitude more expensive than the costs used by EPA in its cost estimate for the proposed rule. The commenter (156) stated that if EPA estimated the cost of retrofitting its own engine in its CSU study (EPA-454/R-00-36a) at today's cost, the commenter believes the cost would be in the hundreds of thousands of dollars. The commenter (156) reviewed published industry studies from the mid-1990's in which 2SLB slow speed engines were retrofit and stated that the following engine upgrades may be needed before a catalyst could be installed:

- Install high-flow fuel valves.
- Replace power cylinders with better designed inlet and exhaust port configurations.
- Add a turbocharger for lean burn operation.
- Deactivate scavenging pistons.
- Change out ignition system for leaner air/fuel mixture.
- Install a new engine control system.

The commenter (156) indicated that this retrofit plus catalyst is not expected to achieve 90-percent control of CO, so the only practical solution is to replace the engine. Because many of these engines are fit to integral compressors, the commenter (156) indicated that replacement costs are higher (must replace both engine and compressor) – estimated at approximately $3,000 per HP. At this replacement cost, the commenter (156) estimated that operator that still run 2SLB slow speed engines will spend millions of dollars in replacement costs per engine with some, including the commenter, spending tens or even hundreds of millions of dollars depending on the number of such engines currently in service. The commenter (156) indicated that this could be cost prohibitive for some older producing fields, which may shut down to avoid incurring this expense.

Commenter 112 stated that no information has been provided for the figures EPA used for operating labor cost and cost of catalyst cleaning, replacement, and disposal. The commenter (112) noted that EPA used an annual maintenance cost of $260 for all engine types, which EPA based on the cost of maintenance for CDPF for diesel engines as calculated for the 2003 non-road diesel engines rulemaking. The commenter (112) disagreed with EPA's assumption that the cost of maintenance for both oxidation catalyst and NSCR was comparable to that for CDPF nonroad diesel engines for the following reasons:

- Nonroad engines are at least somewhat mobile. The operator has the choice of bringing the engine to the shop for maintenance or taking the mechanic to the engine. With stationary engines in the oil and gas industry, there is no choice; the mechanic must go to the remote location of the engine which is often remote requiring additional travel time.
- An engine with NSCR catalyst must be equipped with an AFRC per this regulation. Manufacturers recommend that the O_2 sensor required for AFRC operating be replaced quarterly. Each time the O_2 sensor is replaced, it is industry practice to verify the emissions with a portable analyzer to assure the sensor is functioning properly (failure of new O_2 sensors has been known to occur). Many modern lean burn engines are also equipped with an AFRC to allow stable emission control.
- CDPF maintenance mainly consists of removing inorganic material (metals and ash) from the control device. The source of the particulate is primarily fuel and lubrication oil. Spark ignition engines in the oil and gas industry are primarily fueled with natural gas, which has very low or no particulate in the exhaust.

The commenter (112) believes that these factors increase the cost of maintenance for catalytic controls by a conservatively estimated factor of four.

The commenter (112) noted that although he has not identified any EPA estimates on the cost of catalyst cleaning, replacement, and disposal; he is concerned about this cost especially on specific engine designs. In particular, 2SLB engines have been found to often require more frequent cleaning and replacement of the catalyst because they backfire routine (which coats or destroys the catalyst so that it must be frequently washed or replaced), and older and small engines that have higher lubrication oil consumption and/or lower fuel efficiencies, which may result in quick build-up of HC on the catalyst and cause them to require steam cleaning and more frequent disposal and replacement, according to commenter 112.

Commenter 112 stated that the capital costs estimated in EPA's support document are very low compared with industry's experience. Based on a comparison of costs contained in "Four Corners Air Quality Task Force Report of Mitigation Options," the commenter (112) believes that EPA's low costs result from three major factors:

- Industry finds that the purchased equipment costs (PEC) will be significantly higher than EPA's memo finds. If catalyst and AFRCs were available for this price stated in the EPA memo, it is doubtful that the equipment would have the performance or life needed for industrial equipment to meet the regulatory requirements in this rulemaking.
- The calculation method of multiplying the PEC by a factor ignores the fact that the effort required to install equipment is not linear relative to purchase price. Although a small unit does cost less to install than a large unit, a 100 HP unit does not cost 1/5th the cost to install a 750 HP unit as EPA's estimates imply.
- EPA's calculations appear to assume that the cost of retrofitting an engine with controls is the same as installing the controls on a new engine, but existing equipment is always more expensive to retrofit because of having to travel to the engine site, remove old

equipment from the engine, and to fabricate fittings to accept new equipment. All of this retrofit work is typically being done in the field, at often remote locations verses being done in a shop such as is typically done with new engines.

Commenter 103 believes that the following factors in EPA's analysis resulted in a low estimate of capital costs:

- The EPA used a single data point for all 4SRB engines and assumed the relationship was linear. The purchased equipment cost did not reflect all of the necessary components to perform a complete installation.
- The EPA did not adequately account for the ancillary equipment that must be installed to enable the control device(s) to operate. For example, the vast majority of engines below 500 HP do not have an electrical system capable of supporting Air/Fuel Ratio Controls (AFRC's). As a result, batteries and alternators must be installed on the engines to provide power to the AFRC's.
- The assumption that retrofit costs are the same as a new installation is not realistic. It is more expensive to retrofit engines with controls, especially if it is not done in a shop environment. Many engines will have to be retrofitted in the field.

The commenter (103) provided an analysis of capital costs for equipping 4SRB engines with NSCR based on information gathered from four member companies in the natural gas compression industry. The commenter's (103) analysis for these engines yielded a cost per HP ($/HP) curve that is significantly steeper than EPA's, which the commenter (103) believes shows that EPA's assumptions significantly underestimate the cost for the smaller HP 4SRB engines. At the extreme, the commenter's (103) figures show the cost for 75 HP units in excess of

$150/HP, in contrast to less than $50/HP in EPA's analysis. The commenter (103) noted, however, that their figures and EPA's show good correlation for 4SRB engines above 800 HP.

The commenter (103) also indicated that the total capital investment to install oxidation catalysts on 4SLB engines was also underestimated by the EPA, but to a lesser degree. The commenter (103) stated that there are very few 4SLB engines below 400 HP, and the greatest disparity is on these smaller engines.

Two commenters (103, 227) noted that the majority of 2SLB engines operated by member companies (in the natural gas compression industry) are integral compressor packages manufactured by Ajax. The commenter (103) asserted that due to the nature of this engine and the design of the oxidation catalyst, the cost is dramatically higher than the EPA estimated using its standard factor for oxidation catalyst.

The commenter (103) estimated that the average cost to retrofit engines with the controls necessary to comply with the rule ranges between $50/HP and $70/HP. The range of this number is large because the exact makeup (models and HP) of each operator's fleet is proprietary. The commenter (103) further estimated that approximately 85 to 90 percent of the total fleet represented by the companies belonging to his organization (5.3 million HP) will require retrofit. Using the midpoint of the range ($60/HP) and an assumption of 87 percent of the HP being affected, the commenter (103) estimated that it will cost $346 million dollars for the initial capital investment on just the engines owned by these member companies.

One commenter (225) made the general statement that EPA's estimates are low for the capital and operating costs associated with the use of catalytic control, and are based on old pricing data from one vendor and a limited number of data points that were fit with a linear regression. The commenter (225) also stated that because above-the-floor standards (which require catalytic controls) are based on the cost per ton of HAP removed, EPA must reanalyze the proposed rule with better cost data to determine when catalysts are economically practical.

One commenter (104) noted that proposed 40 CFR 63.6625(g) requires the use of AFRC with the operation of three-way catalysts/NSCR on 4SRB engines at area sources. The commenter (104) stated that AFRC are extremely costly and are not cost effective on smaller engines, while catalysts are not practical on engines that have variable loads such as pump jack engines. The commenter (104) indicated that in Oklahoma (where the commenter's organization operates), catalysts and AFRC costs are estimated to be $8,000 to $16,000 ($2,000 to $4,000 for the catalyst and $6,000 to $12,000 for the AFRC), depending on the engine. The commenter (104) asserted that the proposed requirement will be costly for and burdensome on small businesses and those companies that operate marginal wells on the lower edge of profitability, and requested that the proposed requirement be dropped for all pump jack engines.

Commenter (220) said the cost data considered by EPA in developing the proposed rule is outdated and underestimates the costs to install, operate, and maintain the controls that will be necessary in order for owners and operators of RICE to comply with the proposed rule. The capital and annualized control cost formulas for oxidation catalysts only consider a small universe of engines. The commenter (220) collected vendor data on installation costs and concluded that EPA's assumptions that these costs are the same for existing and new engines is incorrect. The commenter (220) concluded that EPA's costs are too low (e.g., at least 40 percent). Even assuming a 40 percent correction factor, the average capital cost is likely still low for retrofitting older units. In addition, the commenter (220) said that the annual operating costs for the oxidation catalyst control of these units would average about $31,000 per year at each generating facility. The commenter said EPA should gather current data to update the cost equations and provide a specific basis for assuming the cost to install controls on existing and new sources would be the same.

Commenter (220) said that because of the drastic underestimation of the cost of control, EPA has also mischaracterized the cost per ton of emission reduction. As the commenter's (220) engines do not operate for lengthy periods of time, the cost per ton of reduction is high. Based on total emissions from the commenter's (220) facilities of 45 tons of CO, the commenter (220) calculated an estimated cost of $111,000 per ton using EPA's cost assumptions, and said the real number would be much higher. This cost is too high to justify the rule's stringent requirements. Operation of engines in urban areas in accordance with acceptable management practices is sufficient to protect public health and the environment.

Commenter (220) said that because of the high costs to comply with the proposed rule, many municipalities may have to shut down units, affecting the viability of backup power supplies. Members' units provide a vital source of power in emergency situations. Because these same units may be used in peaking circumstances, they do not qualify for emergency unit status and are subject to stringent retrofit controls. In addition, members use engines in sewer systems and along sewer lines to continue sewer operations during power outages. Such units would likely be subject to the prescriptive maintenance requirements in the proposed rule. Other true emergency type units may be large enough to implicate emission reduction requirements for larger emergency units.

One commenter (111) stated that EPA's estimated control costs appear low and provided estimates of control costs for oil and natural gas production facilities in the State of Michigan. The commenter (111) stated that formaldehyde testing costs for 4SRB engines were omitted from EPA's cost analysis, but this cost is approximately $10,000 per test based on the test method required under the proposed rule. The commenter (111) also provided estimates of control costs for 4SRB engines above and below 500 HP and for 4SLB engines between 250 and 500 HP and above 500 HP.

Response: EPA estimated the cost impacts associated with the proposed rule based on information EPA had available at the time of proposal. That information included cost data for the purchase, installation, and operation of control technologies that would be necessary to employ in order to meet some of the proposed emission standards. Based on information available at the time of proposal, EPA derived cost equations for NSCR, the applicable technology for HAP reduction from stationary rich burn engines and for oxidation catalyst, the applicable technology for reducing HAP emissions from 2SLB and 4SLB SI engines. The capital cost and annual cost of NSCR were estimated as a function of engine size as were determined to be \$19.7 x HP + \$1,799 and \$2.65 x HP + \$657, respectively. At proposal, the capital cost and annual cost of oxidation catalyst were determined to be \$11.3 x HP - \$170 and \$1.52 x HP + \$393, respectively. EPA agrees with comments stating that these proposed costs of controls were low.

As a result, EPA revisited the cost data used for the proposal. In addition, EPA requested additional cost data from industry to supplement the existing costs EPA had. EPA added specific costs received from industry for oxidation catalyst for 2SLB engines, oxidation catalyst for 4SLB engines, and NSCR for 4SRB engines. EPA used the available cost information to estimate the capital and annual control costs for different size model engines. EPA then took the capital and annual control costs estimated for each model engine and developed control cost equations as a function of engine size (HP). These cost equations were developed using a combination of

information, including the original vendor equipment estimates EPA used at proposal updated to current costs, new cost information received following the publication of the proposed rule, including detailed cost information from API[24,25] who presented each cost element specifically, information from Exterran, Anadarko Petroleum Corporation, and information from control technology trade association and vendors. For the majority of model engines, EPA used the equipment cost provided by the source, applied EPA's control cost methodology, and determined the total capital cost for each model engine. In some cases, the total capital cost was provided by each source, in which case, EPA used that cost directly. In general, in order to determine the total annual cost for each model engine, and to be consistent, EPA used the information provided by API for the individual cost elements that contribute to the total annual cost, and applied EPA's control cost methodology to determine the total direct and indirect annual costs.
More information on how EPA estimated the cost of controls for the final rule is available in the memorandum titled "Control Costs for Existing Stationary SI RICE", which can be found in the docket.

For the final rule, the capital and annual cost of oxidation catalyst for 2SLB engines, as a function of engine size, was determined as \$47.1 x HP + \$41,603 and \$11.4 x HP + \$13,928, respectively. Compared to the costs developed for the proposal, EPA has increased its estimate of the cost to operate an oxidation catalyst, for example on a 500 HP 2SLB engine by a factor of

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[24] Reciprocating Internal Combustion Engine National Emission Standard for Hazardous Air Pollutants (RICE NESHAP) Proposed Revisions – Emission Control Cost Analysis Background for "Above the Floor" Emission Controls for Natural Gas-Fired RICE. Technical Report Prepared for: INGAA and API. Prepared by: Innovative Environmental Solutions. October 2009.

[25] Letter from Tom McGrath, IES to Brad Nelson, EC/R, Melanie King, EPA, Lisa Beal, INGAA, et.al. Request for Additional Cost Detail for Gas-Fired Engines Emission Controls. April 19, 2010.

17. Based comments received on the proposal and additional cost information obtained between proposal and promulgation, EPA learned that it would be appropriate to distinguish between the control costs for 2SLB and 4SLB engines, which, at the time of the proposal, EPA had used the same costs for both engines. Consequently, for the final rule, EPA developed separate control cost equations for 2SLB and 4SLB engines. EPA agrees that 2SLB engines may need more expensive catalysts and the final capital and annual controls costs reflect that. Stationary 2SLB SI engines typically have lower exhaust temperatures than other engines. For example, during the EPA-sponsored testing at CSU, the 2SLB exhaust temperature ranged from 451°F to 569°F, or an average of 530°F while the 4SLB exhaust temperature ranged 640°F to 734°F, or an average 691°F. Therefore, stationary 2SLB SI engines may have to use premium catalysts, which have a higher cost than regular catalysts. EPA obtained 2SLB catalyst equipment costs directly from a supplier of 2SLB catalyst, which were incorporated into data used to develop control costs for 2SLB. These costs were close to and consistent with other 2SLB catalyst cost data EPA obtained from, for example, API and INGAA and Exterran.

For the final rule, the capital and annual cost of oxidation catalyst for 4SLB engines, as a function of engine size, was determined as \$12.8 x HP + \$3,069 and \$1.81 x HP + \$3,442, respectively. Compared to the control costs developed at proposal for oxidation catalyst, EPA has increased its annual control cost estimate by a factor of close to 4, for example for a 500 HP 4SLB engine. For add-on controls on rich burn engines, EPA also increased its estimate of annual control costs by a factor of 4, between proposal and promulgation, on for example a 500 HP 4SRB engine. For the final rule, the capital and annual cost of oxidation catalyst for 4SRB engines, as a function of engine size, was determined as \$24.9 x HP + \$13,118 and \$4.77 x HP + \$5,679, respectively. EPA believes that an AFRC is needed in order for proper functioning of the NSCR and therefore agrees with the commenters that the cost of the AFRC should be included in the cost of NSCR. The above cited control cost equations include the cost of an AFRC for rich burn engines. The capital and annual control costs developed for the final rule for oxidation catalyst control for 2SLB and 4SLB, and NCSR for 4SRB engines are based on a sufficient number of data points that appropriately represent different model engines and sizes. For instance, for rich burn engines, EPA used 18 data points for engines ranging from less than 50 HP to up to 3,000 HP. EPA believes the final control costs for all engines contain all necessary components and are reflective of current pricing for catalyst-based controls on stationary existing SI engines.

In response to comments regarding the control efficiency capability of 2SLB engines, EPA agrees that it may not be possible for all 2SLB SI engines to achieve 90 percent reduction in CO emissions. EPA's testing a CSU on a 440 HP Cooper Bessemer engine achieved CO control efficiencies between 58 and 69 percent. However, EPA believes catalyst could perform better than that. In fact, Cameron's Compression Systems[26], a supplier of oxidation catalysts for 2SLB engines, guaranteed 83 percent CO removal efficiency based on test results collect up until early 2009. The supplier indicated to EPA that it has recently guaranteed a 90 percent CO removal efficiency. With that said, EPA is finalizing requirements for existing 2SLB SI engines that are not expected to require oxidation catalyst control. For existing 2SLB SI engines at area sources, EPA is requiring management practices. For existing 2SLB SI engines at major sources that are less than 100 HP, EPA is also requiring maintenance practices. For existing 2SLB SI engines at major sources that are greater than or equal to 100 HP and less than or equal to 500 HP, EPA is

[26] Email from Bruce Chrisman, Cameron's Compression Engines to Tanya Parise, EC/R. 2SLB Engine Information. October 22, 2009. EPA-HQ-OAR-2008-0708-0500.

requiring a concentration standard of 225 ppmvd of CO at 15 percent O_2. EPA considered oxidation catalyst for these engines, but determined it was not justified and reasonable to do so based on costs. For more information on EPA's decision, please refer to the memorandum titled "MACT Floor and MACT Determination for Existing Stationary SI RICE ≤500 HP Located at Major Sources."

12.3.2 Comment: Two commenters (103, 112) stated that the equipment life used by EPA to compute the capital recovery factor (20 years) is too high. Commenter (103) believes this equipment life would be reasonable for the engines alone, but is very high for the add-on controls. In the commenter's (112) experience, control equipment life expectancy is approximately 10 years for engines greater than 500 HP and approximately 5 years for smaller engines. The commenter (103) believes that the recovery period should be a maximum of 10 years due to the following factors:

- The economic life of the control equipment is 10 years, during which the element will still need to be replaced every 2-3 years.
- The electronic technology often becomes unsupportable in a time span significantly less than 10 years.
- It is unlikely that the regulatory environment will enable these controls to be used for 20 years. Ever increasing regulations will likely obsolete the technology before the 20 year recovery period has elapsed.

Response: EPA agrees with the commenter that the equipment life used to compute the capital recovery factor was too high. For the cost analysis in the final rule, EPA used an equipment life of 10 years, which is more accurate for these emission controls.

12.3.3 Comment: Two commenters (78, 170) said that the cost effectiveness of adding control devices to older engines should be addressed, because it may not be cost effective to install controls on engines that are nearing the end of their useful life. Control devices such as oxidation catalysts must be designed and sized to match the engines on which they are installed, and one cannot automatically assume that a catalyst system designed for one engine can be used on another. In addition, attempting to retain the catalyst system for use on a replacement engine may limit the source's option for replacement engines. Consequently, if the useful life of the control device is considered in cost effectiveness calculations, if the control device will not be used for its predicted useful life, then the calculations will underestimate the cost effectiveness of the device.

Response: EPA does not agree with the commenter that it should determine the cost effectiveness of adding control devices to engines that are nearing the end of their useful life. It is not feasible to determine the cost effectiveness of every type of operating scenario. Affected sources will have 3 years to comply with this regulation and therefore can decide whether to replace older equipment rather than retrofitting.

12.3.4 Comment: One commenter (103) in the natural gas compression industry believes that EPA has greatly underestimated the costs to comply with the proposed maintenance requirements. The commenter (103) asked member companies in his organization to estimate these costs, and the following items were factored into the additional costs incurred as a result of the additional preventative maintenance trips required under the proposed rule:

- Oil purchased for additional oil changes.
- Oil filters purchased for additional oil changes.
- Spark plugs purchased for additional spark plug changes.
- Labor – the fully burdened labor rate was used for additional time.
- Travel time
- Waste oil and waste oil filters requiring hazardous disposal generated by additional changes.

According to the commenter (103), the data from the member companies indicated the following costs:

- Engines less than 50 HP: Average additional annual cost of $369.86 per HP, or approximately $18,123 annually for a 49 HP engine.
- 2SLB engines 50 – 249 HP: Average additional annual cost of $45 per HP, or approximately $11,110 annually for a 249 HP engine.
- 4SLB engines 50 – 249 HP: Average additional annual cost of $33 per HP, or approximately $8,127 annually for a 249 HP engine.

The commenter (103) also stated that the realized emissions reductions greater than manufacturer's recommended schedules at the given frequencies are null.

<u>Response</u>: EPA has provided an option in the final rule to utilize an oil analysis program to extend the oil change frequency. EPA has also revised the intervals for work practices and

management practices in the final rule. EPA does not agree with the commenter that the management practices in the final rule are overly burdensome and would result in increased cost to the engine owner/operator. The management practices EPA is requiring under the final rule are based on industry practice and normal maintenance procedures currently followed by stationary SI engine operators. It is in the best interest of owners that their engines are well-maintained and kept in proper condition. EPA believes engine operators would continue to follow maintenance procedures to keep their engines in proper working condition and would allocate funds for that purpose, in the absence of the rule. Therefore, EPA does not believe there will be any increased cost. In the event that engine owners and operators might expend additional effort as a result of the final rule in order to maintain their engines, such effort is expected to have a minimal effect on the cost, plus maintaining the engine properly might lead to a longer engine life and might even result in cost savings, which could offset the potential small increased cost owners and operators might experience.

12.4 Implementation and Enforcement

12.4.1 Comment: One commenter (112) believes that operators will have difficulty certifying compliance at major sources for engines that have emission limits, but have no testing requirements (i.e., emergency engines, 4SRB engines less than 100 HP, etc.). The commenter (112) requested that EPA insert the words, "Compliance is assumed if the operator follows maintenance practices as specified in their maintenance plan."

Response: All of the engines that have emission limits in the final rule have to perform emissions testing to show compliance with the rule.

12.4.2 Comment: Four commenters (104, 150, 191, 207) believe that the proposed compliance date of 3 years is too short. One commenter (132) believes that if the rule is promulgated as proposed, the resulting demand for catalytic controls would have serious implications for market demand and feasibility of installing controls within the 3-year timeline. The commenter (132) stated that these factors should be considered in the impacts assessment and rule schedule for compliance. One of the commenters (104) indicated that in Oklahoma alone there are an estimated 67,000 existing engines at oil and gas production sites. The commenter (104) believes that the sheer number of engines and the limited number of qualified companies available to conduct FTIR tests for formaldehyde on 4SRB engines (which are common at oil and gas facilities) limits a company's ability to comply in the proposed time period. The commenter (104) suggested a compliance date of at least 6 years for area sources or, at a minimum, a longer compliance time for small businesses operating such facilities.

Because of the tens of thousands of engines that the commenter believes would have to be tested and modified and the limited number of qualified companies and personnel to perform these functions, commenter 150 urged EPA to extend all proposed compliance deadlines by at least 12 months. In the alternative, the commenter (150) suggested a phased-in approach based on engine size. The commenter (150) stated that 4SLB engines less than 250 HP should be the last engines required to comply because they are low-impact in terms of emissions and because they would be likely to be replaced since they would be unable to meet the standards without costly reconfigurations to install the catalytic controls necessary to comply.

One commenter (207) said that the compliance time would not be sufficient for installation of controls on back-up/emergency engines at nuclear power plants. According to the commenter (207) this is because components installed in nuclear applications are subject to a variety of quality assurance requirements, specifications, and code requirements, none of the current catalytic converter manufacturers are qualified to nuclear safety related standards, and the time frame for current vendors to meet the stringent quality assurance standards and produce an acceptable catalytic converter is estimated to be beyond the 3-year compliance period.

<u>Response</u> The compliance date provided in §63.6595(a)(1) of the proposed rule for stationary existing engines less than or equal to 500 HP located at major sources and stationary existing engines located at area sources is consistent with the typical date of compliance given for existing sources, i.e., 3 years from the effective date of the rule, and is the maximum amount of time that EPA can provide under Clean Air Act section 112(i)(3). EPA believes this is sufficient time for sources to comply with the requirements and does not agree that a 6 year compliance period should be provided. EPA has not included additional compliance time in the final rule.

As discussed in the response to comment 12.1.8, stationary emergency engines at nuclear facilities are not subject to numerical emission limitations. Therefore, there is no justification for a longer compliance time for these engines.

12.4.3 <u>Comment</u>: A few commenters (93, 104, 116) stated that the proposed rule will be onerous and costly on owners/operators of engines at oil and gas production facilities, and it will be also burdensome on EPA and the state agencies. The commenter (104) indicated that there are approximately 122,000 crude oil and natural gas wells in the state where her organization is located (Oklahoma) and there may be as many as 67,000 oil and gas facilities that have at least one engine that would be subject to the proposed rule. The commenter (104) does not think EPA or the state agencies have the staff to implement or manage the proposed rule as written. The commenter (104) asked how EPA plans to address this issue.

The commenter (104) stated that there is much confusion in implementing the current requirements for "new" engines that are less than 500 HP at area sources. The commenter (104) noted that currently the State of Oklahoma (where her organization is located) does not have primacy for the NSPS/NESHAP program as it relates to 40 CFR part 60, subpart JJJJ and 40 CFR part 63, subpart ZZZZ; however, the state requires operators to obtain permits for these types of engines. The commenter (104) indicated that as a result, information required by the "new" engine rule is being submitted to the state as well as to EPA, which has placed additional burdens on small businesses and operators of marginal wells that are duplicative and unnecessary and provide no environmental benefit. The commenter (104) assumes that this same practice will be applied to any final rule for "existing" engines. The commenter (104) asserted that it would be very helpful to the regulated community if one agency implemented the program so that submittal of duplicate data was avoided.

One state commenter (93) expressed that their main concerns with the proposed rule are that the complexity and organization of the rule may hinder compliance efforts and that implementing agencies may be overwhelmed by the increased workload.

One local and state agency association commenter (116) recommended that EPA provide sufficient additional funds for state and local clean air agencies to carry out implementation of the proposed rule. They stated that, currently, federal grants fall short of what is needed to support state and local agencies in carrying out their existing responsibilities. Additional area source programs, which are not eligible for Title V fees, will require significant new resources for state and local air agencies, above and beyond what is currently provided, according to commenter 116. This commenter (116) expressed that without increased federal grants, some state and local air agencies may not be able to adopt and enforce additional area source rules. Even for permitting agencies that do not adopt the rules, it is possible that implementation of the standards for area sources will increase the workload and resource needs of state and local agencies, the commenter (116) said. For example, synthetic minor permits (or Federally Enforceable State Operating Permits) may need to incorporate all applicable requirements, which would include the area source standards, the commenter (116) added. These requirements must also be enforced, according to the commenter (116). The commenter (116) explained that Title V permit fee funds are not available for those efforts and many state and local air agencies do not have sufficient resources for these responsibilities.

Response: Providing additional funds for State and local implementation activities related to this rule, as requested by the commenter, is outside the scope of this rulemaking. EPA is planning on making implementation and guidance material available to the public following the promulgation of this rule. EPA believes such material will be helpful in implementing this rule. EPA has taken steps in the final rule that reduce the burden on both engine owners/operators and state/local agencies. For example, more than 90 percent of the existing engines at area sources are only subject to management practice standards and are not required to conduct performance testing or submit notifications and reports to state/local agencies.

12.4.4 Comment: One commenter (93) reiterated the February 25, 2008 request that EPA allow states to incorporate any new rules or revisions to rules at the next Title V revision or renewal as opposed to opening such permits for cause. The commenter (93) provided that the proposed rule will regulate thousands more engines than anticipated as it now includes: stationary engines of 500 HP or less at major sources, stationary engines at area sources, and stationary CI engines of more than 500 HP at major sources. The commenter (93) stated that it heard from one existing Title V source that has over 300 engines that will be subject to the proposed rule. The commenter (93) requested that EPA consider the reasonableness and resources agencies would need to implement the 18 page flow chart for hundreds and possibly thousands of engines to determine permitting and compliance requirements.

Response: EPA included provisions in the January 2008 final rule at 40 CFR 63.6585(d) that indicate that area sources subject to 40 CFR part 63, subpart ZZZZ, would not be subject to permits under 40 CFR parts 70 or 71 solely because of this rule. This provision will lessen the burden on numerous existing stationary engines located at area sources. EPA believes this should significantly reduce the commenter's concern on this issue. In terms of the compliance burden and implementation process, EPA has made an effort to rely on management practices wherever appropriate, which will minimize the impact on particularly smaller sources and those individually owned and operated. Further, EPA has reserved regular performance testing for larger engines, though smaller engines subject to numerical emission limits will need to test at least once. Finally, EPA will be providing implementation material to assist affected sources in understanding the requirements of the final rule and implementing and demonstrating compliance with the specific provisions that apply to them.

12.5 Energy Impacts

12.5.1 Comment: One commenter (176) recommended that EPA re-evaluate its energy impact determination and consider the impact of the proposed rule's energy requirements on a broader scale rather than limiting its analysis to only sectors of the regulated community. The commenter (176) stated that EPA's evaluation of the energy impact of the proposed rule only considered the electric power sector and failed to account for the impact on the non-industry sector.

One commenter (176) provided that, under section 112(d) of the CAA, EPA can consider cost and energy impacts. EPA concluded in the RIA for the proposed rule that it "is not likely to have a significant impact on the supply, distribution, or use of energy." RIA at 5-9. The commenter (176) disagreed with EPA's conclusion and stated that engines are placed because of concerns as to the reliability of power for the source, particularly in rural areas. The commenter (176) stated that the proposed standards could have a very detrimental impact on energy reliability and many units may have to be shut down due to the cost of compliance.

Response: EPA focused its analysis of energy impacts on the electric power sector because this sector experiences the greatest impact on energy costs of any of the affected sectors. Slightly more than half of the total annual costs of the final standard are incurred by the electric power sector (RIA at 4-39 and 5-2). EPA found that this industry would experience low annualized costs as a percent of industry revenue (less than 0.1 percent). This was also true for most of the other industries affected by the proposed standards. While EPA did not conduct an analysis for sectors not regulated by the final standards, EPA did provide some information on how demand for the agriculture and construction industries may respond to an increase in price based on impacts from the proposal (RIA at 5-7). This information, taken from the Department of Energy's Energy Information Administration, shows that the demand for agricultural products may fall 0.2 percent for a 1 percent increase in its product prices; for construction, the demand will fall 1 percent for a 1 percent increase in product prices. In response to the comment that engines may have to shut down due to the cost of compliance, EPA does not have the ability to estimate engine closures or shutdowns as part of the economic impact analysis in the RIA. EPA does not have sufficient firm-level or unit-level data to estimate such impacts, and EPA typically does not provide such estimates of impacts as part of our economic impact analyses. Nonetheless, EPA does not believe that any units would be shutting down as a result of this rule. The commenter did not provide any information to show that units would have to shut down and no other information is available to indicate that units would.

12.6 Small Businesses

12.6.1 Comment: A few commenters (226, 242) expressed concern over how the proposed rule might impact small businesses. One commenter (242) said that EPA has not properly communicated to small businesses (e.g., Small Business Administration), government installations (e.g., fire and police stations), and homeowners on the proposed rulemaking. The commenter (242) stated that EPA needs to quantify the potential impacts associated with regulating these sources since these sources are not exempt. Also, the commenter (242) said, EPA should conduct an outreach program to communicate the requirements of the rule to the public. One commenter (226) stated that small businesses mostly use small engines and regulation of these engines yields the smallest emission benefits.

Another commenter (226) had similar concerns stating that under the Regulatory Flexibility Act, EPA is required to analyze reasonable alternatives that minimize small business burdens while still achieving the statutory goals. The commenter (226) noted that in the 2002 proposal that EPA acknowledged that small stationary RICE have generally not been regarded as significant sources of air pollution emissions, and solicited comment on ways to structure the proposed rule to focus on the facilities with significant risks and avoid the imposition of high costs on facilities that pose little risk to public health and the environment. However, the commenter (226) noted that the current proposal does not request any risk-based alternatives that would exclude small engines.

One commenter (226) believes the proposed rule affects hundreds and thousands of small businesses that employ engines that are used in oil and gas production, natural gas pipeline companies, and agriculture. The commenter (199) stated that any slight increase in operating costs could lead to the shutdown of the facility, and given the heightened concern with energy cost and availability, EPA should carefully consider any new requirements.

<u>Response</u>: In response to the concerns expressed by commenters about the potential impact of this rule on small businesses and homeowners, EPA conducted a review of the types of engines that were included in the area source category listing for stationary RICE. As a result of this analysis, EPA determined that emissions from existing stationary emergency engines located at residential, commercial, and institutional facilities were not included in the 1990 baseline emissions inventory that was used as the basis for the listing of source categories needed to

ensure that 90 percent of area source emissions are regulated. Therefore, EPA has determined that these engines are not part of this regulated source category, which will help address the commenters' concerns about the impact of the rule on small businesses and homeowners. Both the proposed and final rule required small stationary engines at area sources to meet management practice requirements rather than emission limitations, which also lessens the burden of the rule on those engines. The final rule extends management practices to all emergency engines. In addition, the final rule requires only work practices for stationary engines less than 100 HP at major sources and management practices for stationary engines smaller than 500 HP at area sources, also decreasing the burden of the rule on owner/operators of small engines. Section 112(d) of the CAA is generally technology-based, not risk-based. For engines at major sources, it requires regulation based on emissions data from existing engines. HAP emissions from these sources include carcinogens and HAP without health thresholds. The commenter does not explain how the very limited provisions of section 112(d)(4) or 112(c)(9) would be applicable to this source category.

13.0 Miscellaneous

13.1 Definitions

13.1.1 Comment: One commenter (242) thinks that EPA should amend the definition of affected source to include area source engines and engines less than or equal to 500 HP at major sources to clarify rule applicability.

Response: EPA does not agree that it should revise the definition of affected source in subpart ZZZZ because the definition already includes engines located at area sources and engines less than or equal to 500 HP located at major sources.

13.1.2 Comment: Three commenters (126, 158, 168) urged EPA to clarify and improve its definition of "stationary" RICE, contending that as written, it is difficult to clearly understand what constitutes a stationary RICE subject to regulation under the proposed rule. A problem with the current definition, according to commenter 168 arises when a mobile RICE that has been rented and has been moved to a power plant is deemed to become a stationary RICE under the nonroad definition in 40 CFR 1068.30. Further, commenter 168 claims that many RICE that would be regulated by the proposed subpart ZZZZ are temporary, rental diesel engines that provide outage power and compressed air during refueling and maintenance outages at nuclear power plants or during construction and maintenance activities at coal-fired power plants. Commenters 126 and 168 requested that, in the final rule, EPA revise the definition of stationary RICE or nonroad engine or otherwise revise the proposal to insure that rental, non-self propelled, portable nonroad diesel engines that are located at a utility power plant or area facility for more than 12 months during construction or extended maintenance are exempt from 40 CFR part 63, subpart ZZZZ. If portable RICE were deemed to be "stationary," commenters 126 and 168 requested that the final rule clarify that the owner of the diesel engine, and not the entity that rents and uses it, is required to comply with the rule, including required maintenance and performance testing.

One commenter (158) requested that EPA clarify the types of engines that are considered "non-road engines" versus "stationary RICE." For example, the commenter's (158) firm operates power washers which can be either propelled (moved by hand) while being used or transported to a location at a facility, kept stationary while being used, and then transported to another location within the facility. The commenter (158) requested clarification as to whether such equipment would fit under 40 CFR 1068.30 section (1)(ii) or (1)(iii), which contain parts of the definition of "non-road engine." As another example, the commenter's (158) firm operates portable water pumps, generators, and welders which remain at a facility year-round and are moved to different locations on-site as needed. The commenter (158) requested clarification as to whether the engines powering such equipment would be excluded from the definition of "non-road engine" because they remain at a location for more than 12 consecutive months, which is an exclusion specified in 40 CFR 1068.30.

Response: EPA does not agree that the definition of stationary RICE should be revised. EPA intends for portable engines that remain in one location at a facility for more than 12 months to be considered stationary engines. For the example provided by commenter 168 of temporary rental diesel engines that provide power and compressed air at a facility, if the engines remain at the same location within the facility for more than 12 months, then they would be considered stationary engines. If the engines are located at the same facility but are moved around within the facility, then they would not be considered stationary.

Regarding the clarifications requested by commenter 158, those engines would be considered stationary engines only if they remain in the same location within the facility for more than 12 months. Engines that are located at a facility but moved around the facility are not stationary engines unless they remain at the same location within the facility for more than 12 months.

For engines that are rented, the final rule applies to both the owner and the operator, and the renter is the operator and is subject to the rule. Because both the owner and operator are liable under the rule, the rental agreement should address who will conduct emissions testing or employ management practices for the specific engine, and who will create records, who will hold them for the statutory period and who will report.

13.1.3 Comment: One commenter (121) said EPA should include a definition for "commence construction" to clarify when new sources are covered by the RICE MACT because of the overlap between 40 CFR part 60, subparts JJJJ and IIII and the RICE MACT. Consistent with the NSPS, EPA should define "commence construction" as follows:

"For purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator."

Engines at a closed facility may be relocated and installed at another facility. Clarifying the original order date will assist sources in understanding the applicability of the RICE MACT for engines in these situations, according to commenter 121.

Response: EPA has already provided a definition of "commence construction" in the General Provisions for part 63. The definition can be found in 40 CFR 63.2. As the definitions and provisions for determining and regulating new engines have already been established, and this rule is concerned solely with existing stationary engines, EPA is not revisiting this issue in this rule.

13.1.4 Comment: One commenter (103) believes that the phrase "Owners and Operators" needs to be better defined as it relates to the requirements. The commenter (103) believes that while it is convenient for the EPA to avoid distinguishing between the two, the reality is that there are tens of thousands of engines where the roles of owner and operator are often represented by two independent companies. In the case of a rental compressor, the engine is owned by the lessor and rented to the lessee. According to the commenter (103), the lessor typically (but not always) provides:

- Maintenance including preventative maintenance, repairs, and overhauls. This would include maintenance plans and the documentation of the work performed.
- Adjustment of the engine parameters that control combustion such as ignition timing, air/fuel ratios, etc.

The commenter (103) added that the lessee is typically (but not always) responsible for:

- The day to day operation of the engine including starting, stopping, loading and unloading.
- Emissions testing
- Environmental permitting with the RICE along with the rest of surface equipment including burners, tanks, fugitive emissions, etc.

The commenter (103) stated that EPA was asked to clarify the roles and responsibilities of Owner and Operator as it relates to the NSPS (40 CFR part 60, subpart JJJJ) but has yet to do so, and added that the same mistake should not be made on this proposed rule. The commenter believes that the effects of this ambiguity include doubling or tripling the manpower required for tracking compliance on engines and for recordkeeping because all data not only must be gathered, compiled, sorted, and stored, but in order to transfer to counter parties (from Owner to

Operator, for example) the data must then be carved out according to rental relationships and then conveyed to the other party. The commenter (103) also believes that there is an increased chance of noncompliance from each entity believing the other entity has complied with certain provisions.

The commenter (103) added that where there are rental engines in the natural gas compression industry, the "site" owner and operator will hold the state air permit for the site but is dependent on each of the rental companies for compliance on items such as maintenance plans, while the rental companies are dependent upon the site owner and operator for items such as permitting and testing. The commenter (103) asked the following questions:

- What would happen when an annual emissions test is missed or failed and who is responsible?
- Who is responsible?
- If one company chooses not to comply, is the other company required to perform those functions, if it is even practical?

The commenter (103) asserted that EPA should acknowledge that there are over 15,000 engines that have these issues every day due to its actions and inactions.

Response: This rule applies to both the owner and the operator, regardless as to whether the operator is an agent of the owner or merely a lessee. Because both the owner and operator are liable under the rule, the rental agreement should address who will conduct emissions testing or employ management practices for the specific engine, and who will create records, who will hold them for the statutory period and who will report. The requirements under the rule are clear, divisible and openly subject to divided responsibility under a rental agreement. EPA is willing to work with rental agencies to develop a standard rental agreement clause to ease recordkeeping and reporting.

13.1.5 Comment: One commenter (83) recommended that EPA use the "major" definition for landfills contained in the NSPS/EG rule, which is also used in the federal Title V Program, as part of the final NESHAP when referencing landfill gas RICE. Under the landfill NSPS/EG definition of "major," the design capacity of the landfill (2.5 million megagrams and 2.5 cubic meters) determines what are "major" and "minor" sources. The commenter (83) explained that, if EPA uses the typical NESHAP definition of "major," most stationary RICE located at landfills will be "area" sources and subject to the stringent standards in the proposed rule and will not be able to take advantage of the 10 percent or greater landfill gas exclusion that is being proposed for "major" source RICE.

Response: EPA has to follow the definitions of a major source and an area source in CAA sections 112(a)(1) and (2). EPA is not at liberty to change those definitions, and EPA must regulate as major sources those stationary engines that are classified as being located at major sources under section 112(a). If a stationary engine is located at a source that has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any HAP or 25 tons per year or more of any combination of HAP, it must be regulated as a major source.

13.1.6 Comment: Two commenters (90, 117) requested that the definition of emergency stationary RICE be modified to remove the clause that ICE that supply power "as part of a financial arrangement with another entity are not considered to be emergency engines." One commenter (117) noted that when applied to major sources, as in existing rules, the language may appropriately differentiate between true emergency engines and engines used in a commercial capacity. However, for smaller operations, it is common for multiple entities to share the cost and responsibility for providing emergency power. An example the commenter (117) cited is landlord-tenant relationships where as a part of the lease the landlord provides emergency backup power to the tenant. This occurs at multi-tenant facilities, such as shopping centers, where one tenant's emergency power may be shared by others. The commenter (117) believed that EPA did not intend for these small operations to be excluded from consideration as emergency units. Another commenter (90) noted that most of their units would be excluded from consideration as emergency units under the proposed definition because they provide emergency backup power for clients such as grocery stores, data management centers, and small industrial facilities as part of a financial arrangement. Additionally, they may participate in voluntary utility curtailment programs where they have entered in financial arrangements to self generate power during brief times of utility constraints.

<u>Response</u>: In the final rule published in March 2010, EPA revised the provisions applicable to emergency engines to clarify that engines that are operated as part of a financial arrangement but are used solely for emergency use (e.g. not for peak shaving) are still considered emergency engines. The examples provided by the commenters of a landlord that provides emergency backup power to a tenant or a company that provides emergency backup power to clients such as grocery stores, etc. are situations where the engines are still emergency engines (as long as they are operated per the requirements in §63.6640(f)). If the engine is used for a voluntary utility curtailment program to self generate power during times of utility constraints in return for

financial considerations, the engine would have to meet the requirements for non-emergency engines, with the exception that the engine can operate for up to 15 hours per year as part of an emergency demand response program, as specified in subpart ZZZZ.

13.1.7 Comment: One commenter (253) stated that under §63.6675, a major source is defined as a stationary source or group of stationary sources located in a contiguous area and under common control that emits or has the potential to emit, considering controls, 10 tpy or more of any HAP or 25 tpy or more of any combination of HAP, while an area source is any stationary source of HAP that is not a major source. Therefore, the commenter (253) noted a farm which operates several small stationary irrigation pumps or a commercial building with an installed emergency generator would be classified as an area source, while a food processing facility with an industrial boiler, an emergency generator, and a backup fire pump might be classified as a major source of HAP, due primarily to its boiler emissions. The commenter (253) pointed out that if the farm covers a large area such that it is contiguous with both the food processing facility and an adjacent commercial area, and if all three facilities are owned and operated by the same company, then it appears that the farm, the commercial building, and the food processing facility would all be considered part of the same major source of HAP even if the facilities' operations had nothing to do with one another. The commenter (253) pointed out that as individual facilities operating existing diesel engines not currently regulated under subpart ZZZZ, neither the farm nor the commercial building requires a Title V operating permit because neither meets the definition of a major source under 40 CFR part 70. Further, the commenter (253) stated that although the food processing facility does require a Title V permit as a major source, the adjacent farming and commercial building facilities are not considered part of the

Title V major source, despite being contiguous and under common ownership and control, because they belong to a different major industrial grouping than the food processing facility (see definition of major source under §70.2). The commenter (253) stated that as a result of being classified as a single major source of HAP under the proposed subpart ZZZZ, however, the combined farm/commercial building/food processing facility would also be considered a single major source under 40 CFR part 70; a Title V operating permit would therefore be required to cover all three operations. In addition, the commenter (253) stated that all existing stationary RICE at the farm and at the commercial building would be required to comply with standards of the proposed subpart ZZZZ applicable to RICE at major sources rather than those applicable to area sources. The commenter (253) believes that this situation is not an intended consequence of the proposed rule but is one that needs to be addressed. The commenter (253) strongly encouraged EPA to consider revising the definition of major source in §63.6675, or to otherwise modify the applicability provisions of the proposed subpart ZZZZ, to ensure that unnecessarily burdensome regulatory requirements are not imposed upon area sources with stationary RICE simply by virtue of their location adjacent to a major source of HAP.

<u>Response</u>: EPA does not agree that the definition of major source needs to be revised. If the sources are located in a contiguous area and under common control, then they will be considered a major source. This is required by the statutory definition of major source in Clean Air Act section 112(a)(1), 42 USC § 7412.

13.1.8 <u>Comment</u>: One commenter (126) requested that EPA provide guidance or clearly define the "source" with respect to RICE in the definition of reconstruction in 40 CFR §63.2. The commenter (126) asked if ancillary components such as control panels be considered a component or are they excluded? The commenter (126) requested clarity in terms of reconstruction in subpart ZZZZ, and a generic statement that all ancillary equipment that are necessary to make the unit operate are exempt.

Response: EPA has defined the term "engine" as constituting all parts necessary to operate the engine during emissions testing, including fuel and air intake components, cooling components, exhaust and pollution control components, control computers and the crankshaft, as well as the basic engine block and associated reciprocating engine parts. Control panels consisting exclusively of monitors and gauges and a throttle are not considered parts of the engine and thus are not part of the source. Engine computers that manage the engine in response to a throttle are considered part of the engine and thus of the source. EPA finds the term "ancillary equipment necessary to make the unit operate" ambiguous. The Agency will determine the applicability of any argument that a specific piece of "ancillary" equipment is not part of the source on a case by case basis, as provided for in the CAA.

13.1.9 Comment: One commenter (213) asked that EPA specifically define what constitutes an area source (i.e., by including the amount of HAP emitted) and not rely on the current definition that defines an area source as any source that is not a major source.

Response: The description of an area source provided in the regulations at 40 CFR 63.6585(c), which is the same definition of area source found in the statute in section 112(a)(2), and in the general provisions at 40 CFR part 63, is appropriate and consistent with what has been used for previous rulemakings affecting stationary engines. EPA believes this definition is very clear and underscores that the universe of sources is made up of major sources or sources that are not major sources, which are called area sources. EPA is not finalizing a different definition.

13.2 Clarifications

13.2.1 Comment: Two commenters (155, 242) said that EPA needs to clarify that maintenance activities apply as appropriate because the specific maintenance requirements may not always make sense to conduct on an engine, e.g., 2SLB engines utilize continuous oil-feed so an oil change is illogical for this type of engine.

Response: The two commenters who made the statement regarding oil changes being illogical for 2SLB engines, indicated in their comments that they could provide EPA with additional information on maintenance practices. EPA requested specific recommendations on maintenance practices from industry and from commenters 155 and 242 specifically. EPA received specific recommended maintenance practices for stationary SI engines, including 2SLB engines from Exterran, JW Power Company, and CSI (EJC).[27] Commenters 155 and 242 did not submit separate recommendations, but during a meeting on March 22, 2010[28], API indicated that in terms of appropriate management practices for existing stationary SI engines, that it concurs

[27] Letter from Rebecca Rentz, Bracewell and Giuliani to Melanie King, EPA. Management Practices for SI RICE Area Sources < 500 hp. January 27, 2010. EPA-HQ-OAR-2008-0708-0354.1.

[28] Memorandum from Tanya Parise, EC/R to Melanie King, EPA. Summary of the March 22, 2010 Meeting between EPA and API to discuss the NESHAP for Existing Stationary SI RICE.

with the recommendations submitted by Exterran. Those recommendations supported an oil change interval of every 4,320 hours of operation for 2SLB engines. The oil change interval for 2SLB engines is longer for than for other engines (i.e., 4SLB and 4SRB) because of the different engine configuration of 2SLB engines. EPA concurs with the recommendations submitted by Exterran et. al. and finds them appropriate for the final rule. Further, EPA is including an alternative in the final rule for monitoring the quality of the oil through an oil analysis program. Sources have the option to use an oil change analysis program to extend the oil change frequencies. Sources can also petition the Administrator pursuant to the requirements of 40 CFR 63.6(g) for alternative work practices. Sources have the option to work with State permitting authorities pursuant to EPA's regulations at 40 CFR subpart E ("Approval of State Programs and Delegation of Federal Authorities") for approval of alternative management practices.

13.2.2 <u>Comment</u>: Numerous commenters (112, 132, 154, 155, 162, 186, 227, 242) asked that EPA clarify in the rule where hours has been used to determine maintenance or testing frequency that it is operating hours and not calendar hours. Several commenters (112, 154, 155, 186, 242) said that EPA should clearly specify that the maintenance frequency in the rule are operating hours and not calendar hours. If the engine does not operate during a particular period, it is assumed that no wear, performance, or emissions degradation occur, the commenters (155, 242) said. Therefore, the commenters (155, 242) said, it is appropriate to specify that the maintenance interval is defined as operating hours.

Similarly, commenter (162) said performance testing should be stipulated based on engine use and hours of operation instead of calendar years. Many of the commenter's (162) engines are only operated seasonally. The number of hours operated varies greatly from year-to year, and testing every 3 years seems burdensome given the variable and infrequent operation for this types of uses.

Response: EPA agrees with the commenters that the rule should clarify that the maintenance and testing frequency are based on operating hours and has made this clarification in the final rule. EPA does not agree that it is burdensome to require testing every three years; this frequency is necessary to show that the engines are continuing to comply with the emission limitations in the rule.

13.2.3 Comment: One commenter (155) expressed that EPA should provide allowances for cases where the maintenance schedule elapses during engine operation, e.g., an emergency could occur requiring an engine to operate for more than 200 hours and with a 200 hour maintenance schedule the commenter assumes that EPA did not intend for the engine to be stopped to complete an oil change. The final rule should include a provision that does not require engine shutdown solely for the purpose of conducting maintenance.

Response: EPA agrees that there may be situations where an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the work/maintenance practice requirements on the schedule required in the final rule. EPA has added a provision in the final rule to indicate that if the stationary engine is operating during an emergency situation, then the maintenance activity can be delayed until the emergency is over. The maintenance should be performed as soon as practicable after the emergency has ended.

13.2.4 Comment: One commenter (96) indicated that it has found several issues with the proposed standards in terms of discrepancies, omissions, conflicts and other things that need correction. Specific comments by the commenter (96) are provided in other sections, but in general the commenter believes the rule is complex to follow. Especially since the proposed rule incorporates elements from previous engine rules, it is difficult to determine what requirements apply and commenters 96 and 132 urges EPA to provide guidance documents that will assist the regulated community in determining which requirements apply to the various types of engines.

Response: EPA has made efforts in the final rule to be as clear as possible on the emission standards and other requirements that apply to existing stationary engines affected by the rule. EPA has also corrected discrepancies that were included in the proposed preamble and rule, which assists in making the final rule requirements as clear as possible. Finally, EPA will be developing guidance and implementation material for the final rule. This material will be available to affected stakeholders through EPA's website and will help the regulated community in determining which requirements apply and demonstrating compliance.

13.2.5 Comment: One commenter (96) noted that in 63.6603 of the proposed rule existing engines at area sources are required to meet operating limitations of Table 2b of the proposed rule, but that Table 2b indicates that it only applies to new and reconstructed sources. EPA should clarify what the intent is, the commenter (96) said. The commenter (96) provided various charts for different engine types where it believes that this clarification needs to be made. The commenter (96) believes that the areas marked "e" in the charts provided in the comment letter should be exempt from operating requirements.

Response: EPA agrees with the commenter that the title to Table 2b of the proposed rule on page 9721 of the Federal Register notice is confusing. EPA has clarified the title of Table 2b in the final rule to clearly indicate the applicability of operating limitations. EPA has also clarified and corrected various other inconsistencies that were included in the proposed rule and believes the final rule reads more easily and clearly.

13.2.6 Comment: Numerous commenters (50, 81, 90, 96, 98, 116, 119, 126, 127, 129, 139, 157, 167, 178, 196, 201, 216, 220, 240) referred to apparently conflicting language in the proposed preamble that appears to require initial performance testing of emergency generators and many of these commenters were opposed to requiring performance testing on emergency engines. Two commenters (96, 126) noted that in the preamble of the proposed rule at page 9711, EPA makes the statement "stationary non-emergency RICE located at major sources that are less than 100 HP, stationary RICE located at area sources that are not subject to numerical emission standards, and all stationary emergency RICE are only subject to compliance requirements in the form of management practices to minimize emission levels." The commenter (96) stated that this language contradicts later text requiring numerical emission standards for formaldehyde for engines below 50 HP, CO standards for diesel and 4SLB engines between 50 and 250 HP, and CO and formaldehyde standards for emergency engines at area sources greater than 500 HP. The commenter (96) thinks the preamble statement is the correct one and recommends that other language that conflicts with the preamble language be revised to clarify that only management practices, not numerical emission standards apply to these sources. One commenter (118) had similar concerns as those expressed by commenter 96. Commenters 188 and 203 also asked that

EPA clarify whether performance testing is required for these units because it is not clear from the rule text and specifically wanted explicit language in the final rule that exempts these units from performance testing.

Commenter 119 received clarification from EPA that this was not the intent of the rule, and commenters 119 and 201 requested that EPA clarify this intent in the final rule.

One commenter (162) said that performance testing of emergency RICE seems onerous, may not provide an accurate emissions profile, and should not be required. Emergency RICE emissions during short periods of readiness testing vary from the emissions profile achieved during longer periods of operation when they are used in emergency situations, the commenter (162) said. Commenters 167 and 196 expressed similar comments as 162.

One commenter (127) stated, for example, that page 9711 section C of the preamble to the proposed rule states that "all stationary emergency RICE are only subject to compliance requirements in the form of management practices to minimize emissions." However, the commenter (127) pointed out that, in Table 2 of the proposal preamble and Table 2d of the proposed rule, stationary emergency RICE with greater than 500 HP is listed as having emissions limits.

One commenter (116) stated that it was not clear from the proposal whether existing emergency RICE less than 500 HP at major sources are required to conduct a performance test to demonstrate compliance with the emission limit. The commenter (116) noted that, in Table 2c of the proposed rule, emergency SI RICE between 50 and 500 HP have an emission limit for formaldehyde of 2 ppmv on a dry basis (ppmvd) or less at 15 percent O_2. The commenter (116) also stated that the preamble to the proposed rule, section D.1 states that "[o]wners and operators of existing stationary non-emergency RICE located at major sources that are less than 100 HP and existing stationary emergency RICE located at major sources do not have to conduct any performance testing," but section 63.6612 of the proposed rule (requirements to conduct and initial performance test) states: "[i]f you own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at major of HAP emissions…you are subject to the requirements of this section." Section 63.6612 and Tables 4 and 5 do not distinguish between emergency RICE and non-emergency RICE. The proposed rule language suggests that if an engine has a numerical emission limit, a compliance test is required. The commenter (116) opined that the preamble language is incorrect, but if they are wrong, they suggested that EPA clarify that EPA does not intend to require emergency engines to be tested in Section 63.6612 and in Tables 4 and 5 of the proposed rule.

One commenter (90) noted there are conflicting statements in the preamble concerning if an initial compliance test is a requirement or not (e.g. on page 9704 of the proposed rule it states that area sources subject to an emission standard must do an initial compliance test while on Page 9705 of the proposed rule it states that operators of emergency RICE are specifically excluded from the need to submit a notification of a compliance test). The commenter (90) stated that in EPA's impacts memo, it is expressly stated that a compliance test for emergency use engines would not be required. The commenter (90) further stated that the most significant issue however is not that a compliance test is required for emergency use engines, but what the emission levels are for existing engines with no add-on controls.

One commenter (176) recommended that EPA remove the testing requirements for emergency engines from the proposed rule. The commenter (176) stated that the preamble to the proposed rule provides that such engines are not subject to any performance testing requirements, but that the rule appears to include such testing requirements (i.e., in proposed

Tables 3, 4 and 6 to 40 CFR part 63, subpart ZZZZ). The commenter (176) supported its recommendation by explaining that emergency engines only operate on a limited basis where periodic testing requirements are not necessary.

One commenter (50) found the emissions testing and reporting requirements applicable to emergency generators to be contradictory. In Section III.E of the preamble (FR Page 9705), and again in part 63.6645, existing stationary emergency RICE are excluded from reporting requirements, including pre-emissions testing and post-emissions testing reporting requirements. However, emergency RICE greater than 500 HP are subject to emission limits and testing for CO per Table 2d, thereby making them subject to pre-testing and post-testing reporting requirements. The commenter requests that the rule be modified to clearly indicate that emergency generators are not subject to emissions testing and reporting requirements.

<u>Response</u>: EPA understands the commenters' points, but EPA disagrees that the statement on page 9711 of the proposed Federal Register notice that the commenters refer to conflicts with later text requiring numerical standards. The statement that the commenters refer to is in section IV.C. of the proposed preamble under the heading "How did EPA determine the compliance requirements." That section of the preamble discusses the compliance requirements and how EPA determined appropriate compliance requirements, and is not a discussion of emission standards. Under the proposed rule, EPA did not require performance testing for stationary non-emergency engines at major sources that are less than 100 HP and stationary engines at area sources that are not subject to any numerical standards and stationary emergency engines. EPA explained why it believed it was appropriate to not require performance testing from these

engines and this decision was not in conflict with the decision to require numerical emission standards from some of these engines at proposal.

The requirement that existing stationary engines at area sources subject to a numerical emission standard would be required to conduct an initial compliance test was intended for non-emergency engines at area sources and EPA does not believe that the requirement conflicts with the following statement that emergency engines are also not being subjected to performance testing. However, EPA sees that it may not have been absolutely clear in the proposed language and tables. Therefore, EPA has made clarifications in the final rule regarding which engines are subject to performance testing and believes this resolves the commenters' concerns on this issue. EPA notes that several of the subcategories that were proposed to be subject to numerical limits have, in the final rule, been made subject to management practices or work practice standards, and thus would not be subject to performance testing.

13.2.7 Comment: One commenter (96) indicated that it is not clear when new engines that are subject to SSM limits are supposed to comply and if these engines are supposed to comply as of the date of the proposed rulemaking, a date that has already passed, that is an impossible and unreasonable requirement the commenter (96) said.

Response: New stationary engines should comply with the new requirements for SSM starting with the effective date of the final rule.

13.2.8 Comment: One commenter (63) noted some inconsistencies or areas in need of clarification in the tables of the proposed rule and said that:

- Table 1a, as drafted, appears to apply emissions limitations to all (existing, new and reconstructed) 4SRB engines of any HP, while Table 1b will apply operational limitations only to 4SRB engines greater than 500 HP at major and area sources of HAP. Should Table 1a also apply only to 4SRB engines greater than 500 HP, as Table 1a in the existing regulation does?
- Table 1a establishes emissions limitations for all 4SRB RICE, whereas Table 2d establishes different emissions limitations for these existing units at area sources. Maybe Table 2.d, item 5 is supposed to be ‘non-emergency 4SRB 50>HP<500’ rather than 4SRB > 50 HP, like Table 2.c?
- There is a conflict between Table 1a and Table 2d items 13 and 14, if the engine is a 4SRB emergency SI RICE.

Response: In response to this comment, EPA clarified that Table 1a applies to 4SRB engines greater than 500 HP located at major sources of HAP.

13.2.9 Comment: One commenter (119) said there is some inconsistency between 40 CFR 63.6625(e) and the referenced Table 2d of the proposed rule. Table 2d of the proposed rule explicitly outlines maintenance requirements for engines, but it does not include the provisions in 40 CFR 63.6625(e) relating to manufacturer or owner/operator maintenance plans. Two commenters (118, 119) said EPA should insert the following clause to 40 CFR 63.6625(e): . . .you must operate and maintain the stationary RICE and aftertreatment control device (if any) according to the maintenance schedule in Table 2d, or you must operate and maintain the stationary RICE. . .

The commenter (119) recommended that a clause be added to Table 2d of the proposed rule indicating that as an alternative to the proposed schedules, owners and operators can maintain the stationary RICE according to the manufacturer's emission-related written instruction or develop their own maintenance plan.

One commenter (104) stated that the text in proposed 40 CFR 63.6625 and 63.6655 appears to allow the owner/operator of the engine to develop a maintenance plan in lieu of the requirements provided in Table 2d (i.e., proposed replacement schedule for oil/filters and spark plugs and inspection of hoses/belts). The commenter (104) requested that EPA clarify this issue in the text.

Response: EPA does not agree with the commenters that there is an inconsistency. The maintenance requirements in Table 2d are not the only emission-related operating and maintenance requirements that are recommended by the engine manufacturer, and the language in §63.6625(e) requires owners and operators to follow those requirements. The maintenance plan should include the maintenance practices from Table 2d as well as other maintenance necessary for the engine.

13.2.10 Comment: One commenter (111) indicated that the proposal states that the pressure drop across the catalyst must be monitored monthly for engines greater than 500 HP at area sources (74 FR 9704) and later states that the pressure drop must be monitored continuously (74 FR 9711).

Response: The commenter is correct that there is an inconsistency in the preamble for the proposed rule. The language on page 9711 should have said that the pressure drop must be measured monthly, rather than continuously.

13.2.11 Comment: One commenter (188) noted that the heading on the middle column of Table 2d to subpart ZZZZ of part 63 of the proposed rule, states, “You must meet the following emission or operating limitations at all times, except during periods of startup, or malfunction.” The commenter (188) believed that this language may possibly be interpreted by overly zealous regulators in the field to require a continuous emissions monitoring system (CEMS) on every engine and noted that installing, maintaining and calibrating CEMS would be another unjustifiable and costly burden; especially when applied to small engines and/or those that are redundant/standby. The commenter (188) continued that the same comment applies regarding the heading at the top of the far right column of Table 2d to subpart ZZZZ of part 63 of the proposed rule, which states “[y]ou must meet the following emission or operating limitations during periods of startup, or malfunction.” The commenter (188) recommended that the EPA clearly state that CEMS is not required, and that EPA consider more realistic standards that operators are able to comply with; specifically, that the wording “at all times” be deleted.

Response: Subpart ZZZZ does not require CEMS. Sources may elect to install CEMS, but they are not required. EPA does not agree that the wording “at all times” should be deleted because those requirements apply at all times except as indicated.

13.2.12 Comment: One commenter (160) requested that EPA clarify the status of the RICE landfill/digester gas engine subcategory for major sources. The commenter (160) stated that some engines that use digester gas with HP greater than 500 are CI engines, which makes it appear that they could fall under the major source RICE subcategory or non-emergency CI greater than 300 HP, with a 4 ppmvd CO or 90 percent CO reduction standard. The commenter (160) requested that EPA clarify that this standard only applies to diesel engines, and not to landfill/digester gas engines.

Response: Engines that burn landfill or digester gas should meet the standards applicable to engines burning landfill or digester gas.

13.2.13 Comment: One commenter (256) expressed that the proposed rule is ambiguous as to how an owner or operator of a stationary emergency RICE is to demonstrate initial and continuous compliance with the proposed numerical emissions limitations. The commenter (256) stated that, if the EPA does not believe it is reasonable to subject stationary emergency RICE to performance testing, then there is no purpose for setting a numerical emissions limitation for any stationary emergency RICE.

Response: The final rule does not contain any numerical emission limitations for emergency SI engines. These engines have to meet work or management practices. This addresses the concerns expressed by the commenter.

13.2.14 Comment: One commenter (76) noted that Table 2 in the preamble identifies management practices of spark plug replacement for various 2SLB, 4SLB, and 4SRB subcategories. The commenter (76) asked EPA to clarify whether these categories include diesel or CI engines, as these engines can be manufactured as 2SLB, 4SLB, and 4SRB engines, but have no spark plugs to replace.

Response: Section 63.6590 of the regulations defines 2SLB, 4SLB, and 4SRB engines as spark ignition engines.

13.2.15 Comment: One commenter (76) asked if the requirements for less than 50 HP in Tables 1 and 2 in the preamble apply to emergency or nonemergency engines.

Response: The requirements in the preamble and rule tables for stationary engines less than 50 HP apply to both emergency and non-emergency engines. The requirements were revised in the final rule.

13.2.16 Comment: One commenter (193) requested that EPA clarify that the category of small engines (i.e., less than 50 HP) at both major and area sources is not a universally applicable category of engines that is separate, distinct, all encompassing, and not otherwise associated with any of the other listed engine sub-categories. The commenter (193) noted that the information presented in the referenced tables that contain compliance related requirements should be clarified to express that all engine types less than 50 HP, are not required to fulfill the stated requirements, or EPA should modify the information in its tables to reflect its stated belief that there will be no CI, or lean burn engines of this size. The commenter (193) suggested EPA limit the applicability of the less than 50 HP classification to only those four cycle, rich burn SI engines it used to establish the MACT floor.

Response: The commenter is not correct. The category of engines less than 50 HP as proposed did include all stationary engines below 50 HP, not just 4SRB SI engines. This final rule only includes SI engines; SI engines under 50 HP have been grouped as one subcategory with SI engines 51-99 HP for the final rule and are subject to work or management standards.

13.2.17 Comment: One commenter (209) said the MACT standard for non-emergency 4SRB engines is off by a factor of 10. The commenter (209) pointed to discrepancies in the proposed rule and the background documents. The proposed formaldehyde standard is 200 ppbvd at 15 percent O_2 during steady state and 2,000 ppbvd at 15 percent O_2 during startup or malfunctions. The January 21, 2009 Alpha-Gamma Technologies memo for the MACT floor determination for RICE less than 500 HP at major sources states that the MACT floor is 2 ppmvd of formaldehyde at 15 percent O_2. To be consistent with this background document the proposed standards during steady state should be 2,000 ppbvd and the proposed standards during startup and malfunctions should be 20 ppmvd, not 2 ppmvd.

Response: The proposed 2 ppmvd standard was the MACT floor for 4SRB engines. The standard in the proposed rule of 200 ppbvd was based on going beyond the MACT floor. The MACT and MACT floor determinations for 4SRB engines were revised in the final rule.

13.2.18 Comment: One commenter (227) said that one of the standards (non-emergency RICE at major sources that are less than 50 HP and emergency RICE at major sources) requires the site to follow the manufacturer's maintenance requirements, or develop a maintenance plan. The commenter (227) asked EPA to clarify whether a maintenance plan, if needed, could be developed for a company or must it be written for each site in a company.

Response: The plan must include the maintenance for each engine at each site.

13.2.19 Comment: One commenter (126) requested that the SI and CI subcategories be defined and clarified. The commenter (126) believes that EPA intended to provide the SI category as a "catch-all" for any spark ignition engines that do not fall into other categories.

Response: There are definitions for SI and CI in §63.6675. The commenter did not provide any information regarding what needs to be clarified for these subcategories, therefore EPA is unable to fully respond to the comment.

13.2.20 Comment: One commenter (157) requested that EPA confirm that Table 3 lists the correct site rating for 4SLB RICE greater than or equal to 250 HP. The commenter (157) stated that the heading for the table implies requirements for engine greater than 500 HP.

Response: Table 3 in the preamble to the proposed rule did include requirements for 4SLB RICE greater than or equal to 250 HP and the commenter is correct that this was not correctly indicated in the title of the Table.

13.2.21 Comment: One commenter (47) wanted to clarify that emergency SI engines less than 50 HP are not subject to any requirements.

Response: Existing emergency SI engines less than 50 HP at major sources are subject to work practices. Existing emergency SI engines less than 50 HP at area sources are subject to management practices.

13.2.22 Comment: One commenter (213) requested clarification on whether landfill and digester gas engines are subject to continuous monitoring of catalyst parameters.

Response: The final rule does not contain any continuous parametric monitoring requirements for landfill or digester gas engines.

13.2.23 Comment: One commenter (175) asked for clarification on whether the requirements in Table 2d of the proposed rule apply to engines manufactured prior to June 12, 2004. The commenter (175) indicated that it thought that under 40 CFR 63.6590(c), the standard for new area source engines manufactured after June 12, 2006, would be equivalent to NSPS, and that the NSPS requires a maintenance plan that is not as prescriptive as the oil, filter and spark plug replacement schedule in the proposed rule for existing engines less than 50 HP.

Response: The proposed Table 2d applies to existing stationary RICE located at an area source of HAP emissions. Section 63.6590 of subpart ZZZZ states that a stationary RICE located at an area source of HAP emissions is considered existing if construction of the engine commenced before June 12, 2006.

13.3 Errors

13.3.1 Comment: Several commenters (63, 96, 99, 116, 146, 155, 159, 193, 224, 227, 242) noted errors in the use of mathematical symbols in the proposed rule preamble and rule tables and provided corrections to the tables. The commenters (155, 242) indicated that the "≥" symbol should be changed to "≤" in several cases, e.g., "50≥HP≤249" should be changed to "50≤HP≤249." Commenter 99 said that for example 50>HP<500 should be changed to 50<HP<500.

Response: The commenters are correct that some of the mathematical symbols in the proposed rule were incorrect. EPA has corrected the typos concerning the use of the ≤, ≥, <, and > signs in the final rule.

13.3.2 Comment: One commenter (242) stated that in the EPA Fact Sheet and February 27 News Release EPA said that the rule sets emission standards for engines that "have a site rating of greater than 500 HP, are located at major sources of air toxics emissions, and were constructed or reconstructed before December 19, 2002." The commenter (242) said that the referenced engines are the engines covered by the 2004 RICE NESHAP, where existing rich burn engines where the only existing sources that required add-on controls. The proposed rule sets new requirements for existing diesel engines, but not existing natural gas engines greater than 500 HP at major sources. So it appears the EPA Fact Sheet and New Release contain errors, according to the commenter (242). It should be clarified in these publications that the proposed rule sets standards for existing diesel engines greater than 500 HP at major sources and SSM limits for natural gas rich burn engines greater than 500 HP at major sources.

Response: EPA does not necessarily agree with the commenter that the February 25, 2009 Fact Sheet available at http://www.epa.gov/ttn/oarpg/t3/fact_sheets/rice_neshap_prop_fs_022509.pdf was inaccurate. The applicability dates that distinguish stationary existing engines from stationary new engines are specified in 40 CFR 63.6590(a). Per 63.6590(a)(1)(i), stationary engines greater than 500 HP located at major sources of HAP emissions are considered existing if construction or reconstruction is commenced prior to December 19, 2002. This is consistent with bullet one, sub-bullet three, under the title "Action" in the February 25, 2009 Fact Sheet, which was intended for the existing stationary diesel engines greater than 500 HP located at major sources that EPA is addressing in this rulemaking. EPA could have been clearer in this bullet by stating that new emission standards only apply to existing diesel engines greater than 500 HP at major sources, and not to natural gas engines, as well as specifying the applicability of the SSM limits that were being co-proposed. For the final rule, EPA has made sure that the Fact Sheet and other material are clear.

13.3.3 Comment: One commenter (96) said that if EPA keeps standards for engines less than 50 HP there needs to be a separate subcategory for emergency engines.

Response: The commenter did not provide any information to justify the need for a separate subcategory for emergency engines smaller than 50 HP. In any case, both emergency and non-emergency engines smaller than 50 HP are subject to either work or management practices under the final rule. The practices for emergency engines are slightly different from those for non-emergency engines.

13.3.4 Comment: One commenter (186) noted that there is a typographical error on page 97111 of the preamble where it says "of three years" instead of "or three years."

Response: The commenter is correct.

13.3.5 Comment: Two commenters (172, 178) said that §63.6603 of the proposed rule states that existing stationary RICE located at an area source must comply with the operating limitations in Tables 1b and 2b of the rule. However, the operating limitations in Table 2b of the proposed rule appear to only apply to units at major sources. The EPA should remove the reference to Table 2b of the proposed rule in section 63.6603 of the proposal.

Response: It is not true that Table 2b of the proposed rule only applies to stationary engines at major sources. Table 2b of the proposed rule also applied to area sources and EPA disagrees that the reference to Table 2b should be removed from section 63.6603.

13.4 Discrepancies

13.4.1 Comment: One commenter (193) noted that the §63.6640 requirement that precludes maintenance checks and readiness testing, unless it is recommended by governmental authorities, engine manufacturers, or insurance companies, conflicts with the proposed requirement §63.6625. The problematic wording of §63.6640(f) establishes a prohibition to the operation of an emergency RICE for maintenance and readiness testing purposes unless the owner or operator possesses a recommendation from one of the listed entities. The commenter (0193) believes that if EPA is to require owners and operators to develop plans for the maintenance and operation of emergency engines, in the absence of recommended practices from "Federal, State or local government, the manufacturer, the vendor, or the insurance company," it should not construct accompanying regulatory requirements that do not include the owner or operator developed maintenance and operation plans as valid criteria for authorizing maintenance and readiness testing activities.

Response: EPA does not agree with the commenter that §63.6640(f) should include maintenance checks developed solely by the owner/operator and having no input whatsoever from one of the entities listed in §63.6640(f).

13.4.2 Comment: One commenter (178) noted discrepancies in the applicability of the rule as presented in the text and tables. The commenter (178) states that in several places the tables do not support the text concerning applicability of the rule to specific RlCE unit types. There are numerous inconsistencies between the requirements for large stationary engines and smaller ones, and between those located at major sources and those at area sources. Although there are many more examples, the following are instances of inconsistency:

- EPA should confirm that, in the descriptions to Table 2a and 2b of the proposed rule, the phrase “located at a Major Source . .” applies to all the categories of RlCE contained in those descriptions and not just the last category of RlCE in the titles. In Table 6, Item 11 of the proposed rule, EPA should confirm that the phrase "located at major sources" applies to the universe of existing stationary RlCE >500 HP rather than just to 4SRB >500 HP.
- Assuming that large engines have a larger potential impact, and that requirements proposed for small engines are not applicable to such larger engines, it is not reasonable to impose such requirements on small engines. For example, the requirements for an emergency stationary RlCE >500 HP does not have a 100 hr run-time restriction, yet smaller RlCE do. The commenter (178) suggested this requirement be removed for smaller engines.

Response: The commenter is correct that the phrase “located at a Major Source . . .” applies to all of the RICE listed in the titles of Tables 2a and 2b. The run-time requirements for emergency stationary RICE greater than 500 HP at a major source were promulgated as part of the 2004 RICE NESHAP and are not the subject of this rulemaking. EPA does not agree with the commenter that the 100 hour run-time restriction on maintenance and testing operation should be removed for stationary RICE smaller than 500 HP and stationary RICE located at area sources. Having a different requirement for large engines at major sources is not a sufficient justification for removing the 100 hour limit.

13.5 Other

13.5.1 Comment: A few commenters (103, 111, 150, 155, 224, 225) noted other regulations allows a 200 hour burn-in period for engines with catalysts that are new, reconstructed, or rebuilt. The commenters (155, 224) believe this allowance should also be provided for commissioning of an engine after major maintenance. Major maintenance may not always be considered a rebuild, however, an engine burn-in period would still be necessary to ensure that catalyst damage does not occur, the commenter (155) said. In addition, the commenter (155) also believes that existing engines that are retrofitted should be given a burn-in period. Again, the retrofit may not constitute a modification, reconstruction or rebuild, but necessary upgrades that require burn-in time to prevent catalyst damage may be appropriate, according to the commenter (155). The commenter (155) recommended that EPA revise the current language in §63.6640(d) to read as follows (the commenter's (155) additions are shown in **bold**):

"For new, reconstructed, and rebuilt stationary RICE, **and stationary RICE that have undergone maintenance that could result in catalyst damage upon startup or equipment changes to comply with the requirements of this subpart,** deviations from the emission or operating limitations that occur during the first 200 hours of operation from engine startup (engine burn-in period) are not violations."

One commenter (103) stated that EPA should incorporate a provision for a commissioning period into the rule whereby the RICE is allowed to operate prior to installation of catalytic elements in order to prevent damage to the catalytic elements during engine break in. The commenter (103) attributed the following quotation to EPA but gave no citation:

"EPA understands the "commissioning period" to be the final phase of the construction process. Activities conducted during the commissioning period include: checking all mechanical, electrical, and control systems for the RICE and all related equipment; and confirming the performance measures specified in the purchase agreement. EPA understands that the commissioning period may take up to two weeks to complete. EPA does not consider the "commissioning period" as the initial startup of the unit as long as the RICE is not being used for its intended purpose or any other beneficial use at the facility during this time. Site-specific determinations of initial startup may be required for facilities that operate in a commissioning mode for excessive periods of time."

The commenter (103) indicated that in the natural gas compression industry, it is extremely rare that an engine can be operated under load to facilitate the commissioning without being used for its intended purpose. The commenter (103) believes that the requirement for a site-specific waiver is not an appropriate solution when it is a normal requirement, and asserted that the waiver should be written into the rule.

Two other commenters (111, 225) similarly noted that installation of the catalyst during the break-in period of a new or overhauled unit (typically 50-100 hours) is likely to result in catalyst malfunction due to fouling, masking, or poisoning of the catalyst element.

Another commenter (150) urged EPA to address the potential to generate a deviation during an SSM event consistent with the burn-in provisions set forth in 40 CFR 63.6640(d), which provides that "deviations from the emission or operating limits that occur during the first 200 hours of operation from engine startup (engine burn-in period) are not violations." This commenter (150) added that if the rules are promulgated not to allow burn-in time, costs would be increased due to the need to wash or replace catalyst which would be masked if left on during this period to meet emissions requirements.

Response: EPA does not agree that it should provide a burn-in period in subpart ZZZZ for retrofitted engines or engines that have been subject to maintenance short of a rebuild. EPA does not have any information to indicate that retrofitted engines or engines subject to maintenance would not be able to meet the requirements of subpart ZZZZ immediately after the retrofit or maintenance, and therefore does not agree that such an exemption from the rule requirements should be provided. EPA notes that the pre-existing burn-in period for new, reconstructed and rebuilt engines has not been revised. Regarding the comments that stated that RICE should be allowed to operate prior to installation of catalyst elements, EPA does not agree that this is necessary because this rulemaking affects existing engines that have already been operated. In addition, sources have three years to comply with this rulemaking so they have sufficient time to operate their engines prior to catalyst installation and also have sufficient time to operate their engine following catalyst installation prior to the compliance date of the rule.

13.5.2 Comment: One commenter (242) said that EPA's failure to issue a proposed rule amendment with strikethrough and additions creates additional burden on the community and a rule with strikethrough and addition text would have eliminated the need to review and compare the previous rule text. The commenter (242) urged EPA to use this approach in future rule revisions to minimize rule interpretation issues and intent, inconsistencies, conflicts and unnecessary regulatory uncertainties.

Response: EPA agrees with the commenter that a redline/strikeout copy of the rule would be useful in reviewing the amendments. However EPA does not agree that the failure to do so creates an undue burden on the community.