January 11, 2002

Comments of the Engine Manufacturers Association On The

MODEL REGULATION FOR THE OUTPUT OF SPECIFIED AIR EMISSIONS FROM SMALLER-SCALE ELECTRIC GENERATION RESOURCES, PUBLIC REVIEW DRAFT, NOVEMBER 2001.

The Engine Manufacturers Association (EMA) hereby submits its comments on the draft "Model Regulation for the Output of Specified Air Emissions from Smaller-Scale Electric Generation Resources"(hereinafter, the "Model Rule") as developed by the Regulatory Assistance Project (RAP). EMA is the trade association that represents the world's leading manufacturers of reciprocating internal combustion engines, including spark-ignited and compression-ignition (diesel) engines that are frequently used in smaller-scale electric generating units. The specific EMA members that manufacture the types of generators and distributed generation equipment potentially covered by the Model Rule include Caterpillar, Cummins/Onan, Deere & Company, Detroit Diesel Corporation, Deutz, Volkswagen, and Waukesha Engine.

EMA and its member companies strongly support RAP's initiative to develop a reasonable and cost effective Model Rule intended for state adoption. Such a model will provide a template for adoption of uniform standards among the various state regulatory authorities and thus, if implemented across the country, will minimize costs to industry and the public by preventing the development of a patchwork quilt of discordant and conflicting standards. Moreover, EMA supports the stated objectives of the RAP process to:

1) encourage the deployment of Distributed Generation (DG) resources where cost effective and environmentally beneficial; and,
2) develop a national model through a collaborative approach among state environmental and utility regulators and key stakeholders.

Although supportive of the overall concept and stated goals of the RAP model, EMA believes that the draft document can and should be improved to better achieve the above goals. Accordingly, EMA provides the following comments on the process used to develop the draft Model Rule, the manner in which the draft rule fails to achieve its stated objectives, and the necessary revisions that will need to be made to the Model Rule.

- **The RAP process has not achieved its goal of developing a Model Rule through a collaborative effort with major stakeholders.**

EMA's fundamental concern is that the Working Group that developed the draft model rule did not include adequate representation from several stakeholders. The Working Group consisted of 21 representatives of state regulatory agencies; 13 representatives of federal agencies, environmental groups, or academic/foundations; and just 3 representatives from manufacturers involved in only a small segment of the entire DG industry. Significantly, there was no representation from the electric utility industry, the natural gas or petroleum industry, fuel cell or wind energy manufacturers, the major manufacturers of generators or engines, or users of distributed generation systems.

The absence of representation from such significant segments of the regulated community ignores a significant source of expertise, creates a basic question of fairness, and certainly does not meet the stated goal of "a collaborative approach." The lack of industry representation and input on the draft Model Rule must be resolved if the ongoing process is to result in an acceptable state model rule. Accordingly, EMA again urges that its representatives be allowed to participate in the Working Group. Barring EMA and other stakeholders participation in the Working Group can only hinder, not help, the pending process to develop a sound and cost-effective Model Rule.

- **The Model Rule should encourage the rapid development of distributed generation resources as a means to improve electrical capacity, reliability, efficiency, and overall air quality.**

A model state rule intended to cover DG issues should not only set specific emissions standards, but should also encourage the use of clean, efficient, and economical DG systems. Although the Model Rule attempts to address air quality needs, it fails to provide clear direction, incentives, or efficient processes to encourage the deployment of DG resources. The Model Rule needs to address other issues that currently discourage the introduction of new technologies or deployment of existing technology. Items that need to be better addressed include streamlined regulatory approvals, standardized approaches to take into account the differences in generation efficiencies and fuel-use of the various technologies (including combined heat and power applications as well as line loss issues), exit fees, and certification/permit by rule provisions.

In addition, a primary goal of the model rule should be to ensure that its implementation will reduce emissions associated with current electrical generation facilities and improve the ambient air quality of the state at the lowest cost. Such results will be realized as long as new DG sources are cleaner than the existing generation sources that they will displace. The proper comparison benchmark, therefore, should not be to the cleanest new power plant that could be built (i.e., new combined cycle gaseous turbines), but instead to the existing peaking plants that have to be fired up to meet increased loads that could be handled by new DG sources. The draft Model Rule needs to incorporate this concept into the next revision.

- **The provisions and standards of the model regulation must ensure that consumers have access to a wide array of available technologies in order to foster a competitive marketplace.**

Competition drives technological improvement. Whether it is in energy efficiency, costs, or improvements in environmental controls, a competitive marketplace provides incentives to make better and less costly products. It is important that the Model Rule be crafted so that it does not reduce competition by dictating the use of certain technologies. Setting overly-stringent emission standards may inadvertently discourage or ban certain technologies and will have the overall effect of discouraging DG while increasing its cost.

Although it may not be the intended result, the practical outcome of the proposed emission standards of the draft Model Rule will be to severely limit, if not totally eliminate, several currently available technologies, including the use of reciprocating internal combustion (IC) diesel and gaseous-fueled engines. Although new gaseous-fueled engines with Selective Catalytic Reduction (SCR) may be able to meet the initial 2003 NOx and PM standards, the combination of strict NOx, PM, CO, and CO_2 standards proposed for later years will make it virtually impossible for reciprocating IC engines and other technologies to participate in the distributed generation market. Elimination of entire segments of DG technology will needlessly force customers to fewer, and perhaps, less efficient and more expensive technologies.

Indeed, the extremely stringent suite of emissions standards proposed in the model rule is problematic from a number of perspectives. First, the stringent emissions standards will require even "clean" technologies such as natural gas-fueled generators to add on expensive aftertreatment devices. This significantly increases the initial cost of the equipment and installation, reduces efficiency, and makes it more difficult to justify the addition of DG resources. Indeed, in order for smaller gaseous-fueled engines to meet the proposed 2006 standard for peaking plants they will have to add advanced aftertreatment devices such as premium catalysts or selective catalytic reduction "SCR" systems. The cost of such control equipment often is substantially more than the generator itself.

Second, the increasingly restrictive emissions standards proposed for 2009 will actually discourage technology development and emissions improvements. The proposed 2009 standards for peaking and baseload applications are so stringent that reciprocating IC engine manufacturers do not currently foresee any feasible or cost-effective technology that will allow them to achieve those standards. In fact, there are no currently available data to suggest that any aftertreatment technologies could ever concurrently attain the NO, CO, CO_2 and PM standards that the Model Rule envisions for 2009. Thus, adoption of those standards will effectively ban all petroleum and gaseous-fueled reciprocating IC engine technologies for DG applications.

Third, the consequence of setting standards that can only be met by new, large combined cycle power plants is to eliminate many viable DG technologies and limit choices to a small number of options with no justification or demonstration of significant air quality improvements. Indeed, current (and expected) emissions from DG sources comprise only a very small percentage of a state's overall emissions inventory, and potential future emissions will not change this fact. Thus, the RAP proposal will, without justification, eliminate electrical generation options that in many cases are cleaner than the fossil-fueled power plants that are currently in operation. The Working Group, with appropriate input from manufacturers, needs to revise the draft rule to incorporate more reasonable and achievable emissions standards.

- **The Model Rule should include alternative emissions standards based on a state's air quality needs and facility requirements.**

As previously indicated, EMA supports developing a Model Rule that can be adopted by all of the states to control emissions from smaller-scale electric generation resources. Ideally, a single model rule and uniform national standards would be applied to all states. However, ambient air quality and the need to reduce emissions vary considerably among the states and localities, and EMA believes that it is necessary to develop a Model Rule with sufficient flexibility to recognize these inherent differences.

Although it is appropriate for all states to establish reasonable and achievable emissions standards for DG sources, California or Texas have very different air quality and economic conditions compared to North Dakota or Maine. It makes no sense to ask North Dakota to adopt the same level of emissions standards as California since the level of control needed to achieve attainment and healthy air in California is inherently much greater**.** Any proposed emissions standards logically should be connected to an identified need to reduce emissions within a state.

Thus, although the Model Rule does currently segment the DG market and proposes different emissions standards for emergency backup, peaking, and baseload generators, EMA recommends that additional flexibilities be added.

First, the Model Rule should distinguish between attainment and non-attainment areas. Many states and regions throughout the country are currently in attainment for the criteria pollutants, and there is no need from an emissions inventory, environmental, or public health standpoint to require DG sources within those attainment areas to be subject to the same standards as sources sited in non-attainment areas. EMA recommends that the Model Rule recognize that certain states may require more stringent emission controls in order to achieve attainment. To that end, that the Model Rule should include two alternative standards that states can adopt – one for attainment areas and one for non-attainment areas. Utilizing such an approach (which Texas has adopted) will better serve each particular state's needs and will allow for far more cost-effective emissions control requirements.

Second, customer's needs for power generation vary greatly, and DG facilities range in size from tens of kilowatts to several megawatts. In general, different technologies are better suited to certain loads, e.g., reciprocating IC engines and microturbines are appropriate for small loads while large gas turbines may be needed to supply power to large facilities. Because of technology options and economies of scale, the practicality and feasibility of meeting a defined emissions standard also varies with size; larger facilities generally being better suited to achieving lower emissions levels for a given unit of power output.

Consequently, the emissions standards developed in the Model Rule must recognize these differences in technology availability and economies of scale. Several size classes of facilities and applications should be recognized, and corresponding emissions standards developed appropriate to the size of the application. Under the proposed standards, since there is no consideration of the size of the DG unit, smaller distributed generation technologies and applications effectively will be banned, thus eliminating the opportunity to apply DG to those applications.

- **The draft Model Rule can be improved by increasing its flexibility to address the varied environmental and economic conditions encountered by states and by encouraging a wide variety of DG alternatives to replace current generating capacity that is less efficient or less environmentally friendly.**

EMA believes that the draft rule is a good first step but can be greatly improved to serve as an appropriate national model. The "one size fits all" approach and the very stringent emissions standards for NOx, CO, PM, and CO_2 proposed in the Model Rule do not recognize the diversity of the states and combine to unnecessarily eliminate many existing DG technologies. The unintended consequence of the draft standards is, therefore to discourage the continued expansion of DG, and to eliminate many feasible and cost effective technologies that have lower emissions than existing power sources. EMA stands ready to offer its expertise to work with RAP to develop a suitable model rule and set of standards to achieve the objectives of the Working Group.

In addition to the overarching comments discussed above, EMA has the following specific comments and recommendations on the draft model rule.

Page 6, Section II Definitions, (D) Emergency

The definition of "Emergency" needs to be revised to include events other than a power grid failure. "Emergency" would also need to include power failures, local equipment failures and public service emergencies such as flood, fire, and natural disasters and any condition designated by the Independent System Operator (ISO) as an emergency including an actual or imminent voltage reduction or grid failure.

Page 6, Section II Definitions, (E) Emergency Generators

The definition of "Emergency Generator" also needs to be revised. Emergency generators are a unique power source designed to protect health and safety and prevent significant economic losses when power fails. Such generators are normally exercised to test their readiness and system integrity on a regular basis. In addition, they must be available to operate during any emergency situation regardless of the length of that emergency.

A limit on the length of time should apply only to non-emergency maintenance and testing, and such non-emergency operations should be capped at 200 hours per year.

Accordingly, EMA submits the following definition for inclusion in the rule:

Emergency Generator. Any stationary generator that is utilized only:

1) **Under emergency conditions as defined above, and**
2) **during non-emergency testing or maintenance of the engine, provided that such testing or maintenance shall not exceed 200 hours of operation per year.**

Emergency generators shall not be operated in conjunction with any utility voluntary demand-reduction program or any other interruptible power supply agreement.

Page 7, Section II Definitions, Manufacturer

The definition of Manufacturer needs to be expanded to include the manufacturers of the power system driving the generator.

Page 7, Section II Definitions, Peaking Generator

As defined, a peaking generator includes all generators operating less than 700 hours per year. This would include emergency generators. The definition needs to be revised to exclude emergency generators.

Page 7, Section II Definitions, Mobile Diesel Fuel

Currently, the EPA limits the sulfur content of on-highway diesel fuel to 500ppm. Beginning in 2006, EPA will require the phase-in of on-highway diesel fuel having a maximum sulfur content of 15 ppm. EPA does not currently control the level of sulfur in diesel fuel used in offroad equipment, which is also considered a mobile fuel. To avoid confusion, EMA recommends that the model require diesel stationary generators to use fuel complying with the current EPA requirements for on-highway diesel fuel.

Accordingly, we believe the definition of "Mobile Diesel Fuel" be replaced with a definition for low sulfur diesel fuel" as follows:

Low Sulfur Diesel Fuel – Diesel fuel that meets current EPA sulfur limits for on-highway diesel engines.

Page 7, Section III Applicability, (A)

The term "non-mobile" should be replaced with the term "stationary" to conform to standard regulatory language regarding emissions sources. In addition, and to assure conformance with controlling federal preemption statutes and regulations, "stationary" should be defined as follows:

"Stationary" generator means a generator that is permanently attached to a foundation, or that remains at any single site at a building, structure, facility or installation for more than 12 consecutive months or a shorter period of time for a generator located at a seasonal source. A generator located at a seasonal source is a generator that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains at a single site at a building, structure, facility or installation on a permanent basis (at least two years) and that operates at that single site for three or months each year. A generator that otherwise meets the definition of "nonroad engine" under 40 CFR 85.1602 is not subject to the requirements of this rule.

Page 7, Section IV Emissions

EMA agrees that the Model Rule should address NOx, CO, and PM but believes the CO_2 should not be included. There is no current federal CO_2 ambient air quality standard, and CO_2 is not a regulated emission for other engine applications. In addition, CO_2 emissions are essentially a measure of fuel efficiency. Manufactures already have sufficient incentives to provide the greatest fuel efficiency to their customers. Regulating CO_2 emissions is therefore unnecessary. On the other hand, establishing a CO_2 standard will limit available technology or cause manufactures to have to adjust combustion parameters to emit higher amounts of regulated emissions. Accordingly, the CO_2 standards simply should be removed from the Model Rule.

Also, while it is appropriate to control PM emissions, it is not appropriate to list and set a standard for PM-10. PM-10 is an ambient air quality measurement but does not coincide with the engine-out standards developed by US EPA or CARB. PM standards and measurements for certification are based on specific PM measurement methods that do not separate or distinguish PM -10. It is more appropriate to set standards for PM and then reference the appropriate test and certification methods to measure compliance with the standard.

The draft Model Rule proposes to set increasingly stringent standards every three years beginning in 2003 – less than one year from now. Although EMA supports the concept

of setting more stringent emissions standards for future implementation, the standards and phase-in periods must be reasonable and take into consideration the necessary lead time required to design, manufacture, and market new equipment. The proposed schedule does not address these needs and should be revised.

The first compliance date for new standards is 2003. Engine and equipment manufacturers cannot produce and certify equipment, even if they started today, in time to provide users sufficient lead time to select, order, and receive new equipment by January 1, 2003. The initial implementation date needs to be delayed until at least two years following initial adoption by a state.

Similarly, it is very costly for manufacturers to design, engineer, re-tool, certify and manufacture equipment to meet new standards. Several years of sales of a particular equipment model are needed before a new product can even recoup development costs. The proposed schedule that changes emissions standards every three years does not provide an adequate period of product stability to allow manufacturers to receive an adequate return on investment, and thus will serve to discourage new product development. Federal law provides at least three years of stability between effective dates for new on-highway emission standards (Clean Air Act Section 202(a)(3)(C)). Because of substantially lower sales volumes, a longer period of stability is required for stationary electrical generators.

In sum, the proposed Model Rule needs to be revisited to provide adequate lead time and stability periods between changes in emissions standards.

Page 7, Section IV Emissions, (A) Emergency Generators

The annual operating time for emergency generators is too low and may conflict with state and local requirements that mandate periodic maintenance and testing to assure proper performance. As noted above, EMA suggests that the operating hours for maintenance and testing be capped at 200 hours.

There should be no limit on the maximum hours of operation under actual emergency conditions. If a disaster occurs, or an operator faces multiple power outages throughout the year, the regulation should not prohibit the operator from using the emergency generator to maintain essential services.

Page 8, Section IV Emissions, Emergency Generator Standards

Engine manufacturers do not make specific compression ignition (CI) engines that are used only in stationary applications. Rather, an engine series is designed, built and certified to US EPA nonroad engine standards, and any individual engine may be designated for use in mobile equipment or stationary generator applications. Since most emergency generator units are powered by diesel CI engines, the proposed emissions standards for emergency generators should simply follow US EPA's nonroad engine standards. The table in the draft rule should therefore be replaced with a reference to the

US EPA nonroad engine standards. (See attached copy of current standards and phase-in dates).

Currently, nonroad engine standards are phased in according to engine horsepower rating, so that different categories have different standards. These standards are generally more stringent than those proposed in the Model Rule. EPA is currently evaluating the need for additional standards for implementation beyond 2006. These EPA standards are generally more stringent than those proposed in the Model Rule.

In addition, and in order to avoid unnecessary administrative effort, EMA proposes that any engine that has been certified to meet the currently applicable EPA nonroad emissions standards (through EPA Tier 3) be automatically approved for use in emergency generators under the Model Rule. To accommodate engines that are not certified under EPA nonroad rule, alternate standards should be set that are equivalent to EPA nonroad standards when used with an emergency generator having a 90% efficiency.

Page 8, Section 4 Emissions, (B) Peaking and Baseload Generators.

As noted above, the proposed standards for both peaking and baseload generators proposed in the Model Rule are not technically feasible and would eliminate many technologies including gaseous-fueled reciprocating IC engines. EMA knows of no foreseeable control technology that can be applied to reciprocating IC engines to cost-effectively meet the proposed Phase 2 and Phase 3 standards of the rule. Indeed, the stringent Phase 3 combination of standards proposed for NOx, CO, and PM will not only require gaseous-fueled engines with very advanced catalyst systems to control NOx, but also will require catalytic oxidation and PM filters to meet the proposed PM and CO standards.

The most advanced lean-burn spark-ignited engines can currently achieve engine-out NOx emissions as low as 2.3 lbs/MWh. Thus, to meet even the Phase 1 requirements of the Model Rule will require the use of expensive aftertreatment devices including SCR. The South Coast Air Quality Management District is establishing BACT in 2003 with a NOx limit of 0.5 lbs/MW-hr, which is the level of emissions that is technologically feasible for current emissions control technologies and should be considered the outer limit of what will be available in practice. Reaching that level on gaseous-fueled engines will require the use of SCR or premium three-way non-selective catalyst systems. These systems are expensive (often more costly than the engine itself) and may make the use of such engines cost-prohibitive.

Looking at the proposed 2009 standards, manufacturers know of no available or developing technology that will be able to achieve the NOx standard of 0.30 lbs/MW-hr. Similarly, reducing CO levels from reciprocating IC engines will require additional catalytic aftertreatment devices to achieve that standard. Finally, the PM limit is set beyond the level of consistent measurement and certification capability and is well below

the equivalent 0.03 lbs/ MW-hr that EPA and CARB believe is achievable for mobile sources using catalyzed PM traps.

EMA therefore believes that more reasonable and achievable standards should be adopted for both peaking and prime power operations and suggests that the following standards be incorporated into the Model Rule for attainment areas.

	PHASE 1	**PHASE 2**
<700 HRS/YR		
NOX (lbs/MW-hr)	12.0	7.7
PM(lbs/MW-hr)	0.2	0.2
CO(lbs/MW-hr	11.0	8.0
>700 HRS/YR		
NOX(lbs/MW-hr)	3.1	1.9
PM(lbs/MW-hr)	0.15	0.15
CO(lbs/MW-hr)	8.0	6.0

EMA believes that setting standards beyond Phase 2 is not appropriate at this time. CO_2 should not be regulated, as previously discussed. In addition and following our earlier recommendation that the Model Rule should establish separate standards for nonattainment areas, EMA will work with the Working Group to develop such standards.

Page 9, Section (IV) (D) Technology Review

EMA agrees that a technology review should be conducted. However, each local or state agency should not conduct their own technology review as implied in the Model Rule since this would likely result in different conclusions among the various jurisdictions, and so different emissions standards. Such a result will essentially negate the advantages of the model regulation and uniform standards.

EMA believes that a national coordinated review should be conducted. The provisions for individual local or state reviews should be deleted.

Page 9, Section V (A) Emissions Certification

The Emissions Certification process needs to be streamlined to minimize unnecessary costs and administrative burden to manufacturers. National certification procedures and processes should be used wherever possible, and manufacturers should not have to bear the burden of different labeling and certification procedures for each state. To that end, states should accept certification documentation by the US EPA or another designated national body. No specific labeling of the equipment itself should be required. For IC engines, certification using the EPA D-2 engine dynamometer testing should be accepted.

Regarding the proposed durability period, 15,000 hours is an unreasonable length of time. In fact, given that the standards, as proposed, would take effect in 2003, it would take until September 2004 to test engines for 15,000 hours of operation even if the Model Rule was adopted today. In addition, each technology and manufacturer's practices are different, and while there should be a warranty and durability certification time period, this should be determined by each manufacturer. EMA welcomes the opportunity to work with the Working Group to develop a certification procedure to ensure that emissions levels are reasonably maintained throughout the reasonable useful operating life of the system.

Page 10, Section VI Performance Incentives

The Model Rule should include clearly developed procedures and standardized methods that allow for emissions allowances from DG sources related to energy efficiency and line losses. When considering the standards and certification, adjustments need to be made to ensure that the various technologies are being compared on an equal basis. Emissions improvements need to be balanced against energy efficiency and the conservation of natural resources including provisions that deal with the issues of line losses, combined heat and power efficiencies, and other energy efficiency measures.

Page 11, Section VII Fuel Requirements (A)

This section should be revised to reflect the recommended definition for low sulfur diesel fuel.

Finally, the proposed fuel consumption monitoring does not appear to provide any meaningful information regarding emissions and should be removed. Fuel consumption monitoring is burdensome for compression ignition engines with recirculating fuels systems.

In conclusion, EMA appreciates this opportunity to comment on the draft Model Rule, and we again urge you allow EMA to participate fully in the Working Group process going forward.