Comments on CARB's In-Use Off-road Diesel Vehicle Rule

1. Cost Assessment

CARB needs to (1) calculate the cost of the regulation to the "average" small, medium and large fleet and (2) confirm the ability of such operators to absorb those costs.

I am concerned that proposed regulation will substantially increase my debt burden and affect my ability to stay in business and keep people employed. The construction industry is also highly cyclical and a higher debt burden increases risk and will make it more difficult for average companies like mine to weather economic down cycles.

Such an assessment needs to include administrative costs, such as labor required to assess and develop compliance plans and comply with record-keeping and reporting requirements; and hardware costs, including hardware, installation labor, maintenance and replacement.

Finally, I am also concerned that the regulation is so complex that it would take an army of CARB enforcement/auditing staff to verify compliance. The cost of enforcing this regulation is another cost element that needs to be quantified.

2. Complexity

The regulation is just far too complex. I have tried to take my fleet through the regulation year by year to try to determine costs and best path options. There are just too many variables and too much uncertainty. To effectively plan, I have to perform technology and cost assessments on every single piece of equipment, guess at the availability and costs of technologies in the future, guess at future economic conditions, while accounting for the interrelated nature of NOx and PM controls and the effect of exemptions, which again are pollutant and technology specific. A year or two into the future it becomes hopelessly complex and uncertain. I could burn a huge amount of my time trying to make this work and wind up making mistakes resulting in noncompliance or looking at unexpected, substantial and fairly immediate cost burdens.

I also find it odd that CARB would apply the most complex of it diesel engine risk reduction rules to most complex of the diesel engine categories. That is, even large waste hauler or transit fleets will typically have just a handful of different types of equipment. Calculating emission data and performing technology assessments is therefore far simpler than for the average medium and large off-road fleet, which will typically have a much greater range of engine HP and different types of equipment.

It is difficult enough simply trying to stay in business and keep people employed in California. A regulation such as this one has to be simple and provide reasonable burdens. CARB really needs to explore options to the proposed approach.

3. PM Control Requirements

The proposed regulation makes an admirable attempt to provide flexibility via a highly complex interrelated set of PM and NOx control requirements. Unfortunately, a hard, cold look reveals minimal real flexibility.

The bottom line is that in order t comply with the proposed 2020 PM emission targets, equipment operating that year would have to be almost entirely Tier 2/3s with Level 3 filters, and/or Tier 4 engines. It is true that I could meet an interim target via the BACT route by retrofitting a Tier 0 or 1 machine with a Level 2/3 filter, but that would simply postpone the date that equipment would have to be replaced or repowered by a few years. With Level 3 devices currently at ~$60/hr (for ~175-600 hp) these are not trivial costs.

Given the complexity, burden and costs; and limited real flexibility, a better approach seems fairly clear:

- Rather than requiring medium and large fleet operators go through the labor intensive rigmarole of annual fleet average requirements, BACT, and so forth, when there really is little flexibility, simply require that 20% of Tier 0, 1, 2, or 3 engines be retrofitted (where feasible) with the highest certified device (must be Level 2 or 3), by 2010, 50% by 2015 and 100% by 2020. Operators would have to start with Tier 0s, then 1s and then Tier 2/3s. Any Tier 0 or 1 engines where Level 3 devices are still infeasible by 2020 would have to be retired. For small fleets I would propose the same basic approach with extended compliance deadlines.

This change alone would allow the state to realize the vast majority of what it seeks (substantial reduction in directly emitted toxic emissions from diesel engines) with a much simpler regulation and at substantially lower costs and administrative burdens. Other essential changes I would recommend in concert with the above include:

- Where a fleet average target is not met, the proposed regulation requires retrofit where "feasible." But feasibility is not clearly defined. With enough time and money almost anything can be done. Some type of cost cap on a $/hp basis should be included that defines feasible/infeasible and accounts for the ability of companies to absorb those costs. I note that the only device currently certified costs around $60/hp, and this is just for install costs. For an average fleet of 20,000 hp that equates to $1,200,000 in higher costs for retrofits alone. At 20% of the fleet per year, that gives annual costs of $240,000. Costs like this will be difficult for companies to absorb and at a minimum reduce the rate of fleet turnover to newer engines.
- Unless I missed it, I did not see any cut-off date for certified devices. Obviously, if a device is certified a month before a compliance date, it would be virtually impossible for me to determine feasibility, and get the unit order shipped and installed by the deadline. The regulation should use a date one year ahead of a compliance date as the cutoff date for what constitutes a certified PM control device.

4. NOx Control Requirements

While I understand the role of NOx in secondary particulate and ozone formation and appreciate efforts to reduce NOx emissions, the inclusion of NOx control in this regulation:

1. Deviates from the core regulatory mandate, which is the reduction of directly emitted air toxic emissions from diesel engines.
2. Greatly increases regulatory complexity and costs to what is already an expensive regulation.

The regulation should therefore focus first on PM control and then phase NOx control once substantial progress has been made on the primary (PM) objective.

For NOx control I would again jettison the annual emission compliance rates and targets. It is just too complex, and expensive and affords little real flexibility. In order to meet the 2020 NOx targets, a medium or large fleet would have to comprised of almost entirely Tier 2/3/4 engines and Tier 2 engines would be a liability.

I would start NOx control in 2015 and require that 50% of Tier 0 and 1 engines meet some level of "feasible" NOx control. Feasible would again be expressed on a cost/hp basis. To simply the regulation I would probably have the regulation state that the cost/hp rate would be published by CARB in 2013, and updated biennially, via a coordinated process involving venders and operators. By that date some form of cost-effective NOx retrofit technology should be available as a byproduct of Tier 4 engine technologies. By 2020 I would increase that to 100% of Tier 0 and 1 engines. By 2020 I would also required that 50% of Tier 2 engines meet that "feasible" control requirement. This would give operators more time to replace older equipment, and additional time for the development of lower cost technologies. I note that right now a 10% turnover requirement for a 20,000 hp fleet would cost roughly between $400,000 to $4,000,000 per year depending on whether the equipment is repowered or replaced with new.

3. Implications to CO2 emissions

The impact of the proposed regulation on CO2 emission should be assessed. That is many of the proposed technologies do have fuel use penalties, which increase CO2 emissions. If the state is serious about CO2 control, the implications of regulations such as this on CO2 emissions needs to be assessed.

4. Implications to Moyer Funding

I have received an initial indication that Moyer funding for off-road mobile equipment could be effected if the proposed regulation is adopted. That is, under Moyer Guidance, projects are generally required to have minimum three-year project life before any mandate requiring those reductions takes effect (surplus). If the proposed regulation is adopted early or mid next year, and the first compliance dates of March 1, 2009 and March 1, 2010 date remain, then there would be less than three years between date the

regulation is adopted and the date the first compliance date takes effect (for medium and large fleets). Hence, one could argue that all medium and large fleets would therefore no longer be eligible for Moyer funding.

If my recommendations were taken, then this of course would not be an issue, and the statutory end date for Moyer funding (2015) would roughly line up with the proposed compliance dates.

If in what I hope is the unlikely event that the regulation is adopted pretty much as proposed, I believe that the majority of equipment would still be eligible for Moyer funding. That is, the regulation establishes graduated compliance requirements over a 10 or 11-year period (medium and large fleets). To meet those requirements an operator must at a minimum meet BACT, which requires action on 20% of the fleet (PM retrofit) or 10% of the fleet (NOx fleet turnover). When you couple this with exemptions the majority of a fleet would not be subject to compliance actions for several years into the regulation, and some equipment may not require compliance action until 2019. Hence, the majority of engines would provide "surplus" emission reductions for three years or longer.

The question is of course how to identify those engines that provide "surplus" emission reductions for three years or longer. This could be resolved in a number of ways. For one, an operator wishing to taken advantage of Moyer funding would be required to submit a compliance plan covering four or more years into the future. Equipment not targeted for retrofit or turnover would therefore be eligible for Moyer funding (emission reductions would be surplus).

5. General Overall Clarity

I read this rule ten or fifteen times, and even now I am not entirely certain of the rule requirements. I would strongly encourage CARB have a couple of highly experienced technical editors go through this and every regulation before it is released to the public.

6. Text specific changes

- Section (2) BACT Requirements, (A) Turnover Requirements for Fleet not Meeting NOx Fleet Average, 3a. Exemptions.

  Text indicates vehicles less than 10 years old are exempt from BACT. Yet there is no exemption in this section for repowered equipment. It is the <u>engine</u> and not the vehicle that emits pollutants. Providing an exemption for vehicles less than 10 years old and no exemption for repowered equipment is a disincentive to repower, which is generally a lower cost option to new equipment purchase. Morever, repowering is not cheap. Either text should be changed from "vehicles" to "engines," (preferably to simplify matters) or an exemption should be provided for vehicles that have been repowered with lower emission engines.

- Text under Section (2) BACT Requirements, (B) Turnover Requirements for Fleet not Meeting PM Fleet Average, 3a. Exemptions.

Text indicates that engines in vehicles less than five years old are exempt. Text is unclear if the exemption applies to the engine or the vehicle. Again, it is the engine that emits, not the vehicle. The text "in vehicles" should be deleted.

- In the same section exemption "c".

  Text says "... engines equipped with a diesel particulate filter and Tier 4 final engines" are exempt from PM retrofit requirements. A plain reading of this exemption says that engines with filters and Tier 4 engines are both exempt. I believe CARB intended to say "Final Tier 4 engines with particulate filters" are exempt. But this is wrong. Text should read, "Tier 4 engines as certified and for engines larger than 750 hp final Tier 4 engines as certified." That is, for engines 750 hp or smaller there either is no interim Tier 4 standard or the interim and final Tier 4 PM standards are the same. Hence, there is no point in using "final" for these engines. For 751 hp or larger engines where the final PM standard is lower than the interim standard, the term "final" should be used. Finally, the term "particulate filter" is redundant because those engines meet a emission standard that is well below the PM target and will have some form of highly efficient PM control. Thus, the term "as certified" would be sufficient.