NO2 WORKING GROUP
TELECOM MEETING
June 30, 2004

Minutes of the Meeting
Participants: List attached

OPENING COMMENTS:

Ms. Annette Hebert from the California Air Resources Board (ARB) opened the meeting to discuss highlights of what the committee have been working on and the next steps for the NO2 working group. She announced that the next International Diesel Retrofit Advisory Committee (IDRAC) meeting will be held in October, probably late in the month, depending on the executive officer's schedule, and that we intend to have a report from the workgroup at that time.

REPORTING ISSUES:

Mr. Scott Rowland from ARB made a request to all participants:

- Regarding IDRAC, please let us know if there are other meetings scheduled at that time that may conflict with the members of this group.
- Because it is sometimes difficult to tell who has participated in conference calls, please email Ms. Susan Reed, sreed@arb.ca.gov, of your attendance today.
- On a large conference call it is not always known who is speaking, so if you would please identify yourself, it would be helpful.

MODELING AND EXPOSURE DISCUSSION:

The meeting was turned over to Mr. Paul Henderick from ARB who reported on the Modeling and Exposure Subgroup, whose objective is to determine what retrofit scenarios would create problems with nitrogen dioxide (NO_2), with the emphasis on near-field, freeway, and school bus. The group discussed the Johnson Matthey (JM) study (JM-IVL) which measured NO_2 along side trucks for 45 seconds. It was felt that the study was a good start and also that it was helpful in defining near-field. It also brought up other questions and/or concerns among the group:

- There was only one vehicle in the study, we would like to see more vehicles included.
- At one meter away, there is a steep drop off on NO_2 concentration. Is this typical or an anomaly?
- It is critical that we know what we started with. What is the dilution ratio? Do we know what the oxides of nitrogen (NOx) concentration was in the test?
- Several members expressed the need to have additional measurements including ambient level of NO_2, NO_2 tailpipe emissions, fractions of NO_2 and particulate matter (PM). Measurement should be expressed as grams per brake horsepower-hour (g/bhp-hr).
- It was also not clear what type of vehicle was used in the study, whether it was a small diesel pick-up or a long haul truck.
- We need to know the history of the filter, was it new, recently regenerated, or cleaned? The evaluation of results depends on loading of soot. JM states the filter was in a “fresh state”, but we need them to define what they mean by that.

- The study was done in 1999, does JM have status update and are they going to follow-up.
- How useful was this study and do we want further info from JM?

- CHILDREN'S SCHOOL BUS EXPOSURE STUDY:

Mr. Scott Fruin from ARB discussed two studies that he has been working on from last summer. The first was the Children's School Bus Exposure study, which involved five unconditioned buses, one with a trap, and one NG bus. The buses used urban routes around Los Angeles (LA) in high traffic areas, which reflect the real school bus route and time of day. Tracer gas was used to detect bus emissions and it was noted how much of the buses' own emissions were getting back into the cabin (more with windows closed). Most exposure was due to commuting rather than at bus stops. The NO_2 levels were 2-3 times higher in the bus than ambient air. Several questions were brought up as to whether there was an obvious point of entry into the buses and was there an impact on emission levels due to the location of the exhaust. Measurements were taken at separate points at the rear and front of the bus. Ambient measurements were from Air Quality Management District monitoring stations. The self-pollution effect varied with higher traffic and with open/closed windows. The situation was also worse on older buses, since school buses are not built as tightly as transit buses. The next study will take more of these variables into consideration.

Mr. Fruin then discussed the freeway study from last summer that generated data that would be useful to the committee using real world conditions. The approximately 2 hour driving route started from USC to 10 Fwy - 60 Fwy – 5 Fwy – 710 Fwy to 110 Fwy and back again. Results showed significant increase in nitric oxide (NO) in heavy truck traffic.

It was asked if there was a fact sheet available for the study since it was a lot of information to describe on phone call. Mr. Fruin said that he would put together a summary for the group.

- POSSIBLE FUTURE STUDY:

Mr. Henderick, discussed the possibility of doing a study with the LA Sanitation fleet and taking measurements as their vehicles return to the yard.

Points to be considered in setting up this study:

- Several members mentioned that in doing these studies it would be helpful to measure mass emissions; total NOx, and ambient PM along with NO and NO_2.
- Point of concentration – would it be idling or moving?
- Tom Lanni from NYDEC mentioned that NY bus may have similar situation, he will investigate details.
- Important to consider instrumented and chase vehicle rather than captive fleet. We may not get true picture of what is happening on the road. A hybrid study of the two would be most useful.
- Suggestion to use transfer station where vehicles would under load.

Ms. Hebert, pointed out that a lot of these studies would be nice to do if there were unlimited funds available. We don't know how much ARB will be able to spend, and if anyone has money for studies that we could tap into, it would be appreciated. Because we have a need for data quickly due to our regulations we may not be able to do all the studies we would like and the NO_2 issue may need to be looked at outside of the PM retrofit realm. Our intent is to not

make the situation worse than it already is by retrofitting the vehicles affected by the regulations.

Regarding level of toxicity of NO_2, it was mentioned that in investigating exposure limits, we need to collect as much data as possible, from different countries, different area in order to quantify risk level.

TECHNOLOGY SUB-GROUP:
Mr. Henderick, stated that we hope to get some baseline engine-out NO_2 data from the engine manufacturers to help define our control limit and if the 20% limit is feasible. He mentioned that we have not received any data as yet, and asked if any other members have data they may share with us.

We are looking at data to determine how the verification procedure should limit NO_2 and we are interested in both raw exhaust engine-out and chassis emissions.

REGULATORY SUB-GROUP:
Mr. Dale McKinnon discussed the issue of lab-to-lab variability on NO_2.

- Concern of variability in chassis vs. eng dyno measurement unless shown as percentage.
- Do we need to define differences?
- If procedure defined for traps, should be okay for DOC's too.

Ms. Hebert, stated that we (ARB) were not aware of the sub-group meeting and that ARB needs to be included in any meeting involving regulatory issues.

Mr. Rowland, stated that ARB management is not dropping the use of their testing option, and in-use testing must meet same requirement, so we would look for the same NO_2 for in-use. Not in-field, but in-use. They would need to use the same cycles that they use for verification since we can't correlate 2 tests and we can't throw one of them out.

Ms. Hebert, asked what the group thought about looking at the total toxicity. Overall toxicity may be the same or below, and we would get certain amount of credit for reducing PM. Is this possible and what factors are associated with it?

The general consensus of the group was that toxicity would need to be assigned to each component and there is no way to weight toxicity of diesel PM. It is an interesting idea but very difficult and very complicated to do because of the different toxicity and how it affects individuals.

- "DEGREENING" AND NO_2 ISSUES:
  - We don't want to be using a fresh unit.
  - We don't have an actual number agreed upon except that is shouldn't be fresh. Currently we have aging up to 1000 hours and there is a suggestion that can be folded into existing regs. We don't want to make the verification procedure any more costly and time consuming that it already is.

- LAB TO LAB TESTING:

"Round-robin testing – how to do it? Mr. Marc Rumminger mentioned that NREL is starting round-robin of chassis dyno testing and he will check into it. Mr. Keshav Sahay, said that they had contacted us also but it didn't go anywhere.

ACTION ITEMS:

- Add Mr. Mike Starr to the Technology subgroup.
- Mr. Marc Rumminger and ARB staff will follow up with NREL lead.
- Mr. Dale McKinnon will send Ms. Annette Hebert minutes of the Technology subgroup meeting.
- Mr. Tom Lanni will check test data that he has to see if it includes baseline data.
- Exposure scenarios will be posted to the NO_2 Working Group website as they become available.
- Other members will canvas their data for possible resolutions to the concerns we discussed and have suggestions for the next meeting. The subgroups will hold a meeting within the next 2-3 weeks. Possible dates are the July 21st or 22nd.

CLOSING:

Mr. Scott Rowland reiterated the need to go to IDRAC with solid suggestions. We will have a full workgroup meeting in August, possibly the week of August 23rd, with a target date of Wednesday August 25th, 9:00am conference call. Please notify us of any big meeting conflicts. MECA and all individual MECA members are encouraged to attend the meeting.

END OF MEETING.

ATTENDEES
NO2 Working Group Meeting
June 30, 2004

NAME		COMPANY
Sam	Altshuler	PG&E
Tony	Andreoni	ARB
Alberto	Ayala	ARB
Chad	Bailey	EPA
Dipak	Bishnu	ARB
Mike	Carter	ARB
Bill	Charmley	EPA
Dan	Donohoe	ARB
Scott	Fruin	ARB
Annette	Hebert	ARB
Paul	Henderick	ARB
Rod	Hill	ARB
Vernon	Hughes	ARB
Cle	Jackson	EPA
Dennis	Johnson	EPA
Tom	Lanni	NYDEC
Jacques	Lemaire	AEEDA
Stephan	Lemieux	ARB
Dale	McKinnon	MECA
Susan	Reed	ARB
Scott	Rowland	ARB
marc	Rumminger	Cleaire
Keshav	Sahay	ARB
Kathryn	Sargeant	EPA
Jim	Shears	ARB
Joe	Somers	EPA
Michael	Starr	SWRI
Eric	Stevenson	BAAQMD
Jeb	Stewart	CIAQC
Chien	Sze	EPA