

TEXAS MOBILE SOURCE SUMMIT

SESSION 1: ENGINES AND FUELS

MODERATOR: MORRIS BROWN, TCEQ

FACILITATOR: JOE WALTON

PROPOSED AGENDA:

- Diesel and other engine technologies
- Fuel formulations and other fuel issues, including alternate fuels
- Use of existing engines (technologies for retrofitting, fuel additive, practices to reduce idling or VMT, etc.)
- Enforcement issues/tampering/diesel I&M

MEETING MINUTES:

Introductions by Candy Garret, introduces Morris Brown and Joe Walton of TCEQ.

Morris states that the format for the session should be as a group idea brainstorming session focusing on NO_x reductions from engines and fuels. Facilitator Joe Walton will provide the microphone for participants in the group to bring up new ideas, topics of discussion, or questions and answers.

Morris begins discussion by stating that we are looking for more room for reductions through technology from vehicles and engines. One important focus should be on retrofits for existing fleets because new vehicles already meet standards. So what are the new ideas for old vehicles retrofit technology? There is room for more reductions here.

Morris - What role should states play in the national program on new fuels and additives? How does something like TXLED fit into the national scheme?

- More reductions from existing programs from better enforcement of things like the light duty standards for heavy duty vehicles and inroad and on-road testing.
- MOVES – new EPA vehicle emissions modeling program – synergize with other methods?
- What barriers need to be overcome? Federal/local regulations? Commercial issues? Miscommunication between regulating community and public.

Candy to Morris – talk about new engine technologies and programs at TCEQ.

Morris – Programs focusing on after treatment technologies, unique catalysts, 7 or 8 technologies to be approved by CARB/EPA. There are new fuel additives being looked at through the TXLED program. New engine technology - brand new engines that meet the .1 PM standard, locomotives that go from Tier I to Tier II, heavy duty hybrids, gas/electric, diesel/electric; Railroad hybrids for locomotive switchyards. The typical switchyard engines are diesel/electric with the diesel engine as a generator. The

new technology has smaller engines with battery packs - or replace existing technology with total electric.

The open discussion begins with EPA:

EPA - hybrid switchers for switchyards. Take a non-road engine of 500 hp for use in switchyard applications. Cost ?

Morris – NTRD program for retrofit of existing and new engines, use non-road generators for switchyards.

EPA – prime mover is not auxiliary power generator.

Morris – yes, prime movers. Take a 1500hp switcher and replace with 500 hp non-road gensets, so engines don't always run/idle. Use battery packs.
Other non-road technology is catalysts/exhaust tech combined with modifying engine operations.

Consultant – replacement program for on-road retrofits. What about state funding for replacement and retrofit incentives?

Morris – good idea, combining technologies, exhaust technology with engine operations changes, needs testing and verification work.

TCEQ - \$18 million for R&D in the last few years. Not all ideas work.

Engine Manufacturers Association (EMA) – Summary of EMA technology and development status. Soon to be out are new low emission engines that meet EPA/CA and TX regulations for NO_x and PM for 2007.

Other new technologies:

- headlines, PM filters for '07,
- after treatment and clean diesel
- catalysts for PM and HC
- working with Southwest Research and Consulting
- getting emissions levels that are too low for testing for PM with newer engines
- will meet 2007 NO_x regulations for TX, CA and EPA
- 2010 .2 grams/ph-hr regulations will be difficult to meet
- Selective Catalytic Reduction (SCR) is new interest for EMA, Europe has SCR that works
- urea tank is biggest problem to overcome
- NO_x absorbers may not work, cost a problem
- wondering what tank regulations would be like from EPA?
- Non-road will meet .1 gr/hp-hr for PM for marine and locomotives, working with CARB and EPA for Tier 4.

In summary – new engines will have reduced emissions to as low as technology will allow, encourages looking for reductions from existing fleets – retrofits; ultra-low sulfur diesel necessary for exhaust technology and after treatment.

A discussion follows involving several guests from TCEQ, EPA, and EMA and private sector:

TCEQ – TERP program: 1980 to 2007, won't be able to use '06 standards unless manufacturers can show at lower standards. Need better communication.

Voluntary Retrofit Program – retrofit verification process must include as many makes and models as possible, can EPA broaden verification process to include more makes and models.

EPA – would like to broaden process but needs to figure out how to explain technology to ensure make and model applicability.

-Need to speed up process to meet 2009/2010. CARB and CA care about PM and not NO_x like Texas.

EPA – Verification should only take about 4 or 5 months however answering questions takes time.

ETV verification process is a different program; independent process for verification; test labs; document test process and protocol; quantify emission difference.

Voluntary uses ETV process data, takes it to other engines. Focus on real world reductions. Speed problem is due to communication between EPA and manufacturers

EPA – Reflash. Has Texas offered incentives to encourage reflash testing?

TCEQ – registering 18 wheelers in Texas. Would like to encourage EPA to do a recall as Texas does not have the authority. The state cannot offer incentives for required rules.

EMA – Voluntary program for track owners. No charge for reflash when engines are built.

EPA – we need incentives to encourage reflash testing ASAP. How?

TCEQ – EPA assumes reflash has already been done so there is no incentive because Texas cannot get SIP credit.

EPA – there are modeling problems

TCEQ – this is an EPA modeling issue. EPA says use a 90% default rate for Reflash.

TCEQ – attainment occurs at the monitors, not in the models.

- CA has its 'Flash and Match' program.

TCEQ - There is a disconnect with TERP and the rest of emissions inventory – one way around the 90% default rate is to give TERP credit for reflash/retrofits and do retrofit and reflash at the same time.

- How hard is it to see if reflash has been done?

EPA – reflash documentation is difficult. CA is doing it.

- Does anyone at EPA know of diesel light duty fleet I&M?

- I&M for OBD is being done in Connecticut. Could I&M check be done for diesels registered in county? Hook scan tool fairly easy but they have to know what they are looking for; Very different task. I&M for light duty vehicles has been effective, more than MOBILEG. Diesel I/M opacity on smoke only. Diesel has less than 6000lbs, very light duty. For 2010: 008tpd and .0002 tpd in DFW – 125,000 vehicles. In Houston area there are 6.5 million vehicles eligible.

- I&M program – fake inspection stickers; I&M model is done with a 96% compliance rate. What is the real non-compliance rate? What about non-registered vehicles?

- CA has done a lot of work in non-compliance. There is a 5-8% noncompliance rate in AZ. 20 to 40% of vehicles do not return if they fail to pass the first time.

TCEQ – Let's talk about non-road and marine:

- NRTD retrofit technologies. Is there anything for non-road?

TCEQ- Yes, Cummings has a SCR unit. CARB/ETB has about a 25% NO_x reduction and are looking for 50%.

-There are a few companies out there that are making these types of units for non-road. Fork loader retrofits.

EMA – one issue is that there is not much available for non-road. They are more difficult due to the diversity of non-road equipment/different work cycles, etc. Retrofit would have to be case by case for non-road engines. This subject that needs attention.

TCEQ – PM is easier than NO_x for non-road. SCR is very difficult for all these different non-road engines. PM reductions can be done with lower sulfur fuels and PM traps.

TCEQ – Temperature variance is also a problem for non-road.

- One cleaner non-road approach is to have local governments put incentives into the contract bidding process so that contractors are rewarded for using reduction technology on their equipment or incentives for finishing early.

TCEQ – Fuels are a good thing to look at because they affect such a large number of vehicles. Is there anything cleaner than Phase II RFG available?

- there is clean diesel for light duty vehicles but can we go to gasoline for light duty?

- Some new fuels and additives have come out in the last year, and there will be more in the next 5 to 6 years: TXLED, ultra-low sulfur diesel, spark ignition, homogeneous combustion, PNG derived no sulfur fuels in 2012, there is a lot of work being done with fuels and additives and the potential for large benefits in the near future, slowly implemented over the next 15 or so years.

- Devices and technology that prepare fuel prior to combustion. Lubroxil and 2 similar additives.

TCEQ – these fuels and additive need verification just like technology, TXLED program working on additives. It is time consuming and costly. The additive industry is looking at NO_x. There are already big advances for sulfur and PM. Need to focus on NO_x.

- There is currently commercially available retrofit NO_x control technology that gets a 40% NO_x reduction and 85% PM reduction with EGC Johnson Massey.
EGRT – exhaust gas reduction technology.

- The DART program has 400 vehicles in refuse, school buses.