FEDERAL ADVISORY COMMITTEE ACT

Clean Air Act Advisory Committee

Mobile Sources Technical Review Subcommittee

CO-CHAIRS: MICHAEL WALSH AND ROBERT SAWYER DESIGNATED FEDERAL OFFICIAL: SUZANNE RUDZINSKI

Minutes of the Subcommittee's Meeting on February 12, 2003
Alexandria, Virginia
DRAFT February 27, 2003

Registration

Registration began at 8:30 a.m. Meeting attendees received a packet of information, including the meeting agenda, handouts of presentations, a welcome message and background information for observers, the meeting evaluation form, information on the members of the Subcommittee, a meeting calendar, a restaurant list, and a Mobile Sources Technical Review Subcommittee (MSTRS) Workgroup organization chart. A list of attendees is attached to the end of these minutes. Presentations will also be available on the MSTRS website.

Introductions and Announcements

Mike Walsh (co-chair, consultant) called the meeting to order at 9:00 a.m., and members and observers introduced themselves. Bob Sawyer (co-chair, University of California at Berkeley), who is leaving the Subcommittee to move to London, did not attend the meeting due to illness. The Subcommittee will present a plaque to Dr. Sawyer at a later date in appreciation for his work. Mr. Walsh presented Suzanne Rudzinski (EPA) as the new MSTRS Designated Federal Official (DFO). She has been active in EPA voluntary programs, conformity, and fuels and fuel additives. She introduced Barry Garelick as the new MSTRS Alternate DFO. He is experienced in air quality and transportation issues.

Mr. Walsh discussed a few business items. Ted Kotsakis (Oregon DEQ) will replace Andy Ginsburg (Oregon DEQ) as a Subcommittee member. Mr. Ginsburg now sits on the Clean Air Act Advisory Committee (CAAAC), parent Committee of the MSTRS. The minutes from the October 16, 2002 MSTRS meeting were approved with no comments or revisions from the group.

Summary of Accomplishments/Issues in OTAQ

Margo Oge (Director of OTAQ, EPA) gave a summary of OTAQ priorities and accomplishments to date. She discussed non-road sources, especially agricultural and industrial, stating that they will become the most prominent mobile source polluters after the on-road diesel rule is fully implemented. The EPA will propose regulations to reduce sulfur in non-road diesel fuel to 15 parts per million (ppm) and to reduce particulate matter (PM) emissions from non-road diesel engines by 90 percent. The program will result in health benefits for the public due to the drastic decrease in PM emissions. Regulations will adopt three rules from the on-road diesel

program: test procedures, in-use requirements, and equivalent after-treatment standards. Ms. Oge added that, as with the on-road diesel rule, non-road engine manufacturers will be given time to develop technology to implement the new regulations.

The non-road rule has finished its first round of technology review through a FACA process. She estimated that the second report will be finished by the end of the year. This program combined with hybrid vehicle and fuel cell vehicle programs will provide benefits of reducing emissions of criteria pollutants and toxics, increasing fuel economy, and decreasing greenhouse gas emissions.

Ms. Oge also noted that the MOBILE6 vehicle emission model has been completed and introduced to States, and has very few technical concerns. The EPA is also developing a new model, MOVES, which is designed to collect better in-use data for developing emission factors, and to put together more effective tools. She also noted that the Recreational Vehicle Standard for snow mobiles, ATVs, and off-road motorcycles has been finalized. This standard will prevent 1,000 deaths per year from recreational vehicle emissions.

Ms. Oge reported that OTAQ is working with stakeholders, especially in urban areas, to obtain better data on air toxics. In particular, OTAQ is interested in voluntary programs. One example is the Smart Way Transport Partnership, a voluntary program with 14 partners (including Federal Express, Nike, and Coca-Cola), led by Ms. Rudzinski. The partnership is intended to address fuel economy for ground freight operations (including cleaner fuels, better tires, idling, and aerodynamics) and is expected to reduce 18 million metric tons of carbon in 10 years. Ms. Oge also reported on efforts to address the existing on- and off-road fleet, especially school buses, in the Diesel Retrofit Program.

Ms. Oge discussed current legislation, including the energy bill, transportation funding bill, and budget. No progress has been made on the energy bill; however, the Bush administration is interested in pursuing it this year. The EPA is currently working with the Department of Transportation on the transportation funding bill. Regarding the budget, OTAQ is evaluating needs to improve emission labs and testing facilities. Money has already been approved to upgrade the National Vehicle and Fuel Emissions Laboratory (NVFEL), which was recommended by the NVFEL Workgroup's biannual review.

Finally, Ms. Oge reported on in-use tools and programs for on-road diesel trucks, buses, and cars, as well as off-road vehicles. OTAQ is working with Ford and others to commercialize hydraulic hybrid vehicles. The EPA has also certified its first fuel cell vehicle, a Honda FCX. In addition, OTAQ is putting together a fuel cell team to investigate products and guidelines.

Mr. Walsh asked if Ms. Oge had any insight on legislation for mobile sources under the Clean Air Act. Ms. Oge reported that the transportation bill will address conformity. The only other legislation would be the Clear Skies Initiative (CSI).

Blake Early (American Lung Association) commented that the Lung Association has concerns about the consent decree with heavy duty diesel manufacturers. In particular, he noted that the reflashing program was part of the decree and only 4 percent of reflashing is actually occurring. Thus, the emission reductions expected as part of the reflashing program are not there. Ms. Oge agreed that the Original Equipment Manufacturers (OEM) are responsible for the reflashing program and are not enforcing it. The Office of Enforcement is working to evaluate why reflashing is not occurring. Analysts have shown that if reflashing does not happen in the next 2 years, emissions benefits will not be realized at all in older vehicles. Tim Tindall (Detroit Diesel) noted that the timing of engine overhaul is critical. Once engines are out of warranty, it is more difficult to track them, but most engines are overhauled at around the 1 million mile mark. Therefore, most fleets dispose of their trucks before the engine is overhauled. However, he also noted that the overhauls that are occurring are being reflashed, according to the standards of the reflashing program.

Bob Schaefer (BP) commented on Ms. Oge's statements about the budget. He noted that he was part of the team that reviewed NVFEL and that the budget will indeed provide the lab with much-needed new technologies. Mr. Schaefer also asked about the status of the current Air Toxics Rule. He noted that this rule was based on 1998-2000 data and asked whether there is a requirement in the rule for EPA to update that baseline. Ms. Oge was unsure about the status of the baseline. However, she noted that she and Mr. Garelick would look into this. She also noted that the program for blending and certifying gas at a terminal used the statutory baseline for air toxics.

At the close of the discussion, Ms. Oge requested that the group bring their ideas to her and to Mr. Walsh so that they know what issues need to be addressed.

Report from the Air Toxics Workgroup

Chris Laroo (EPA) presented an update from the Mobile Sources Air Toxics Workgroup. He reviewed the workgroup charter, reported on accomplishments to date, and discussed next steps for the workgroup. In terms of recent accomplishments, the workgroup has reached agreement on VOC, aldehyde, and ketone sampling and analysis protocols; they will reference California Air Resources Board (CARB) Methods102/103 for the nine VOCs and Method 104 for aldehydes and ketones. Manufacturers, including a Ford, GM, and DCX consortium, have made modifications to these CARB methods to improve sample efficiency and increase analytical accuracy. Protocol development is needed for PM, diesel exhaust organic gases (DEOG), polycyclic organic matter (POM), and dioxins/furans. The workgroup intends to write a summary report to the MSTRS for the next meeting. In conclusion, Mr. Laroo stated that the goals of the workgroup have been accomplished. The workgroup will recommend that further research be pursued to improve mobile sources air toxics measurement.

Steve Flint (NYSDEC) inquired as to whether testing methodology focused on certification testing or field applications. Mr. Laroo stated that the workgroup was not looking at

certification testing and instead was focusing on in-use protocols. They have considered field applications, but there are questions of whether methods should be developed for old or new vehicles. He noted that with stricter regulations, emissions will decrease to an almost undetectable level.

On-Board Diagnostics (OBD) Policy Workgroup Closing Report

Lori Stewart presented the final report from the OBD Policy Workgroup. The workgroup addressed NAS issues from the July 2001 inspection and maintenance (I/M) assessment (future failure rates for aging vehicles, pollution prevention approach of OBD, lack of overlap in tailpipe and OBD failures) as well as stakeholder concerns (potential conflict of interest, OBD durability and warranty issues, tampering devices). The workgroup report summarizes the latest data on OBD use in I/M programs. Ms. Stewart noted that data from Oregon and Wisconsin are the best available. She also noted that OBD systems are 90 percent effective in picking up evaporative emissions.

A question was raised regarding OBD failures for vehicles in need of repair but not yet exceeding emission standards, i.e., "clean-but-broken" vehicles. Mr. Walsh asked if, as vehicles age, the malfunctions tend to be more serious. Ms. Stewart indicated that as opposed to newer vehicles, emissions tend to exceed standards when older vehicles malfunction. Data to date show that average tailpipe emissions reductions for OBD failures are not statistically different from tailpipe failures. The workgroup recommended that EPA continue and increase high-mileage testing, that EPA and the OBD Technical Workgroup continue to pursue a full lifecycle analysis of OBD benefits, and that EPA's next update of MOBILE6 should incorporate the latest data on the full range of benefits of OBD.

Ms. Stewart discussed the lack of overlap between tailpipe and OBD failures and cited a Colorado study in which 23 of the vehicles assessed failed the tailpipe test but not OBD. Mike McCarthy (CARB) asked if there was a pattern in these failures. Rick Barrett (Colorado DPH&E) stated that some of these failures are issues that EPA and CARB are aware of, while others are still being investigated. Mr. Walsh noted that OBD is still evolving and will improve over time. Ed Gardetto (EPA) stated that early OBD systems had a loophole that failed to monitor the catalyst for NO_X reductions, but new 2005 OBD systems will address that problem. Robert Brown (Ford) noted that it really wasn't a loophole, but at the time early systems were produced, they were not required to address NO_X failures. The workgroup recommended that they try to quantify what portion of the "lack of overlap" is of concern. In addition, the workgroup recommends that the OBD Technical Workgroup review data from both the EPA High-Mileage study and the Colorado Department of Public Health and Environment study to further assess OBD effectiveness at identifying high emitters. Ms. Stewart also noted that the workgroup recommended that EPA develop an ongoing evaluation program focused on high-emitting vehicles missed by OBD. Finally, the report recommends that the workgroup assess the approximately 2,000 Federal Test Protocol (FTP) data points available in 2004/2005 through the new manufacturer In-Use Verification Program (IUVP).

Regarding State OBD programs, Mr. Walsh asked if EPA is looking at a cross-section of centralized and decentralized areas. Ms. Stewart noted that centralized areas (WA, OR, GA) are easier to monitor, while decentralized areas are more challenging. In the future, EPA hopes to get information on decentralized areas from the States.

Regarding the tampering issue, Mr. Walsh asked how many devices are being sold. Ms. Stewart stated that determining the proliferation of these devices is one of the highest priorities for EPA and the technical workgroup. Mr. McCarthy noted that there are two target audiences for tampering devices. The first (and primary) audience is made up of "hot rodders" who want to remove the catalyst. The second audience is made up of people who decide it is cheaper to put a tampering device on their vehicle rather than fixing the control device. Mr. Early stated that tampering is especially fraudulent when sellers install a tampering device instead of fixing the vehicle. Mr. Barrett noted that the cost to install such a device is $600-700 for an Audi and presumably cheaper for domestic vehicles. Ms. Oge noted that EPA wants to look into the tampering issue.

Ms. Stewart wrapped up with next steps for the OBD Policy Workgroup report. The workgroup will prepare the report for the subcommittee, and the subcommittee will forward it on to the Clean Air Act Advisory Committee. The report will be posted on EPA's website at www.epa.gov/otaq/obd.htm.

Report from the Modeling Workgroup

Gene Tierney (EPA) reported on the status of MOVES (Multi-Scale Motor Vehicle and Engine Emissions System). Currently, model development is under way, the fleet and activity database is being updated, and data gathering is nearing completion. Initial uses for MOVES include climate inventory support (especially for U.S. Greenhouse Gas Emissions and Sinks) and policy evaluation. MOVES will ultimately provide in-house inventory support, finer scale modeling assessments, policy evaluation for all OTAQ programs, and support for SIP development and conformity. Full on-road implementation is scheduled for Fall 2005. At that point, the model will be an alternative to, and will eventually replace, MOBILE6. He also noted that the model is being developed with the assistance of an independent peer review panel. The new model will be integrated with DOT's new-generation traffic simulation model (TRANSIMS) and DOE's California Fuel Cell Partnership GREET model. Mr. Walsh noted that GREET would enable lifecycle analysis of alternative fuels.

Mr. Tierney discussed the EPA Mobile Source Observation Database, a repository for data taken from mobile sources. The EPA is currently in the process of collecting data from many additional tests from outside sources for the database. These data will be a sound foundation for the MOVES Greenhouse Gas model. Mr. Walsh asked if the work for developing predictive emissions monitoring systems (PEMS) for measuring PM is still on track. Mr. Tierney responded

that contracts to develop the technology are in place, and results will be demonstrated by the end of the year.

Mr. Walsh asked if MOVES models could be run on a desktop or laptop. Mr. Tierney stated that they could, but multiple runs would take a long time.

Mr. Walsh asked what issues the Modeling Workgroup is wrestling with and if they need more support. The workgroup is currently working on designing the model and gaining a better understanding of what the end results will be. Mr. Tierney noted that the workgroup is trying to get more State involvement, since States will be the main users of the model. Mr. Walsh replied that the MSTRS will try to find more States to be involved in the process. He will contact Bill Becker (STAPPA/ALAPCO) to discuss the issue.

Loren Beard (DCX) asked why MOVES was needed to create a carbon inventory, since carbon emissions could be calculated using fuel consumption. Mr. Tierney replied that the current methods of developing carbon inventories were top-down, and it would be useful to have bottom-up methods as well. MOVES has more options and greater capabilities than its predecessors, which will benefit policy analyses and complement other emerging technologies.

Mr. Schaefer asked if there would be a companion model for stationary and area sources. Mr. Walsh noted that this type of model would be more difficult. An observer asked about MOVES in terms of evaporative emissions. Mr. Tierney stated that, at this point, the model doesn't address evaporative emissions. In the short run, the model will rely on traditional sources of data to measure these emissions. The workgroup would like to expand beyond basic toxics measurements.

Report from the OBD Technical Workgroup

Jerry Gallagher (J. Gallagher & Associates) presented an update of OBD Technical Workgroup activities. He cited two OBD test programs of interest to the workgroup: Colorado Department of Health OBD FTP study and EPA High-Mileage Testing. The workgroup is interested in determining evaluation criteria and better definitions for their analysis. Dr. Gallagher reported that the Controller Area Network (CAN) will be phased in starting with the 2003 model year and will be fully phased in by 2008. In addition, scan tool manufacturers are working on updating systems to read CAN. Sixteen areas are using OBD for pass/fail decisions (including decentralized areas in GA, OR, WI, and IL, and centralized areas in Phoenix, AZ). He noted that using both decentralized and centralized areas will allow for comparison.

Dr. Gallagher reported on follow-up steps to address the Policy Workgroup's recommendations in their final report. The OBD Technical Workgroup plans to: (1) review high-mileage OBD data and State OBD I/M data; (2) quantify concern on "lack of overlap;" (3) review CDH data; (4) explore technical means for identifying tampering devices; and (5) review the

impact of Tier 2 and fleet aging. Dr. Gallagher also reported on OBD tampering and requested information on the States' experience with this issue.

Mr. Walsh asked if data are routinely coming in to the workgroup. Dr. Gallagher stated that EPA has most of the data. Mr. Schaefer asked if the Colorado Department of Health OBD FTP study and the EPA High-Mileage study used a range of technologies. Mr. Gallagher stated that the Colorado Study and EPA High-Mileage study follow the same protocol. Both privately-owned and commercial fleet vehicles were studied, and individual vehicles were chosen with a range of driving experiences. The High-Mileage study criteria included OBD-equipped vehicles with over 100,000 miles. Mr. Flint asked if California is still operating a pass/fail program for OBD. Mr. McCarthy replied that the program is still pass/fail, but the State is gradually ratcheting the program down to meet final regulations. The program was not mandatory until last year.

Panel Discussion on the Future of U.S. Hybrid Electric Vehicles

Mr. Brown presented on Ford's hybrid electric vehicle (HEV) program. Ford's HEV has 52-56 percent fuel economy improvement, up to 36 percent CO_2 reduction, 500 miles or more between fuel stops, performance like a V6 from an I4, and emissions 7.5 times cleaner than the low emission vehicle (LEV). Essential hybrid operations include downsizing the engine, regenerative braking, and electric launch and drive. Ford's HEV program is driven by consumer wants and needs. Mr. Brown reported that consumers are seeking an environmentally friendly, competitively priced vehicle. Most surprising was that consumers were looking for high recycleability in an HEV. Mr. Brown noted that HEV batteries are exclusively provided by Sanyo and that they are packaged in the rear of the car. More information on the HEV is available at Ford's public website www.hybridford.com.

Mr. Beard gave a presentation on the future of U.S. electric hybrids. He noted that the goals of hybridization are enhanced vehicle performance and reduced fuel consumption. Environmental benefits include reducing fuel consumption, CO_2 emissions, and criteria pollutant emissions, though fuel consumption and criteria pollutant emissions are independently regulated. The fuel economy benefit of hybrids is most pronounced in cyclic driving, such as urban stop-and-go driving (e.g., buses, garbage trucks). Hybrids do not offer cost-effective fuel economy benefits in highway driving or towing. For this reason, DaimlerChrysler has explored other alternatives including diesels, E-85 flexible-fuel vehicles, and compressed natural gas (CNG) vehicles.

The following comments and questions ensued, addressed to both Mr. Brown and Mr. Beard. Mr. Walsh asked for clarification of an electric launch. Mr. Brown replied that an electric launch starts the vehicle as an electric vehicle. One participant asked when the Ford Escape (the HEV) would be commercially available. Mr. Brown stated that it would be available in Nov/Dec 2003. Participants asked if the Escape would be available around the country and if any dealer is equipped to service the vehicle. Mr. Brown replied that it would be available around the country and should be able to be serviced at any dealer. Another participant asked about the

useful life of the battery. Mr. Brown stated that the useful life is 10 years. Also, the battery runs the heating and air conditioning systems, and the car includes an electric air conditioner compressor. Mr. Brown recommended that the United States establish a national energy policy to encourage incentives for HEV purchasers. Mr. Brown also noted that the engine will run on gasoline because Ford is not convinced that consumers will purchase diesel hybrids. Mr. Schaefer asked if Ford's marketing strategy looked at rental fleets as a market for the Escape. Mr. Brown responded that it would be difficult to get the cost down low enough for rental fleets to even consider the Escape, even if the costs were spread out. Mr. Brown also noted that Ford decided to make some trade-offs in order to provide better fuel economy. Mr. Flint asked if this technology would provide a long-range solution. Again, Mr. Brown stated that a national energy policy would be necessary to put incentives in place. Mr. Schaefer cited a recent Wall Street Journal article that stated that 30,000 hybrids are now owned. He asked if there was any marketing information on who is buying these hybrids and if they are only being purchased by "green-minded" consumers. Mr. Beard responded that DaimlerChrysler has done market research and has not been able to make a business case to sell hybrids in their segment of the market. Mr. Brown responded that Ford has done market research as well. He stated that he is unsure of the market research specifics and that he is uncertain of how sustainable the hybrid market will continue to be.

Mr. McCarthy asked if the Jeep Liberty (an advanced diesel vehicle) would be available in all 50 States. Mr. Beard noted that it could end up as a 45-State vehicle and will have to be market-tested. One participant asked if there is a gain in hybrid fuel efficiency with urban driving. Mr. Beard stated that DaimlerChrysler is still testing noise, vibration, and harshness but they believe there is an 11-12 percent improvement for city driving. However, Mr. Beard noted that their target was not really fuel economy. Mr. Flint noted that, from an emissions perspective, a Bin 5 generator would be a bonus at a construction site, particularly because it would be certified as a light-duty vehicle.

Wrap-up

Ms. Oge made a recommendation that Ms. Rudzinski become the new co-chair of the MSTRS with Mr. Walsh. There were no comments or objections.

Mr. Walsh and Ms. Rudzinski asked meeting participants about what approach the MSTRS should take in the future and what other topics should be included for future discussion. Ms. Rudzinski suggested changing the meeting format to a more open, round-table discussion. Mr. Flint noted that extensive discussion of one topic at a meeting might get cumbersome and might even stretch into several meetings. Mr. Walsh agreed that some topics might be more efficiently covered in a workgroup, but others might lend themselves to an open forum, such as vehicle labeling or marketing methods.

Mr. Walsh asked the group about important vehicle or fuel-related issues for future MSTRS consideration. Ms. Rudzinski suggested the tampering issue. Mr. Schaefer

recommended misfueling aspects of the on- and off-road diesel rules. Mr. Walsh added that the cetane content in diesel fuel has been overlooked up to this point but could be an important aspect to discuss. Mr. Beard agreed that cetane is of interest, as cetane content is 55 percent in Europe, but only 40 percent in the United States. Another participant suggested retrofit activity as a good topic for the MSTRS to address. He believes that the Subcommittee could benefit from shared experiences and future plans, including warranty requirements and retrofit of the existing fleet. Ms. Rudzinski asked the group if retrofit activity is a topic better covered by a workgroup or by the whole subcommittee. The group agreed that the topic warrants general discussion.

Mr. Walsh pointed out that there will be many vehicles in the coming years that will not be covered under any regulations, and they will be a large part of the emission problem in the future. One participant suggested an evaluation of the current status of tools and improvements toward curbing greenhouse gas emissions. Mr. Schaefer asked if the off-road diesel proposal would be issued by the next meeting. Mr. Walsh suggested that this issue may be a good agenda item for the next meeting, which could include an informational presentation on the up-coming rule. Chuck Freed (consultant) suggested conducting proactive analyses on full lifecycle emissions for all vehicles, but especially recreational ones like ATVs, as well as alternative fuel vehicles (AFVs) and analyzing greenhouse gas emission reduction benefits.

The next meeting of the MSTRS is scheduled for June 11, 2003 at the Radisson Hotel in Old Town in Alexandria, VA. Mr. Garelick asked meeting participants to fill out and return the evaluation forms from the information packet and to submit travel vouchers as soon as possible. The meeting was adjourned at 2:15 p.m.

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Attendees of the Subcommittee's Meeting on February 12, 2003
Alexandria, Virginia

Members, Alternates, and Speakers

Name	Organization
Mike Walsh, co-chair	consultant
Loren Beard*	DaimlerChrysler
Robert Brown*	Ford Motor Co.
John Cabaniss	AIAM, Inc.
Mike McCarthy, sub for Tom Cackette	CARB
Harry Diegel	Ford Motor Co.
Blake Early	American Lung Association
Steve Flint	New York State DEC
Jerry Gallagher	J. Gallagher & Associates
Ted Kotsakis, sub for Andy Ginsburg	Oregon DEQ
Chris Laroo*	EPA
Margo Oge	EPA
Bob Schaefer	BP
Lori Stewart*	EPA
Susan Tashjian, sub for John Cabaniss a.m.	AIAM, Inc.
Gene Tierney*	EPA
Tim Tindall	Detroit Diesel

*speaker

Observers

Name	Organization
Rick Barrett	Colorado DPH&E
Donna Boysen	M.J. Bradley & Associates
Susan Collet	Toyota
Roger Fairchild	Consultant
David Ferris	GM
Chuck Freed	Consultant
Ed Gardetto	EPA
Charlie Gorman	ETI
John German	Honda
Ross Jenkins	Parsons
Martin Jeter	VA DEQ
Doug Lawson	NREL
Vince Mow	Waekon Corporation
Mark Oberndorf	NADA
Darren Samuelson	Greenwire
Dennis Smith	U.S. DOE
Lawrence Smith	SWRI
Suanne Thomas	VW
Andy Vaichekauskas	Mitsubishi R&D
Rob Wilson	Sensors, Inc.

Staff

Kathy Boyer	EC/R, Inc.
Stephen Edgerton	EC/R, Inc.
Barry Garelick (alternate DFO)	EPA
Megan Hoert	EC/R, Inc.
Suzanne Rudzinski (DFO)	US EPA