Review of EPA's NVFEL

Laboratory Modernization Plan

by

Emission Test Laboratory Upgrade Workgroup

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Review of EPA's NVFEL Equipment Modernization Plan Background

- NVFEL first sought outside review of its long-range laboratory modernization plan in 1997, first review completed July 1998
- The 1998 review included several recommendations, among them that NVFEL seek periodic followup review
- At NVFEL's request, and with MSTRS' approval, Workgroup reassembled spring of this year
- NVFEL Laboratory Modernization Plan consists of three parts
  - Staff Development Plan (Appendix V)
  - Facility Modernization Plan (Appendix VI)
  - Equipment Modernization Plan (Appendix VII)

Review of EPA's NVFEL Equipment Modernization Plan Workgroup Members

Giedrius Ambrozaitis*	Mercedes Benz
Bill Baker*	Detroit Diesel
Rick Bishop*	John Deere
Tommy Chang	American Honda
Dick Gibbs*	New York Dept. of Environmental Conservation
John Johnson*	Michigan Technological University
Bob Jorgensen, Co-chair*	Cummins Inc.
Richard Middleton	DaimlerChrysler Corporation
Maurice Moulton	Toyota Motor Corporation
Donald Nagy	Ford Motor Company
Thomas Rhoad	Ford Motor Company
Mike Sabourin, Co-chair*	Environmental Protection Agency
Robert Schaefer	BP
Raphael Susnowitz*	California Air Resources Board

* Also a member of the first review group

Review of EPA's NVFEL Equipment Modernization Plan Scope

- Vehicle testing of cars and trucks (chassis dynamometer)
- Engine testing of on- and off-road heavy-duty engines (engine dynamometer)
- Fuel analysis and related issues
- State programs
- Personnel related requirements

Review of EPA's NVFEL Equipment Modernization Plan Key Points

- Procure and install low emission vehicle and engine compliance and correlation test capability
- Expand correlation program testing
- Provide experts to participate in harmonization forums dealing with test procedures, test methods, and standards development
- Continue the resource commitment to upgrade the expertise of technical staff and encourage involvement in the professional community
- Revise the CFR emissions testing specifications
- Maintain and support full documentation of its laboratory procedures and practices
- Regularly update the laboratory modernization plan and continue to seek stakeholder review

Review of EPA's NVFEL Equipment Modernization Plan Laboratory Core Business Functions

- Conduct targeted testing of vehicles, engines and fuels to confirm compliance with regulations
- Participate in correlation test programs
- Develop procedures and general guidance for emissions test laboratories
- Perform testing to support regulation development
- Perform concept testing of advanced vehicles, engines and fuels
- Conduct chemical analysis in support of fuels and emission characterization
- Perform tests and develop procedures in support of state and local governments
- Perform in-use emission testing to support emissions inventory models
- Support efforts to harmonize emission regulations domestically and internationally

Review of EPA's NVFEL Equipment Modernization Plan General Recommendations Applicable to All Sectors

- Procure and install low emission vehicle and engine compliance and correlation test capability
- Participate in correlation testing with stakeholder laboratories, and expand service to other stakeholder organizations
- Provide technical experts to participate in harmonization forums dealing with test procedures, test methods and standards development
- Continue the resource commitment to upgrade the expertise of NVFEL technical staff and encourage greater involvement in the professional community
- Take a lead role to revise the Code of Federal Regulation (CFR) specification for emission testing
- Reconvene stakeholder review group on biennial basis

Review of EPA's NVFEL Equipment Modernization Plan Recommendations: Vehicle Testing

- Dedicate specific test cells for specific test purposes
  - One cell with hydrokinetic dyno for vehicles emitting > 0.02 g/mi NMHC
  - One cell with 48" electric dyno for vehicles emitting > 0.02 g/mi NMHC
  - One cell with 48" electric dyno and bay mini-dilute for vehicles emitting < 0.02 g/mi NMHC
  - One cell for diesel vehicles
- Metrology or other basic research should be done in above cells as appropriate
- Install equipment to conduct special environmental testing (I.e., cold CO, SC03) or enhanced evaporative testing only after core needs have been met
- Do not install equipment to do large volume testing
- Develop expertise in new technologies for emission measurement

Review of EPA's NVFEL Equipment Modernization Plan Recommendations: Heavy-Duty Engine Testing

- Incorporate proposed 2007 HDE testing procedures into NVFEL heavy-duty test sites as soon as possible
- Actively participate in heavy-duty engine correlation testing programs
- Include partial-dilution particulate sample systems at the heavy-duty test sites
- Establish a heavy-duty engine test cell for non-road engine testing
- Establish correlation program for portable emissions measurement (PEM) systems
- Improve HC and NMHC measurement capability

Review of EPA's NVFEL Equipment Modernization Plan Recommendations: State and Local Support

- Support emission inventory and air quality models
- Evaluate mobile source particulate size distribution
- Investigate toxic compounds in mobile source exhaust gases
- Establish coordinated testing programs among public emission laboratories
- Harmonize testing of certification and expected in-use fuels

Review of EPA's NVFEL Equipment Modernization Plan Recommendations: Fuels Testing

- Implement a "visible" quality assurance system
- Have the Fuels Testing Laboratory audited to ISO Guide 17025 Lab Standard
- Reconsider the scope of the project to "speciate" diesel fuel to obtain basic knowledge to anticipate future diesel fuel regulations
- Identify a contract laboratory that could be relied upon to do compliance testing analyses if the Fuels Testing Laboratory was inoperable or experienced a compliance testing load that could not be accommodated
- Designate one of the senior analysts in the Fuels Testing Laboratory to be a working and voting member of ASTM Subcommittees D2.04 on Hydrocarbon Analysis and D2.03 on Elemental and Chemical Analysis
- Provide consulting services to industry concerning proper installation and operation of fuels compliance methods

Review of EPA's NVFEL Equipment Modernization Plan Recommendations: Personnel

- Hire graduates with two or four year technology degrees to be the next generation testers at NVFEL
- Continue to invest in high-tech training at the current budget level. Technology is changing fast, NVFEL will have to invest heavily to keep up with changes
- The Technologist Career Track is a great way to encourage and retain the best of NVFEL's testing staff. It should be expanded to allow newly hired employees with technology degrees to participate in this advanced training as well
- Over the last two to three years, NVFEL has developed a very diversely skilled and degreed laboratory staff. Continue to look for the opportunity to match specific projects with staff expertise

Review of EPA's NVFEL Equipment Modernization Plan Summary

- NVFEL should be commended for expanding and improving its laboratory modernization plan and seeking stakeholder review and recommendations
- NVFEL needs to procure and install low emission vehicle and engine compliance and correlation test capability
- NVFEL needs to expand its correlation program testing
- NVFEL needs to provide experts to participate in harmonization forums dealing with test procedures, test methods, and standards development
- NVFEL needs to continue the resource commitment to upgrade the expertise of technical staff and encourage involvement in the professional community
- NVFEL needs to revise the CFR emissions testing specifications
- NVFEL needs to maintain and support full documentation of its laboratory procedures and practices
- NVFEL should update this plan annually and seek stakeholder review biannually