



Engine
Manufacturers
Association

ADVANCED COLLABORATIVE EMISSIONS STUDY "ACES"

Initial ACES Workshop

November 6-7, 2003

Aurora, Colorado

Impetus For New Research

HAD Findings: Need For Re-Evaluation

- Following a 12-year review process, EPA released its health assessment document (HAD) for diesel engine emissions on September 2, 2002.

- Among its several important findings, the HAD stresses the limited future relevance of the health effects studies of DE that have been undertaken to date, and the need for a comprehensive reevaluation of emerging diesel technologies and fuels:
 - “The health hazard conclusions are based on exhaust emissions from diesel engines built prior to the mid-1990s.” (p. 1-3.)

Impetus For ACES Initiative

- “As new and cleaner diesel engines, together with different diesel fuels, replace a substantial number of existing engines, **the general applicability of the health hazard conclusion will need to be reevaluated.** With new engine and fuel technology expected to produce significantly cleaner engine exhaust by 2007 (e.g., in response to new federal heavy duty engine regulations), **significant reductions in public health hazards are expected** for those engine uses affected by the regulations.” (p. 1-3.)
- “As cleaner engines replace a substantial number of existing engines, **the risk perspective will need to be reevaluated.**” (p. 8-17.)

Impetus For ACES Initiative

- EPA's recognition of the need to reevaluate risk perspectives regarding diesel exhaust echoes earlier findings of CARB.
- As a part of its 1998 TAC proceedings, CARB recognized that changes in engine technologies and fuel formulations "may have had an effect on the particulate characteristics and chemical composition of diesel exhaust. Therefore, **the risk estimates should be updated as more information becomes available.**" (CARB Resolution 98-35.)
- Similarly, in its final rulemaking establishing the 2007-2010 emission standards for heavy-duty diesel engines, EPA noted that once those standards are implemented, "**diesel vehicles will achieve gasoline-like exhaust emissions levels**, in addition to their inherent advantages over gasoline vehicles with respect to fuel economy, lower greenhouse gas emissions, and lower evaporative hydrocarbons." (66 Fed. Reg. 5005, Jan 18, 2001.)

Impetus For ACES Initiative

- The conclusions of EPA's HAD reveal a critical need to plan for and perform comprehensive emission analyses and speciation/toxicity studies of prototype 2007-2010 engine technologies (operating on ultra-low sulfur diesel fuel).
- The objective of this comprehensive research program -- known as the Advanced Collaborative Emissions Study ("ACES") -- is to develop the necessary data to assess and characterize in a timely manner (i.e. in the 2007-08 time frame) the emissions and any potential health effects from real-world exposures to exhaust from advanced prototype 2007-2010 engines, after-treatment systems and reformulated fuels.

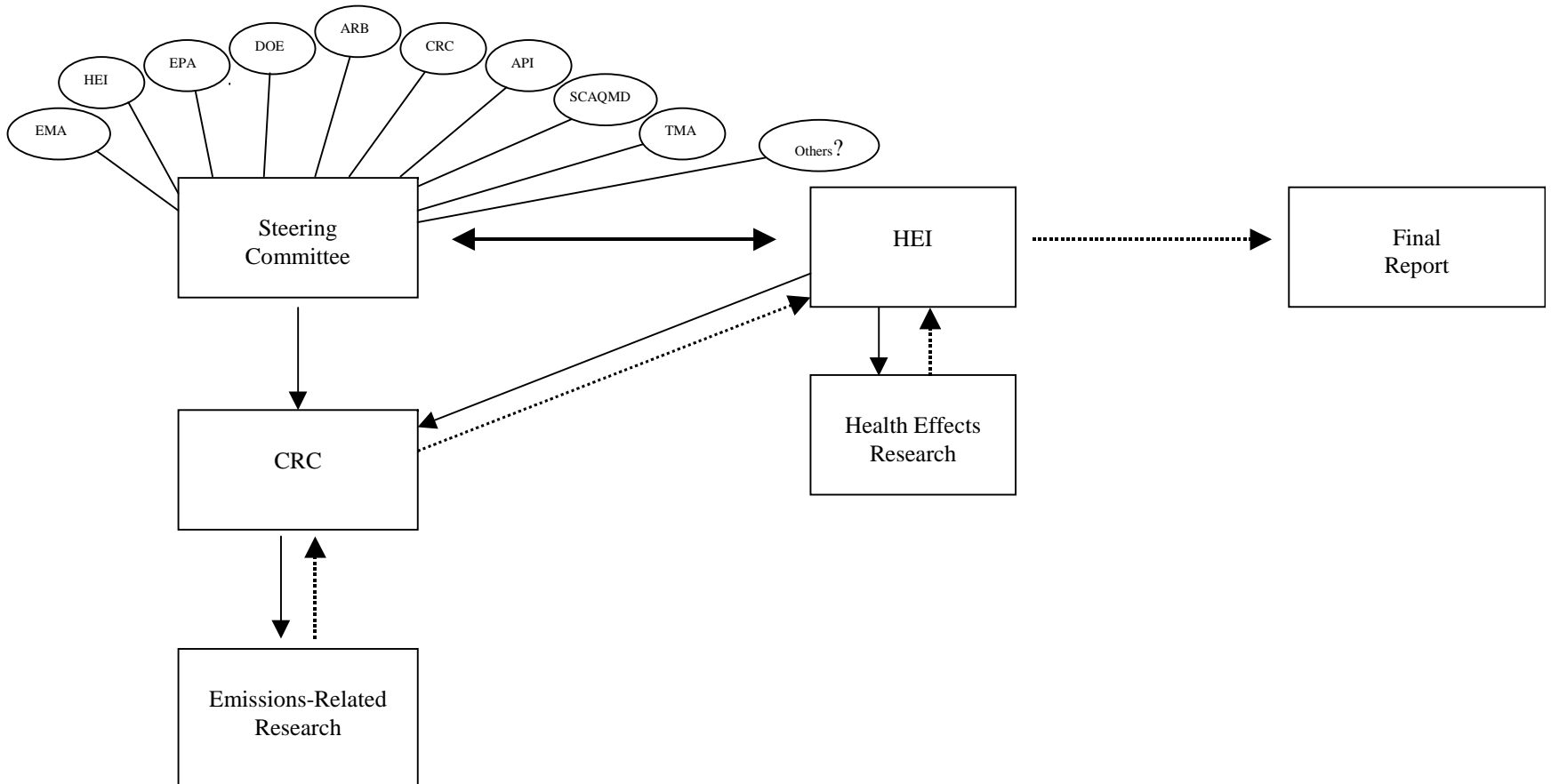
Impetus For ACES Initiative

- Without comprehensive data and analyses relating to the nature and composition of prototype 2007-2010 diesel engine exhaust, there is a possibility that the potential benefits of new engine designs, aftertreatment systems and fuels may not be recognized.
- Thus, as a necessary follow-up to the HAD, it is critically important that new, objective, real-world data regarding the composition and properties of emissions from advanced diesel technologies be developed and disseminated.
- This new information and a detailed understanding of the changes in emissions are needed in order to fully assess and implement sound public policy choices regarding future diesel technologies.

The Need For Collaboration

- Because of the cost, complexity and timing of the envisioned emissions research program, there is a critical need to coordinate the ACES initiative with HEI, EPA, CRC, ARB, DOE, API and other key stakeholders. Industry and government agencies share a common interest in objectively assessing the potential benefits from the stringent 2007-2010 mandates relating to diesel engine emissions and fuel formulations.
- Ongoing studies by DOE, CRC and other research groups may present unique near-term opportunities to coordinate and integrate the ACES program into current emissions studies in a synergistic and economical manner.

DRAFT ORGANIZATIONAL CHART FOR “ACES” INITIATIVE



Anticipated Timing Of The ACES Program

- The anticipated timeline for the ACES program is generally as follows:

Year 1

Formation and Meeting(s) of Steering and Coordinating Committee(s)

Nov. 2003 – June 2004

Planning Workshop to develop study details and emission measurement and toxicology endpoints

Initial design of logistics for project implementation (e.g., operations and locations, interaction with engine companies, coordination of emissions and health work, etc.)

Preparation of solicitations for emission facilities and health study investigators (precise timing mechanism to be determined)

Summaries (e.g., comparative tables, results) prepared of selected existing emission and health characterization studies

Jan. 2004 – June 2004

Solicitation and selection of emission testing facilities and health study investigators

Detailed preparation with companies and test facilities for timing and availability of advanced engine prototypes

Finalization of emission measurements and health endpoints

Development of QC procedures and QA oversight mechanism

Anticipated Timing Of The ACES Program

July 2004

Provision of advanced engine prototypes (with catalyzed particle filters but likely not the most advanced (2010-compliant) NOx technologies)

Year 2

July 2004 – Dec. 2004

Set-up and pilot testing of engine prototypes

Detailed scopes of work and protocols developed with health investigators

Jan. 2005 – June 2005

Initial emission characterizations

Set-up and piloting of health research/testing techniques

Year 3

July 2005 – June 2006

Emission testing and health research work proceeds

Year 4

July 2006 – Dec. 2006

Emission and health work completed; reports prepared

Jan. 2007 – June 2007

Reports prepared and submitted to Review.

Year 5

July 2007 – June 2008

Review and publication of reports

Workshops and briefings for widespread dissemination and interpretation.

Step One: This Workshop

- To implement ACES, it is necessary to develop an agreed-upon outline of what should be studied and how, both from an emissions characterization perspective and a toxicology perspective.
- That outline should be consistent with the time frame for ACES (4-5 years) and should be geared toward assessing the types of real-world exposure concentrations that are most relevant to potential public health impacts.

Step One: This Workshop

- The operative questions to consider include:
 - 1) How can we best characterize/speciate/produce for toxicology and assay testing representative emissions from advanced (2007-2010) on-highway diesel-fueled engines as they may be experienced by representative near-source receptors?
 - 2) What toxicology/assay testing can we design and complete over the next 4-5 years to assess the potential public health impacts that may result from representative exposures to emissions from advanced on-highway diesel-fueled engines as experienced by representative near-source receptors?

Step One: This Workshop

- Elucidation by this group of the best means to address these and other key questions will help build the outline for ACES.
- If we are successful in crafting a workable consensus-based outline, a solid foundation for ACES can be established, and a unique program for developing key information to guide critical public policy choices can be pursued and (with dedicated effort) completed to the benefit of all stakeholders.

Conclusions

- The ACES initiative is necessary to ensure that the introduction of advanced technology diesel engines, aftertreatment systems and fuels is accompanied by an updated, accurate and real-world re-evaluation of the potential health effects associated with such advanced diesel technologies and products.
- This workshop is a key first step – hopefully a spring board – to setting the ACES initiative in motion toward completion.