Voluntary Diesel Retrofit Program

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Background Information

- EPA launched the Voluntary Diesel Retrofit Program March 22, 2000 at the Diesel Emission Control Retrofit Workshop hosted by Corning, Inc. We discussed:

  - The serious health effects of diesel emissions and the impact they have on our communities
  - Upcoming diesel engine and fuel regulations
  - Our goals for the Retrofit Program:

    • To have commitments for 10,000 retrofits by the end of 2000
    • To create several pilot projects
    • To Build Partnerships
    • To help identify potential funding sources
    • To create the details of a National Retrofit Program
    • To create a web site that serves as an information clearinghouse
10,000 Retrofit Commitment Goal

- Any change to an engine system above and beyond what is required by EPA regulations that improves the emission performance of a diesel engine will count:
  - Addition of new/improved emission control equipment
  - Upgrading a certified engine to a cleaner certified configuration
  - Upgrading an uncertified engine to a cleaner “certified-like” configuration
  - Conversion of any engine to run on a cleaner fuel
  - Early replacement of older engines with newer/cleaner engines
  - Use of cleaner fuel and/or emission reducing fuel additive

- As of December 21, 2000, the official count is approximately 13,500 commitments for retrofit
Current Pilot Projects

• Create ‘seed’ projects to generate interest
• Allow EPA to evaluate various technologies
  - Emission performance
  - Durability and Maintenance
• Since the Corning workshop:
  - **Seattle:** Everett, WA School District
    • 20 - 50 School buses
  - **Washington DC,** Metro Area Transit Authority (WMATA)
    • 10 metro buses with PM and NOx control
  - **Washington DC,** Waste Management, Inc.
    • MOU to retrofit ~10 Sanitation trucks
  - **Norfolk Naval Base**
    • Marine CI engines
    • Very high fuel sulfur levels (~4000 PPM) present great challenge
Pilot Projects

Transit bus in New York City’s Clean Diesel Demonstration Program
Future Pilot Projects

• Expansion of the 4 pilots:
  – St. Louis
  – Atlanta
  – Houston

• Integration of our in-use testing capabilities with our retrofit projects.
  – ROVER testing
  – Pre-installation
  – Post-installation
  – Durability assessments
Details of the Retrofit Program

• We want to create a uniform process that each city, state, or fleet owner will follow

• Following this process provides confidence that reductions are real

• Components of this process:
  – Verifying Retrofit Technologies
  – Conservative Project Phase-in Schedules
  – In-use Testing Requirements
  – Calculating Emissions Reductions
Details of the Retrofit Program

1. **Verifying Retrofit Technologies:**

- Transitioning from the NESCAUM 3rd party review to EPA’s Environmental Technology Verification (ETV) Program

- The ETV program will:
  - Develop generic testing protocols and more specific testing plans
  - Provide objective performance data
  - A Technical Panel has been developed to finalize details of the testing protocols
  - Next meeting to be held at the end of this month

- OTAQ will turn performance data into the “Verified Technology List” which will:
  - List Percent Reductions
  - Describe compatibility issues
  - Be available on the Retrofit web site
2. **Conservative Project Phase-in Schedules:**

- Incorporating Voluntary Measures in a SIP requires credit shortfalls to be remedied in a timely manner
- Retrofit technologies still relatively new…credit shortfall possibilities exist
- Phasing in allows for an opportunity to recover shortfalls by installing more retrofits

The schedule:

- **Year 1:** Pilot projects, less than 50 retrofit units
- **Year 2:** Expand pilot project to retrofit no more than 25% of fleet
- **Year 3:** Expand project to retrofit no more than 50% of total fleet
3. **In-use Testing Requirements:**

- In-use testing responsibility of the retrofit manufacturer
- Testing required for a given product after 500 units sold
- Two groups of units are identified and tested at 2 stages:
  - 25% and 75% of manufacturer’s useful life
- At each stage:
  - At least 4 units must be tested, up to 10
  - To pass each test: at least 75% of verified reduction must be achieved
  - To pass the Stage: 4 units must pass **AND** >70% must pass
  - Engine or chassis dyno tests are appropriate, mobile emissions testing systems are a possibility
  - Failures initiate FTP dyno testing and possibly de-verification
4. Calculating Emissions Reductions:

• Three equations can be used to calculate reductions:
  – Fuel consumption
  – Mileage
  – Service

• Baseline emission levels for Highway vs. Nonroad
  – Highway: Official certification levels are available
  – Nonroad: Most retrofits may be pre-regulated: no info available

• BSFC: May be difficult to obtain in g/bhp-hr
  – Highway: Mobile 6 model
  – Nonroad: ?

• EPA’s Retrofit Calculator
Voluntary Retrofit Web Site

- Web site’s address:  www.epa.gov/otaq/retrofit
- Contains the following information:
  - Technology verification information
  - Funding information
  - Information about past and current retrofit projects
  - Diesel emissions and control information
- Went live on December 1, 2000
- Received over 4,000 hits last month
- Web site demonstration