In-Use Retrofit Section
Off-Road Programs

Manufacturers of Emission Controls Association (MECA)

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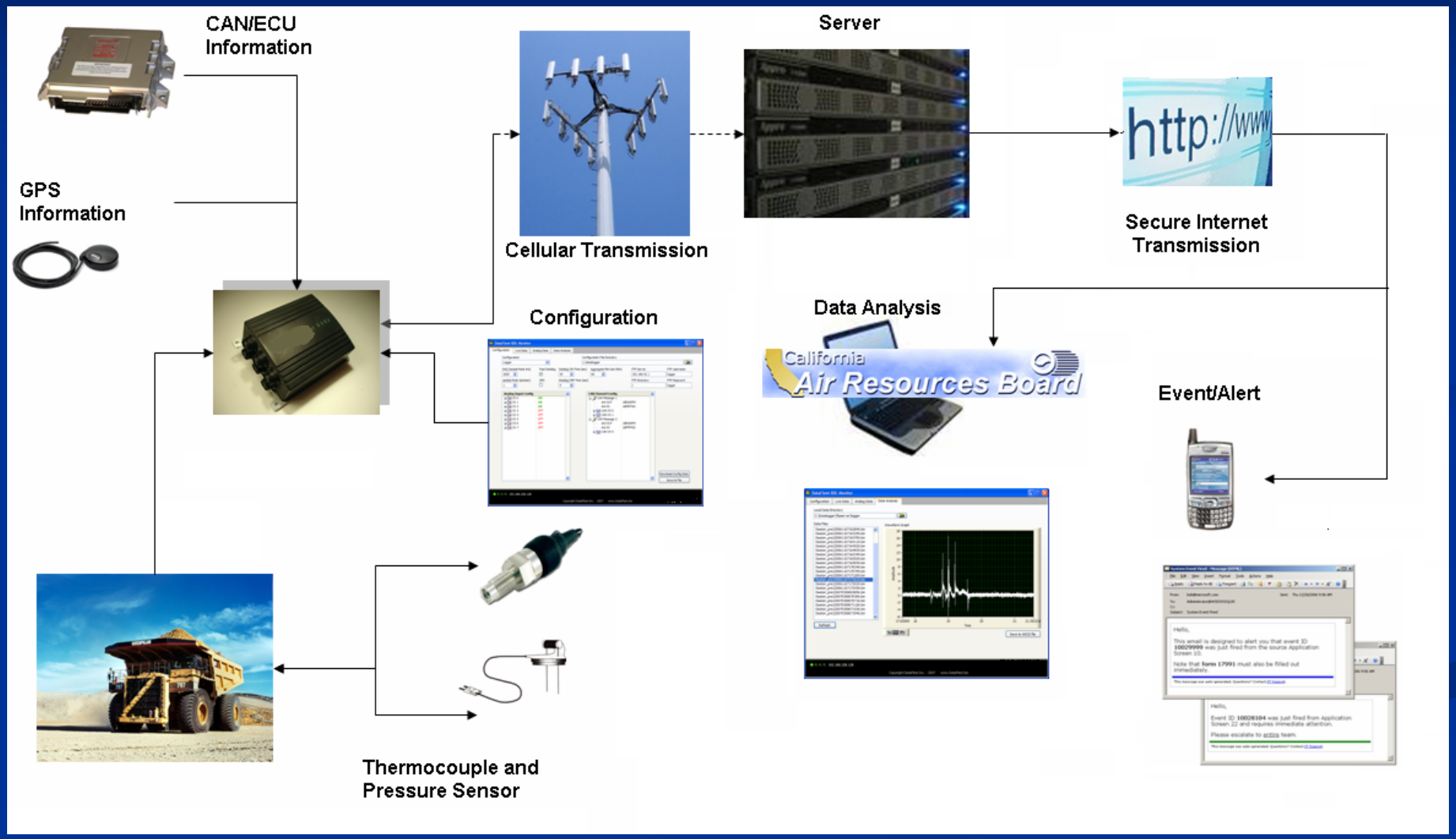
Presentation Outline

- Objectives of Demonstration Programs
- Program Implementation
  - Device Selection Process
  - Installations
  - Incidents
- Conclusions
- Recommendations

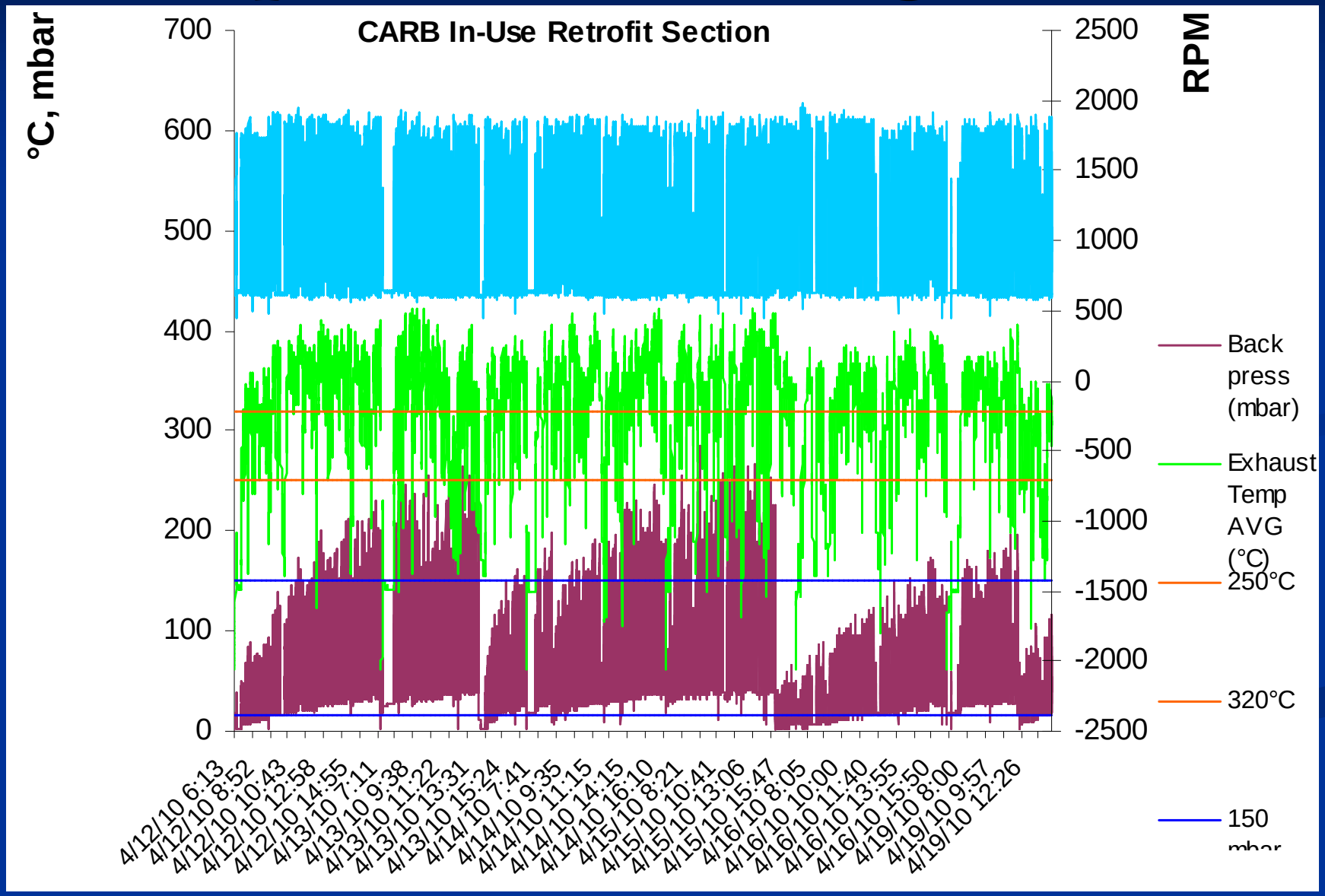
Showcase and SEP Objectives

- Reduce diesel PM emissions (Level III)
- Demonstrate durability and effectiveness of DPF systems (PEMS)
- Demonstrate new technologies
- Increase number of verified devices
- Monitor DPF performance over time

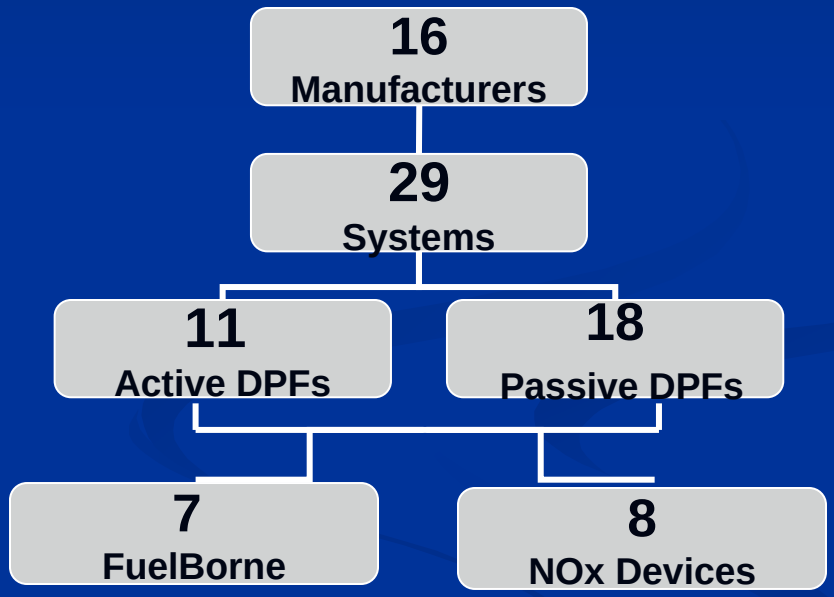
ARB Data Logger



Backpressure with Regeneration



Emission Control Manufacturer Participant List

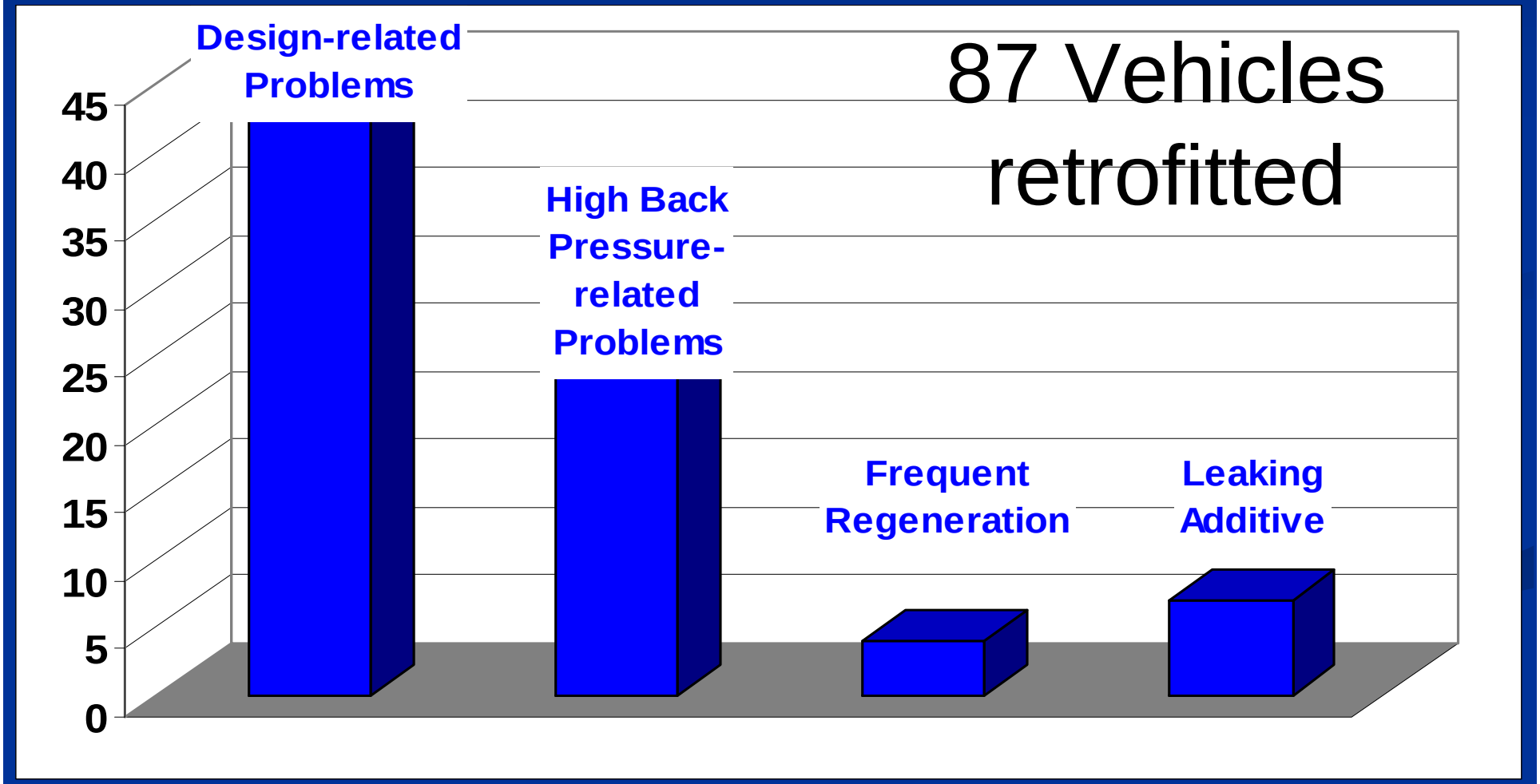


Catalyst Systems	Vehicles
16 Tier 0	Tier 0 (16)
22 Tier 1	Tier 1 (38)
27 Tier 2	Tier 2 (26)
23 Tier 3	Tier 3 (7)

Device Selection and Approval

- Data log vehicles
- Evaluate engine (OEM specifications)
- Submit design and cost
- OSHA requirements
- Budget, technology, diversity

Main Incident Categories and Percent Occurrence



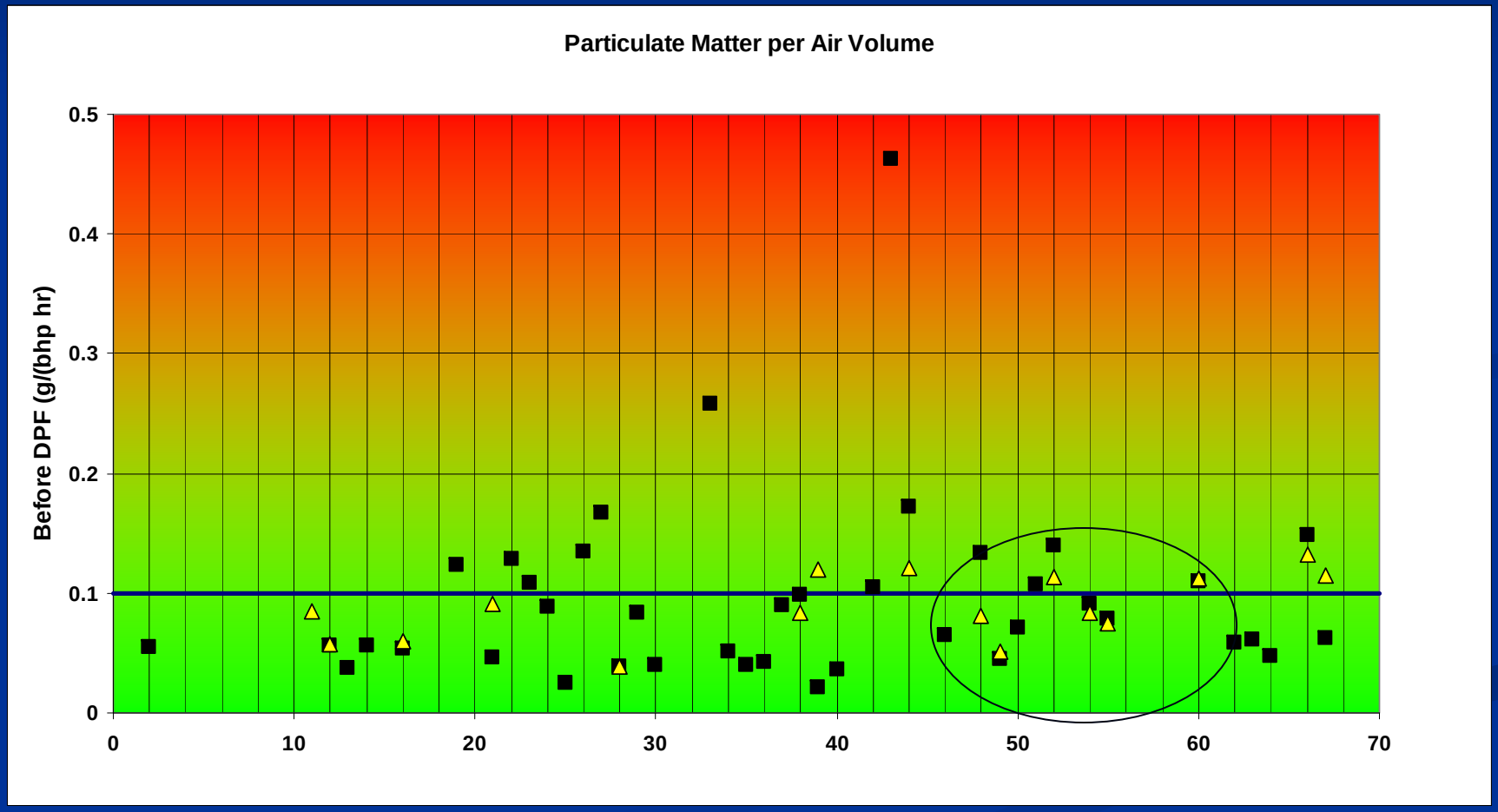
DPF Installation Issues

- Inexperienced installers (who is responsible?)
  - Tier 3 engines (NOx / PM ratio)
  - Undersized DPF
- Shock and vibration greater for off-road
  - Insufficient strengthening and support
  - Hoses and wires not shielded correctly
- Timely resolution of installation issues

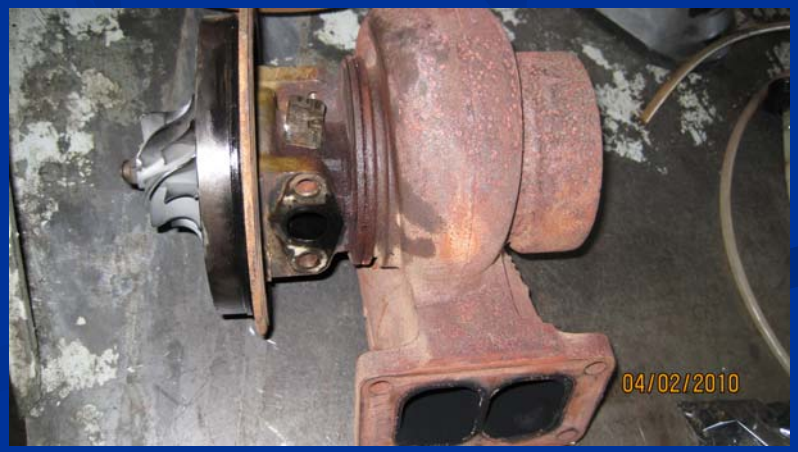
Improper Installation

Additive Leak / Loose Fitting

Inadequate De-Ashing / Training



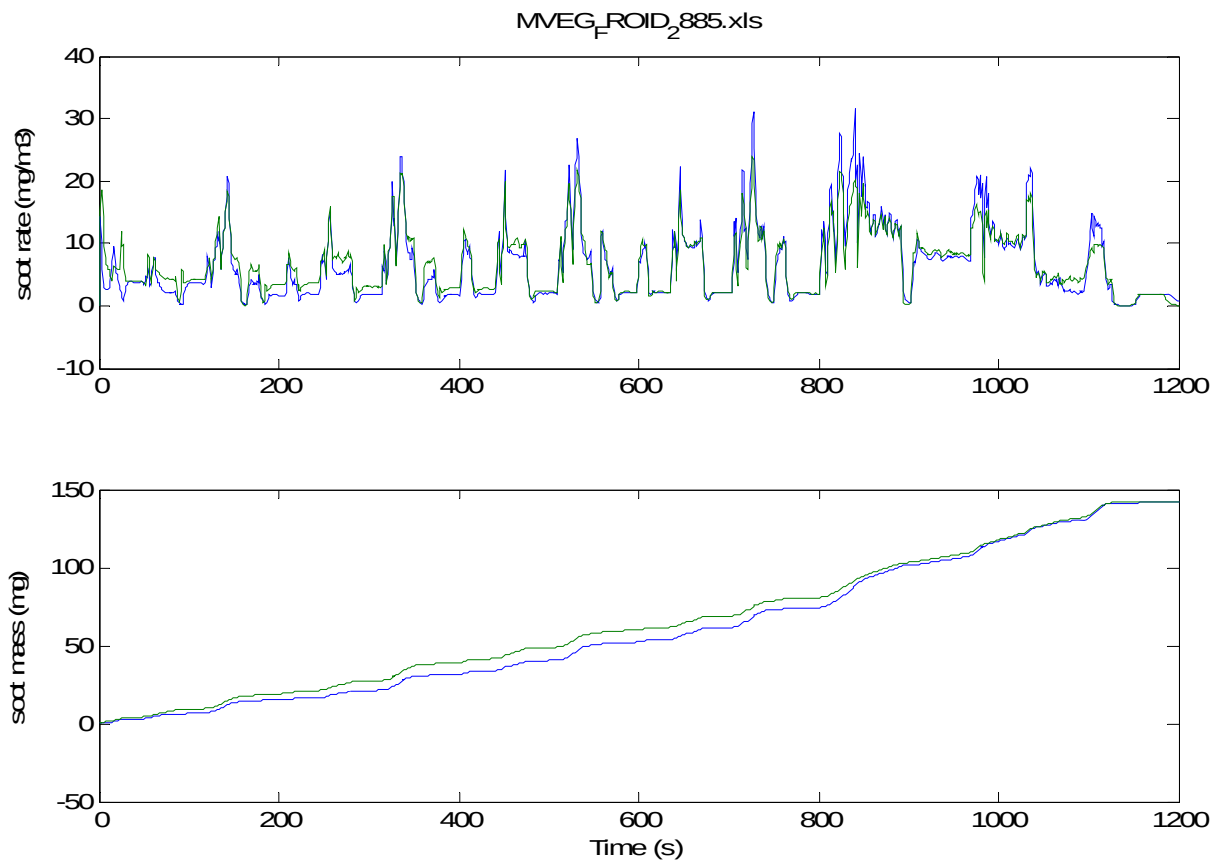
High Back Pressure



Conclusions

- **Retrofits Work**
- Proper evaluation of engine conditions
- Vibration isolation / Shock accommodation / Heat insulation
- OSHA requirements (SCRs)
- Faster response of device manufacturers to issues
- Proper fleet/operator training
- Recommendation of proper instrument for de-ashing DPF (Birth Weight)
- Oil consumption records (20 quarts)
- Proper engine maintenance
- Visual engine indicators are obsolete with DPF

Correlation with Micro Soot Sensor



Recommendation

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- Website:
- http://www.arb.ca.gov/diesel/showcase/showcase.htm