

Compression Ignition and Heavy-Duty Certification

2009 EMA Certification Workshop

May 05, 2009

California Environmental Protection Agency

 **Air Resources Board**

2009 EMA Certification Workshop

- 2010 General Certification Topics
- 2010 On-Road Certification and Implementation Topics
- 2010 Off-Road Certification Topics

2010 Certification

General Topics

- New Certification Section Created
- Diesel Engine Durability Program
- 2010+ Durability Program
- Certification Application Issues

New Certification Section Created

Compression Ignition and Heavy-Duty Certification (CIHD Cert-Section)

Responsibilities:

- On-Road HD (Diesel + Otto) Engines
- On-Road Heavy-Duty Vehicles
- California Medium-Duty Vehicle Engines
- Off-Road Compression Ignition Engines

Compression-Ignition and Heavy-Duty Certification

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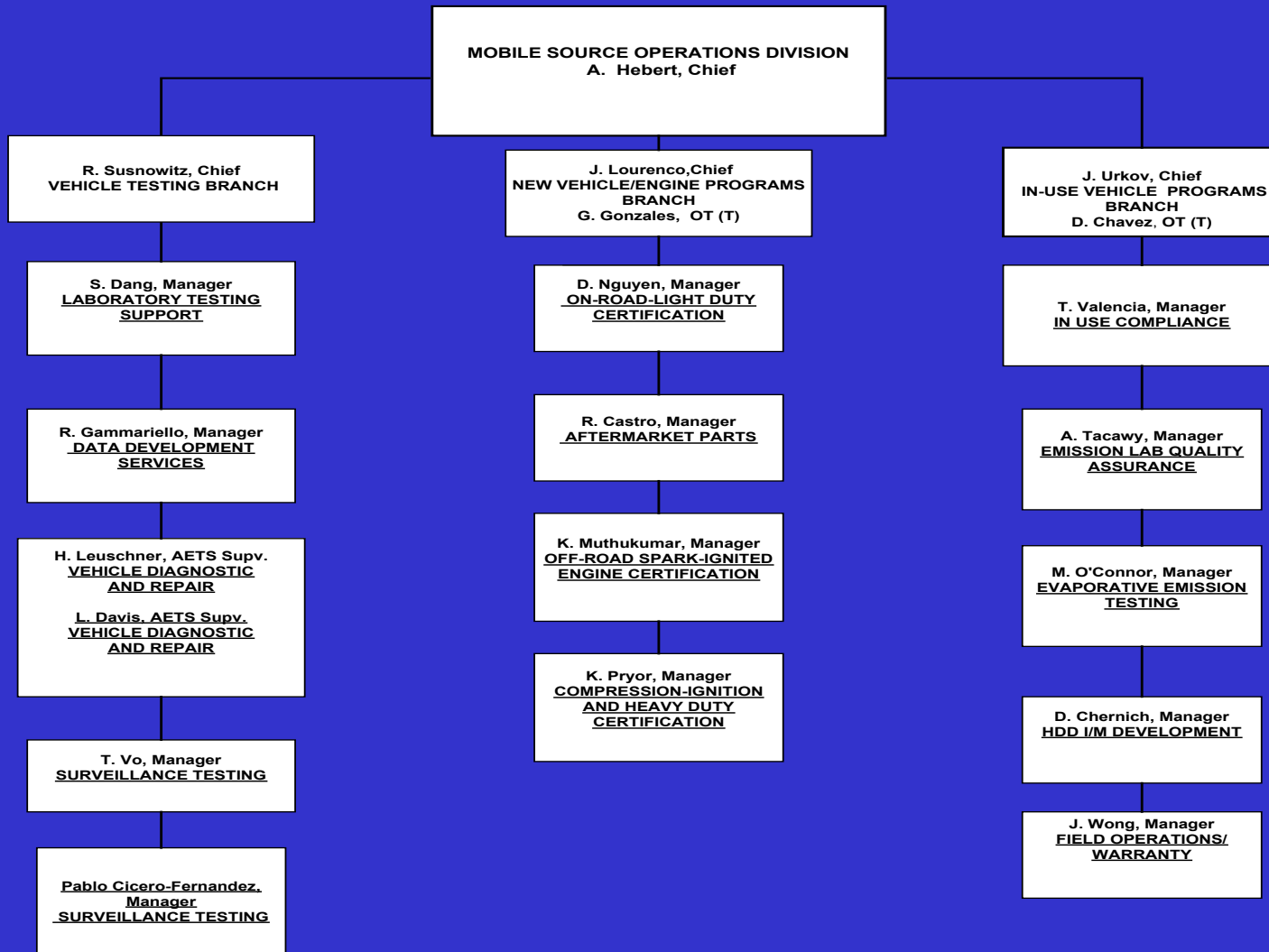
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Mobile Source Operations Division Org Chart



Certification

Diesel Engine Durability Program

- New durability testing required for
 - MY2010 = on-road HD diesel engines
 - MY2011 = Interim Tier-4 new technology engine
 - MY2014 = Tier-4 new technology engine
- ARB and EPA work closely to have common requirements

Certification

MY2010+ Durability Program For On-Road HDDEs

- ARB wants 50% UL in-use representative DF testing
- Alternative DF testing and stable DFs through 2012 for Mfrs participating in co-op test program
- Must account for in-use DPF regeneration (frequency, duration, and emission deterioration) and critical ECS maintenance (e.g., DPF ash cleaning, EGR valve/cooler)
- ARB is still engaged in the DF discussion

Certification

Typical Certification Issues

- Streamline Review Process Timing
- Expedited Application Processing

Certification

Streamline Processing Time

- Avoid submitting all applications in Oct.-Dec. timeframe (submit carryover family early)
- Submit AECD documents early (at least 90-days before application)
- Submit and discuss durability plan early (before service accumulation begins) with ARB and EPA simultaneously
- Discuss DPF, SCR strategies and other new technology information early

Certification

Expedited Application Processing

- Plan ahead - submit applications early in the year (Mar.-Aug.)
- Provide certification staff with priority list
- If requested, certification staff will try to expedite processing of 1-2 applications per MY
- Certification staff cannot expedite processing of all applications for a manufacturer

2010 Certification

On-Road Topics

- OBD
- SCR Concerns
- Hybrid HD Vehicle Certification
- Idle Emission Reduction 2010+
- OCR Engine Family
- Service Information
- Warranty Reporting

On-Road Heavy-Duty On-Board Diagnostics

- MY2010-2012, one engine family with OBD per non SVM (except alternative fueled engines)
 - Parent rating (highest sales) – full OBD
 - Child ratings (others) – extrapolated OBD (malfunction criteria per engineering evaluation approved by ARB)
- OBD documents to MSCD directly
- OBD approval letter from MSCD to Mfr to DMS

On-Road Heavy-Duty

SCR Concerns

- Deterioration:
 - Linear vs. non-linear deterioration
 - Interaction w/ upstream DPF
- Ammonia:
 - Ammonia storage and related durability concerns
 - Ammonia slip (@ 25 ppm as “smell-able”, for certification 10ppm limit??)
- Cu-based SCR, TAC formation not finalized

On-Road Heavy-Duty

Hybrid Certification

Under current procedures, two cert options

- Option 1: Using Certified Engines within the proper vehicle class
 - Re-cert not needed if no change to engine calibrations and AECD limits
- Option 2: Chassis Certification (engine + hybrid system + vehicle)
- No changes planned

On-Road Heavy-Duty Hybrid Certification

CA transit agencies seeking Hybrid Electric Buses (HEBs) to meet Urban Bus fleet rules

MHDD engine use in HEBs allowed provided:

- No change in engine calibration and engine operates within AECD limits
- Engine MFRs to demonstrate 435K-miles emission compliance
- Acceptable demonstration – MHDD engine in HEB
 - Engine change-out at 185K and 370K miles
 - Open to other demo approaches

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On-Road Heavy-Duty

Idle Emission Reduction 2010+

Engine Shutdown System (ESS) - MAC 07-03

- ESS required for all CA-only and all 50-state-labeled engines not in exempt vehicles
- A complete reflash to “no ESS” for exempt vehicles is required for MY2010+; Mfrs may **no longer** disable ESS software toggle
- Armored Truck added to exempt vehicle list

On-Road Heavy-Duty

OCR Engine Family

- Engines with OCR must certify the entire family to worst-case emission adjustment factors
- Must follow CHC-2006-007-1 guidance letter
- Same FEL applies to ALL engines with or without OCR in an engine family
- Existing 2007+ engines can have OCR under an approved field fixes

Heavy-Duty Service Information

Annual Website Reports

- Website reports are mandatory
 - ARB has received few submittals from HDDE Mfrs in the past two years
 - Received submittals from only 38% of EMA members – the remaining 62% have not submitted
 - Possible penalties for non-submittal
- ARB needs Mfrs' reports to create the required annual report to the state legislature on the effectiveness of the service information regulation.

Service Information

Contact Information

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Heavy-Duty EWIR Reporting

2008Q4 EWIR Data

- 11 HD Manufacturers Reporting
- ~1000 Components Reported by HD Mfrs
- 380 Parts >10%, 29 Parts > 100%
- FIRs and EIRs are being submitted
- EIRs Contain No Emission Data
- No Corrective Actions From Reporting
- ARB Will Meet with Each Mfr

Amended Warranty Regulations

- Regulations Approved by OAL in Dec '07
- ARB Sued Jan '08 by EMA & Aft Mkt Industry
- Court Ruled Against ARB in Dec '08
- ARB to Repeal Reg in Jun '09
- ARB Continues Under Existing EWIR Regs
- ARB Will Pursue EWIR Amendments

Warranty Reporting

Contact Information

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2010 Certification

OFCI Topics

- Diesel Particulate Filters (DPFs)
- Selective Catalytic Reduction (SCR)

2010 Certification - OFCI

Diesel Particulate Filters

- Diesel Particulate Filters (DPFs) are considered as a new technology, i.e. 50% of UL deterioration period testing is required
- Operator Commanded Regeneration (OCR) is allowed under safe harbor provisions (CHC-2006-007-1)

2010 Certification - OFCI

Selective Catalytic Reduction (SCR)

- Similar concerns addressed by On-Road guidance
- Final inducement must be engine shut-down
- Early warnings and inducements are encouraged
- Recommended minimum fuel : DEF tank (2:1)
- SCR tamper resistance is required

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