2012 E2S2 — CARB’s New Mobile Equipment Regulations

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CARB's New Mobile Equipment Regulations

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14. ABSTRACT

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19a. NAME OF RESPONSIBLE PERSON

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18
Government and Industry Partnership

- Jorge Rodriguez
  - CARB regulatory overview and related URS activities

- Mark G. Weir
  - U.S. Navy Fleet Readiness Center Southwest (FRCSW) organizational compliance program execution

FRCSW PAO SPR 0013 (5/1/2012)
California Air Quality

- Population – 37,691,912 *(July 2011 U.S. Census)*
- Vehicles – 31,987,821 *(2010)*
- Several non-attainment areas for 8-hr ozone
- Emission reductions from Mobile sources
- >40,000 trucks/day
In 1998, California Air Resources Board (ARB) identified diesel particulate matter (diesel PM) carcinogenic.

- Diesel Risk Reduction Plan (DRRP) – 2000
  - New standards
  - Control technology

- First ATCMs
  - Idling restrictions on school buses (2002)
  - Stationary engine (2003)
• All diesel trucks, GVWR > 14,000 lbs
  – First drafted 2008, Finalized 2011
  – PM, NO$_x$ and GHG
• Trucks > 26,000 lbs, required retrofits
• Replace all trucks when 20 years or older
  – EPA MY 2010 standards (NO$_x$ and PM)
• Exemption:
  – Tactical vehicles
  – Low-use (less than 1,000 miles per year)
Off-road Diesel Regulation

- All non-road mobile diesel equipment, engine ≥ 25 bhp
  - First drafted in 2007, final amendments 2011
  - PM and NO$_X$
- Initial compliance date 1/1/2014
- Small, medium and large fleets
- Fleet averaging (weighted)
- Other requirements:
  - Reporting, labeling, idling
Large Spark-Ignition Regulation

- All non-road large spark-ignition (LSI) engine forklifts, sweepers/scrubbers, industrial tow tractors or ground support equipment (GSE)
  - Drafted 2006, Final amendments 2011
  - ≥ 25 bhp AND > 1.0 L displacement
- Small, medium, large fleets
- Forklift vs. non-forklift
- Fleet averaging
Compliance Options

• Retirements
• Replacements
  – T&B: MY 2010 Standard
  – ORD: Tier 4 Non-road Engine Standard
  – LSI: MY 2010 Standard (CA only)
• Retrofits
  – Diesel Emission Control Strategies (DECS)
    • PM + NO\textsubscript{X}
  – Three-way catalyst
    • NO\textsubscript{X}, HC and CO
### California Waivers and Authorizations

<table>
<thead>
<tr>
<th>Date/Volume</th>
<th>Title and Action</th>
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<tbody>
<tr>
<td>April 4, 2012 Volume 77, Number 65 pp. 20388-20392</td>
<td>Large Spark-Ignition Engines and Fleets</td>
</tr>
<tr>
<td>October 31, 2011 Volume 76 Number 210 pp. 67184-67186</td>
<td>California State Nonroad Engine Pollution Control Standards; Large Spark Ignition (LSI) Engines; Fleet Requirements for In-Line LSI Engines and Other Industrial Engines; Opportunity for Public Hearing and Public Comment</td>
</tr>
<tr>
<td>February 9, 2011 Volume 76 Number 27 pp. 7196-7198</td>
<td>California State Nonroad Engine Pollution Control Standards; Request for Authorization of Airborne Toxic Control Regulation; Opportunity for Public Hearing and Public Comment</td>
</tr>
<tr>
<td>February 21, 2012 Volume 77 Number 34 pp. 9916-9923</td>
<td>California State Motor Vehicle and Nonroad Engine Pollution Control Standards; Mobile Cargo Handling Equipment Regulation at Ports and Intermodal Rail Yards; Notice of Decision</td>
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- **Truck and Bus**
  - CARB notes request is w/in scope of previous waiver of Federal Preemption
  - Idling Requirements, approved February 6, 2012
- **ORD**
  - EPA has not granted this waiver (2008)
- **LSI**
  - EPA granted CARB waiver on April 4, 2012
  - Standards and fleet requirements
DoD Response

- Region XI Regional Environmental Coordinator (REC) highly involved
- Secured tactical vehicles exemption for all regulations
- Blanket exemptions for both NALF San Clemente Island and NBVC San Nicolas Island
Nationwide Impacts

• CA laws resonates throughout the nation
  – “…decision will affect not only persons in California, but also entities outside the State who must comply with California's requirements.”
  – “…determine and find that this is a final action of national applicability…”
  – New engine standards
  – Fleet requirements
Fleet Readiness Center
Southwest, San Diego, CA

Maintenance
Repair
Organization

- Navy and Marine Corps aircraft and shipborne systems
- Components and Engines
- Manufacturing
- Engineering and Logistics
Fleet Readiness Center
Southwest, San Diego, CA

• Diverse industrial workforce of 4,225 personnel
  • 2,675 civil service employees, 550 contractors and 1,000 active duty military
  • 5 labor unions
  • Footprint: 358 acres, 80 bldgs, 45 metric tons CO2E
  • 2009 SECDEF Award for Industrial Installation Sustainability, 2008 Shingo Silver Medallion, 2009 CAPE Eureka Award
  • Registered AS9100, AS9110, ISO 9001 and ISO 14001

• Platforms
  • Aircraft – FA-18, E2/C2, CH-53, H-60
  • Shipborne – LM-2500 gas turbine engines, aircraft carrier catapults, arresting gear and landing systems
California based Naval Stakeholders

• Command Levels
  • All commands within California

• NAVFACSW
  • Provides consolidate support for California ATCM compliance activities
  • Owns, operates and leases to other commands the largest share of Naval Material Handling Equipment (MHE), i.e., forklifts

• CNO N45
  • Maintains oversight of environmental compliance activates
FRCSW Forklifts
LSI Fleet Attributes

• Organizational
  • FRCSW is a Navy Working Capital Fund (NWCF) organization
  • Forklifts owned by 10 industrial operational cost centers within FRCSW
  • Each cost center must budget for and establish their individual product/service/labor rates

• Functional
  • Approximately 60 vehicles
  • Some as old as 28 yrs, some new, average fleet age is 15 yrs
  • Mostly 4K and 6K units
  • Approximately 10 electric units
  • Initial fleet average is 8.5 g/bhp-hr NOx + HC
FRCSW Forklifts
Fleet Attributes
LSI Compliance Strategy
Short Term

- Normal attrition and replacements – fleet average **5.7 g/bhp-hr**
- Low use exempt – approximately 30 units
  - Implement low use management program
  - Investigate the use of a COTS based Centralized Fleet Automated Management System (CFAMS)
- Tactical exempt – approximately 10 units
- Retrofits – none
- Low use and tactical exemptions – result in fleet average of **3.0 g/bhp-hr**
- New replacements – 5 units – results in fleet average of **0.9 g/bhp-hr**
LSI Compliance Strategy
Long Term

• Dispose of older [non-compliant] units

• Implement COTS based Centralized Fleet Automated Management System (CFAMS)

• Pool remaining units and share
Benefits of Phased Strategy Approach

Low Use Exemption Strategy

• Lowers immediate capital replacement costs
• Higher operating and maintenance costs for larger fleet
• Achieves compliance quickly

Fleet Reduction Strategy

• Lowers unit cost via shared resources and improved utilization
• Lowers operating and maintenance costs for smaller fleet
• Maintains lifecycle compliance
California’s LSI engine regulation is a refinement of the EPA LSI regulation – it would be fair to say the two regulations are “harmonized”.

California regulation is a point on the line segment represented at 0.6 g/bhp-hr HC+NOx [equivalent to 0.8 g/kW-hr]

EPA regulation is the whole line segment.
National Impacts

- Manufacturers who comply w/ California are in compliance w/ EPA

- Most [if not all] manufactures will build engines meeting the California regulation, i.e., they will not build different models engines for California only

- Fleet averaging is required only by CARB in California – necessitating replacements, purchases and/or retrofits. The balance of the Nation will achieve equivalent emissions performance in time as a consequence of natural vehicle attrition.