Fundamentals of CARB’s In-Use Off-Road Vehicle Rule

Associated General Contractors of California
Los Angeles, CA
August 21, 2008

Justice & Associates
First-of-kind Rule Designed to Reduce Oxides of Nitrogen \((\text{NO}_x)\) and Particulate Matter (PM) from Self-Propelled, In-Use, Off-Road Equipment

- Adopted by the California Air Resources Board (CARB) July 26, 2007
- Approved by the California Office of Administrative Law (OAL) May 16, 2008
- Became Effective June 15, 2008
Rule Applicability

- Commercial Off-Road Diesel Vehicles
  - 25 Horsepower and Greater
- Includes Construction, Mining, Industrial, Airport Ground Support Equipment
  - Loaders
  - Dozers
  - Scrapers
  - Skid Steers
  - Excavators
  - Etc.

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Does NOT Apply to On-Road Vehicles
  • Will be Addressed in a Different Rule

Does NOT Apply to Vehicles Used Primarily for Agricultural and Forestry Operations
  • Greater than 50% of Operating Hours
Fleet Size Parameters

- Rule Requirements Vary by Fleet Size
  - Small Fleet < 2,500 Horsepower
    - No NO$_x$ Requirements
    - Fleet Retrofit Beginning 2014
  - Medium Fleet = 2,501 Horsepower to 5,000 Horsepower
    - NO$_x$ and PM Requirements
    - Fleet Compliance Beginning 2012
  - Large Fleet = Greater Than 5,000 Horsepower
    - NO$_x$ and PM Requirements
    - Fleet Compliance Beginning 2009
All Fleets Must Submit an Initial Inventory Report Based on the Fleet as it Exists on March 1, 2009

- Large Fleet Report Due April 1, 2009
- Medium Fleet Report Due June 1, 2009
- Small Fleet Report Due August 1, 2009

These are not Compliance Reports, Just a Detailed Fleet Inventory

- Vehicle Age
- Manufacturer
- Model Number
- Engine Age
- Horsepower
- Serial Number
- Etc.
CARB will issue Equipment Identification Number (EIN) Unique to Each Vehicle After Receipt of Initial Inventory Report

- Must Paint on Vehicle Within 30 Days
- EIN Remains with Vehicle if the Vehicle is Sold
Off-Road Rule
“Thou Shalt Nots...”

• Idling Limit
  • No Idling for More Than Five Minutes
    – This provision became enforceable on June 15, 2008
  • Six Idling Exemptions:
    1. Queuing
    2. Verification of Safe Operation
    3. Testing, Servicing, Repairing or Diagnostic Purposes
    4. Idling Necessary to Accomplish Work for Which the Vehicle was Designed (such as a Crane)
    5. Idling Required to Bring the Machine System up to Operating Temperature
    6. Idling Necessary to Assure Safe Operation of the Vehicle
  • Medium and Large Fleets Must Have a Written Idling Policy by May 1, 2009
    – CARB Developing Sample Policy

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Off-Road Rule

"Thou Shalt Nots..."

- No Tier 0 Equipment May Be Added after March 1, 2009
- Many Fleets Will Not Be Able to Add Tier 1 Equipment Either
Table 1. ARB and USEPA Off-Road Compression-Ignition (Diesel) Engine Standards (NMHC+NOx/CO/PM in g/bhp-hr). When ARB and USEPA standards differ, the standards shown here represent the more stringent of the two.

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a) The PM standard for hand-start, air cooled, direct injection engines below 11 hp may be delayed until 2010 and be set at 0.45 g/bhp-hr.
b) Standards given are NMHC+NOx/CO/PM in g/bhp-hr.
c) Engine families in this power category may alternately meet Tier 3 PM standards (0.30 g/bhp-hr) from 2008-2011 in exchange for introducing final PM standards in 2012.
d) The implementation schedule shown is the three-year alternate NOx approach. Other schedules are available.
e) Certain manufacturers have agreed to comply with these standards by 2005.
Fleet Average Compliance

- Option 1: Meet NO\textsubscript{x} and PM Average Targets
- A Fleet Average is a Horsepower–Weighted “Goal” Based on “Targets” Contained in Tables in the Rule
- Fleet Average Targets Decline Over Time
  - NO\textsubscript{x} Targets Decline Each Year from 2010 through 2020
  - PM Targets Decline Every Other Year from 2010 through 2020
    - 2015 through 2025 for Small Fleets
If You Are Not Able to Meet the Fleet Averages You Have Alternative Compliance Options

- $\text{NO}_x$: Turn Over a Percentage of the Horsepower in Your Fleet Each Year
  - 8% per year from 2010 through 2015
  - 10% per year 2016 through 2020
  - Replacement, Repowering and Retirement Qualify

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• PM: Apply Verified Diesel Emission Control Systems (VDECS) to 20% of the Horsepower in Your Fleet Each Year

• CARB Refers to the NO$_x$ and PM Compliance Alternatives as the “BACT Path”

• BACT Means “Best Available Control Technology”
Annual Compliance Flow Chart

Here's How It's All Supposed to Work:
Large and Medium Fleets

Start Here
Determine Normal Turnover For Next Compliance Date

Will Fleet Meet NO\textsubscript{x} Fleet Average Target?

\begin{itemize}
  \item \textbf{YES}
  \begin{itemize}
    \item Will Fleet Meet PM Fleet Average Target?
      \begin{itemize}
        \item \textbf{YES}
          \begin{itemize}
            \item Will 20\% Of Total HP Have Been Retrofit With Highest Level VDECS In Past Year?
              \begin{itemize}
                \item \textbf{YES}
                  \begin{itemize}
                    \item Apply Highest Level VDECS or a Tier 4 Engine with a Particulate Filter To Another Engine
                      \item Done For Year
                  \end{itemize}
                \end{itemize}
              \end{itemize}
          \end{itemize}
        \end{itemize}
      \end{itemize}
  \end{itemize}

\item \textbf{NO}
  \begin{itemize}
    \item Will Required \% Of Total HP Have Been Turned Over In Past Year?
      \begin{itemize}
        \item \textbf{YES}
          \begin{itemize}
            \item Turn Over Another Engine
        \end{itemize}
      \end{itemize}
    \end{itemize}

\item \textbf{NO}
  \begin{itemize}
    \item Turn Over Another Engine
  \end{itemize}
\end{itemize}
All fleets submit Annual Compliance Reports according to the following schedule:

- Large Fleets Begin Submitting Annual Reports in 2010
- Medium Fleets Begin Submitting Annual Reports in 2012
- Small Fleets Begin Submitting Annual Reports in 2014

If the Annual Report indicates the fleet is in compliance, CARB will issue a "Certificate of Reported Compliance"

- Having this Certificate will become a requirement to bid on many projects
Credit for Early Repowers

- Fleets that have repowered vehicles by replacing Tier 0 engines with Tier 1 or higher engines prior to March 1, 2009 receive credit towards the NO\textsubscript{x} Turnover requirements of the rule

Credit for Early Retirement

- Fleets that retire Tier 0 vehicles at an average rate greater than 8 percent per year (based on total fleet horsepower) between March 1, 2006 and March 1, 2009 receive credit towards both the NO\textsubscript{x} and PM Requirements of the rule
  - This credit is very difficult to obtain
  - Must shed more than 24% of the fleet horsepower over this 3-year period to qualify

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Credit for Early Retrofit

- Fleets that have installed the highest level VDECS on vehicles before March 1, 2009 receive double credit towards the PM requirements of the Rule

- Medium Fleets Receive Single Credit from March 2009 Through March 2012

- Small Fleets Receive Single Credit from March 2009 Through March 2014
Exemption From Turnover (NOx) Requirements

- Small Fleets
- Tier 1 or Higher Engines (Through 2013)
- Vehicles Less Than 10 Years Old
  - Based on Vehicle Age, NOT Engine Age
- Vehicles Retrofit With Best Available VDECS in the Past 6 Years
- Interim and Final Tier 4 Engines
- Low-Use Equipment
  - Less than 100 Hours Per Year
    - Must have a non-resettable hour meter
    - Use with caution on Tier 0 and Tier 1 Equipment

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Exemption From Retrofit (PM) Requirements

- Vehicles Less Than 5 Years Old
  - Based on Vehicle Age, NOT Engine Age
- Engines/Equipment Where VDECS Installation Poses A Safety Risk
  - Must Apply to CARB for this Exemption
- Interim and Final Tier 4 Engines Equipped with an OEM Particulate Filter
  - Doesn’t have to be a VDECS
- Engines Retrofit With A Level 2 Or Level 3 VDECS Prior to Rule Adoption
- Low Use Equipment
  - Less Than 100 Hours Per Year
    - Must have a non-resettable hour meter

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All Vehicles Must Be Labeled

- CARB Assigns an Equipment Identification Number
- Labeling Must Occur Within 30 Days
- Specific Requirements for Label Size and Location on the Vehicle

Adding New Vehicles

- If Complying Using the Repower/Retrofit Option (BACT Path), Only Tier 2 or Newer Engines Can be Added to the Fleet
Incentive Funding

- Carl Moyer funding opportunities have virtually been eliminated for Large Fleets
  - Medium Fleets may have another year or two
  - Small Fleets may be able to qualify based on NO\textsubscript{x}, but number of operating hours is a problem
Surplus Off-Road Opt-in for NO$_x$ (SOON) Program

- Developed jointly by CARB, South Coast AQMD and San Joaquin Valley APCD
- Purpose is to obtain additional NO$_x$ reductions for PM2.5 attainment by 2014
  - NO$_x$ is a PM$_{2.5}$ precursor
- Applies to fleets with greater than 20,000 horsepower statewide under common ownership with more than 40% Tier 0 and Tier 1 on January 1, 2008
  - Medium and Small fleets may have the ability to participate

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Based on “Incentive” Funding

- Funding will work much like the current Carl Moyer repower grant funding program
  - Contractors will likely still have to pay for rebuild costs
Fleet Requirements

- Must apply for funding to meet more restrictive SOON NO$_x$ Fleet Average Targets
  - Must implement projects if funded by the participating district
  - Must submit a compliance plan and work with district-specific recordkeeping and reporting requirements
    - First compliance plan for South Coast due in early 2009
SOON-funded repower projects may not be used to demonstrate compliance with the base CARB rule during the period of the contract

- Contracts may be as long as 7 years
- Tier 3 under SOON = Tier 0 under CARB

SOON-funded equipment must reside in the participating air district for a minimum percentage of operating time for each year of the contract
Rule Will Be Expensive

- CARB Estimate Approximately $3.4 Billion
- Industry Estimate Approximately $13 Billion

Next Steps

- Submit Waiver Request to Federal EPA
  - Rule Emission Standards Become Effective After EPA Authorization is Obtained
- At this Point Other States May Adopt this Rule

Potential Legal Challenges

Off-Road Implementation Advisory Group

Enforcement

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### Benchmark Dates for Off-Road Diesel Rule

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<tr>
<th>DATE</th>
<th>ACTION</th>
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<tbody>
<tr>
<td>5.16.2008</td>
<td>Office of Administrative Law Approval of Rule</td>
<td>Establishes 30-day clock for rule registration by California Secretary of State.</td>
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<td>6.15.2008</td>
<td>California Secretary of State approves Rule</td>
<td>Idling restriction of no more than 5 minutes becomes enforceable.</td>
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<tr>
<td>3.1.2009</td>
<td>Establish Fleet for Initial Inventory Report</td>
<td>All fleets will file an initial inventory report based on the fleet as it exists on this date.</td>
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<tr>
<td>3.1.2009</td>
<td>Prohibition of Purchase - Tier 0 Equipment</td>
<td>No fleet may add a Tier 0 piece of equipment to their fleet.</td>
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<tr>
<td>3.1.2009</td>
<td>Prohibition of Purchase - Tier 1 Equipment (some Large Fleets)</td>
<td>Large fleets not meeting the NOX and PM Fleet Averages for 2010 cannot add a Tier 1 piece of equipment to their fleet.</td>
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<tr>
<td>4.1.2009</td>
<td>Submit Initial Inventory Report</td>
<td>Large fleets must submit their initial inventory report to CARB based on the fleet as it existed on March 1, 2009.</td>
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<tr>
<td>5.1.2009</td>
<td>Develop Idling Policy</td>
<td>Large and Medium Fleets must have a written Idling Policy.</td>
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<tr>
<td>6.1.2009</td>
<td>Submit Initial Inventory Report</td>
<td>Medium fleets must submit their initial inventory report to CARB based on the fleet as it existed on March 1, 2009.</td>
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<tr>
<td>8.1.2009</td>
<td>Submit Initial Inventory Report</td>
<td>Small fleets must submit their initial inventory report to CARB based on the fleet as it existed on March 1, 2009.</td>
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<td>11.1.2009</td>
<td>Last Date to Establish Delivery Delay Protection</td>
<td>Last day to place a purchase order for equipment or VDECS order and receive compliance protection in the event the equipment or VDECS is not delivered prior to the next compliance date.</td>
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<tr>
<td>3.1.2010</td>
<td>Establish Fleet for Annual Compliance Report</td>
<td>Large fleets will file an annual compliance report based on the fleet as it exists on this date.</td>
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<td>4.1.2010</td>
<td>Submit Annual Compliance Report</td>
<td>Large fleets will file an annual compliance report.</td>
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<td>Last Date to Establish Delivery Delay Protection</td>
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<td>3.1.2011</td>
<td>Establish Fleet for Annual Compliance Report</td>
<td>Large Fleets will file an annual compliance report based on the fleet as it exists on this date.</td>
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<td>4.1.2011</td>
<td>Submit Annual Compliance Report</td>
<td>Large Fleets will file an annual compliance report.</td>
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<td>3.1.2012</td>
<td>Establish Fleet for Annual Compliance Report</td>
<td>Large Fleets will file an annual compliance report based on the fleet as it exists on this date. Medium Fleets file a baseline report based on the fleet as it exists on this date.</td>
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<td>4.1.2012</td>
<td>Submit Annual Compliance Report</td>
<td>Large Fleets will file an annual compliance report.</td>
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<td>6.1.2012</td>
<td>Submit Annual Compliance Report</td>
<td>Medium Fleets will submit a baseline report based on the fleet as it existed on March 1, 2012.</td>
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<td>Last Date to Establish Delivery Delay Protection</td>
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<td>3.1.2013</td>
<td>Establish Fleet for Annual Compliance Report</td>
<td>Large and Medium Fleets will file an annual compliance report based on the fleet as it exists on this date.</td>
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<td>4.1.2013</td>
<td>Submit Annual Compliance Report</td>
<td>Large Fleets will file an annual compliance report.</td>
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<td>6.1.2013</td>
<td>Submit Annual Compliance Report</td>
<td>Medium Fleets will file an annual compliance report.</td>
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<td>Last Date to Establish Delivery Delay Protection</td>
<td>Last day to place a purchase order for equipment or VDECS order and receive compliance protection in the event the equipment or VDECS is not delivered prior to the next compliance date.</td>
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<td>3.1.2014</td>
<td>Establish Fleet for Annual Compliance Report</td>
<td>Large and Medium Fleets will file an annual compliance report based on the fleet as it exists on this date. Small Fleets file a baseline report based on the fleet as it existed on this date.</td>
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</table>
If you have any questions, please contact us at:

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