A Workshop on Reducing Emissions from Diesel Engines

April 7, 2008

Sprague
DEMAND MORE THAN SUPPLY

Ultra Low Sulfur Diesel Update
Tim Keaveney
Agenda

- **Introduction to Sprague**
- ULSD supply update
- ULSD supply considerations
- Conclusion
Sprague Energy: Evolving to Meet Customer Needs

**Fueling America’s Growth 1870-1950**
- Founded in Boston
- Supplied whale oil and coal to fuel thriving economy
- Owned fleet of 27 vessels
- Ran Allied coal support efforts in WWII

**Modernization 1950-1960**
- Transitioned to residual fuel oils
- Acquired and built new terminals
- Focused on industrial customers

**The Energy Crisis 1970-1985**
- Sprague family sold to Royal Dutch Shell…
- …only to sell to Axel Johnson two years later
- Expanded into distillate fuels and reseller class of trade
- Built two refineries

**Expanding Capabilities 1986-Today**
- Expanded product offerings:
  - Gasoline
  - Jet fuel
  - Natural gas
- Leveraged terminals for bulk materials handling
- Expanded into break-bulk handling
Our Products and Services

**End Users**
- Natural Gas
- Fuel Oils
- Coal

**Resellers**
- Motor Fuels
- Risk Management

**Materials Handling**
- Bulk
- Break Bulk
- Lumber
- Liquid

Sprague
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### Sprague’s Commitment to the Environment

<table>
<thead>
<tr>
<th>Industry leader in marketing clean fuels</th>
<th>Industry leader in environmental preparedness</th>
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<tbody>
<tr>
<td><strong>Ultra Low Sulfur Diesel</strong></td>
<td><strong>Active participant in regional response cooperative</strong></td>
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<td>- Built the infrastructure for and began marketing ULSD 6 years ahead of the EPA mandate</td>
<td>- Extensive employee training program</td>
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<td>- Supplying over 100 million gallons annually to nearly every major transit authority in the Northeast</td>
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<td>- 2005 Inaugural EPA Children's Environmental Health Award recipient</td>
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<td><strong>Biodiesel &amp; Bioheat</strong></td>
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<td>- First terminal operator/marketer to provide biodiesel blending capabilities in the Northeast</td>
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<td>- First operator to market biofuel specifically for home heating applications</td>
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- [2005 Children's Environmental Health Recognition Award](#)
- [National Biodiesel Board Member](#)
- [National Safety Council of Northern New England](#)
- [Certified Marketer](#)
- [Biodiesel](#)
- [Piscataqua River Cooperative](#)
- [Demand More Than Supply](#)
Sprague Owned Terminal Network

Sprague's terminals hold over 300 million gallons of liquid storage
Agenda

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Ultra Low Sulfur Diesel Regulations

- **On-road Diesel**
  - 2004: 500 ppm
  - 2006: 80% 15 ppm, 20% 500 ppm
  - 2007 & later: 15 ppm

- **Non-road Diesel**
  - 2004: 5000 ppm
  - 2006: 500 ppm
  - 2007 & later: 15 ppm

- **Locomotive & Marine Diesel**
  - 2004: 5000 ppm
  - 2006: 500 ppm
  - 2007 & later: 15 ppm

- **Home Heating Oil**
  - 2004: 5000 ppm
  - 2006: 5000/500/15 ppm?
  - 2007 & later: 500/15 ppm?
ULSD Implementation

Key Dates

- Key Dates: -
  - On-Highway
    - **June 1, 2006** – 80% of *refinery* output & *imports* will be 15ppm (excludes refiners granted hardship provisions)
    - **September 1, 2006** – *terminals* that participate in selling ULSD must adhere to all requirements
    - **October 15, 2006** – *retail outlets and trucking fleets* must adhere to all documentation and tracking requirements
    - June 1, 2010 – all on road fuel is 15ppm
  - **Non-Road, Locomotive & Marine (NRLM)**
    - June 2007 – NRLM fuel sulfur content reduced to 500ppm
    - June 2010 – NR fuel sulfur content reduced to 15ppm
    - June 2012 – LM fuel sulfur content reduced to 15ppm
  - Jan. 1, 2007 – OEM’s introduce into marketplace new vehicles with emission control devices, which will require the use of ULSD
ULSD Update

• The fear is behind us!
• 2006 transition from LSD to ULSD has gone smoothly
• Proper planning has paid off
• No significant strain on ULSD supply
• The impact to the on road sector has been minimal
• Challenge: supplying those calling for LSD!
Who is Storing What?

• Limited storage capacity reduces duel fuel capabilities

• The Rule: All major northeast wholesale fuel oil terminal operators now store 15ppm ULSD

• The Exception: Terminals that store 500ppm LSD

• Conclusion: ULSD is now widely available in the marketplace, with 500ppm being a “niche” product
US Distillate Fuel Oil Production, Sulfur Content (PPM)

- 70% Less than 15 PPM
- 13% 15 - 500 PPM
- 17% Greater than 500 PPM

Total US Production ~ 4.2 million bbls/day

Source: US Energy Information Administration
500 PPM Diesel Availability Today

- 15 - 500 PPM
- Less than 15 PPM

Locations:
- Revere, MA
- Providence, RI
- BP, Brooklyn, NY
- Oceanside, NY
- Sunoco, Newark, NJ
- Northville Holtsville, NY
- New Bedford, MA
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ULSD Supply Considerations

• Contract with experienced, credible, financially responsible supplier
• Obtaining consistent high quality product
  – meeting/exceeding OEM specifications
  – meeting operability standards
  – meets federal, state and local regulations
  – utilize Quality Assurance Control Program to ensure product integrity
• Securing adequate supply
  – vendor alternative supply sources
  – geographically desirable back-up terminal network supply system
  – back-up delivery system
• Securing competitively priced product
  – posting mechanism options
  – firm fixed price opportunity
  – bulk purchase opportunity
ULSD Supply Considerations

• Lubricity
  – ULSD is deficient in lubricity characteristics
  – Suppliers now required to treat for lubricity at terminals
  – Typical ULSD >600 um HFRR testing
  – ASTM D975 spec = <520 um wear scar
  – Consult with OEM for specific lubricity requirements
  – Ask your ULSD supplier for HFRR test results
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Conclusion

• EPA mandates now require non road users to burn low sulfur fuels

• Limited supply of LSD will force non road users to burn greater amounts of ULSD through 2010

• 2010 all non road fuel will be required to be ULSD

• Diesel users should work with OEMs and fuel suppliers in order to source the proper fuel for their equipment
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Doing More

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