NSPS OOOO0a

Fugitive Emissions Requirements

International Petroleum Environmental Conference
November 10, 2016
New Orleans, LA

Margo D. Moss
Margo.moss@lmenviro.com

Lee J. Lemond
Lee.lemond@lmenviro.com
About Us

- Founders of L&M Environmental Response
- Compliance Consulting & Emergency Response Services
- Former Regulators at the Louisiana Department of Environmental Quality
Presentation Overview

- EPA’s National Enforcement Initiative
  - Leak Detection & Repair (LDAR)

- Compliance with New NSPS OOOOa Fugitive Emissions Rules
  - LDAR Program for Natural Gas Processing
  - Fugitive Inspections for Affected Cover & Closed Vent Systems
  - Fugitive Emissions Program for Well Sites & Compressor Stations
National Enforcement Initiative

LDAR Programs are included under the 10/1/17 expanded NEI through 2019 aimed at cutting Hazardous Air Pollutants (HAPs), which began in 2004.

EPA has worked to identify and address illegal and excess emissions of toxic air pollutants from leaks and flares at facilities that have a significant impact on air quality and health in communities since this initiative began in 2004.

- EPA, website

This enforcement action is part of EPA's national initiative to reduce emissions of HAPs by enforcing compliance with the Clean Air Act’s “leak detection and repair” (LDAR) regulations. EPA has determined that leaking equipment such as valves, pumps and connectors are the largest source of emissions of hazardous air emissions from chemical manufacturers and petroleum refineries.

- DOJ, Settlement Press Release
Nationwide Focus on Inspection & Enforcement

https://www.epa.gov/enforcement/national-enforcement-initiative-cutting-hazardous-air-pollutants
EPA LDAR Penalties

<table>
<thead>
<tr>
<th>Violation Type</th>
<th>Max (per instance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Testing Violations</td>
<td>$375,000</td>
</tr>
<tr>
<td>Failure to Repair Leaks, First &amp; Final Attempts</td>
<td>$375,000</td>
</tr>
<tr>
<td>Reporting</td>
<td>$37,500</td>
</tr>
<tr>
<td>Recordkeeping</td>
<td>$37,500</td>
</tr>
<tr>
<td>Failure to Perform Method 21 Correctly</td>
<td>$10,500</td>
</tr>
<tr>
<td>Failure to Identify Affected Component</td>
<td>$5,000</td>
</tr>
<tr>
<td>Equipment Standard Violations</td>
<td>$2,000</td>
</tr>
<tr>
<td>Failure to Tag Leaking Equipment for Repair</td>
<td>$2,000</td>
</tr>
<tr>
<td>Missed Monitoring &amp; Inspection</td>
<td>$2,000</td>
</tr>
</tbody>
</table>
## Recent LDAR Related Settlements

<table>
<thead>
<tr>
<th>Facility</th>
<th>Date</th>
<th>Violation Type</th>
<th>Total Cost</th>
<th>$ Fine</th>
<th>Capital Exp.</th>
<th>SEP</th>
<th>Enhanced LDAR</th>
<th>Criminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refineries (6)</td>
<td>2016</td>
<td>LDAR &amp; Various</td>
<td>$425 Million</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Chemical (1)</td>
<td>2016</td>
<td>LDAR</td>
<td>$3.5 Million</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Refinery (1)</td>
<td>2016</td>
<td>LDAR &amp; Emissions Limit</td>
<td>$249,000</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Nat. Gas Processing (1)</td>
<td>2015</td>
<td>LDAR</td>
<td>$885,000</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Chemical (1)</td>
<td>2014</td>
<td>LDAR &amp; Various</td>
<td>$2.7 Million</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Chemical (1)</td>
<td>2013</td>
<td>LDAR</td>
<td>$800,000</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Chemical (2)</td>
<td>2012</td>
<td>LDAR &amp; Control Emissions</td>
<td>$6.3 Million</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Refinery (1)</td>
<td>2011</td>
<td>LDAR &amp; Various</td>
<td>$710 Million</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

a Number of facilities included in settlement.
NSPS OOOOa Overview

▶ **Affects:** New, modified and reconstructed sources after September 18, 2015.

▶ **Effective:** August 2, 2016.

▶ **Initial Compliance Period:**
  ▶ **Begins:** August 2, 2016 or startup
  ▶ **Ends:** August 2, 2017

▶ **Augments:** NSPS OOOO (New or modified after August 23, 2011).
  ▶ Adds fugitive requirements for well sites and compressor stations.
  ▶ Includes new requirements for affected wells, storage vessels and pumps.
## Affected Sources & Facilities

<table>
<thead>
<tr>
<th>NAICS Code</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>211111</td>
<td>Crude Petroleum and Natural Gas Extraction.</td>
</tr>
<tr>
<td>211112</td>
<td>Natural Gas Liquid Extraction.</td>
</tr>
<tr>
<td>221210</td>
<td>Natural Gas Distribution.</td>
</tr>
<tr>
<td>486110</td>
<td>Pipeline Distribution of Crude Oil.</td>
</tr>
<tr>
<td>486210</td>
<td>Pipeline Transportation of Natural Gas.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Affected Facility</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Completions (for hydraulically fractured wells)</td>
<td>All</td>
</tr>
<tr>
<td>Wet seal centrifugal compressors</td>
<td>All (excludes well sites)</td>
</tr>
<tr>
<td>Reciprocating compressors</td>
<td>All (excludes well sites)</td>
</tr>
<tr>
<td>Pneumatic controllers</td>
<td>All</td>
</tr>
<tr>
<td>Natural gas driven pumps</td>
<td>At NG processing plants and well sites</td>
</tr>
<tr>
<td>Storage Vessels</td>
<td>All</td>
</tr>
<tr>
<td>Collection of fugitive emissions components</td>
<td>Well sites and compressor stations</td>
</tr>
<tr>
<td>Equipment Leaks at NG processing plants</td>
<td>All NG processing plants</td>
</tr>
<tr>
<td>Sweetening units at NG processing plants</td>
<td>All NG processing plants</td>
</tr>
</tbody>
</table>
Adjacent Facilities Definition

EPA’s 3 factors to determine source applicability:

1. SIC code
2. Common control
3. Located at contiguous or adjacent properties

Shared Equipment
Within ¼ Mile
Fugitive & LDAR Requirements in OOOOa

- LDAR for Onshore Natural Gas Processing Plants (§60.5421a & VVa)
- Fugitive Inspections for Covers & Closed Vent Systems (§60.5416a)
- Fugitive Program for Well Sites and Compressor Stations (§60.5397a)
LDAR Natural Gas Processing

- Existing VVa requirements.

- OOOO Specific Requirements
  - Assume each piece of equipment is in VOC or wet gas service unless documented otherwise.
  - Additional Recordkeeping for Pressure Relief Devices:
    - List of equipment ID numbers and certification of no detectable emissions.
    - Leak Tag - weatherproof & readily visible w/equipment ID.
    - Leak Records must be kept in a log for 2 years.
### Natural Gas Processing LDAR - Repair Log

<table>
<thead>
<tr>
<th>Component ID</th>
<th>Leak Tag ID</th>
<th>Date of Leak</th>
<th>Monitoring Instrument ID</th>
<th>Monitoring Technician ID</th>
<th>(1) Leak Statement</th>
<th>(1) Date First Repair Attempt</th>
<th>(1) Repair Method</th>
<th>(2) Leak Statement</th>
<th>(2) Date Repair attempt</th>
<th>(2) Repair Method</th>
<th>Date DOR Determined</th>
<th>Max Reading Placed DOR</th>
<th>&quot;Repair Delayed&quot;</th>
<th>Reason for DOR</th>
<th>Signature of Operator Making Determination</th>
<th>Estimated Date for Repair</th>
<th>Unit Shutdown Dates</th>
<th>Repair Date</th>
<th>Max Reading Post-Repair</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/KV-124</td>
<td>13</td>
<td>08/01/16</td>
<td>TVA-0755</td>
<td>L. Lemond</td>
<td>Above 500 ppm</td>
<td>9/1/16</td>
<td>Ignite</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>9/2/17</td>
<td>0.0 ppm</td>
<td>Repair Delayed</td>
<td>Shutdown required</td>
<td>MUM</td>
<td>9/2/17</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### OOOOa LDAR Leak Definitions

<table>
<thead>
<tr>
<th>Component</th>
<th>Service</th>
<th>Leak Definition</th>
<th>Leak Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRD</td>
<td>G/V, LL</td>
<td>500 ppm</td>
<td>Above 500 ppm</td>
</tr>
<tr>
<td>PRD*</td>
<td>LL, HL</td>
<td>10,000 ppm</td>
<td>Above 10,000 ppm</td>
</tr>
<tr>
<td>Pumps - polymizing mon.</td>
<td>LL</td>
<td>5000 ppm</td>
<td>Above 5000 ppm</td>
</tr>
<tr>
<td>Pumps - Other</td>
<td>LL</td>
<td>2000 ppm</td>
<td>Above 2000 ppm</td>
</tr>
<tr>
<td>Connectors</td>
<td>G/V, LL</td>
<td>500 ppm</td>
<td>Above 500 ppm</td>
</tr>
<tr>
<td>Compressors</td>
<td>Any</td>
<td>500 ppm</td>
<td>Above 500 ppm</td>
</tr>
<tr>
<td>Valves</td>
<td>G/V, LL</td>
<td>500 ppm</td>
<td>Above 500 ppm</td>
</tr>
<tr>
<td>Pumps, Valves, Connectors*</td>
<td>HL</td>
<td>10,000 ppm</td>
<td>Above 10,000 ppm</td>
</tr>
<tr>
<td>Closed Vent Systems &amp; Control Devices</td>
<td>NA</td>
<td>500 ppm</td>
<td>Above 500 ppm</td>
</tr>
</tbody>
</table>

*Example Repair Log*
Fugitive Inspections for Covers & Closed Vent Systems

- On Affected Storage Tanks
  - Monthly Inspection - Visual, olfactory, auditory

- On Affected Centrifugal Compressors, Reciprocating Compressors & Pneumatic Pumps
  - Closed Vent System – Semi-Permanently or Permanently Sealed (ex. joint, seam, welded connections)
    - Initial Inspection – Method 21
    - Annual Inspections - Visual
  - Closed Vent System – Other Components (ex. hoses, sampling ports, open ended)
    - Initial Inspection – Method 21
    - Annual Inspection – Method 21
    - Annual Inspection – Visual
  - Covers
    - Initial Inspection – Visual
    - Annual Inspection – Visual
  - Bypass
    - Monthly Inspection - Visual
# Fugitive Inspections for Covers & Closed Vent Systems Summary

<table>
<thead>
<tr>
<th>Components</th>
<th>Initial Visual</th>
<th>Initial M21</th>
<th>Monthly Visual</th>
<th>Annual Visual</th>
<th>Annual M21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed Vent - Sealed</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Closed Vent - Other</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Covers</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Bypass</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

*On Affected Centrifugal Compressors, Reciprocating Compressors & Pneumatic Pumps*
Fugitive Program for Well Sites & Compressor Stations

- Fugitive Emissions Plan
- Fugitive Emissions Monitoring
- Reporting & Recordkeeping
Fugitive Emissions Monitoring Plan

- **Frequency**
- **Procedures & Timeframe** - repairing leaks & verifying repairs.
- **Recordkeeping**
- **Monitoring Method & Equipment**
  - OGI Specifics - trainings, wind speeds, daily check, calibration & survey procedures.
  - Method 21 Specifics - calibrations, detection limits & background reading.
- **Sitemap** – with defined observation path.
- **Component List** – with method to determine location (M21 only).
- Plan for “difficult-to-monitor” & “unsafe-to-monitor” components.
Fugitive Emissions Monitoring Survey

- **Method 21 & OGI is the most effective.**
  - OGI for identifying.
    - Good screening tool, saves time, helps identify leaks from any sources including UTM, DTM & non-tagged.
    - Specialized training, difficulty quantifying, visual interference, cannot be used for certain annual inspections,
  - Method 21 for quantifying.
    - Industry standard, readily available, easy to calculate emissions from leaks.
    - Time consuming, missed leaks, human error including performance & recordkeeping

- **Leak Definition:**
  - OGI – No visible emission
  - M21 - < 500ppm
Fugitive Emissions Report

- **Initial Monitoring Report.**
  - Due 90 days after startup or end of initial compliance period.

- **Annual Monitoring Reports.**
  - Due annually by the date of initial report.

- Can combine reports for multiple facilities.

- State specific reporting requirements.
Example Fugitive Emissions Report

OOOoa Fugitive Monitoring Report

I. Facility Information
   Company Name:  
   Site Name:  
   Address:  
   Latitude:  
   Longitude:  

II. Monitoring Period
   July 1, 2017 to September 30, 2017

III. Survey Information
   Survey Date:  
   Start Time:  
   Stop Time:  
   Technician Name:  

   A. Field Data
      Ambient Temperature:  
      Max Wind Speed:  
      Sky Conditions:  

   B. Instrument Information (Calibration documents kept separately)
      Method Type:  
      Monitoring Instrument:  
      Serial Number:  
      Calibration Verification Date:  

   C. Monitoring Plan Compliance (Circle one)
      Did deviations from site specific monitoring plan occur?  
      YES  NO
      If yes, explain:  

IV. Monitoring Survey Results
   A. Survey Totals
      Component Type:  
      Normal-to-Monitor Monitored:  
      Difficult-to-Monitor Monitored:  
      Unclassified-to-Monitor Monitored:  
      Values  
      Connectors  
      PIP  
      Open-ended lines  
      Compressors

   B. Survey Leak & Delay of Repair Totals
      Component Type:  
      Leaks:  
      Placed on DOR:  
      Values  
      Connectors  
      PIP  
      Open-ended lines  
      Compressors

V. Repair Information
   A. Total Components not repaired in 30 days or 2 years for STBs
      Component Type:  
      Normal-to-Monitor:  
      Difficult-to-Monitor:  
      Unclassified-to-Monitor:  
      Values  
      Connectors  
      PIP

   B. Delay of Repair
      Type:  
      Explanation for DOR:  
      Repaired Date:  
      Resurvey Date:  
      Resurvey Instrument ID:  
Fugitive Emissions Recordkeeping

- Additionally maintain onsite or at the nearest field office for 5 years:
  - Fugitive Emissions Monitoring Plan.
  - OGI photos/videos of survey run.
  - Emissions level (ppm).
  - Component ID.
  - Repair methods.
  - Number of tagged components (leaking).
Data Management Systems

▪ Recordkeeping proves compliance!

▪ Challenges
  ▪ Extensive information.
  ▪ OOOOa affected facilities are decentralized.

▪ Data Management System
  ▪ Addresses challenges.
  ▪ Allows for quick access to accurate records.
  ▪ Assists in compliance by automating workflows & integrating regulatory limits
Data Management System Options

- Paper
- LeakDAS
- Proprietary Data Management Systems
- NVIRO leaks
Questions?

www.lmenviro.com
Office: 504-534-8563
24/7 Emergency Response: 504-517-5637

Margo D Moss  Lee J Lemond
Margo.moss@lmenviro.com  Lee.lemond@lmenviro.com