Underground Natural Gas Storage

Update on Underground Gas Storage Regulations
&
Strategies for Compliance

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General Statistics
Based upon EIA Data

- 128 Operators
- 4.8 TCF Working Capacity
- ~390 Storage Fields
- 85% Reservoir-Aquifer, 15% Salt Caverns
- 17000 Wells
- First Annual Reports were due March 15, 2018
State Participation

- State Regulators are mostly not the agencies responsible for topside pipelines
  - California Division of Oil, Gas, & Geothermal Resources (DOGGR)
  - California Public Utility Commission
  - California State Fire Marshal
- Similar, but separate program for UGS State Partners
- States in initial 2018 Partnering Program
  - Certification: AR, MN, PA
  - Agreement: CA, IL, KS
- Other states expected to join
### Number of Facilities by PHMSA Region Based on PHMSA and State Partners in 2018

<table>
<thead>
<tr>
<th>Region</th>
<th>PHMSA Responsibility</th>
<th>States Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interstate Facilities</td>
<td>Intrastate Facilities</td>
</tr>
<tr>
<td>Eastern</td>
<td>114</td>
<td>0</td>
</tr>
<tr>
<td>Central</td>
<td>49</td>
<td>44</td>
</tr>
<tr>
<td>Southwest</td>
<td>22</td>
<td>36</td>
</tr>
<tr>
<td>Western</td>
<td>19</td>
<td>12</td>
</tr>
<tr>
<td>Southern</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Totals</td>
<td>221</td>
<td>108</td>
</tr>
</tbody>
</table>
PHMSA Inspections

• Initial inspections by PHMSA or States
• Based on Interim Final Rule, less Stay of Enforcement
• Focus on written procedures and implementation plans
• Inspection questions shared with operator prior to start of inspection
• More detailed IM inspection content is forthcoming
• Discussion between Inspectors and Operator personnel is expected, supported by procedures, documented analysis and records
• Some time will be spent on field observations
What’s coming from PHMSA?

2018
- Compliance Cases begin, and are posted
- Inspector Training
- State Tag-Alongs

2019
- Final Rule
  - Will account for the final disposition of non-mandatory aspects of the RPs
- Revised FAQs
- Revised Inspection Questions with IMP Content
- Sustained TQ classes
- Public Workshop & start of Annual UGS Conference
Industry Current State Challenges

- Most operators have managed integrity risk informally
  - Pressure and/or flow data gathering and analysis
  - Downhole inspections and leak surveys
  - Inventory verification
  - Routine O&M programs or capital programs
- Characterization of risk – where is the soft underbelly?
  - Equivalent of industrial triage
    - Which assets are healthy vs. in need of attention?
    - Age may not be a deciding factor
    - Data availability & quality vary widely by operator
RCP’s Risk Management Strategy

- Risk Analysis
- Asset Integrity Assessment Tracking
- Remediaion Progress Tracking
- Process Development / Improvement
- Gap Analysis / Effectiveness Evaluation
Baseline Audit/Compliance Dash Board

- Stoplight approach to API 1170 and 1171 “Should” and “Shall” Requirements
- Corrective action tracking to bring everything to “green”
- Captures deviation justification
Process Development and Improvement

- Storage Integrity & Risk Management Plan
- RP 1171 35+ written process requirements
- Site-Specific Operation Procedures
Risk Management

Risk Assessment for Individual Wells & Reservoirs
- Baseline Risk Assessment & Periodic Updates
- What-If P&M Scenario Assessments
- Linkage of Relevant Documents/Records
Asset Management Workflow

- Manage Assets, People, Inspections, Documentation & Data Analysis
  - Preventative & Mitigative Measures
  - Integrity Assessments
  - Remedial Work Progress
    - Who Work is Assigned to
    - When Work is Completed
    - Follow-up Action Items
  - Documentation Storage
  - Analyze Data
    - Corrosion growth rates
    - Risk inputs
RCP’s Risk Management Strategy

- **Gap Analysis / Effectiveness Evaluation**
- **Process Development / Improvement**
- **Remediation Progress Tracking**
- **Risk Analysis**
- **Asset Integrity Assessment Tracking**
Thank You & Questions?

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