Safety Issues: Integrity Assessment, Data Integration, and Federal/State Oversight

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Integrity Assessment

Data Integration

- HCA Identification
- Threat Identification
- Risk Assessment
- Preventive & Mitigative Measures
- Remediation
- Integrity Assessment
Selection of Method(s)

• Integrity assessment methods
  • In-line inspection (ILI)
  • Pressure testing
  • Direct assessment
  • Other methodologies
In-line Inspection (ILI) / Smart Pigs: High Resolution Magnetic Flux Leakage (MFL) Tools

Source: PHMSA
In-line Inspection (ILI) / Smart Pigs: High Resolution Magnetic Flux Leakage (MFL) Tools

Source: PHMSA
Direct Assessment

Close Interval Survey

Excavation

Direct Examination of External Corrosion

Source: Southern Pipeline Services, PHMSA
## Comparison of ILI and Direct Assessment

<table>
<thead>
<tr>
<th>Pros</th>
<th>Direct Assessment</th>
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<tr>
<td><strong>In-line Inspection</strong></td>
<td><strong>Direct Assessment</strong></td>
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<tr>
<td>• High per-mile discovery of anomalies</td>
<td>• Less disruptive</td>
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<tr>
<td>• Covers long distance of continuous</td>
<td>• Effective for confirmed internal, external, and stress corrosion</td>
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<tr>
<td>pipeline segments</td>
<td>cracking threat</td>
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<tr>
<td>• Multiple threats</td>
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<td>• Most predictive and preferred tools</td>
<td></td>
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<tr>
<td><strong>Cons</strong></td>
<td></td>
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<tr>
<td>• Pipeline configuration</td>
<td>• Corrosion threat only</td>
</tr>
<tr>
<td>• Operational complication</td>
<td>• Limited coverage</td>
</tr>
<tr>
<td></td>
<td>• Relies on selecting regions for indirect inspection</td>
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<tr>
<td></td>
<td>• Relies on selecting location for direct examination (dig)</td>
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Safety Issues

- Use of direct assessment as the sole integrity assessment method
- Advancement in ILI technologies
- Use of ILI for intrastate pipelines lags behind interstate pipelines
Data Integration

- HCA Identification
- Remediaction
- Preventive & Mitigative Measures
- Integrity Assessment
- Risk Assessment
- Threat Identification
GIS data of pipeline

ILI run data

Pipe features (from PODS)

Source: New Century Software
GIS Data of Pipeline and Environment

Source: New Century Software
ILI run data

| 203+10 | 281+60 |

Source: New Century Software
Examples of Integrity Assessment Results

External metal loss
Manufacturing anomalies
Longitudinal weld features

Source: New Century Software
Safety Issues in Data Integration

- Assembling data to improve threat identification, risk assessment, and overall risk model’s confidence
- Incorporating new data in a timely manner
- Inaccurate data
Use of GIS in Data Integration

• Unified referencing system
• Industry-wide effort to merge pipeline data model with GIS model
• Operators are familiar with GIS’s capability
Federal and State Oversight

- Pipeline operators design and implement IM programs
- Federal and state inspectors ensure compliance
- PHMSA oversees state safety programs and provides resources
Issues in Federal and State Oversight

• IM program inspections differ among states
• State IM program inspections differ from federal IM program inspections
• PHMSA’s role in mentoring rated poorly
• State-to-state and federal-to-state coordination needs improvement
Limitations of NPMS

- Standards drafted in 1998
- Positional accuracy +/- 500 feet
- Limited pipeline attributes
- No attribute identifying HCA segments
Summary

• Gradual increasing trend of significant incident rate leveled off since 2004

• Corrosion and material failure rates in high consequence areas are low (2010–2013)

• Integrity assessment covered beyond HCA

• PHMSA’s continual efforts and improvements
Summary

• Increase use of ILI, especially for intrastate pipelines
• Improve guidance in threat identification, risk assessment, and data integration
• Increase state/state and federal/state coordination
• Develop standards for use of geospatial data and a repository of authoritative data sources for HCA identification
• Strengthen data collection