NGA Pre-Winter Briefing on System Reliability

December 3, 2019
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Enbridge Gas Transmission System

Miles of Pipe: 18,939
Number of Compressor Stations: 137
Total Horsepower: 3,710,833
Lincoln, Co KY Incident

- On August 1, 2019, an incident occurred on Line 15, resulting in the death of one person and injuries to at least six others.
- Most of Line 15 was constructed between 1952 and 1957 and is largely comprised of API X52 pipe manufactured by A. O. Smith.
- Both lines 10 and 25 were temporarily shut down until the lines could be assessed for possibility of damage from the incident. Both lines have been returned to service.
- Line 15 from Kosciusko, MS to Uniontown, PA has been isolated from the parallel pipelines and its pressure reduced by 20% per PHMSA's CAO.
- The actual cause of the failure has not been determined. The NTSB is conducting a metallurgical investigation to determine the exact cause.
- Efforts are underway to assess all segments of Line 15 that have pipe manufactured by A.O. Smith of similar vintage and type to the pipe involved in the failure.
- The recent incident in Kentucky has given us cause to reevaluate additional threats associated with A.O. Smith pipe, specifically manufacturing defects including long seam weld fusion and hard spots.
- The investigation has given us cause to revalidate the data provided in previous inspections and the confidence in conclusions regarding previous hard spot assessments.
- Given that our confidence in these previous assessments is in question, we have taken voluntary pressure restrictions of approximately 10% from the last 60 day high on other parts of UST system that contain A.O. Smith-manufactured pipe of similar nature.
## Highest Risk Segment Remediation Overview

<table>
<thead>
<tr>
<th>GeoHazards</th>
<th>Internal /External Corrosion</th>
<th>Stress Corrosion Cracking</th>
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<tbody>
<tr>
<td>• 15 segments restricted</td>
<td>• 10 segments restricted</td>
<td>• 11 segments restricted by 10%</td>
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<tr>
<td>• Tool runs and high strain analysis completed</td>
<td>• 13 segments with internal corrosion &amp; 12 with external corrosion</td>
<td>• All but 1 tool run complete</td>
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<td>• All remediation work completed and full pressure restored early 2Q19</td>
<td>• All but 3 tool runs have been completed</td>
<td>• Vendor reports take 4 months – receipt now thru late Oct</td>
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<td>• Remediation planned to be completed on all but those 3 lines prior to November</td>
<td>• Working to complete remediation by mid November</td>
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<td>• 16 accelerated runs currently being scheduled before year end</td>
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<table>
<thead>
<tr>
<th>Selective Seam Weld Corrosion</th>
<th>Corrective Action Order</th>
<th>A.O. Smith Pipe</th>
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<tbody>
<tr>
<td>• 10 segments restricted by 5% in May – Additional 16 segments identified and restricted in August based on field inspection results</td>
<td>• 10 segments restricted by 20% per PHMSA – Line 15 Kosi-Uniontown in conjunction with KY incident</td>
<td>• 39 additional segments restricted by 10%</td>
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<tr>
<td>• Tool runs for each above are required – scheduling in progress – goal is to have runs done prior to YE</td>
<td>• Tool runs and additional tests/mitigation measures being planned</td>
<td>• Hard Spot Tool validation in progress</td>
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<td>• Remediation work is being prioritized - complete 4Q19-2Q20</td>
<td>• PHSMA approval required to restore service</td>
<td>• Working aggressively to secure tools and schedule tool runs</td>
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<td>• Targeting 2Q20 for return to full service pending results of NTSB Investigation</td>
<td>• Sections will be returned to service as completed.</td>
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<td>• Most remediation work planned to be complete 3Q20 pending results of NTSB investigation</td>
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AGT
Early Winter Pressure Restrictions

AGT
Proactive Pressure Restrictions:
- G-1 & G-5 System
- J-1 System
- 26” M/L Lambertville to Mahwah Mainline
- 26” M/L Stony Point to Southeast 26” M/L
- L36B Chaplin to Burrillville
Penn Jersey
Proactive Pressure Restrictions:
• Line 12 Delmont to Perulack
• Line 19 Bechtelsville to Lambertville
• Line 1: Lambertville to Linden
• Line 1-D and Line 1-D-3: Downstream of Linden

Remediate Plan Prior to Winter:
• Line 12: Perulack – Shermansdale
• Line 27: Shermansdale to Grantville
• Line 19: Grantville to Bernville
• Line 12: Bechtelsville to Lambertville

CRP
• Line 1-A Eagle to Chester
• Line 1: Eagle to Lambertville
Enbridge Meetings with State Agencies

- NY: October 31, 2019
- MA: October 31, 2019
- NJ: November 8, 2019
- PA: November 22, 2019
- CT: December 12, 2019
Summary of Our Approach

• Ensure our assets are safe and reliable

• Improve certainty through increased inspection and data

• Ensure transparency in our plans and schedules

• Leverage all technologies and prioritize our work to restore capacity as quickly as possible

• Improve confidence with each iteration of inspection
  • Improve predictability and scheduling