The oil pipeline industry has undertaken a voluntary environmental performance tracking initiative, recording detailed information about spills and releases, their causes and consequences.

The pipeline members of the American Petroleum Institute and the Association of Oil Pipe Lines believe that tracking and learning from spills will improve performance, thus demonstrating the industry's firm commitment to safety and environmental protection by results.

This is one of a series of fact sheets and industry advisories drawn from the Pipeline Performance Tracking System, "PPTS."

PPTS ADVISORY FOR OPERATORS: INTERNAL CORROSION AND CRUDE OIL

Internal Corrosion Is Important for Crude Oil Systems

The detailed information provided to PPTS for spills of 5 barrels or more shows that an average of 34 Internal Corrosion incidents per year occurred over the 1999-2001 period. Internal Corrosion accounted for 53% of the crude oil incidents involving any kind of Corrosion, Internal or External. While Corrosion releases have only infrequent public safety impacts, Corrosion is nonetheless the largest cause of crude oil spills, especially from onshore pipelines. Crude oil systems accounted for 93% of the Internal Corrosion incidents, and the data show that Internal Corrosion is almost exclusively a crude oil system issue. For refined products and HVL systems, Internal Corrosion releases are a small share of the small number of Corrosion releases.

Some Characteristics of the Pipe Involved

According to PPTS data for releases of 5 barrels or more from 1999-2001, there were a total (not an annual average) of 70 Internal Corrosion crude oil leaks on onshore pipe. Of these, 5 (only 7%) had been inspected by an inline tool, and 38 (54%) had internal corrosion mitigation measures in place.

Crude oil systems serving mature producing areas encounter a variety of operations issues that are important for internal corrosion. The limited data on the decade of construction for the pipelines involved suggest that these systems may in fact be serving older producing areas where volume may be only a small share of its peak. About 26% of the Internal Corrosion crude oil incidents took place on pipeline laid before 1940, while the pipe laid before 1940 represents 9% of the total reported miles in the ground in mid-2000; about 29% of the Internal Corrosion crude oil incidents took place on pipeline laid during the 1940s, while the pipe laid during the 1940s represents 13% of the total pipeline miles. Furthermore, 9 of the 10 incidents on pipe installed during the 1940s occurred on lap-welded pipe, a manufacturing technique that was supplanted in the late-1920s.

Considerations for Operators

Operators of crude oil systems, especially older systems that are running or have run at reduced volume, velocity and/or pressure, should consider the following factors in their risk assessments and ongoing integrity management programs:

- Did an inline inspection tool show an anomaly in the pipe's bottom clock positions?
- Did a dig to examine an anomaly identified by inline inspection fail to find evidence of External Corrosion? If so, was the possibility of Internal Corrosion investigated?
- Is the system serving a mature production/resupply area?
- Is the type of pipe associated with early manufacture, regardless of the installation date? (Lap-welded pipe, for instance, installed in the 1940s.)
- Are there additional steps that might be undertaken, such as cleaning pigs or additional internal corrosion mitigation measures that are matched to the type of crude oil and/or type of corrosion experienced?