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Fitness for Service - *Defined & Explained*

Fitness for Service Defined

Fitness for Service (FFS) is the pipeline's ability to operate in a manner that ensures the safety of the people that live and work near pipelines, protects the environment, while dependably transporting natural gas from sources to markets.

Interstate Natural Gas Association of America (INGAA) members established natural gas pipeline FFS principles similar to those of programs widely used in other industries, such as transportation, energy, construction, chemical, nuclear and power generation.

FFS has been an integral part of consensus standards for pipelines since the mid-1980s, and is now embodied in American Society of Mechanical Engineers' B31.8 and B31.8S. The Pipeline and Hazardous Materials Administration has incorporated many elements of the consensus standards into the Minimum Pipeline Safety Standards.

FFS Has Been Applied to Metal Loss/Corrosion Since the 1980s

Pipeline operators apply a variety of techniques to assess a pipeline segment's physical condition. In-line inspection (ILI) with high-resolution magnetic flux leakage sensors is used to identify and characterize metal loss. High-resolution geometry sensors are used to identify, characterize and measure deformations in pipelines. Operators use this data to calculate risks and predict pressure failure points. Their calculations account for a generous, built-in safety margin below regulated maximum allowable operating pressure (MAOP).

Why INGAA Created FFS

INGAA designed their FFS program to address previously untested pre-regulation pipeline, or pipelines built prior to federal regulations established March 12, 1970. Pre-regulation pipe accounts for approximately two thirds of all onshore natural gas transmission pipelines.

Starting Point and Timeline

The FFS program establishes a starting point for evaluation and remediation of pre-regulation pipeline in High Consequence Areas (HCAs) that lack traceable, verifiable and complete test records. Further, the FFS process defines a priority-based process, and includes a timeline for analysis, implementation and completion of the program.

Evaluation of Pre-Regulation Pipe

INGAA members designed a decision tree for evaluation of pre-regulation pipeline records to identify any existing gaps. Pipe segments that have had a pressure test to 1.25xMAOP are fit for service subject to 49 CFR 192, consistent with the NTSB recommendation on the PG&E failure in San Bruno. Where traceable, verifiable and complete records are lacking, progressive steps are taken that are incrementally more and more conservative in correlation to the sufficiency of data. This process yields eight possible cases. Each case assigns conservative testing, operating and corrective measure guidelines. The cases are:

1. Pipe segments in **HCAs, Class 3 or 4 that have a strength test to at least 1.25xMAOP** can continue to operate under 49 CFR 192, subject to the Continual Evaluation requirements of 49 CFR 192.937.
2. Pipe segments in **HCAs^{H}, Class 3^{M} or 4^{M} that have a strength test to at least 1.1xMAOP that are piggable** can do one of the following:
   a. Run ILI that identifies and characterizes long seam and pipe body anomalies,
   b. Conduct a pressure test to 1.25xMAOP,
   c. Reduce pressure to 80% of the established MAOP, or
   d. Replace the pipe not meeting these conditions.
3. Pipe segments in **HCAs^{H}, Class 3^{M} or 4^{M} that have a strength test to at least 1.1xMAOP that are not piggable or those that do not have a strength test of at least 1.1xMAOP** can:
   a. Conduct a pressure test to 1.25xMAOP,
   b. Reduce pressure to 80% of the established MAOP or
   c. Replace the pipe not meeting these conditions.
4. Pipe segments in **Class 1 or 2 that have a strength test to at least 1.1xMAOP that do not contain pipe with known long seam issues** can continue to operate under 49 CFR 192.
5. Pipe segments in **Class 1^{M} or 2^{M} that contain pipe with a known history of long seam issues that are also piggable** can:
   a. Run ILI that identifies and characterizes long seam and pipe body anomalies,
   b. Conduct a pressure test to 1.25xMAOP,
   c. Reduce pressure to 80% of the established MAOP or
   d. Replace the pipe not meeting these conditions.
6. Pipe segments in **Class 1^{M} or 2^{M} that contain pipe with a known history of long seam issues that are non-piggable segments** can:
   a. Conduct a pressure test to 1.25xMAOP,
   b. Reduce pressure to 80% of the established MAOP or
   c. Replace the pipe.
7. Pipe segments in **Class 1^{L} or 2^{L} that contain pipe with no known history of long seam issues** can continue to operate under 49 CFR 192, subject to the Continual Evaluation requirements of 49 CFR 192.937.
8. Pipe segments that are **not HCAs^{L}, Class 3^{L} or 4^{L}, and that are operating at or below 30% SMYS** can continue to operate under 49 CFR 192, subject to the Continual Evaluation requirements of 49 CFR 192.937.

H*- High priority (HCAs); will be pressure tested by 2020 if records or pressure tests are insufficient. INGAA is working with technology providers and research organizations to expand ILI capabilities to evaluate material and construction threats in lieu of hydrostatic pressure testing for high priority pipe segments.*

M *– Medium priority Class 1 and 2 areas outside HCAs with a known history of long seam issues and Class 3); will be pressure tested or inspected via advanced ILI by 2030.*

L *– Low priority may continue to operate under current regulations and standards, subject to the Continual Evaluation requirements of 49 CFR 192.937.*