

Pipeline Integrity Management

- For safe, continuous and economical product transportation

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Pipeline Integrity Management

A key aspect of Pipeline Integrity Management (P.I.M) is identifying locations along the pipeline that are most vulnerable to corrosion. Another important aspect is to predict the corrosion of the entire pipeline over a period of time to predict the possibility of pipeline failure (corrosion rate vs. time to failure).

To give you the broad overview, we have divided P.I.M up into three main categories:

- Direct Assessment
- Integrity Plan
- Project Management.

Direct Assessment

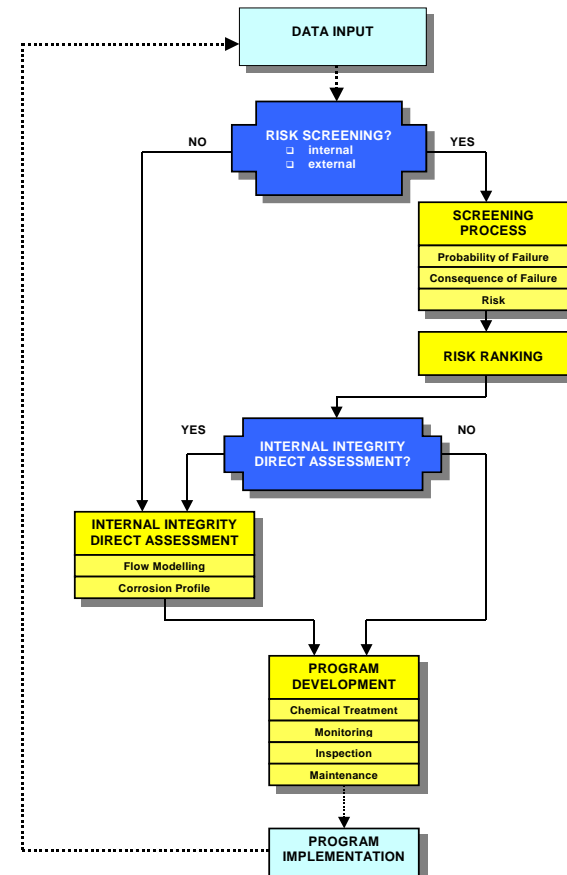
- Internal and external conditions
- Pipeline risk ranking
- Flow modeling
- Corrosion rate profile calculation
- Integrity management.

Internal conditions

An Internal Corrosion Direct Assessment is a process that identifies areas within the pipeline where liquids (produced or condensed) or electrolyte, introduced by an upset condition, may reside. It then focuses on a direct examination on specific locations in each area where internal corrosion is most likely to occur. If there is no evidence of internal corrosion, in the most likely locations, then the entire section can be considered to be of low risk for internal corrosion.

Key technologies/elements

- Topographical profile
- Pipeline operation data summary
- Flow regime
- Water hold-up
- 3 phase velocities
- Liquid transit time
- Critical inclination angle
- Corrosion rate profile
- Probability of failure
- Critical flow rate.



External conditions

An External Corrosion Direct Assessment is a process that identifies areas along the pipeline that have potential for corrosion attacks due to elements like soil composition, corrosion protection system, coating quality and wet/dry environments. Based on the outcome of the assessment, an integrity plan is developed.

Key technologies/elements

- Close interval potential survey (CIPS)
- Direct current voltage gradient (DCVG) survey
- C-scan survey.

Elements in direct assessment

- Pre-assessment (computer aided)
- Determination of excavation locations
- Indirect/direct assessment (validation)
- Continuing evaluation.

Risk screening

- Used to risk rank all pipelines or pipeline segments
- Qualitative analysis
- Both internal and external threats
- Result is used to prioritize expenditures and resources.

Integrity Plan

- Operations and procedural manuals
- Corrosion mitigation
- Corrosion monitoring
- Maintenance and inspection.

Development of a field-working document that represents the pipeline's requirements for pigging, chemical mitigation, monitoring, verification and maintenance.

Project Management

- Data management
- Burst pressure calculations (RSTRENG, B31G)
- Fit for service calculation
- Third party verification
- Corrosion management audits.

FORCE Technology's project management approach compliments and expands the pipeline owner/operator's day to day data management activities and includes the following elements:

- Develop project scope
- Project cost estimate
- Qualification of subcontractors
- Cost control and reporting
- Quality control
- Status/management reporting
- Collection and review of all historical information:
 - Design info (pipe material, coating, CP, soil,...)
 - Historical operational information (damage/maintenance reports, process data)
 - Historical ILI data
 - Corrosion monitoring data.

