Working Group 3: Identifying Gaps with Assessment Methods

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How do you know which assessment method is the correct one to use?

- Both hydrostatic testing and internal inspection technologies (ultrasonic crack detection and circumferential field MFL) have been successfully used to assess pipelines for seam defects

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What are the pros/cons for available assessment methods?

- Ultrasonic crack detection
  - Pros:
    - Identifies all existing defects above a detection threshold
    - Can detect ‘tight’ cracks, (SCC)
    - False positives in dig programs give assurance that all injurious defects have been mitigated
    - No service disruptions for customers
  - Cons:
    - Indirect assessment
    - Ineffective for thin wall pipe
    - Custom tools designs required for lighter liquids (HVL’s)
    - Poor characterization of non-injurious manufacturing defects
    - False positives create extensive and expensive dig programs

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What are the pros/cons for available assessment methods?

- Circumferential Field MFL:
  - Pros:
    - Identifies all existing defects above a detection threshold
    - Effective for thin wall pipe
    - Effective for lighter liquids (HVL's)
    - False positives in dig programs give assurance that all injurious defects have been mitigated
    - No service disruptions for customers
  - Cons:
    - Indirect assessment
    - Cannot detect 'tight' cracks, (SCC)
    - Custom tools designs required for lighter liquids (HVL's)
    - Poor characterization of non-injurious manufacturing defects
    - False positives create extensive and expensive dig programs

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What are the pros/cons for available assessment methods?

- Hydrostatic Testing:
  - Pros:
    - Direct performance based assessment
    - Effective for all wall thickness
    - Effective for all products transported
    - Effective for ‘tight’ cracks, (SCC)
  - Cons:
    - Service disruptions for customers
    - Remaining defects are theoretical in size and location
    - “Destructive” test with associated consequences (damage to 3rd parties)
    - Testing itself induces large pressure cycles
    - Difficult to accomplish leak-free with temperature compensation calculations and no engineering judgment

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Improving Hydrostatic Testing Methods

- The only thing that can provide additional confidence against in-service failure is higher test pressures
- Rate at which hydrostatic tests are brought to test pressure can reduce likelihood of pressure reversals

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Improved Pressure Cycle Modeling Approaches

- Establish standards regarding the use of SCADA data for modeling:
  - Sampling interval (minutes, seconds, hours)
  - Sampling duration (weeks, months, years)
  - Scrubbing data for outliers
  - Bin size and order
- Factor of Safety based upon data quality determination/historical operation knowledge
- Re-modeling frequency based upon operational changes/time left to retest
- Toughness assumption when lacking test data
- Different failure models available

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