A Hazardous Liquids Pipeline Operator's Perspective

A Panel #4 Presentation on Identifying Interactive Threats & Understanding Options
PHMSA Risk Assessment & Recordkeeping Workshop
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Presented by:
Richard M. Dalasio
Sunoco Logistics, L.P.

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Informed Decisions Regarding Pipe Integrity
Influence of Regulations and Standards

- Utilize accurate and relevant data
  - API 1163 - Consistency and reliability of ILI data
  - API 2611 - What data to consider at facilities
- Leverage various and disparate data sources
  - API 1160 - Need and process to integrate data
  - B31.8S - Need to integrate
  - 195.452 - Analyze all available data about pipeline integrity
- Identify and understand interactions between data
  - API 1160 - Mechanism narrative
- Prioritize efforts through risk based approach
  - 195.452 - Focus on HCA's

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Data Compilation – Background Resources

- Construction Records
- Operating History
  - Pressures, flow rates, cycling regimes
  - Product history
  - Failure history
- Operations Staff
  - Leveraged knowledge of Field Staff, Operations, Integrity, etc.
- Subject Matter Experts
- Repair History
- Previous Inspection Results

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Data Compilation – Current Inspection

- Risk Based Inspection Method Selection (Hydrostatic Pressure Testing vs. In-Line Inspection)
  - Anticipated Threats
  - HCA Locations & Types
  - Line Volume & Modeling
- In-Line Inspection Data
  - Preferred over Hydrostatic Testing
  - Standard Suite - Deformation & Metal Loss tools
  - Specialized Tools used to address Specific Threats
    - ✓ SCC, Seam related issues, Residual stress, etc.

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Data Compilation – Current Inspection

- Hydrostatic Pressure Testing
  - Re-qualify or raise MOP
  - Remove a line from the Risk Based Alternative
  - As a physical test of critical anomalies
  - Supplement other inspection methods
  - An option where technology is limited
- Elements of ECDA
  - Targeted inspection using ECDA methods
  - Provide additional data for integration
  - Not widely used for qualifying liquid pipelines

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Data Integration

- Cross-Disciplinary Stakeholder Meetings:
  Sunoco Logistics Method
  - Risk Assessment Meetings (RAM's)
    - ✓ Post-Inspection meetings discussing all facets of a pipeline's operation
    - ✓ Lines reviewed with representatives of various departments
    - ✓ Discuss potential risks and potential P&M actions
  - Continual Assessment Meetings (CAM's)
    - ✓ Bi-annual meetings used to discuss the overall integrity program and mitigation strategies
    - ✓ Review operational changes, industry findings, etc., that could affect line re-inspection schedules or methodologies

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Data Integration

- Numerical
  - Spatial Alignment
    - ✓ Map the data to a common frame of reference to account for underlying spatial errors in the different data sets
    - ✓ Weld alignment across ILI runs
  - Temporal Alignment
    - ✓ Multiple ILI data set comparison (MFL, USWM, TFI, USCD, etc)
    - ✓ CIS/CP measurement integration
    - ✓ Relevance of compared data based upon when each data set was collected – the timeframe it represents

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Data Interpretation

- Thresholds
  - Single attribute exceedance of a specified level
    - ✓ Depth, Failure pressure, Polarization, etc.
    - ✓ Code Defined & Company Defined
- Differential Analysis
  - Identification of synergies and coincident events
    - ✓ Metal loss, geometry anomaly and ground disturbance
    - ✓ Depressed CP at external metal loss
  - Identification of inconsistencies
    - ✓ Wrinkle bends in straight sections of pipe
    - ✓ Dents vs. appurtenances
    - ✓ Corrosion vs. mill anomalies

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Data Interpretation

- Differential Analysis (con't)
  - Map & Imagery Driven Analysis
    - ✓ Corrosion at utility crossings
    - ✓ Deformation alignment (roads crossings, farm fields, etc.)
    - ✓ Internal corrosion at low spots
  - Pattern Recognition
    - ✓ Linearly aligned anomalies - either metal loss or dents
    - ✓ Mill anomalies
    - ✓ Potential pipe type (joint lengths, seam identification)
    - ✓ Identification of past relocation/replacement areas

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Data Gaps

- Defaults
  - Knowledge driven (date of install, project specs, etc.)
  - Worse than average, but not always “worst case”
- Historical Inference
  - What was produced from the source at that time
  - Inference from incomplete data sources
- Risk Based Prioritization
  - Some data elements influence risk result more than others
  - Probability of outliers cannot be reduced to zero

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Data Gaps

- Representative Sampling
  - Materials Testing & Research
- Data Review/Updating Process
  - Integrating ILI Data Findings
  - Integrating Field Results/Findings
- Training
  - Resolve Gaps Through Training/Education
  - Dissemination of Industry Knowledge

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Risk of Regulations

- Codification of complex relationships
  - Black/white uniformity to support unambiguous compliance audit
    - ✓ Creates artificial risk of non-compliance
    - ✓ Elevates secondary risk factors leading to misdirection of resources
    - ✓ Discourages consideration of secondary factors as their application is conditional
  - Influence on standards to use definitive language (“shall”) as opposed to conditional language (“may”)
    - ✓ Denies the fact that there is an enormous body of knowledge outside the standard that bears on decisions within the scope of the standard (i.e. Engineering Assessment)
    - ✓ Far too many possibilities that cannot be anticipated by definitive standards and regulations.

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Panel #4: Identifying Interactive Treats & Understanding Options

Liquid Operator Work Group Members

- **Richard Dalasio (Sunoco Logistics, L.P.)**
- **Bruce Dupius (Transcanada Pipeline)**

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