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CRUG-2011 Workshop

How does an Operator Select a Composite Repair System Including Any Internal Company Requirements

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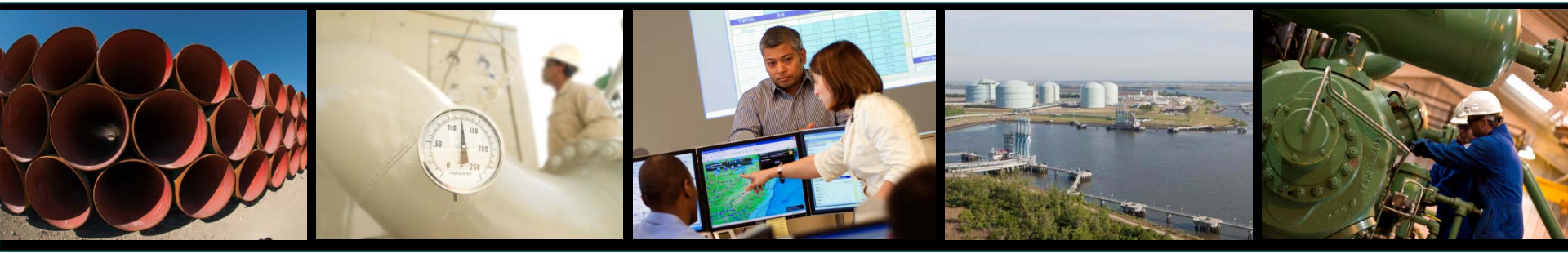


Defining Our Purpose

El Paso Corporation provides natural gas and related energy products in a safe, efficient, and dependable manner

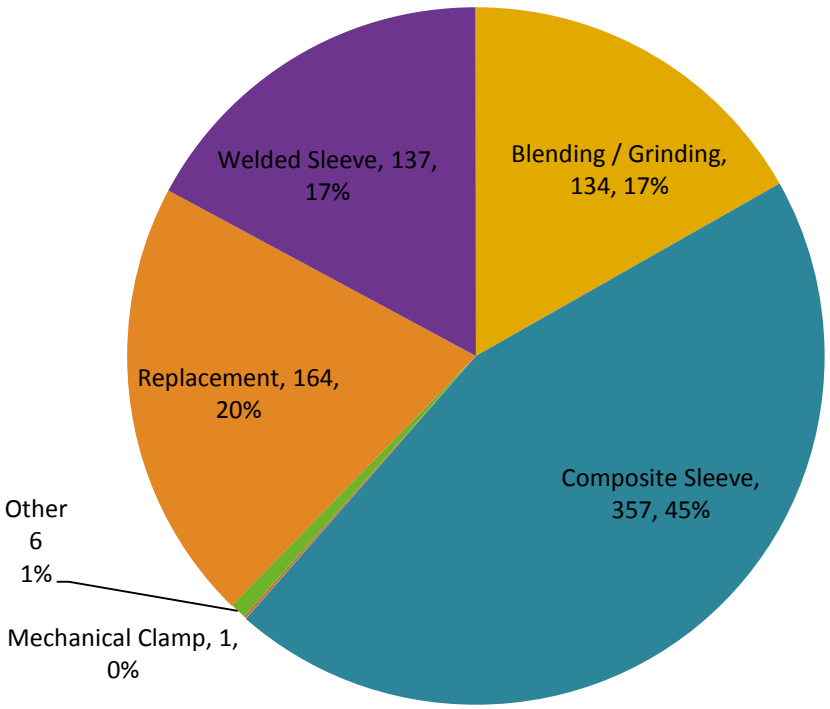
Repair System

- Repair or replacement required upon discovery of a leak, imperfection or defect that impairs the serviceability of a pipeline
- Damages: Corrosion, dents, scratches, gouges, SCC, etc.
- Imperfections: Laminations, hard spots, cracks
- Discovery could be a result of Pipe Inspection, ILI, Corrosion Surveys, Leak Surveys
- CFR requires integrity management of the pipeline against the threats identified in B31.8S

Transmission Line Repair System

- 49 CFR 192.713 Requirement
  - Cutout and replace
  - Use method that reliable engineering tests and analyses show can permanently restore the serviceability of the pipe.
- Accepted Pipeline Repair methods
  - ASME B31.8S
  - Details of methods in "PRCI's Pipeline Repair Manual"

El Paso Pipeline Group 2010 Repairs



Typical Repair System Used

- Dents or Mechanical Damage
  - Composite or Weld Sleeve (Type A) if plain dent, no stress risers
  - Weld Sleeve (Type B) if accompanied with stress riser, weld, seam
- Corrosion
  - Recoat
  - Composite – Regulation allow up to 80% metal loss
  - Weld Sleeves
- Manufacturing defects
  - Long Seam – Weld Sleeve
  - Other surface defects : Lamination, Cracks – Weld Sleeve
- Construction imperfections
  - Defective Girth weld – Weld Sleeve
  - Wrinkles – Composite (with certain limitations)

Operators Expectation of Repairs

- Effectively meet the regulation and restore integrity of the pipeline
- Repair System expectation:
  - Easy to Procure & Design
  - Reliable & Permanent – Test Results
  - Easy to install
  - Its an OQ Task – Training, Qualification records
  - Installation training for Company or representatives
  - Cost

Composite Repair Requirements

- Compatible to pipeline steel and coating
- Permanent Repair - permanently restore the serviceability of the pipe
- Qualification Testing
  - Strength - Long-term
  - Cathodic Disbondment
- Surface Preparation – Clean metal
- Installation Procedure Training
  - Employee & or Contractors

Composite Repair Requirements

- Other Design Consideration
  - Impact resistance – damage prevention
  - Pipe Reinforcement – Axial, Bending
  - Coating, UV,
  - ILI recognition
  - Water and harsh environment
- Quality Assurance – Key hold points
- Cost – Material, Labor & Time for application

Design & Testing Standard

- No design or testing defined in codes
- ASME PCC-2 – A common ground for testing & design
- Testing through JIP advantageous
  - Common testing procedure
  - Easy to compare and understand performance
  - Ease of design & performance document retrieval in case of audits.

Composite Repair System

- Why is it more popular now
  - Codes & Standards accept composite repairs as alternative methods
  - Easy to procure and store
  - More repairs due to Pipeline Integrity Rule
    - Scheduled Inspection and Maintenance
    - Required Re-Inspections

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Questions….

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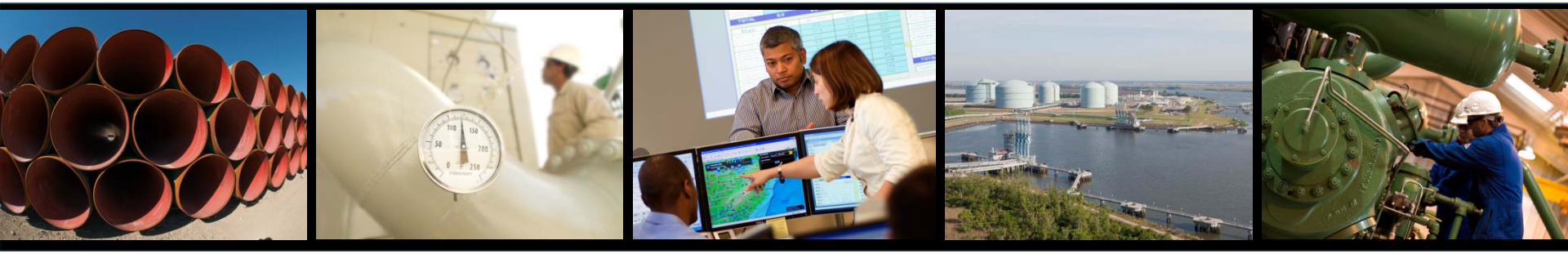

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