2009 New Pipeline Construction Workshop

PHMSA Workshop

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Natural Gas Transmission Pipeline Lessons Learned/Best Practices

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Topics

- History
- Project Scopes
- Issues
- Causes
- Adjustments and Corrections
- Summary and Successes

History

- Supply and Demand

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- Aging Infrastructure

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- Regulatory Evolution

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- Aging Infrastructure
- Regulatory Evolution
- Resource Challenges

Project Scopes

- Industry
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  - New compressor installation requirements
    - Evolving emission requirements
    - Equipment obsolescence
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  - KM Louisiana Pipeline
    - 135 miles of 42"OD and 2 miles of 36" OD, high pressure pipeline
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    - Joint Venture between Kinder Morgan (50%) and Energy Transfer (50%)
    - 508 miles of large diameter, high pressure pipeline: 40 mi. 30" OD; 262 mi. of 42" OD; 206 mi. of 36" OD
    - 90% of pipeline system constructed using the Class 1, .8 design MAOP "Special Permit" criteria
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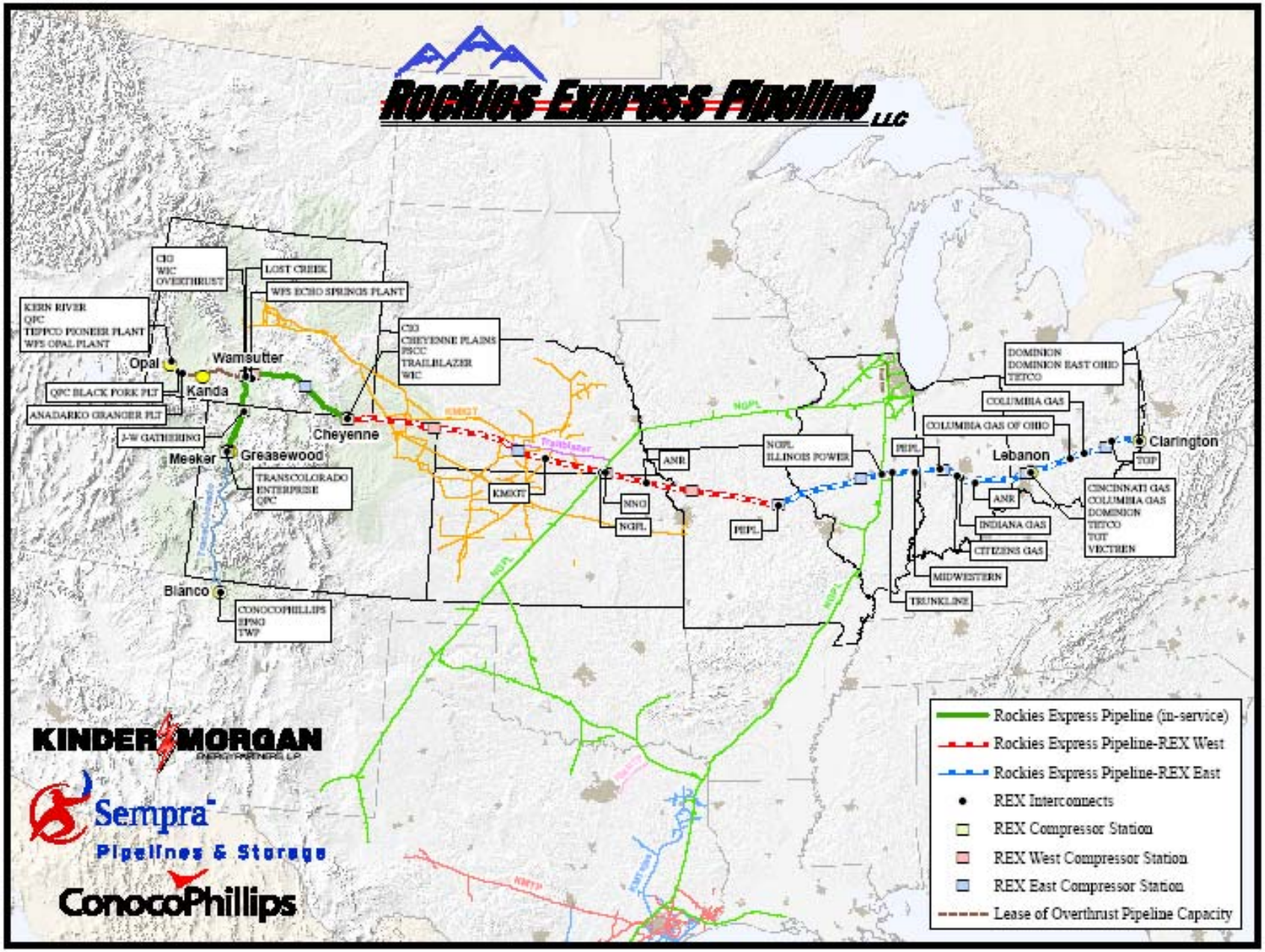
  - Rockies Express Pipeline (REX)
    - Joint Venture between Kinder Morgan (51%), Sempra Pipelines and Storage (25%) and ConocoPhillips (24%)
    - REX Entrega 1-'06, REX Entrega 2-'07, REX West '07 & '08, REX East '08 & '09
    - 1680 miles of large diameter (primarily 42" OD), high pressure pipeline
    - 76% of pipeline system constructed using the Class 1, .8 design MAOP "Waiver" criteria
    - 15 compressor stations: 42 units; 456,290 hp
    - Approximately 6,500 project personnel working on the construction at the project peak



Ownership: Kinder Morgan 51%, Sempra Pipelines & Storage 25% & ConocoPhillips 24%

Issues – REX Case Study

- Wide range of QUALITY related issues
  - Material quality
  - Welding quality
  - Field Coating quality
  - Lowering and backfill quality
  - Buoyancy verification
  - Engineering design, Survey and “As Built” quality
  - Hydrostatic testing verification and performance

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  - Contractual deadlines
  - Landowner issues

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  - Landowner conflicts
- Other Complexities and Complications
  - Additional construction standards and commitments (.8 design “Waiver/Special Permit”)
  - Increasing environmental regulations, close parallel construction and other requirements

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- Expectations management
- Performance management

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  - Third party pipe stress analyses
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- Additional QA/QC resources dedicated to projects:
  - Additional company management personnel were dedicated to the field construction work
  - Third Party QA/QC audits

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- Construction and operating standards, procedures and criteria are more stringent in order to improve safety and environmental performance.
- The number and size of projects has stressed all stakeholders' resources.
- Stakeholders must commit to a higher level of QA/QC in order to move toward project improvement.