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Presented by Dan Kortum, Dominion Transmission, at the West Virginia Energy Infrastructure Workshop on December 11, 2003 at Stonewall Resort, Roanoke, WV. This meeting was a part of the Energy Roadmap Workshop Series commissioned by West Virginia Governor Bob Wise.

Energy Infrastructure Workshop December 11, 2003

Dan Kortum

Dominion Transmission

Infrastructure

- Two principal components
  - Pipelines
    - Gathering
    - Transmission

  - Compression

Limited Pipeline Capacity

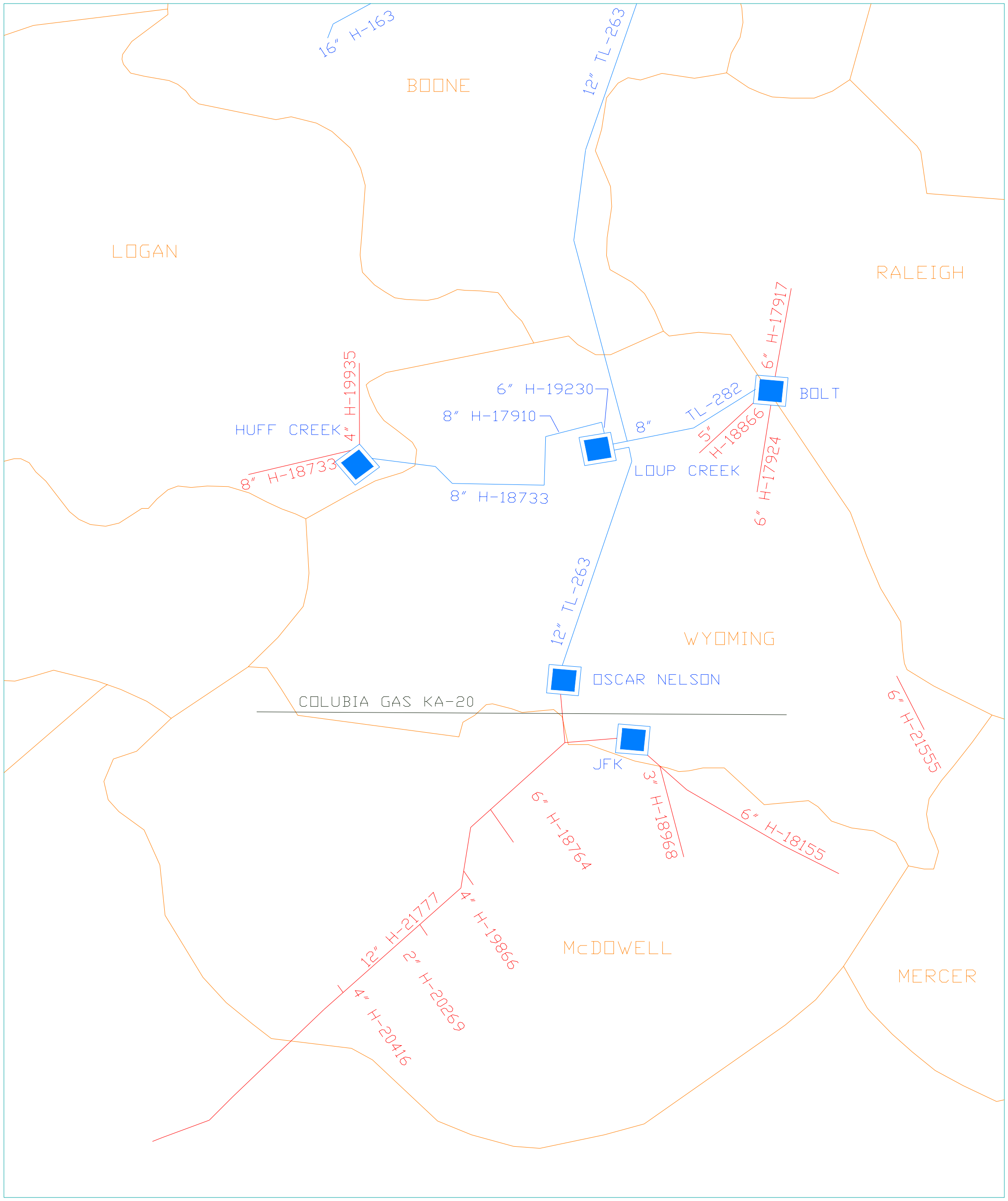
- Single most important obstacle to significant natural gas development in WV
- New construction
  - More cost and time
  - Allows gas to reach new markets
- Upgrade current facilities
  - Less expense and time
  - Not an answer if markets restricted

Gathering vs. Transmission

- Gathering
  - 4 - 6 inch pipe, usually less than 100 psi
  - Generally not the problem and can be remedied with new pipe or minimal compression
  - Production rights usually permit installation of gathering pipe across the lease – at no cost
  - New gathering still moves production to existing markets

Gathering vs. Transmission

- Transmission
  - Large diameter, 16 – 30 inch
  - Operates at 250 – 1000 + psi
  - May cross property with no interest in the production or end use market - thus requiring landowner negotiations
  - NIMBY factor
  - Only real way to reach new markets



16" H-163
12" TL-263
BOONE
LOGAN
RALEIGH
6" H-17917
BOLT
6" H-19230
8" H-17910
8"
TL-282
5" H-18866
HUFF CREEK
4" H-19935
8" H-18733
LOUP CREEK
6" H-17924
8" H-18733
12" TL-263
WYOMING
OSCAR NELSON
COLUBIA GAS KA-20
6" H-21555
JFK
3" H-18968
6" H-18764
6" H-18155
12" H-21777
4" H-19866
2" H-20269
4" H-20416
McDOWELL
MERCER

Dominion Transmission

- TL 263 operates at capacity year round
- Compression opportunities are limited
  - Merely moves the bottleneck downstream
- Major stations are virtually full year round
  - Oscar Nelson - 40,000 mcfd
  - JFK - 9,000 mcfd
  - Loup Creek - 25,000 mcfd

Columbia Transmission

- KA 20
  - Major west to east outlet for Columbia
  - Capacity constrained in the summer months due to reduced market
  - Compression may offer limited solution

East Tennessee

- Also moves gas west to east
- No direct interconnect in West Virginia
- Requires significant construction for producer to deliver gas into ETNG

Financing

- $1 million per mile (transmission)
- Appropriate rate of return required
- Pipelines must compete with growth and non-regulated projects for internal corporate capital
- “Build it and they will come” will not secure internal funding

New Paradigm Needed

- End Use Markets cannot be the only buyer of firm capacity (FT)
- Producers must think in terms of buying FT
- 15-20 year terms not unreasonable
- Possible option is a capital contribution to the project
- Producers not convinced their production – or gas prices – will last that long

New Construction

- New pipeline construction requires a minimum of three to four years
- Landowner opposition to new construction is growing
- Requires commitment of all stakeholders. No one can wait for the other to act

Regulated vs. Non-regulated Projects

- Regulated
  - Eminent Domain rights
  - Additional time & cost
- Non-regulated
  - Not likely in today's economic climate

Federal Energy Regulatory Commission (FERC)

- Holds jurisdiction for interstate projects
- Requires project be for the "Public Convenience and Necessity"
- Must not duplicate other projects
- Must prove markets and need exists
- Expedited hearing process now available

FERC's Expedited Process

- Dominion first to use on Greenbrier Pipeline
- 11 month process (vs. two years previously)
- Requires upfront resolution of problems
  - Landowner approvals
    - 1500 land tracts, 1100 landowners
  - Market confirmation
  - Rate design
- Requires community involvement in all phases

Greenbrier Pipeline Timeline

▪ Open Season	4th Qtr 2000
▪ Finalize Agreements	1st Qtr 2001
▪ File FERC Application	3rd Qtr 2001
▪ Receive FERC Approval	3rd Qtr 2003
▪ Start Construction	2nd Qtr 2004
▪ In-Service	2nd Qtr 2005

Summary

- Pipeline capacity needed
- New markets offer best opportunity
- Regulated projects most likely to succeed
- Long lead times needed for construction
- New financing paradigm required
- All stakeholders involved in solution

Questions?