Challenges with Construction of a Large Offshore Transmission Pipeline

Marine Technology Society
September 23, 2010
Michael Kologinczak, P.E. (TX)
FAST FACTS

• Largest Pipeline in the Gulf of Mexico

• First Pipeline in the Eastern Gulf

• Only Offshore Gas Pipeline Shore Crossing into FL

• First New Natural Gas Pipeline in FL in 40 Years

• Gas to Create Electricity for 4.5 million Homes
ORGANIZATIONAL STRUCTURE

- Project Consulting Services
- Stolt Offshore Inc.
PROJECT SCOPE

- 1.1 Billion cubic feet/day
- 437 Miles Offshore
- 2,180 psig
- 150 Miles Onshore
- 119,000 HP Compression in AL
- $1.5 Billion
PROJECT SCOPE

- 6 Locations
- 8 Mid-Line Ball Valves
- Check Valve
- Piggable Wye
PROJECT SCOPE
PROJECT SCOPE
WATER DEPTH
PIPE SPECS

• 36” Diameter

• 0.820” – 1.375” Wall Thickness

• X65 and X70 Pipe

• FBE External Corrosion Coating

• Liquid Epoxy Internal Coating
PIPE LOGISTICS

PIPE MILLS

- **Berg**, Panama City, FL - 119 Barges
- **Europipe**, France & Germany - 16 Ships
- Over 58,000 pieces of Pipe

CONCRETE WEIGHT COATING

- Bredero Price Company
- Concrete up to 3.75” thick
- Density up to 205 pcf
PIPE LOGISTICS

Alabama
PIPE LOGISTICS

Florida
WEATHER CHALLENGES

- 11 Month Construction
- Winter construction
- Tropical Storm Barry (7 days)
- Tropical Storm Gabrielle (5 days)
- Hurricane Michelle (3 days)
PERMITTING – TYPICAL AGENCIES

Minerals Management Service  AL Public Service Commission

FL Fish & Wildlife Conservation Commission  National Marine Fisheries

MS Dept. of Environmental Quality  Environmental Protection Agency

AL Department of Conservation & Natural Resources  FL Department of Environmental Protection

US Fish & Wildlife Service

US Army Corps of Engineers

MS Dept. of Marine Resources  Tampa Port Authority

US Dept. of Transportation
LIVE BOTTOM

Hard Bottom = Live Bottom
• *Avoid*

• *Minimize*

• *Mitigate*
LIVE BOTTOM – AVOID IMPACTS

Pinnacle Trend

Steamboat Lumps

Florida Middle Ground
LIVE BOTTOM – MINIMIZE IMPACTS

Federal Low Relief Live Bottom Stipulation Areas

- Surveys to characterize Live Bottom communities
- Video and Digital Still Camera mapping
- 884 linear miles of survey
- Quantitative analysis of live bottom species
LIVE BOTTOM MITIGATION

- Approx. 150,000 tons of limestone boulders
- Fabricated limestone reef modules
- Transplant live bottom organisms
SUNSHINE SKYWAY BRIDGE

- Pipeline design modeling
  - Damage from a vessel spud drop
  - Impact from a tractor trailer
PIGGABLE WYE

- Big Inch Marine Systems
- 36” Diameter
- Design based on FEA Analysis
- Weight: 32,173 lbs
COMMISSIONING

Direction of Pig Travel

Alabama

Natural Gas

Nitrogen

Nitrogen

Dry Air

Florida

Pig Train 3

Pig Train 2

Pig Train 1
COMMISSIONING

Risks:

• Nitrogen bypass
• Inability to Control Pig Speed
• Excessive Pig Wear
• Stuck Pigs
• Failure to locate Pigs
Differential Pressure vs. Time

Elapsed Time (hr)

Differential Pressure (psl)
COMMISSIONING
WHAT’S NEXT

• **Phase 2:** 100+ miles onshore FL  
  In-service 2004

• **Phase 3:** 35 miles onshore FL  
  In-service 2008

• **Phase 4:** 18 miles in Tampa Bay  
  Compression in AL & FL  
  In-Service 2008/09

• **Phase 5:** Compression in FL  
  In-service 2011
CONCLUSION

Questions?

Michael.J.Kologinczak@Williams.com