Platform Holly Sub Sea
Power Cable Replacement
October 8, 2014

www.venocoinc.com
Platform Holly Cable

- Installed in 1966 as part of original Platform
- Power Cable de-rated over years
- At times Cable has limited production
- Bundled communication cables had already failed
- Cable pre-dated modern design and codes
- Cable and Power Supply Reliability in question
As Built Replacement of Power Cable

- Restore power supply to original load capability
- Update communications cable to fiber optics
- Minimize Environmental Impact
- No platform down time due to cable replacement project
- Complete during routine platform maintenance shutdown in 2014

KEEP THE LIGHTS ON!
Platform Holly Cable Replacement

Project Phases:

- Preliminary Cable Routing
- Cable Design / Specification
- Order the Cable
- Finalize Design
- Permitting
- HDD bore
- Platform I-tube and routing
- Pipeline Crossing
- Construction
- Testing
- Power Cut Over
Platform Holly Cable Replacement

- **Cable Selected:**

  **KERITE CATALOG NUMBER 341G25-J4458**

  - 4x AWG#10 [1/0] Filled Uncoated Copper Conductor
  - Puremmid-Stress Control Layer
  - Outer (PE) Isolation (30mil)
  - Insulation Shield
  - Extruded Nonmetallic Layer
  - 9 mil Copper Tape
  - 8 oz. Shield PVC Jacket Primed with PHASE 2
  - (12) 100 lbs. Per Eyelet. Sunlight Resistant.
  - Polyethylene Insulation
  - 2 Strands, APL, 34 strand, Virgin Noodle, Critical Distance to an undisturbed EMI tube with screen/jacket.
  - Core Tape
  - Polyethylene Sheath
  - 4 SWG Graphite Steel Armor Wire
  - Black HDPE Jacket (4 mil)

  Approx. Weight in Air ~ 11.26 lbs/mi
  Approx. Weight in Salt Water ~ 6.47 lbs/mi

  Notes: All dimensional data subject to manufacturing tolerances.
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Final HDD Bore Design – Bennett Trenchless Engineers
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Final HDD Bore Design – New Exit Point
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Permitting

- California State Lands Commission – Lead Agency
- California Coastal Commission
- California Regional Water Quality Control Board
- Department of the Army – Corps of Engineers
- City of Goleta
- Santa Barbara County Air Pollution Control District

- Hundreds of Pages / Scores of Conditions
- Months to Obtain
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HDD Bore + Regulatory Monitoring - Every Operation – Every Day – Every Site

5 Monitors for 3 -4 ft Entry Hole
3 = EQAP Monitors in Blue Hats
1 = Cultural Resources in White Hat
1 = Native American Monitor in White Hat
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Contingency Dive Team – Ready on Standby All Day
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Rhodamine Dye Requirement
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- Inadvertent Surface Release of Drilling Mud
  - Material detected in water, no dye detected

- New Plan
  - Drill and Ream the last 300’ with Water Only (No Drilling Mud)
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Pipeline Crossing Mats
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Lay the Cable – First Pull Cable Into Ellwood Onshore Facility
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Lay the Cable – Now to Holly – Tight Work Space Constraints
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OOPS!
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It Gets Worse - Twisted
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Cut & Splice it Together
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Splice Again, Rinse & Repeat
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Up Through the I-Tube
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Testing the Cable and Fiber Optics
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Pipeline Crossing – Cable Cover
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Resident Inspectors Ecstatically signed off project
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What did this all cost?

- Planning, Engineering $ 357K
- Permitting, Monitoring $ 571K
- Cable Purchase $1,587K
- Installation $5,802K

- Total $ 8,317K

- Not a single accident of any kind
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Prevention First

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