RVOC 2014

UNOLS Wire Pool

Rick Trask
Wire Pool Manager
Wire and Cable Purchases, Distributions and Testing

Past 3 years:
• Purchased 25 reels of wire/cable/synthetic (1)
• Distributed 27 reels
• Tested 201 samples from UNOLS vessels

Attempting to maximize the utilization of previously used resources to meet the needs of the UNOLS fleet (10 lengths distributed)
Wire Maintenance

- Draft policy written
- Comments solicited from small group
- Versions 2, 3, ….followed
- Draft sent to RVOC and RVTEC for comments
- Comments incorporated in a version distributed most recently to the Safety Committee.
- Under review by the Safety Committee
Wire Disposal

Matt Hawkins' Back Yard
Wire Disposal

• Require approval through the Wire Pool
• May be shipped to the East Coast storage location for closer evaluation
• Three scrap metal companies have expressed willingness to dispose of unusable wire from the pool
  – Challenge to find companies interested in sporadic disposal of a variety of metal compositions
What has been happening in the Wire Pool with regard to synthetic tension members?
Synthetic Substitute for 9/16” Wire Rope
General Purpose Specification

• High ratio of strength to weight
• O.D. of 9/16” to minimize mods to winch/sheave train systems
• Unbroken lengths up to 13,720 m
• Capable of being used on both single drum and traction winches
• Operate continuously over appropriately sized sheaves without degradation in strength.
• Withstand cyclical loading in tension without degradation in strength
• Clamping of instrumentation without loss of strength
• Easily terminated in the field
• Rotational Stability (minimal axial rotation)
Meet or exceed performance specifications of 9/16” Wire Rope

• Rotate no more than 5°/ft at 45% RBS. A change of tensile load of 10% RBS \(\rightarrow\) <1°/ft
• Breaking strength \(\geq\)32,500 lbs
• Withstand 50,000 flexure cycles at 35-40% of RBS with strength reduction < 5% RBS
• Withstand 50,000 tension cycles from 0-45% RBS with strength reduction < 5% RBS
Phillystran Recommendation: PSTB-Technora

- Torque balanced design
- 36 strand laid design
- Aramid strength bearing core and cover braid jacket
- Jacket provides external abrasion resistance
- Jacket is sacrificial -> no contribution to strength -> field repairable.
PSTB-Technora

• Laid design provides better internal abrasion resistance than a braided design
• Technora offers good heat resistance for internal heat caused by friction
• Possible field termination options include:
  – hand splice
  – compression fittings
  – Nicopress
  – poured spelter sockets

Best approach TBD
Does it meet the performance specifications?

Manufacturer will test rope performance
  – Breaking Strength
  – Rotation Tests
  – CBOS Tests
  – Tension Cycling
# Tension Member Comparison

## 9/16” 3x19 Wire Rope

- Wt. of Corer in SW = 2000
- Wt. of Sample in SW = 100
- Wt. of 5.5 km WR in SW = 7722
- Total = **9822**

### Quasi-Static Load
- Pound-Mass of corer in air = 2600
- Pound-Mass of mud sample = 350
- Pound-Mass of WR = 8877
- Total Mass of System = **11827**

- Dynamic Load = 8870
- Transient Load Pull Out Load = 2000
- Est. Max Load Pounds-force = 20992
- FS=Est. Max Load/BS = 1.55

## 9/16” PSTB-Technora

- Wt. of Corer in SW = 2000
- Wt. of Sample in SW = 100
- Wt. of 5.5 km Syn in SW = 720
- Total = **2820**

### Quasi-Static Load
- Pound-Mass of corer in air = 2600
- Pound-Mass of mud sample = 350
- Pound-Mass of Syn = 2035
- Total Mass of System = **4985**

- Dynamic Load = 3738
- Transient Load Pull Out Load = 2000
- Est. Max Load Pounds-force = 8858
- FS=Est. Max Load/BS = 3.81
Questions?
• Minimum breaking strength
• General D/d ratio is 20:1
• Factor of safety of 5 for overhead lifting slings
  – Modified based on safety, payload, desired working life of rope, user discretion
• Sheave groove 10% oversized compared to rope diameter