

RVOC Safety Committee Meeting April 2022

Use of Synthetic Line for over-the-side handling systems



Synthetic Line



- 9/16" Diameter Plasma HiCo line
- Draft Operational Guideline developed specifically for the R/V
 Armstrong Piston Coring cruise in the Puerto Rico Trench.
- Cortland's engineering staff and manufacturer's laboratory test results
- Knowing the Armstrong's over-boarding configuration, (no. of sheaves, sheave diameter) and the anticipated loads an estimate of rope life was projected.
- Each load cycle contributes a small percentage of rope damage.





What we learned from manufacturer's testing.

• Armstrong: Four 48" diameter sheaves with an anticipated piston core pull out load of 15,000 lbs.

Life Factor = D/d * Factor of Safety With D/d=85 and FS=2.5 the Life Factor is 215

• 165,000 double bend cycles to failure*---> 40,000 operations

If FS reduced to 2.0 (18950 lbs.) 45,000 double bend cycles to failure

* 9/16" dia Cortland Plasma HiCo line





R/V Neil Armstrong Cruise AR64-2

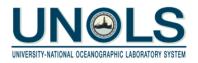
- 48 coring operations (17 Piston Cores, 24 Gravity Cores, 7 Multi cores)
- Max wire out 8348 m
- Max tension 15,000 lbs. during pre-trip
- Piston core tension range: 9500 to 14,900 lbs.





What we don't know.

- What % of rope life was expended during the Armstrong coring cruise or how much life is remaining?
- When should the rope be retired?



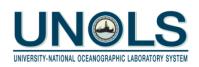


How do we proceed?

- Wire Rope and Electro-mechanical cables have been limited to a few manufacturers.
 - Reasonable approach for a pool resource.
 - Simplifies the inventory requirements
 - Build experience with select products
 - Possible pricing advantages
 - Establish rapport with the manufacture(s) engineering staff
- Recommend following that proven approach with synthetic rope
 - Utilize the products of one manufacturer
 - Work with their engineering staff to develop safe operating practices

How do we proceed (continued)

- Evaluate each proposed use:
 - Wire pool will work with the manufacturer's engineering staff to establish safe working parameters on a case by case basis.
 - Requires sufficient lead time to evaluate prospective uses and FS
 - Establish a History
 - Track double bend cycles
 - Track tensions
 - Breaking Strength history
 - Develop retirement criteria
- No Review of pending operation? Then what? Limit FS≥5, Minimum D/d=40, require frequent break tests



Any Questions?