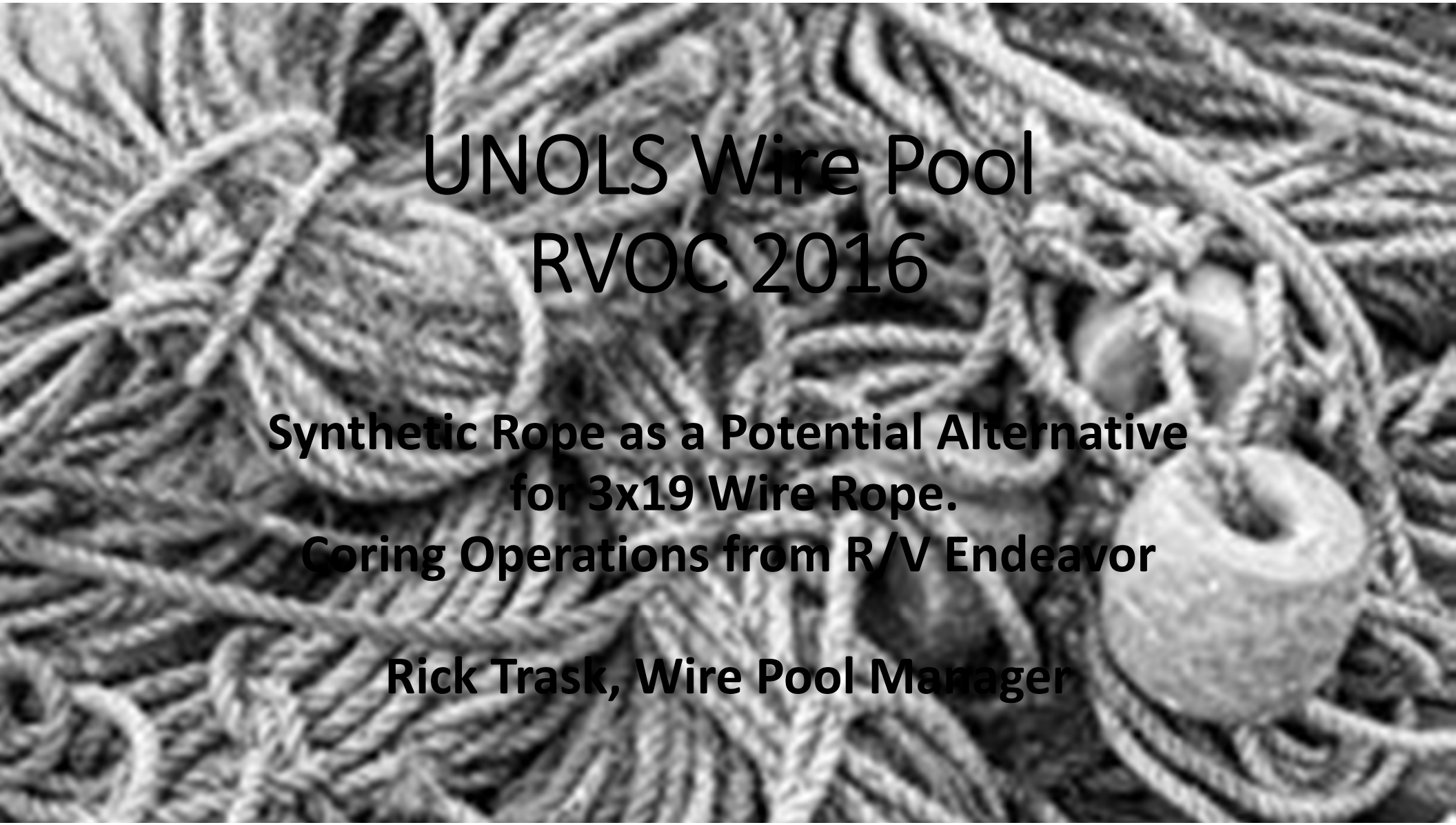


UNOLS Wire Pool
RVOC 2016

Synthetic Rope as a Potential Alternative for 3x19 Wire Rope.
Coring Operations from R/V Endeavor

Rick Trask, Wire Pool Manager

All Kinds of Concerns

- Traction winch or direct drive?
- What ship?
- If a traction winch can the traction heads be re-conditioned adequately for synthetics?
- Will the synthetic rope level wind properly?
- Will the synthetic rope knife into the core of the storage drum?
- Will there be slippage on the traction heads?
- Will the synthetic be snagged by rough traction sheaves?
- What rope materials and constructions should be tested?
- If a jacketed rope is tested will there be relative movement between jacket and core?

We can talk about it forever or we can get out there and try something and see what happens.

Preparations

R/V Endeavor Traction Winch

Removal of 9/16” 3X19
Trawl wire

Re-conditioning the traction sheaves

Pivoting grinders with wire wheels and Scotch-Brite discs

Protected from the elements

Tool Coating Wax applied
Wrapped in plastic

Dock Side Testing Before Departing Woods Hole

Synthetic Rope Samples

Phillystran

- Name: PST
- Diameter = 9/16”
- MBS= 32,500 lbs
- 7 strand “wire lay” construction with an overall braided jacket
- Technora Aramid Fiber
- Specific Gravity = 1.39
- Elongation @ 30% of MBS = 1.25%
- Sample Length = 1000 m

Samson

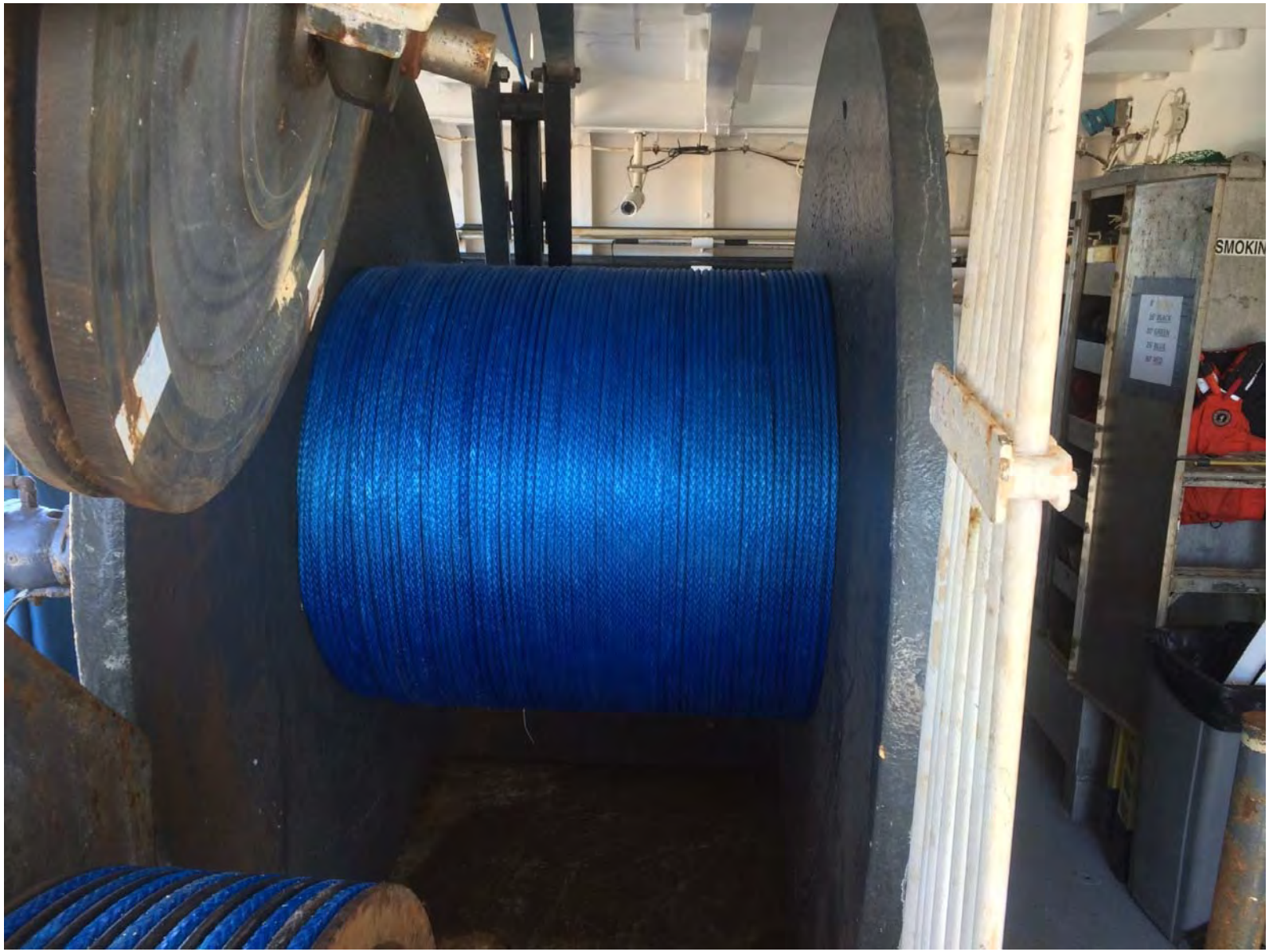
- Name: Unnamed
- Diameter = 9/16”
- MBS= 32,500 lbs
- 12-strand single braid construction
- Dyneema DM-20 Fiber
- Specific Gravity = .98
- Elongation @ 30% of MBS = .96%
- Sample Length = 1000 m

“The Plan”

1. Wind the Samson product onto the winch and attempt load tests.
2. Off spool the Samson product and wind on the Phillystran product.
3. Attempt load tests with the Phillystran product and if satisfactory leave the Phillystran product on the winch.
4. Attempt gravity coring operations in 800 m and 80 m water depths.
5. At sea, off-spool the Phillystran rope and wind on the Samson rope.
6. Attempt gravity coring operations using the Samson rope.
7. Return to Woods Hole hopefully with cores for Science and some experience using synthetic ropes.

Winding the Samson Product onto the R/V Endeavor Winch


DANGER


SMOKIN

Load Testing the Samson Product

5,000 lbs. load test

10,000 lbs. weight

15,000 lbs.
Load Test

Samson Product Removed

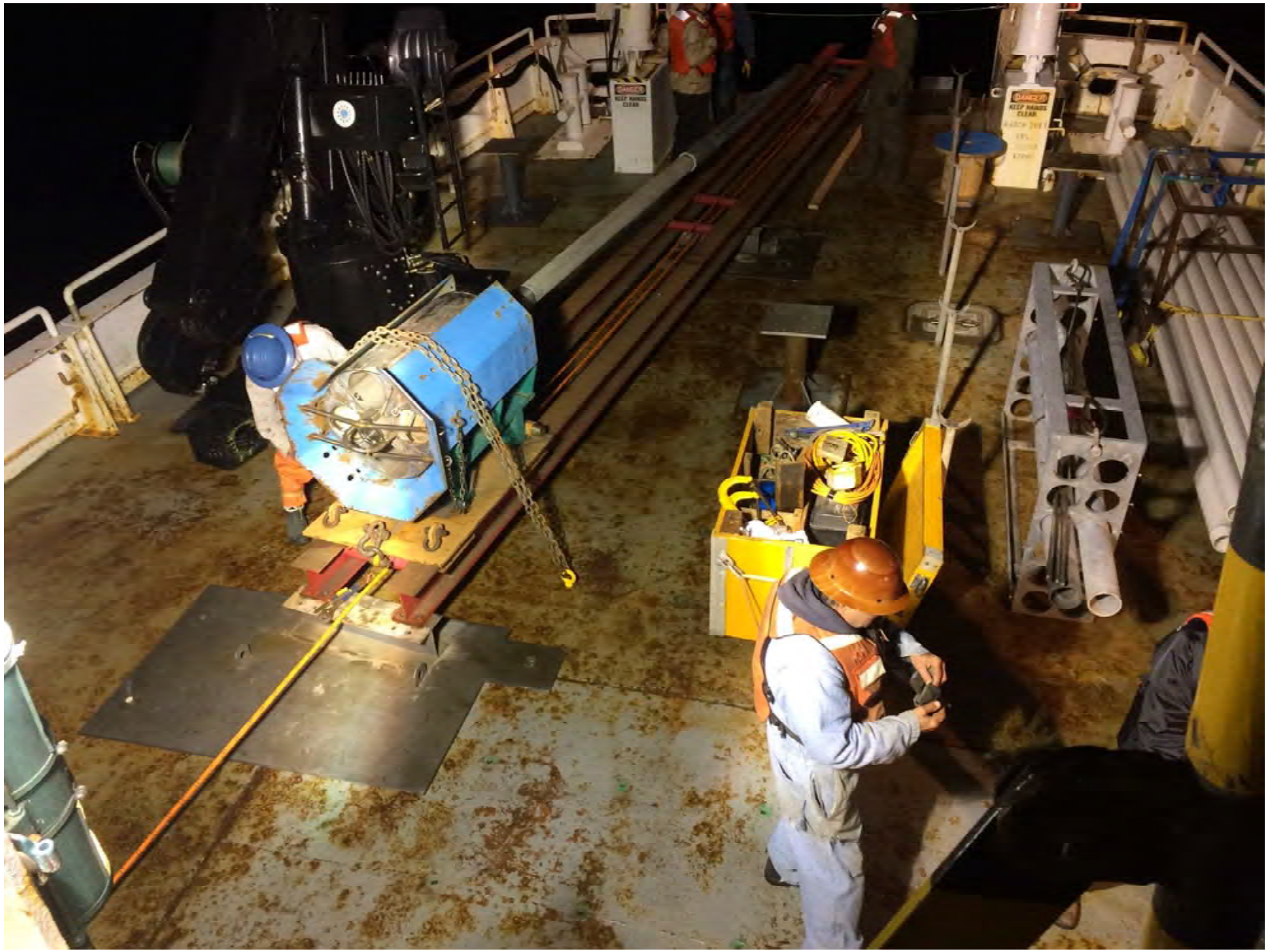
Phillystran Product wound onto the winch and load tested lifting 5,000, 10,000 and 15,000 lbs. successfully.

Gravity Coring Operations

R/V Endeavor

Cruise EN-576

April 12 to 15, 2016


DANGER
KEEP HANDS CLEAR
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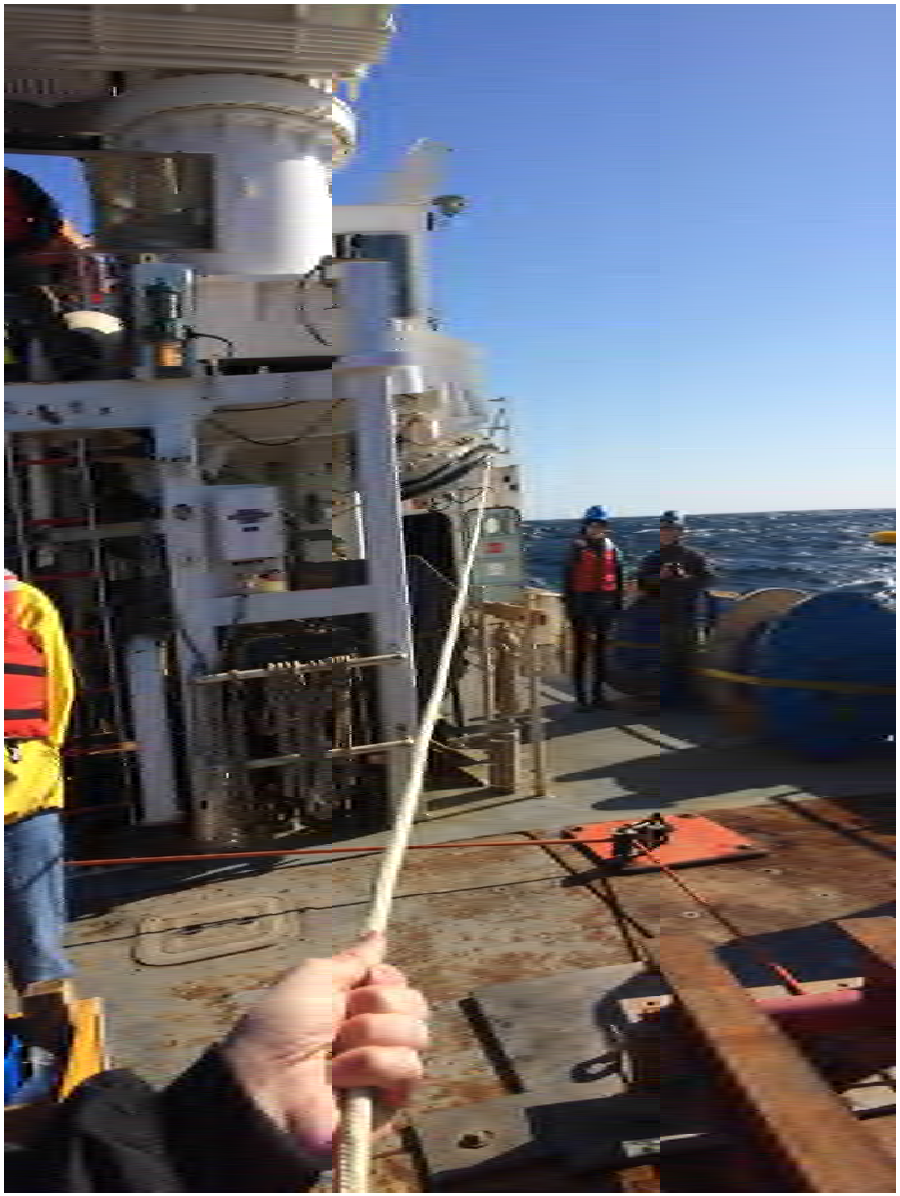
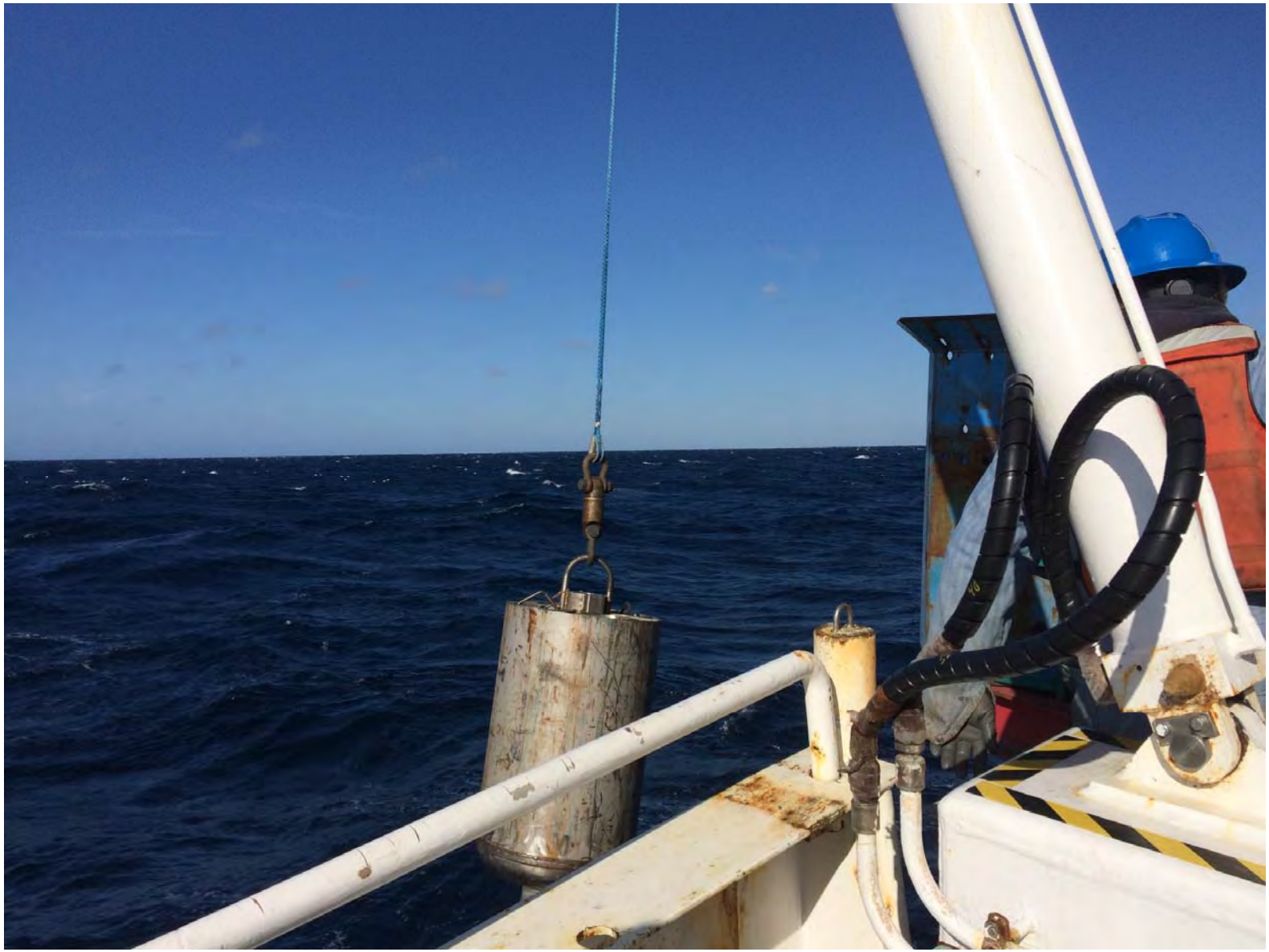


Precautions following some modifications to the rail system.


DANGER
KEEP AWAY
WHEN RUNNING
WARNING
WIRE FAILURE
CAN CAUSE INJURY


NATIONAL SCIENCE FOUNDATION
WHOI



Slide Sequence Immediately Following Core Penetration and During Pullout

Returned to Woods Hole

- A total of 9 gravity cores taken for Science
- Steve D'Hondt (URI) and Lloyd Keigwin (WHOI) had requested cores if possible
- Five cores in 800 meters of water.
- Four cores in 80 meters of water.
- Pullout tensions ranged from 5200 to 9100 lbs.
- In addition we completed a 20 mile survey at the 80 m site using the ship's 3.5 kHz system.

Additional Testing of a third synthetic sample

- 250 ft sample of a Cortland product called BOB for Braid Optimized for Bending.
- Used the Samson product as a winch leader to which the BOB was attached.
- BOB sample diameter = 5/8”
- MBS = 51,400 lbs.
- Specific Gravity = 1.18
- Elongation at 30% of MBS = 1.12%
- Blend of fibers that improve the bend over sheave CTF
- Conducted dock side load tests using the BOB

Load tests utilizing the Cortland BOB Product

25,000 lbs. Load Test with BOB

RT1


Many thanks to the crew of the R/V Endeavor and the OSU Coring Group.
ENDEAVOR
NARRAGANSETT, RI

Slide 57

RT1 Richard Trask, 4/15/2016