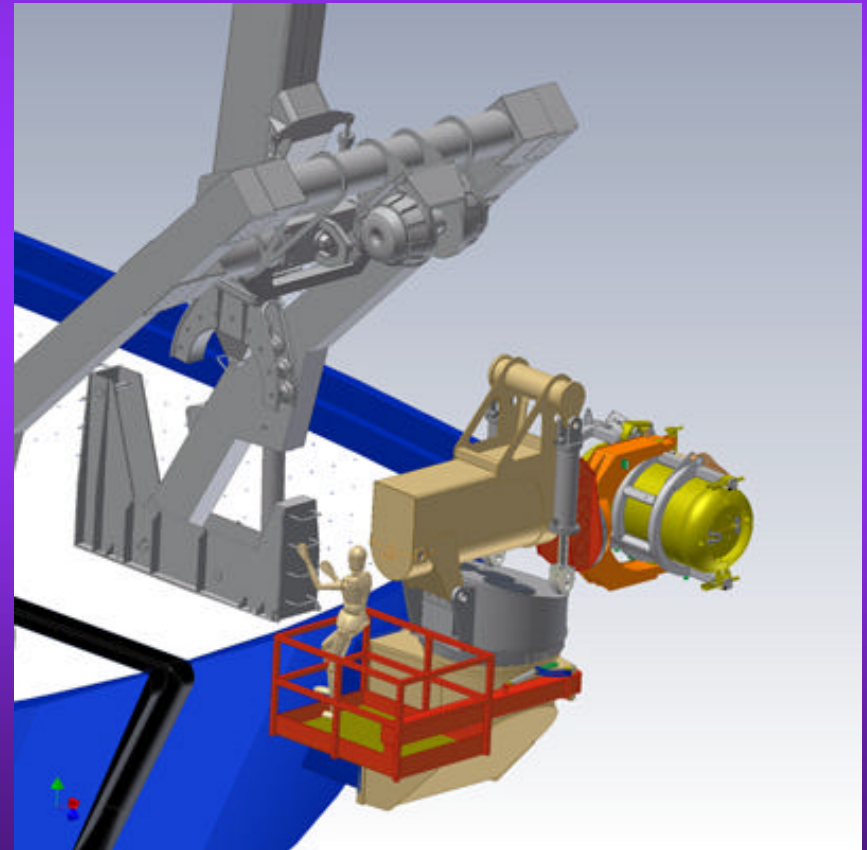


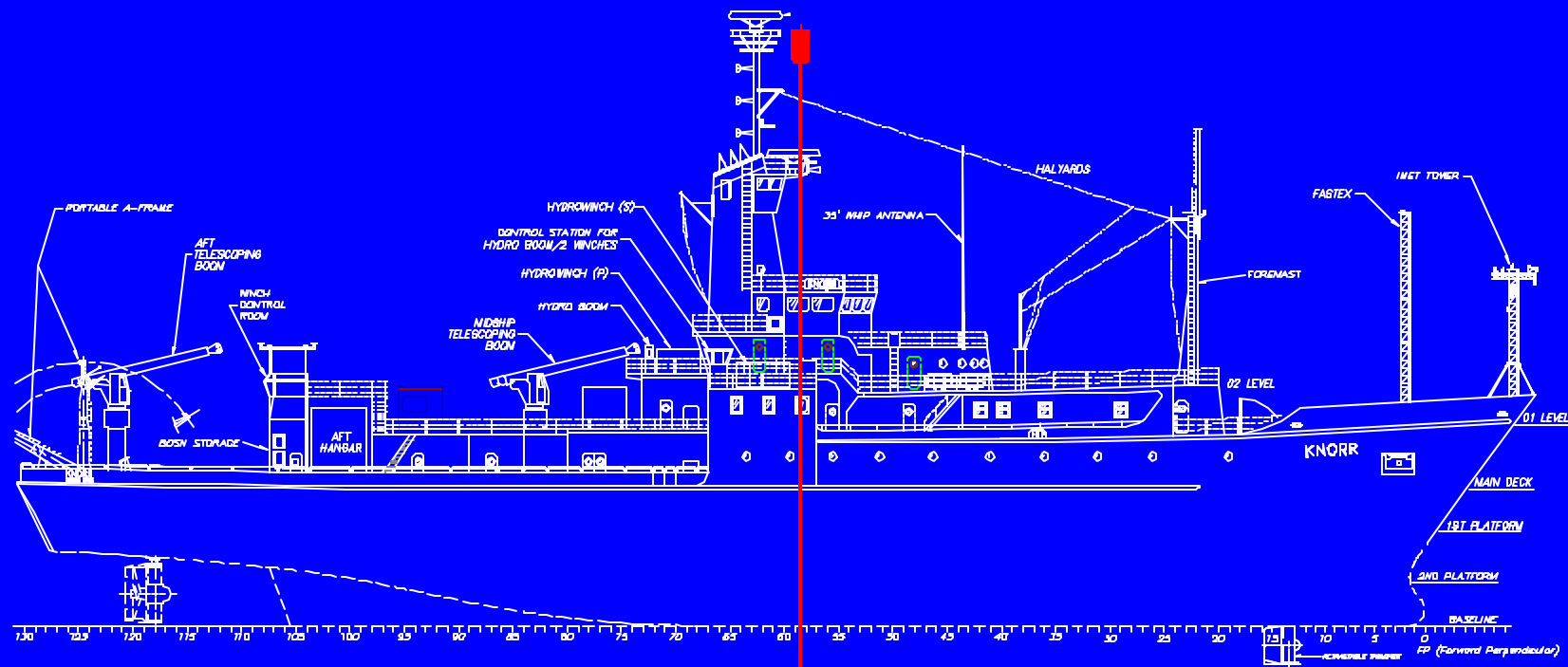
# WHOI LONG CORE R/V KNORR



# SYSTEM OVERVIEW

- CURRENT MAX CORE LENGTH = 45 M
- TAPERED WALL BARREL ASSEMBLY
- VARIABLE WEIGHT HEAD = 12,500 – 27,000 #
- ACOUSTIC MODEM RELEASE \*X4\*
- HI-MODULUS SYNTHETIC MAIN
- ODIM CTCU ROPE HANDLING SYSTEM
- ALLIED A-FRAME AND 'GRAPPLE'
- STERN SHEAVE
- PROGRAMMED STARBOARD DAVITS [H/V trans]

# THE 'PROBLEM'



# FIRST STEPS

- ATLANTIC DRY DOCK MAR 2005
- 'SUPERDECK'
- FOUNDATIONS:
  - A-FRAME
  - TRANSOM GRAPPLE
  - STERN SHEAVE
- STRUCTURAL ADDITIONS = 55 K #
- EQUIPMENT ADDITIONS EST = 175 K #

# JACKSONVILLE 03/05



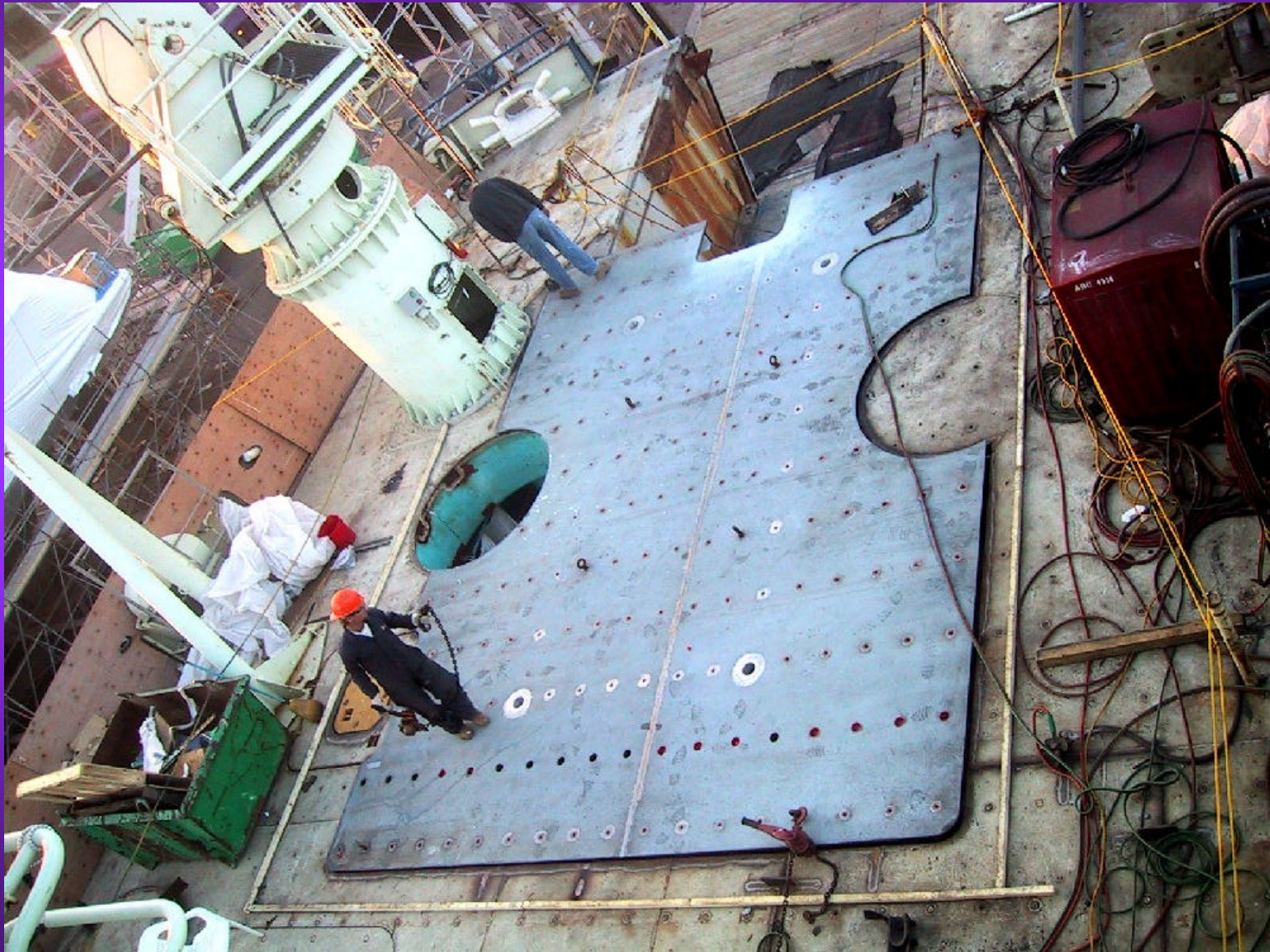


# SUPERDECK & STERNRAMP CUTOUTS





# SUPERDECK FIT-UP





# STERN-CLOSURE/SHEAVE MODULE







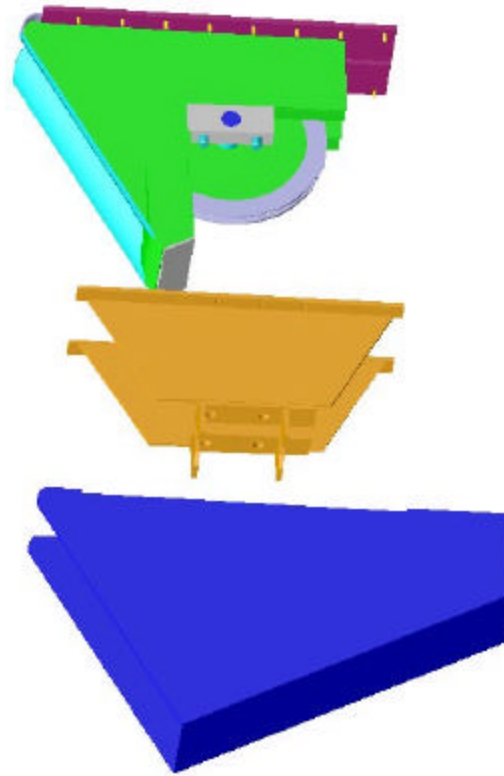


# STERN-SLOT W/ TIEPLATES

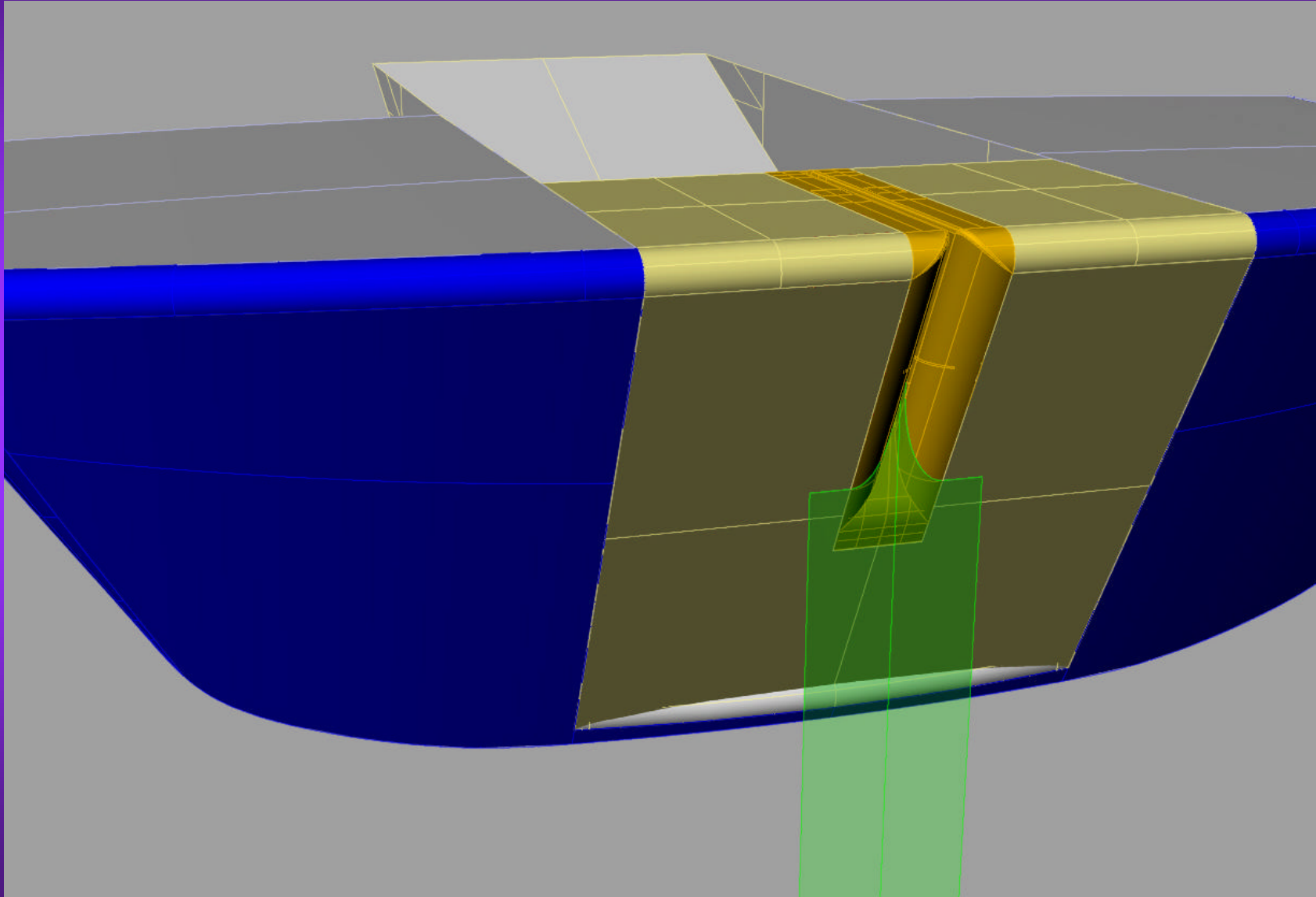




# SMITH-BERGER PACKAGE



# STERN SHEAVE FAIRING- ROPE ALIGNMENT



# STARBOARD HANGER MODS

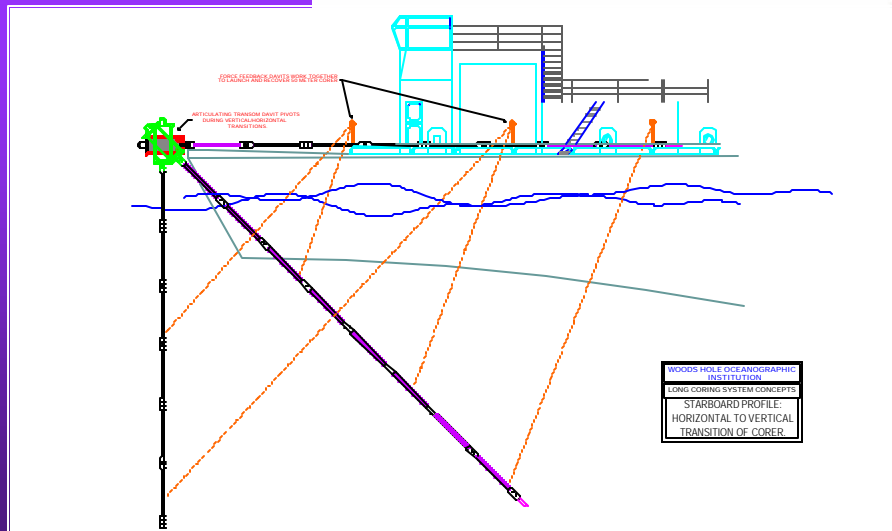
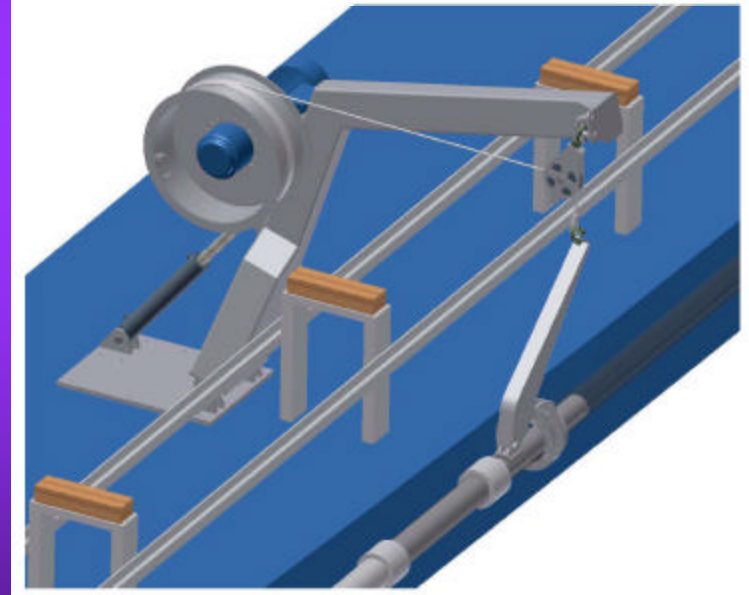
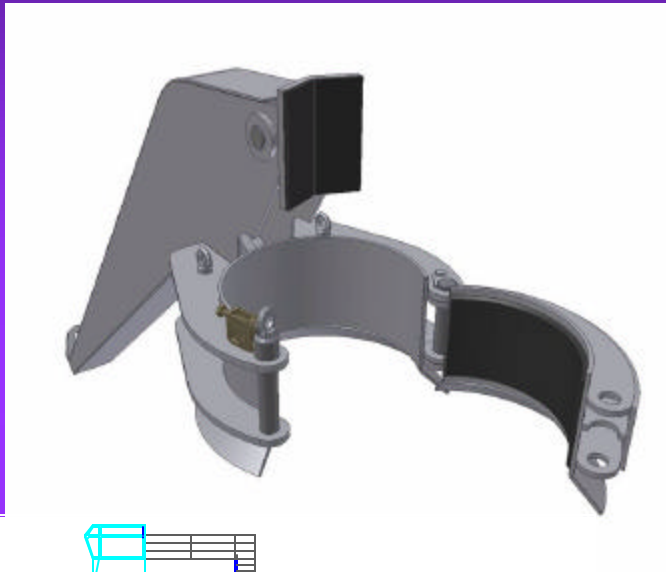




# HANGER BUTRESSES



# STARBOARD DAVITS FOR H/V TRANSITION



# THE ROPE

## WHY SO BIG ?



1. Maintenance of a high factor of safety during all phases of the coring operation.  
Target levels: 10-12: 1 during system deployment and recovery; 5-6:1 at maximum dynamic loading [core pullout].
2. By keeping the weight of system/rope strength ratio extremely high, pre-release elongation and subsequent rebound after core triggering will be minimized. This enhances our ability to further control/dampen the elastic recoil and adjust system parameters to avoid sample disturbance.
3. As a result of dialog with end users, rope applications consultants, fiber suppliers and rope manufacturers, it's become clear that the 'bigger the rope' that we can employ, the longer it will last.



# PUGET SOUND ROPES ANACORTES, WA



# HYBRID ROPE

- 2" DIA. 12 X 12 TORQUE BALANCED
- MBL = 365,000 #
- 7 KM LONG
- UHMWPE + VECTRAN [LCP]
- BLENDED ENDS, PLASMA MIDSECTION
- FIELD REPAIRABLE
- ELONGATION w/ 30,000 # CORER @  
5,000 METERS DEPTH = 3.5 M

# DAY 1





DAY 15



# STRONG/SENSITIVE



CAREFUL HANDLING CRITICAL

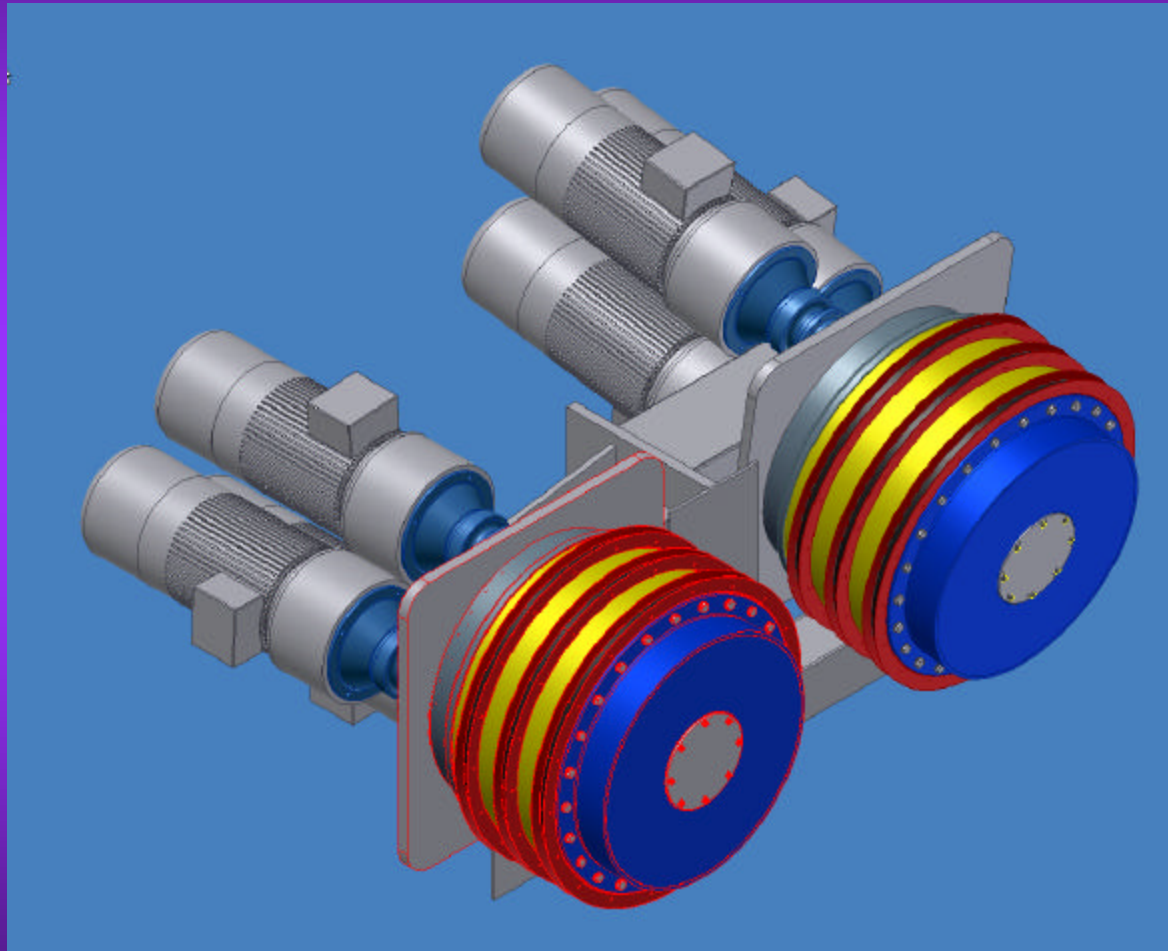


# CTCU Prototype



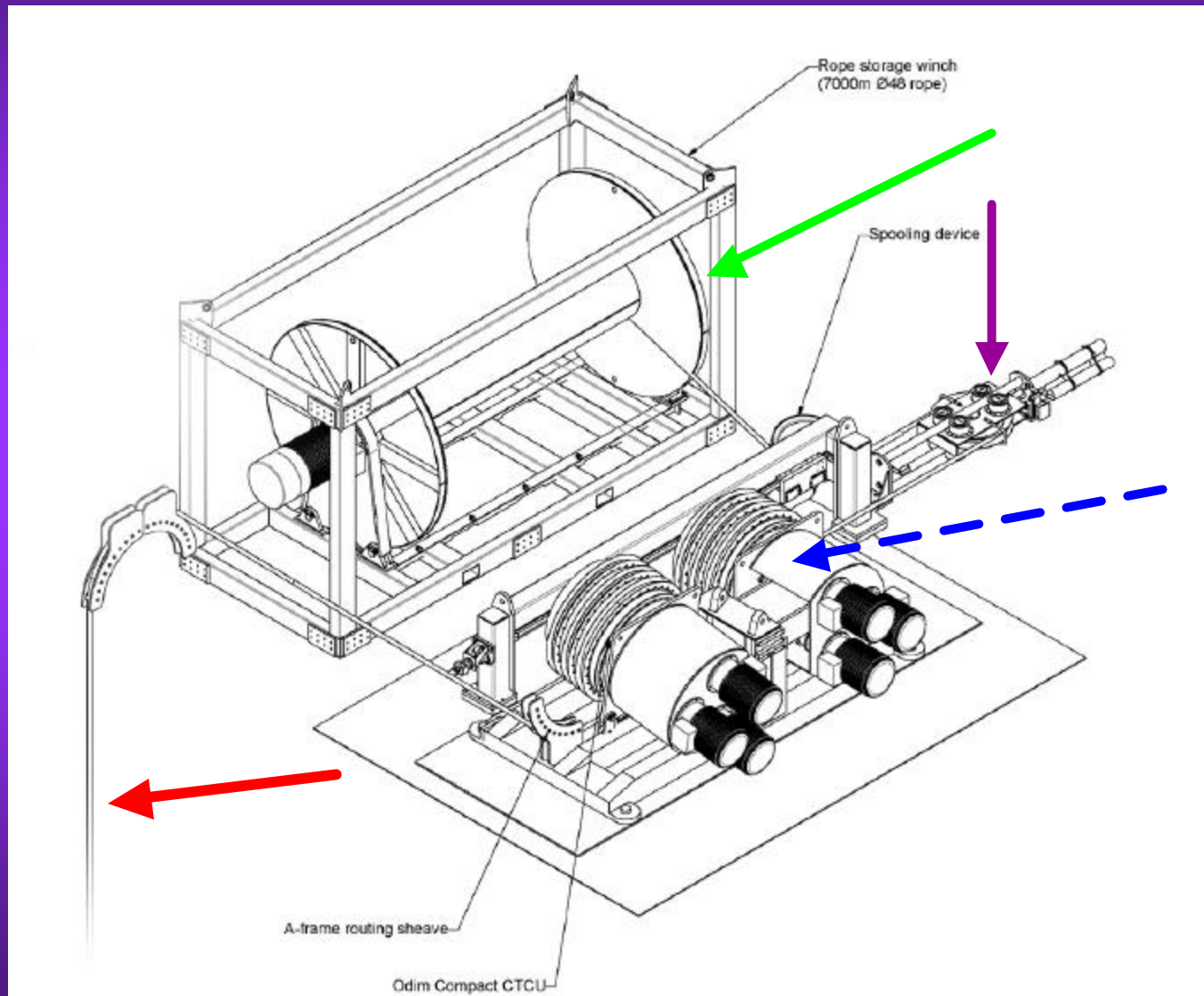


# 'COMPACT' CTCU





# The 'algorithm'





# FACTORY TESTS ODIM ASA

## HARIED, NORWAY 09/06



# ALLIED DOCK TRIALS: WOODS HOLE





# GRAPPLE ASSEMBLY





## 2-CRANES - NO SCRATCHES







# STERN SHEAVE FITTING







# DYNAMIC TESTING



20 TONS OF GREAT HARBOR

# **AUTOMATION FOR THE WHOI LONG CORE PROGRAM: DEVELOPING POSITION SENSOR CONTROL TECHNOLOGY FOR THE MARINE ENVIRONMENT**



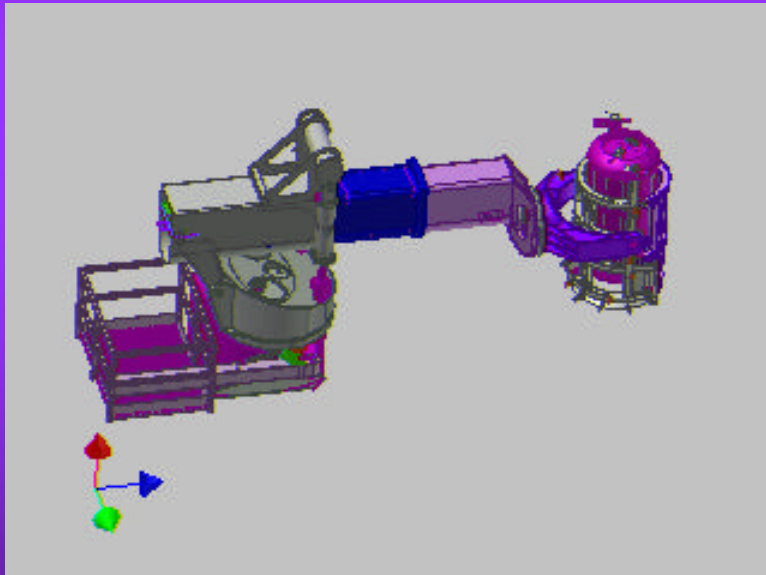
**Grayce B. Kerr Fund INC.**



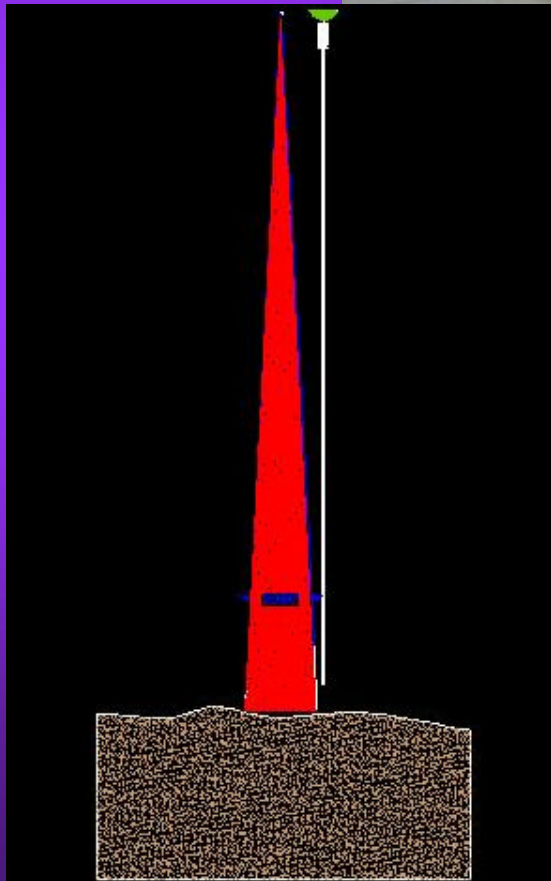


### Advanced Balluff transducer design enhances operational performance

Patented Balluff auto-tuning allows use of a wide range of range of cylinder position magnets including those already installed in existing operational equipment. Balluff's TA12 also compensates for performance changes caused by temperature fluctuations, allowing it to provide consistent, stable accuracy over a temperature range of -40 to 185°F. Additionally, the TA12's enhanced wave guide construction provides a high level of resistance to shock and vibration.



Rotary Encoders and Linear Variable Displacement Transducers



COREHEADS

# RELEASE MODULE

Core Deck

Monitor Comms! Terminal Button/Led Help!

Monitor

CHARGE RELEASE  
ok charge  
CHARGE STATUS?  
CHARGE STATUS?

RECONNECT

OK

Release Ack

RANGING READINGS

OFF

Ranging Rate (Sec)  
10 SET

RANGE (meters)

POLLED READINGS

Power Altimeter first

OFF

ALTITUDE (meters)

Polling Rate (Sec)  
2 SET

GENERAL SETTINGS

Remote ID  
0 SET

Response Timeout (Sec)  
10 SET

BOTTOM CONTACT CONTROL

Drop Weight  
OK

Drop Ack

AUTOMATIC RELEASE

Charge and Arm release first

Auto Release @ Altitude Release Altitude (m)  
OFF 50.00

Auto Release @ Altitude or @ Bottom Contact  
OFF

Auto Release Active

Auto Release @ Bottom Contact  
OFF

MANUAL PRERELEASE SEQUENCE

The following two steps MUST be performed and confirmed prior to selecting a Release Command.

1. Charge Release Capacitors (13 Minutes to charge)  
Charge Capacitors ON Charging Complete

2. Arm the Release  
ARM OFF

MANUAL RELEASE

Release NOW  
OFF

ALTIMETER CONTROL

Move Boom  
OFF

Boom Direction  
In Out

Altimeter Power  
OFF

Boom Position  
In Out

Comm 1

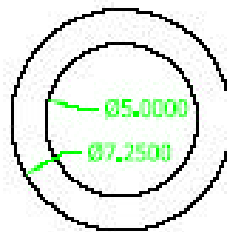
Logging OFF

10/10/2006 09:42:39



# LONG CORE PIPE

TOP BARREL STOCK



O.D. = 7.25" I.D. = 5.00" WALL = 1.125"

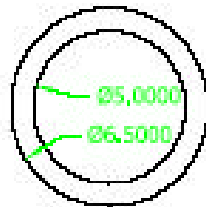
WEIGHT PER FOOT = 74 LBS

LENGTH = 20 FEET

12 PIECES 20' LONG = 240' TOTAL

1500# EACH TOTAL WT. = 18000 #

MID BARREL STOCK



O.D. = 6.50" I.D. = 5.00" WALL = 0.75"

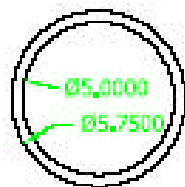
WEIGHT PER FOOT = 46 LBS

LENGTH = 10 FEET

20 PIECES 10' LONG = 200' TOTAL

460# EACH TOTAL WT. = 9200 #

BOTTOM BARREL STOCK



O.D. = 5.75" I.D. = 5.00" WALL = 0.375"

WEIGHT PER FOOT = 21.5 LBS

LENGTH = 10 FEET

20 PIECES 10' LONG = 200' TOTAL

215# EACH TOTAL WT. = 4300 #

