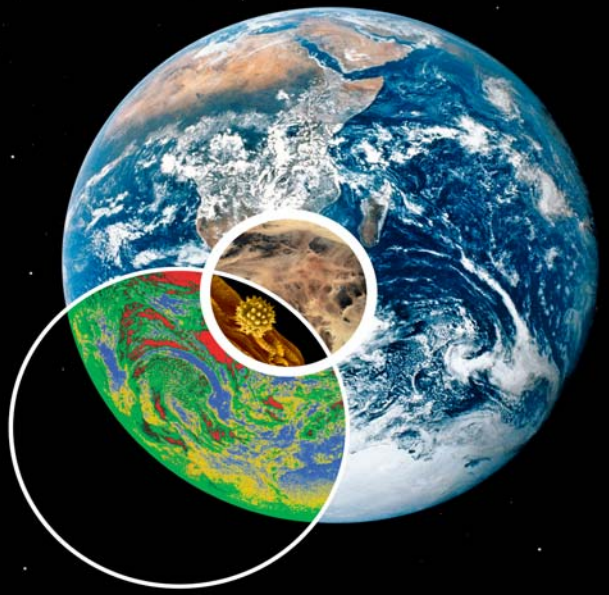
# LAMONT-DOHERTY EARTH OBSERVATORY
## OF COLUMBIA UNIVERSITY



# Marcus Langseth

# Marcus Langseth

## Project History

- Ewing to ‘Replacement Ship’
- ’Replacement Ship’ conversion to Langseth
- Langseth to Research Ship

## Shakedown & Calibration cruises

- Shakedown 1
- Calibration 1
- Shakedown 2
- Calibration 2

LAMONT-DOHERTY
EARTH OBSERVATORY
OF COLUMBIA UNIVERSITY

# The Questions:

How might ***Ewing*** be upgraded to best address the scientific needs of the community?

What additional capabilities should the ship have?

What are the tradeoffs between optimizing seismic capabilities and general-purpose capabilities?

What is practical - reasonable - optimal?

LAMONT-DOHERTY EARTH OBSERVATORY
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## Workshop Recommendations:

*If the goal is to:*

- Tow multiple long streamers
- Improve source repeatability using linear gun arrays

*and*

- Improve general purpose/OBS capabilities

*then*

- ***Ewing*** cannot satisfy these needs, and the possibility of securing a used industry vessel should be studied

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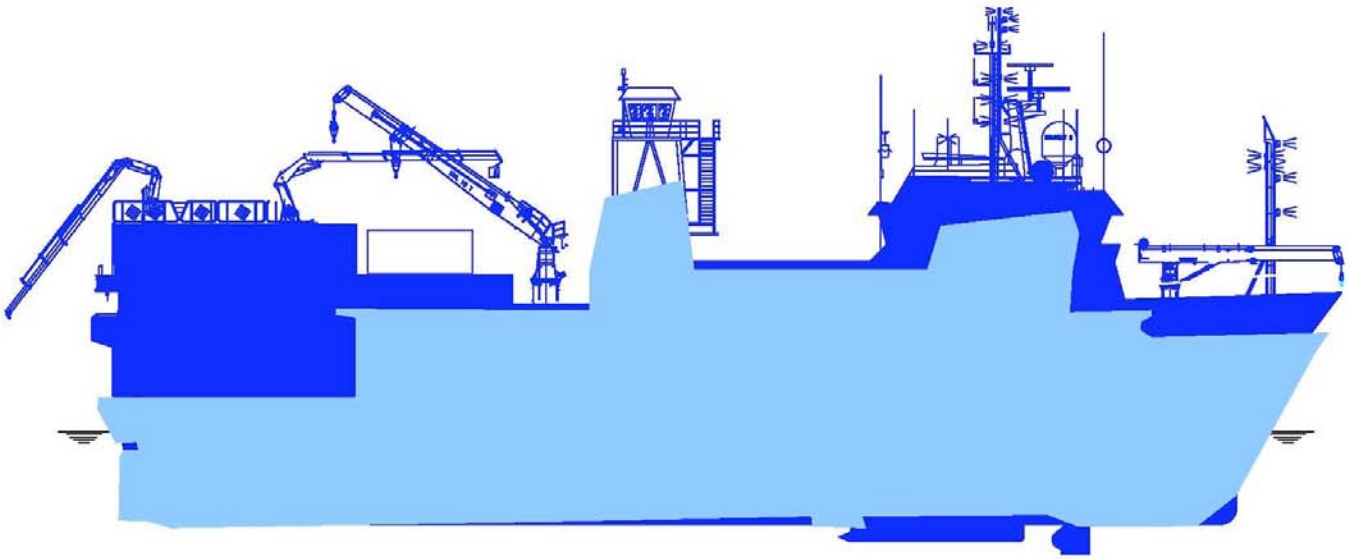
# Replacement Vessel Comparison with the R/V Maurice Ewing

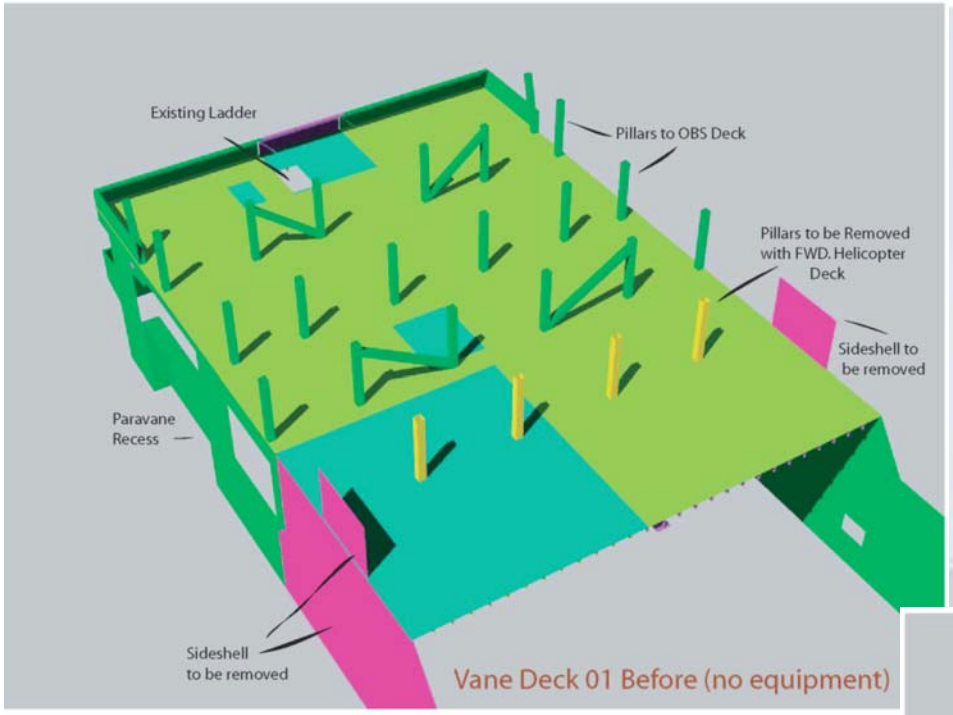


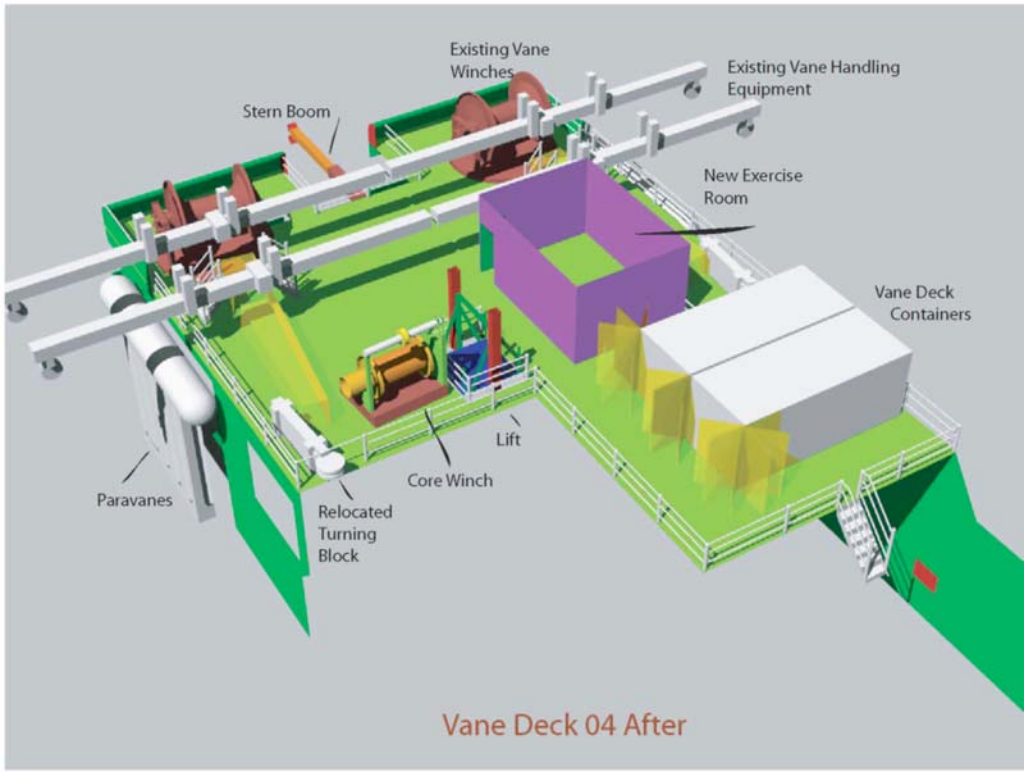

Main Deck

# M/V LEGEND

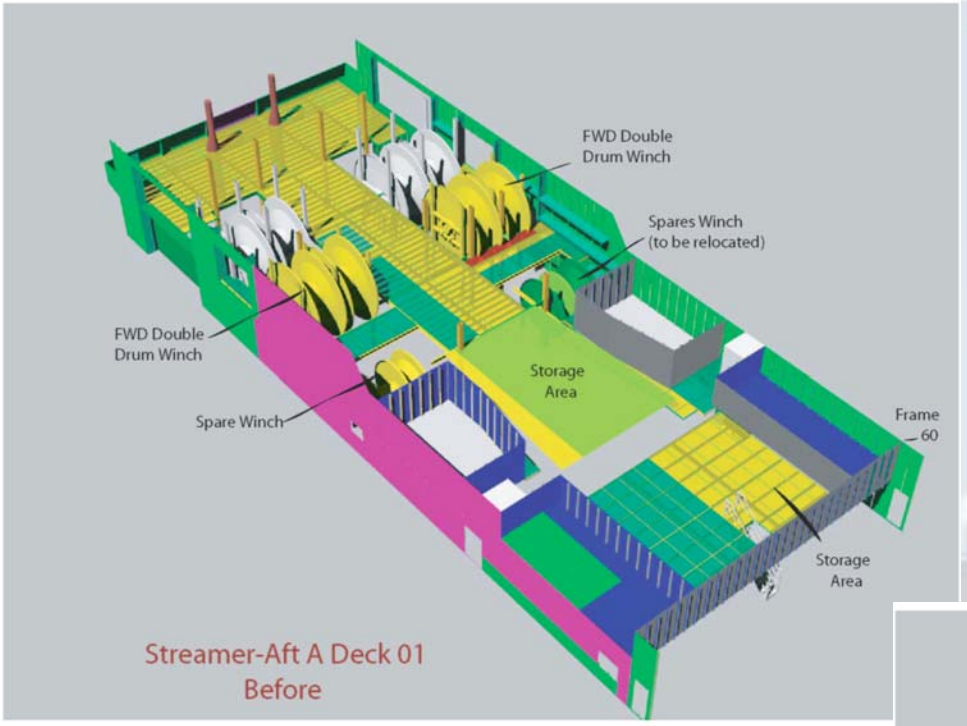
# R/V LANGSETH

# VANE DECK

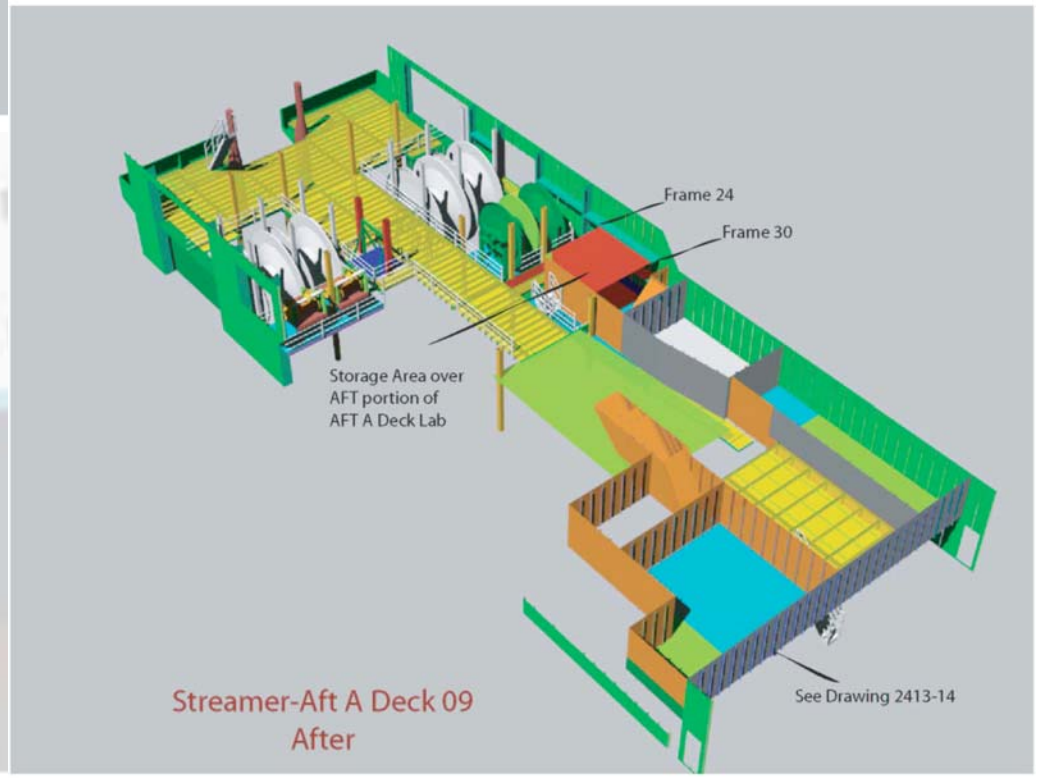

Existing Ladder
Pillars to OBS Deck
Pillars to be Removed with FWD. Helicopter Deck
Sideshell to be removed
Paravane Recess
Sideshell to be removed
Vane Deck 01 Before (no equipment)


Existing Vane Winches
Existing Vane Handling Equipment
Stern Boom
New Exercise Room
Vane Deck Containers
Lift
Core Winch
Paravanes
Relocated Turning Block
Vane Deck 04 After

# STREAMER DECK

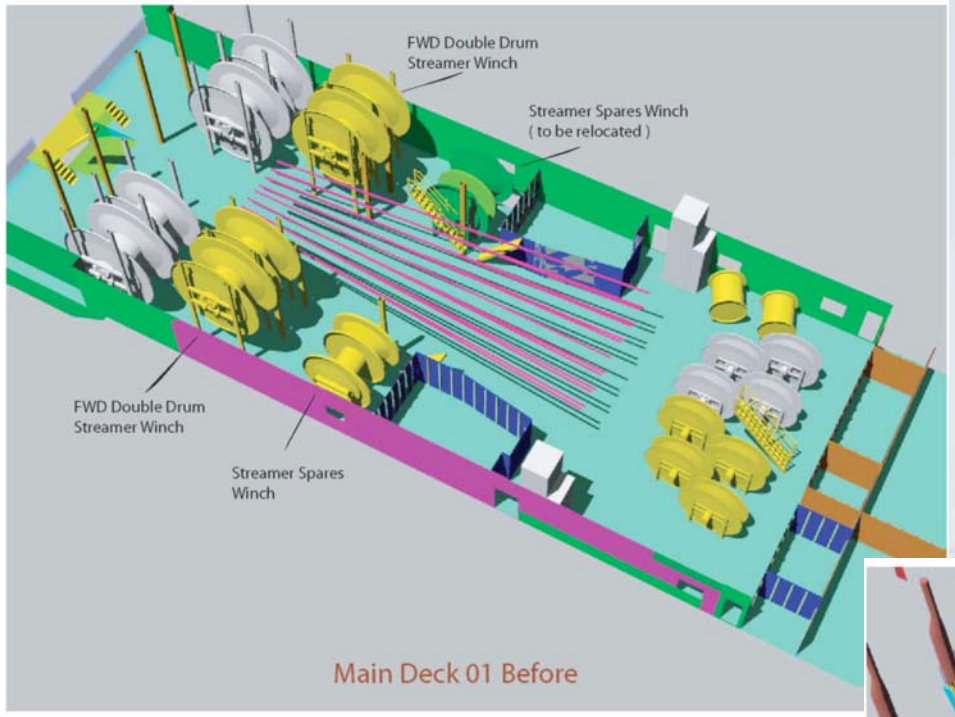



Streamer-Aft A Deck 01
Before

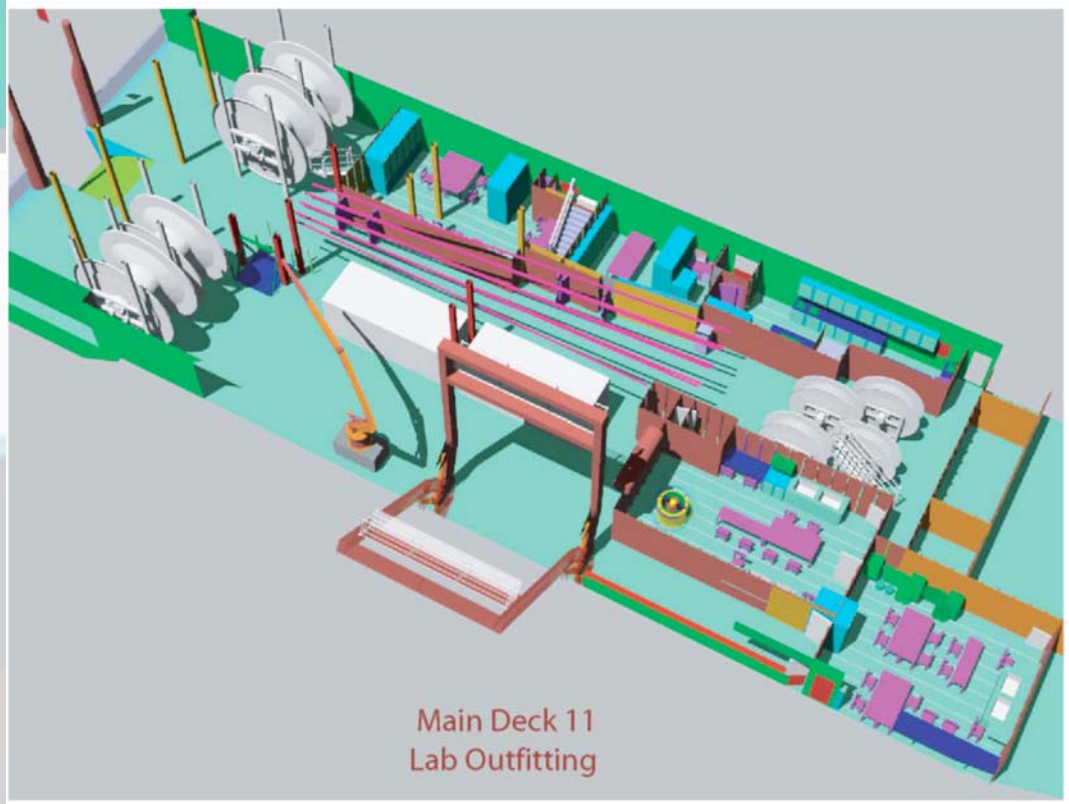



Streamer-Aft A Deck 09
After

# MAIN DECK

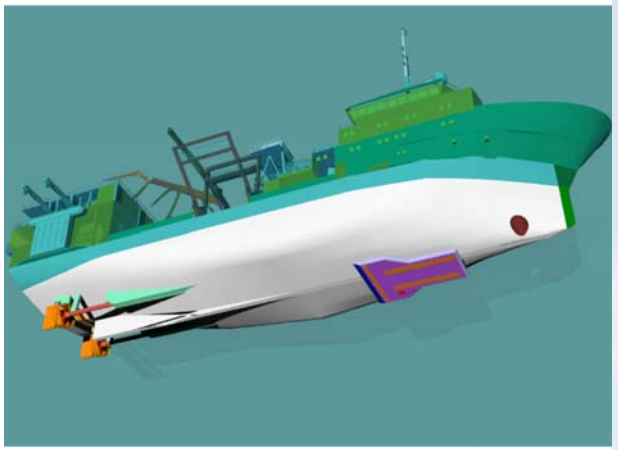


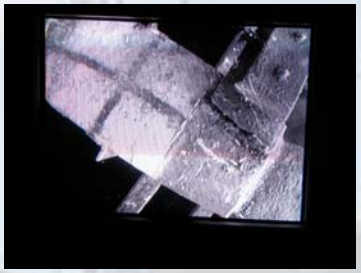

Main Deck 01 Before



Main Deck 11
Lab Outfitting

# EM120 1º x 1º





Transducer Array

48 Modules

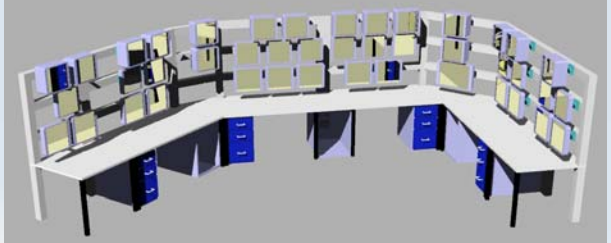
each with 18 Elements

Receive Array

16 Modules

each with 8

Transducer Staves



# MAIN CONSOLE


MARCUS G. LANGSETH

# Marcus Langseth

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## Shakedown & Calibration cruises

- Shakedown 1
- Calibration 1
- Shakedown 2
- Calibration 2

# LANGSETH TO RESEARCH SHIP

Finish Conversion

Ship Classification to ABS

COI & Reflagging to USCG

Vessel Operational

DP Testing

Multibeam Testing

NSF Ship Inspection

Vessel Title

# Streamer Loading

# Marcus Langseth

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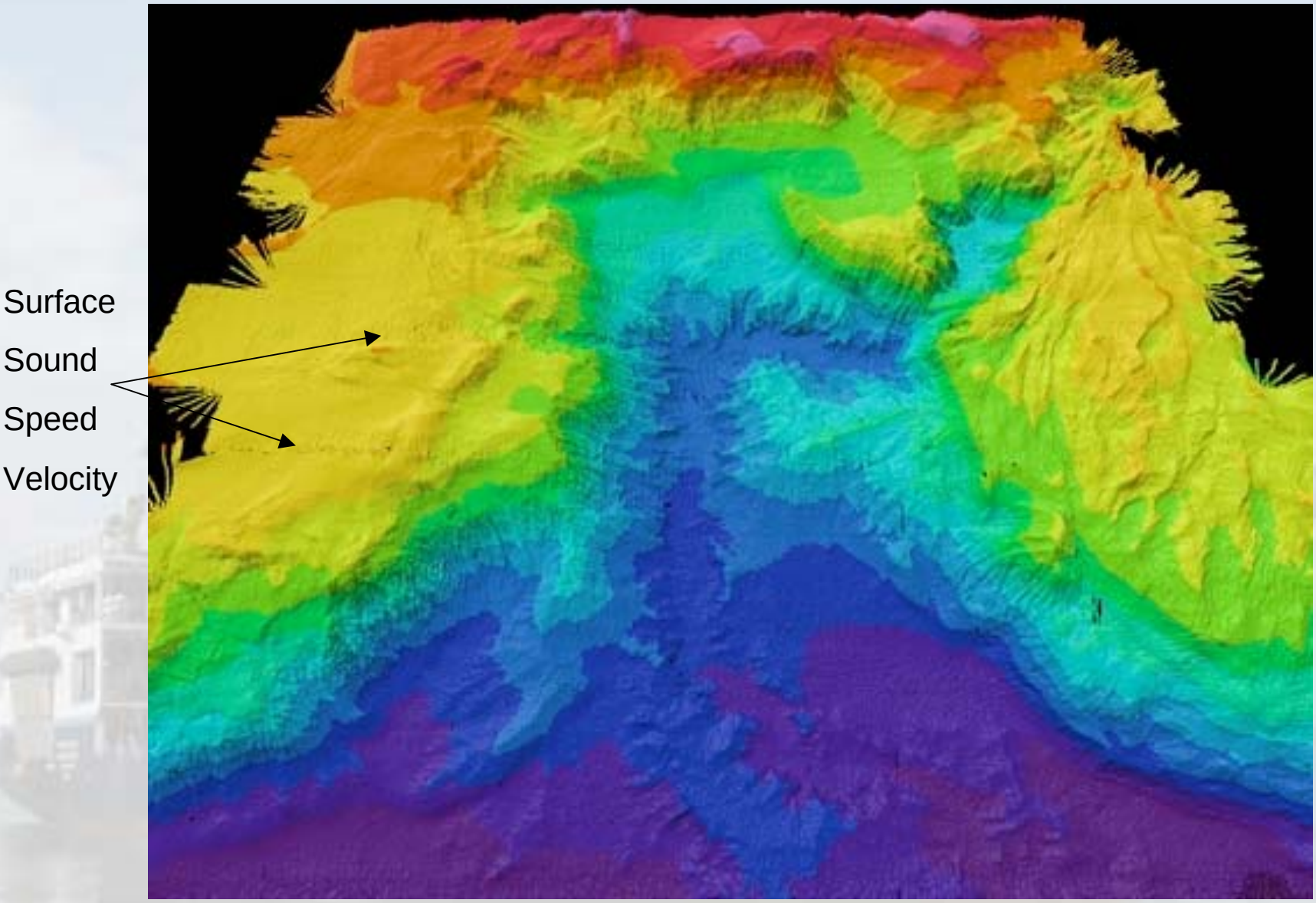
# LANGSETH SHAKEDOWN & CALIBRATION CRUISES

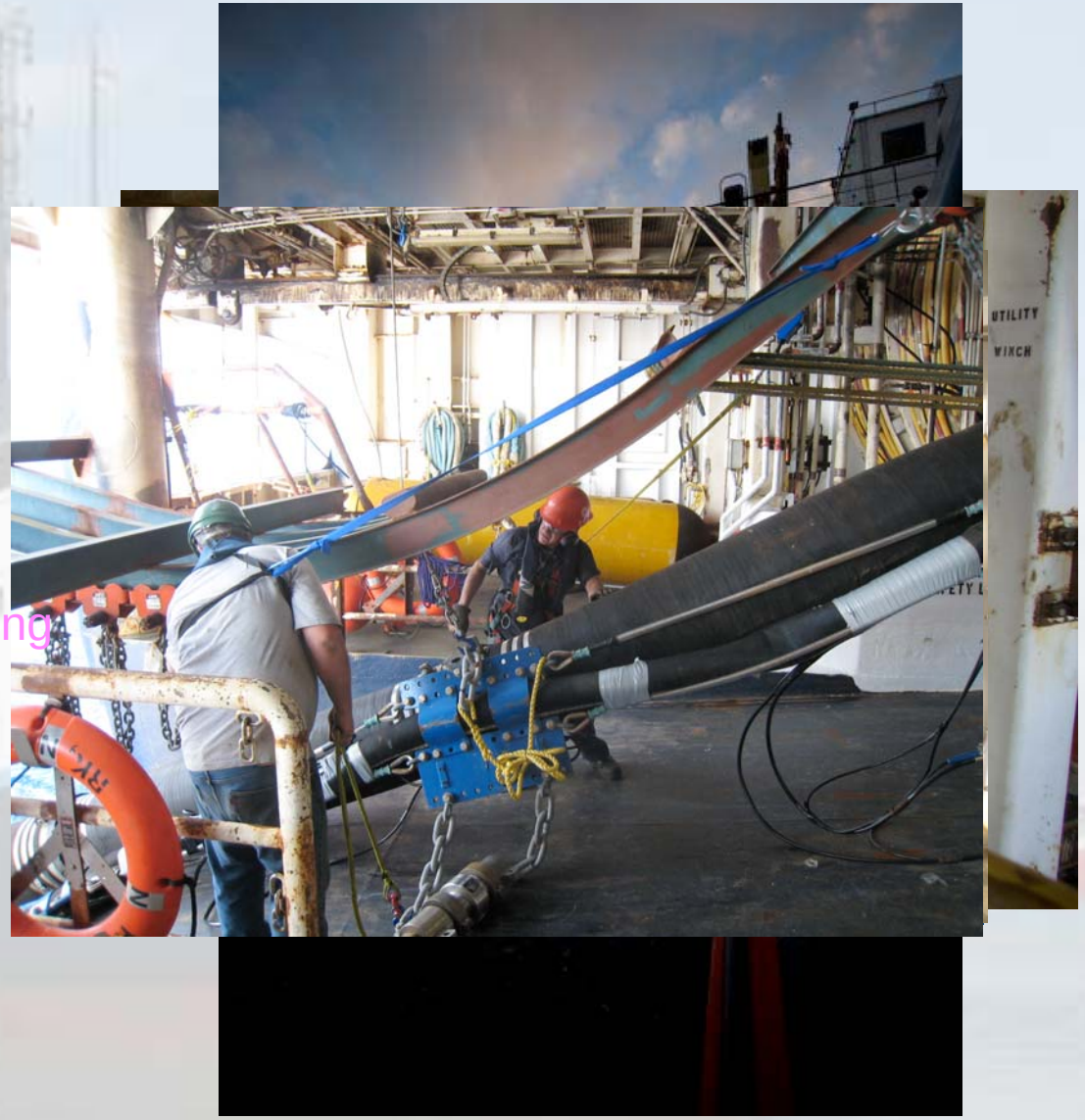
- DP calibrations : 24 – 28 Sept.
- Multi-beam cal : 21 – 27 Oct.
- JMS Inspection : 7 – 8 Nov.
- Diebold,leg#1 : 21 Nov – 6 Dec
- Tolstoy,leg #1 : 17 – 21 Dec
- Diebold,leg #2 : 3 – 24 Jan
- Tolstoy, leg #2 : 27 Jan – 6 Feb

# Langseth Multibeam Acceptance

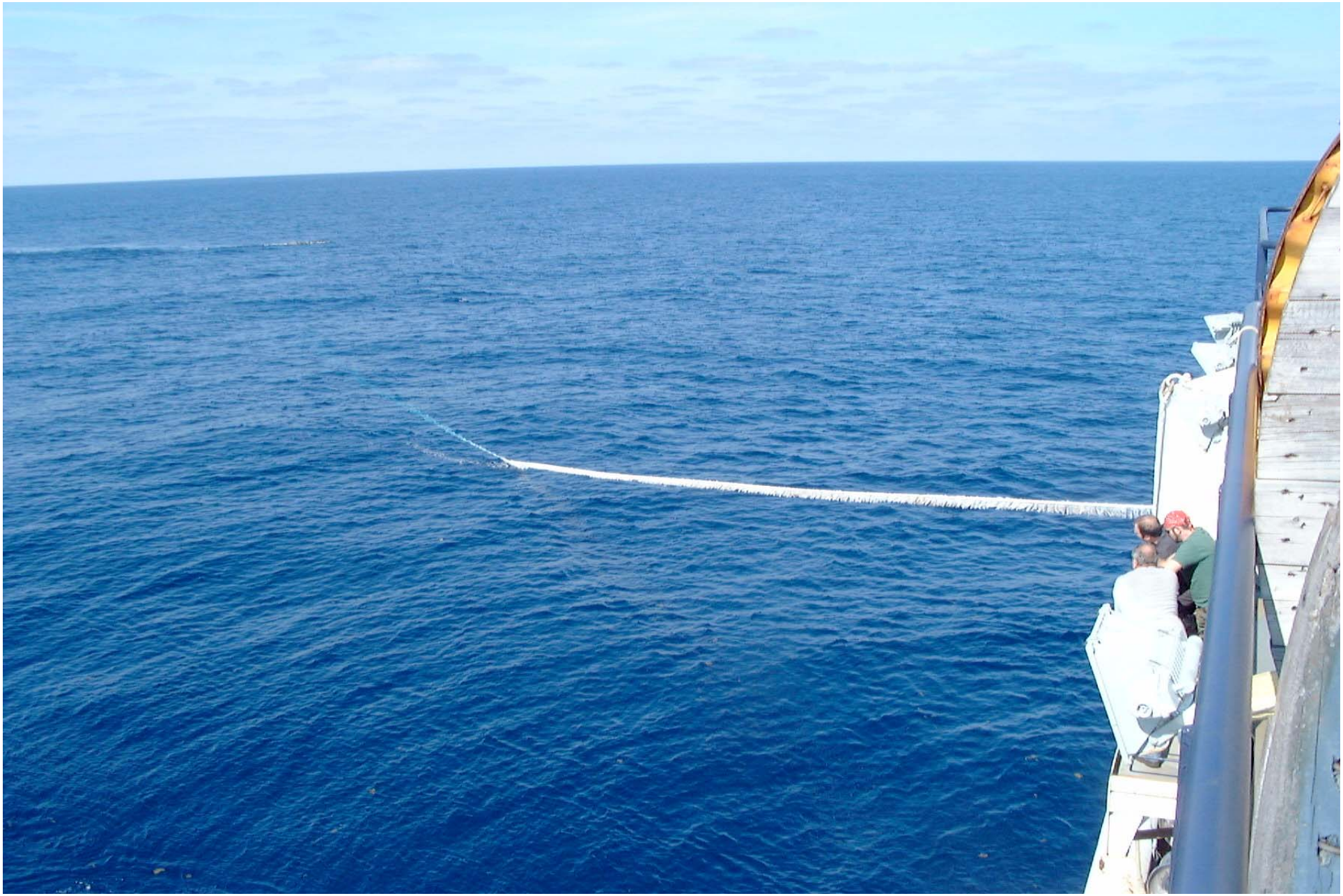


# Shakedown & Calibration Cruises
# Status Report For First Leg

- Sound Source
  - Handling
  - Firing and Towing
- Vane
  - Handling
- Streamer
  - Handling
  - Build
  - Birds, Collars and Ballasting
- 3D Arrangement
  - Streamers
  - Sound Source Arrays
- Support Systems and Data




A-72

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## Shakedown & Calibration cruises

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- Calibration 2

# Lamont Buoy

-18’ long
-16” dia
-Launched and recovered with A Frame or HIAB
-No attachment to ship
-Will be anchored at shallow site.
-Same as on Ewing

# BBN Buoy

# Marcus Langseth

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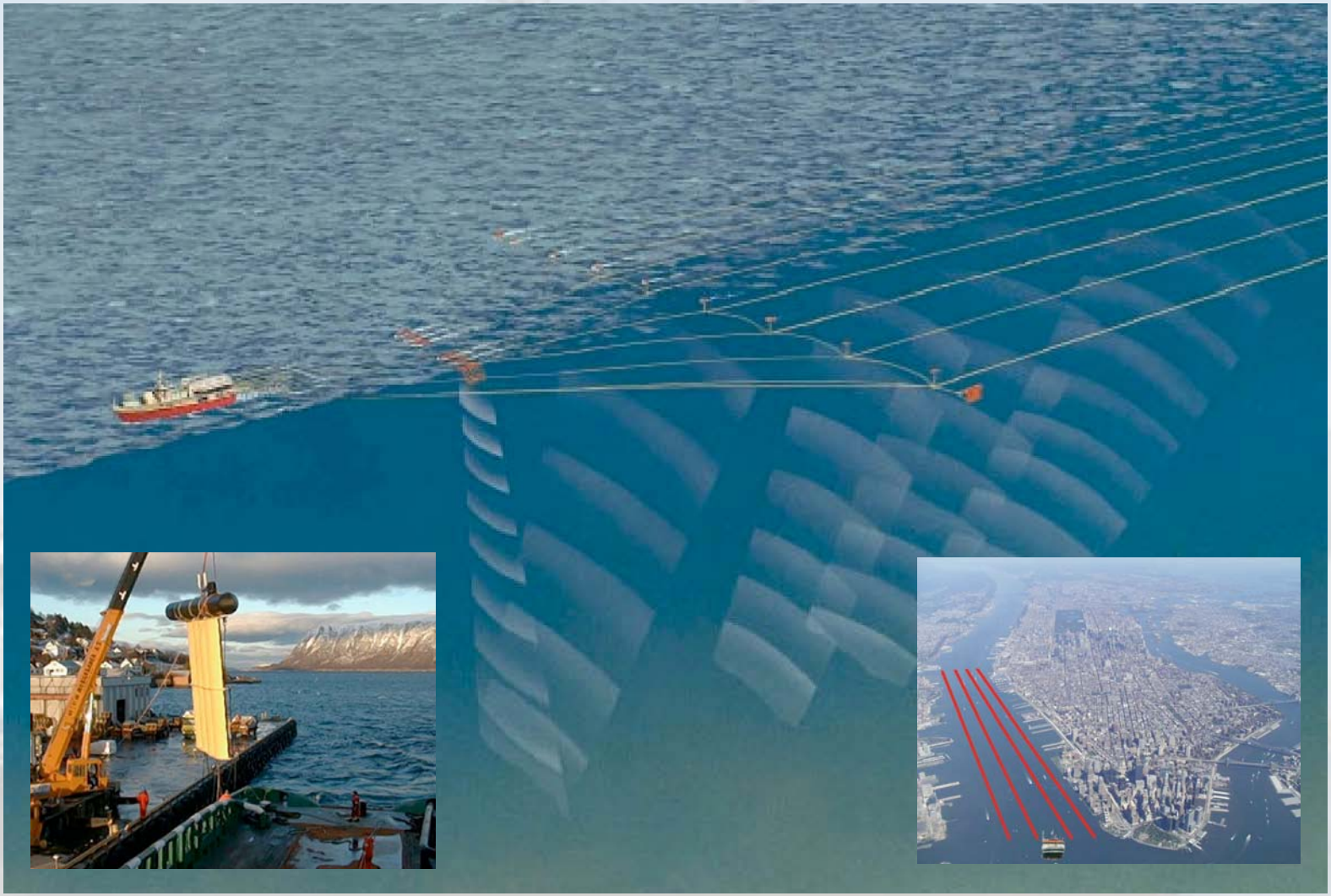
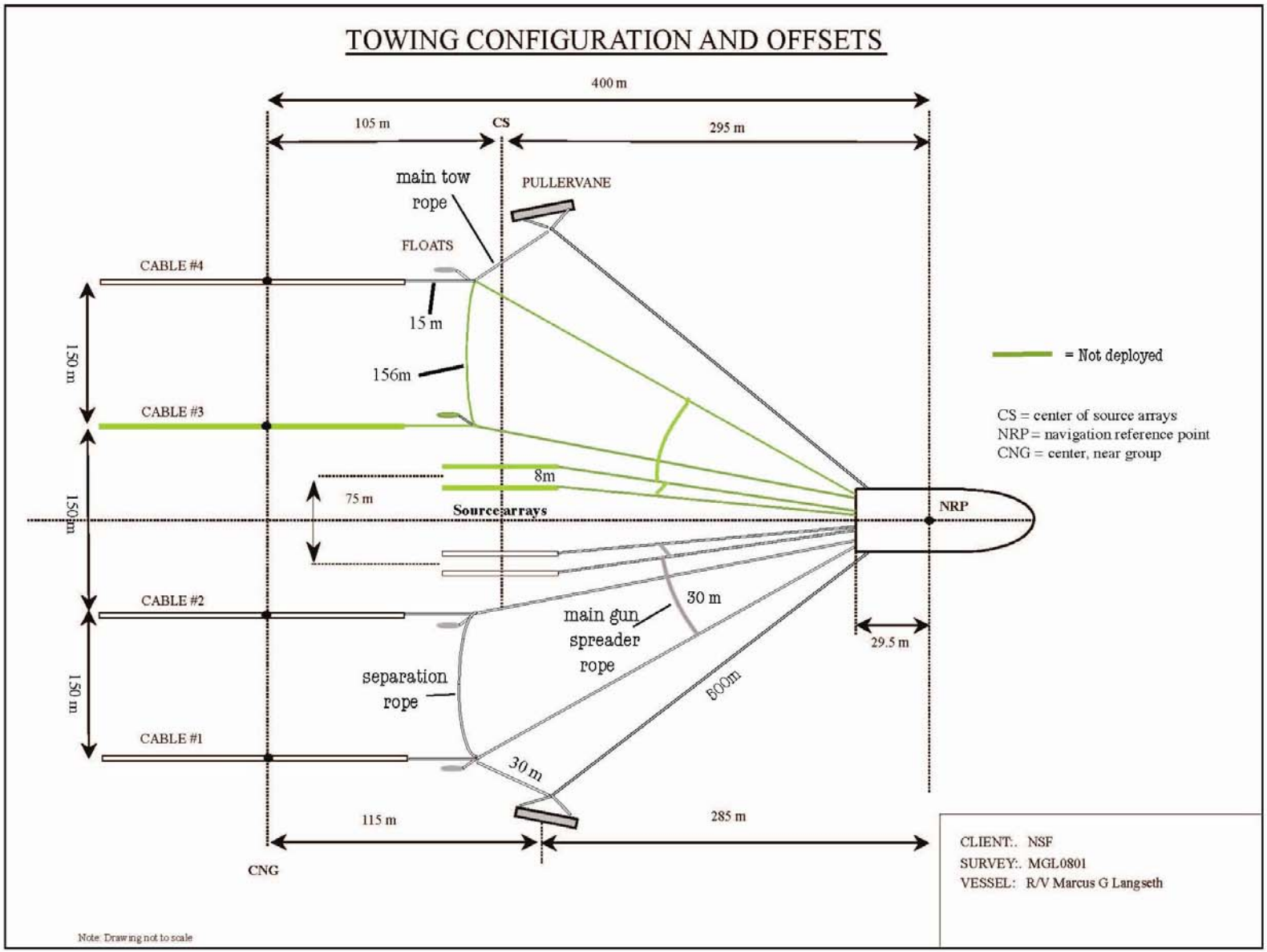
# R/V Marcus Langseth

MCS Paravane Towing – Example of What Needs to Go Right

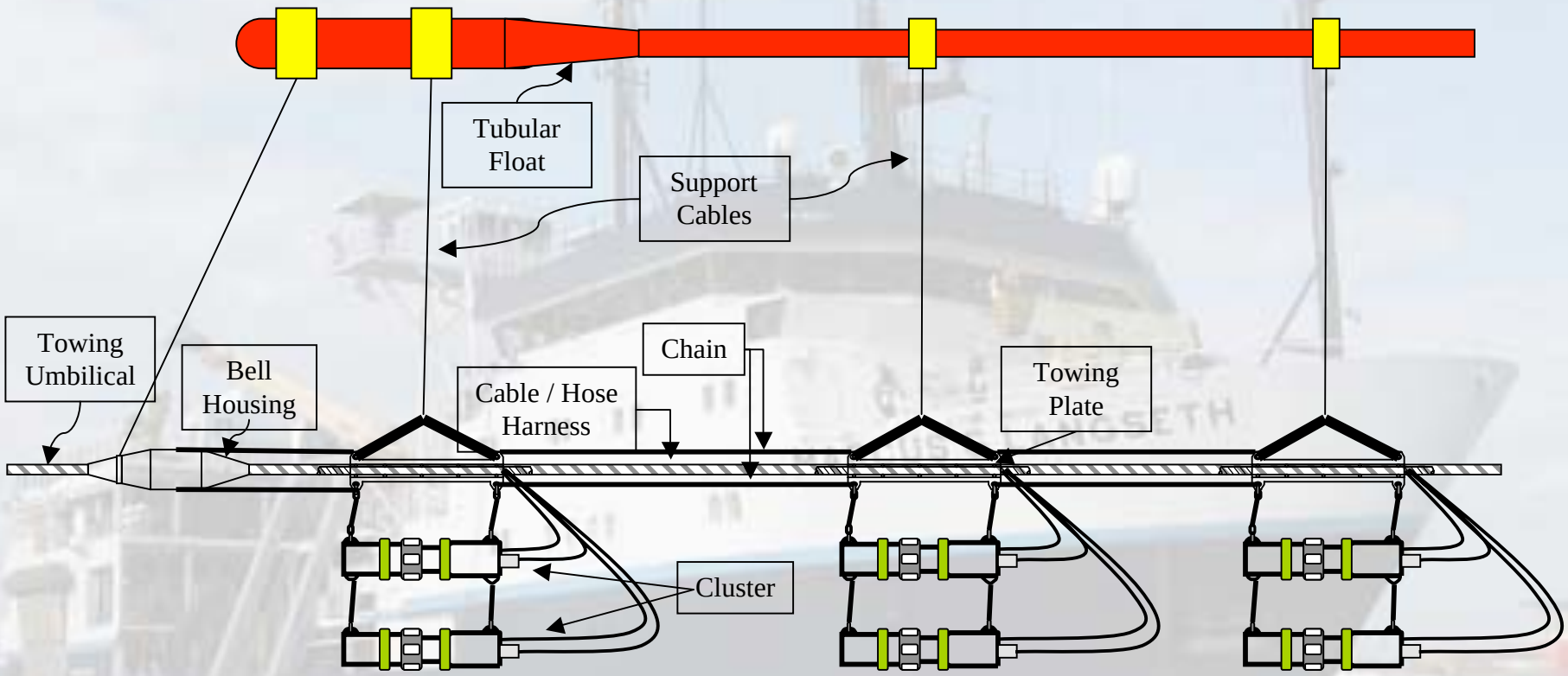


# R/V Marcus Langseth

MCS Paravane Towing – Example of Why

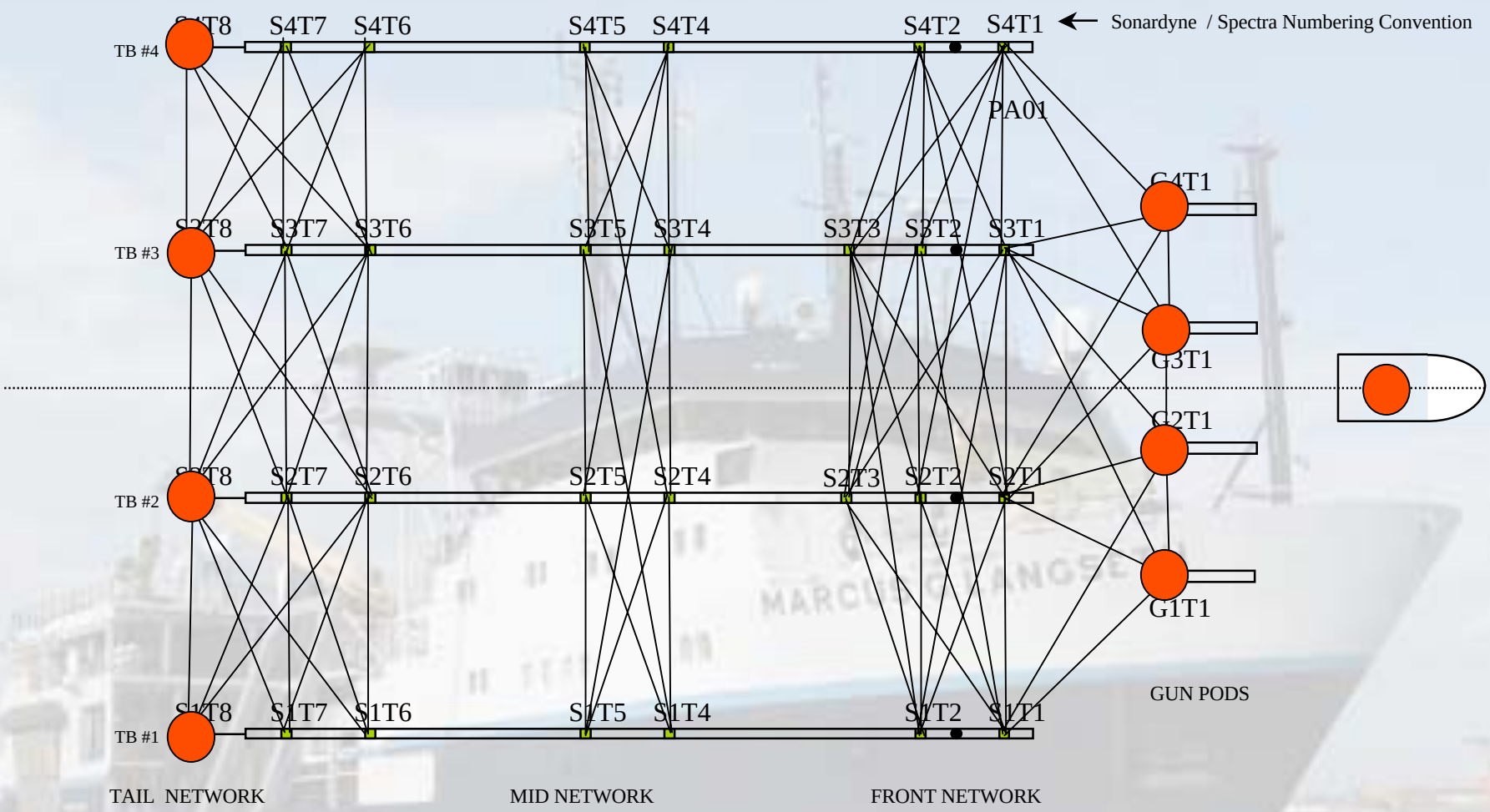

TOWING CONFIGURATION AND OFFSETS
400 m
105 m
CS
295 m
main tow rope
PULLERVANE
FLOATS
CABLE #4
15 m
150 m
156m
CABLE #3
8m
75 m
Source arrays
150m
NRP
CABLE #2
30 m
main gun spreader rope
29.5 m
separation rope
600m
150 m
CABLE #1
30 m
115 m
285 m
CNG
= Not deployed
CS = center of source arrays
NRP = navigation reference point
CNG = center, near group
CLIENT:. NSF
SURVEY:. MGL0801
VESSEL: R/V Marcus G Langseth
Note: Drawing not to scale

# Towed Air Gun Array



# Linear Sound Source Arrays

# SONARDYNE ACOUSTIC NETWORK WITH GPS REFRENCE




CLIENT:
SURVEY:
VESSEL: R/V Marcus G Langseth

SEQ: 001-

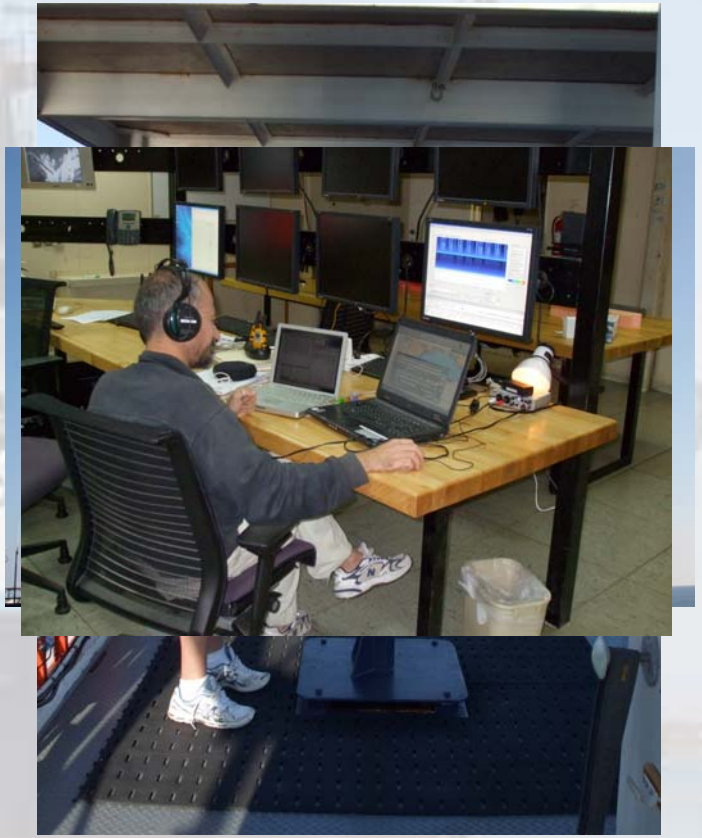
Note: Drawing not to scale

# Marine Mammal Observers (MMO's)

- 5 MMO's for seismic operation cruises.
- Daytime rotation of visual MMO's and 24/7 PAM while conducting seismic operations.
- Other bunk spaces potentially required for guest MMO's from the local region's waters.

# MGL's Superior Visual Observation Capabilities

- **Two "Big Eye" Binoculars installed on the tower, 16M above the main deck.**
- **Enclosed Observation Booth on the tower.**
- **Rightwaves & SEAMAP PAM systems. PAM stations both in the main lab and the tower.**
- **Closed Circuit TV cameras and monitors so that areas can be observed forward of the beam that may still be within the safety radius but obscured by the ship.**



# MGL0804,0807

http://faculty.gg.uwyo.edu/holbrook/Costa/MGL0804.html