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R/V Marcus G. Langseth

Summary of 2010 Operations/Capability Upgrades and Glosten Winch Study Report

UNOLS Fleet Improvement Committee Meeting October 13 2010 Arlington, VA

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Overview of 2010 Activities

Shipyard and Maintenance, Jan-April 2010

Vigor Shipyard, Portland, OR:

Important Ship Projects:

1. Dry-dock for hull painting and required tail shaft repairs.
2. Installation of 18 new transmit array elements on Kongsberg EM122 MB system (warranty repair) and all 16 receive array elements (damaged in shipyard).
3. Major Aft-Peak Tank Repair
4. Ariel Seismic Compressor Overhaul

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SHIPYARD –February 2010

Painting of Hull below waterline (right) and pulling tail shafts (below).

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2010 Maintenance Period Engine Upgrades

Rolls Royce Engine System Upgrades:

- Steering System
- Engine Control
- Engine Overhaul

2011 and Beyond Engine Upgrades/Overhauls :

- UMAS- Engine Alarm System
- HeliconX3- Engine Pitch Control
- Gearbox – Overhaul and Clutch Inspection

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2010 Science Projects

1)Refurbishment of Uncontaminated Seawater System Piping
2) Replacement of Knudsen SBP with new 3260 unit
3) Gravimeter repair and calibration
4) Installation of new lab computer racks
5) Successful Sea Trials/Patch Test of Repaired Kongsberg EM 122 MB System off Honolulu
6)The Source Sub-Arrays were completely dismantled and rebuilt from the ground up.
7)A MicroSV and SBE38 Temp Probe were installed in the Sonar Pod
8)SO/IT Office in the Main Lab was renovated.
9)Streamers Cables 1, 2, & 3 were removed from the vessel to allow for re-termination of Armored Tow Leaders (Lead-Ins)
10)DigiCourse 5011 Cable Levelers were upgraded to work with new DigiCourse DMU that were purchased in 2009
11)AG Airlock Control System was installed on the SourceSub-Array for controlling of air leaks on the strings.

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Important 2011 Science Projects

Western-Geco Streamer Acquisition

Currently reviewing draft agreement to obtain all remaining Syntrak seismic equipment from Western-Geco for cost of shipping. ~40km of streamer sections along with a lot of other needed equipment and electronics.

Additional Maintenance Period Science Projects

Pending Upgrades :

- ADCP Installation
- New 3.5khz Transducers for Sub-bottom Profiler

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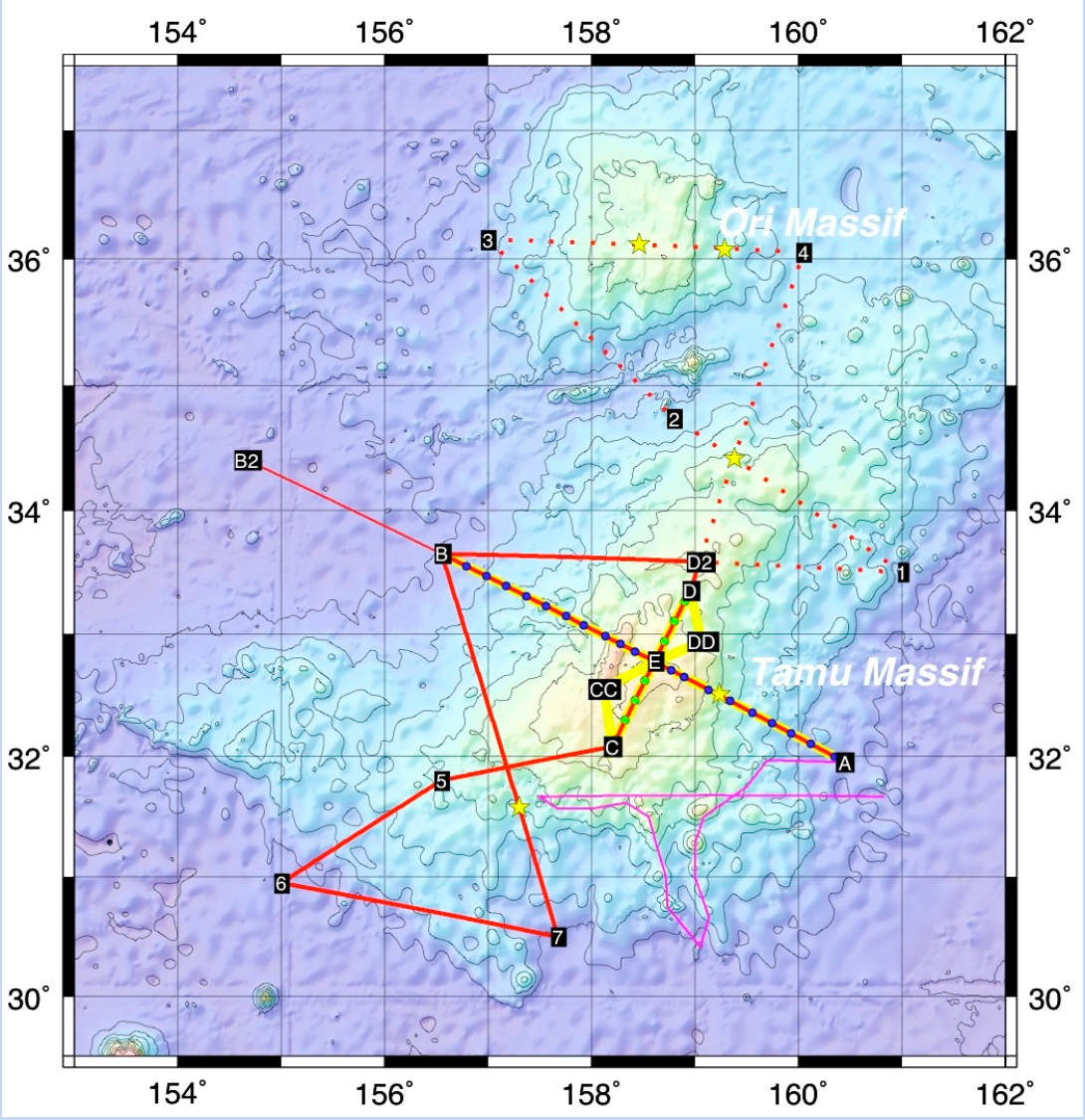
Shatsky Rise Cruise- July-August 2010 (Korenaga and Sager)



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Shatsky Rise Cruise Overview- (Korenaga and Sager)

- **MCS profiling was conducted with no major issues, yielding high-quality reflection data for TAMU Massif.**
- **Successful Deployment of all WHOI OBS**
- **EM 122 MB System performed very well.**
- **Two Medical Diversions delayed cruise 16 days and cruise was extended by 7 days.**
- **Approximately 8-10 days of unfinished seismic on northern portion of Shatsky Rise**

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SHATSKY SCIENCE SUMMARY from Co-Chief Scientists:

"The *Langseth fired over 47,000 shots from its 36-gun tuned airgun source into an array of seismic receivers: the Langseth's 6-km-long multichannel streamer and 28 WHOI OBS. As far as the southern part of the survey is concerned, the operational goals of the experiment were achieved in full. Multichannel seismic (MCS) profiling was also conducted with no major issues, yielding high-quality reflection data. OBS data show spectacular wide-angle refraction and reflection arrivals with the source-receiver distance often exceeding 200 km. The data collected during this experiment are sufficient to accurately determine the entire crustal structure of the Tamu Massif and will provide key information on the early magmatic construction of Shatsky Rise".*

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Preview of 2011 Operations

6 Cruises Planned beginning in April- Total of ~250 Days:

1. Costa Rica 3-D (Bangs- NSF)
2. Gulf of Alaska (USGS- ECS)
3. Alaska Margin (Shillington- NSF)
4. Bering Sea (USGS-ECS)
5. Chukchi Sea (Coakley- NSF-OPP,)
6. Line Islands (Gaherty- NSF)

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The Glosten Winch Study

Major Goal: Improve overall capabilities of vessel for both general purpose and seismic work.

Overall Considerations:

•MODIFICATION DIAGRAMS

Show all proposed modifications clearly in a deck by deck format with accompanying descriptions.

•STRUCTURAL CHECKS

Provide structural evaluation of the deck sockets, new winch foundations, deck modifications, fairlead foundations, stern hydroboom

•SCIENCE MISSION ARRANGEMENTS

Provide a set of arrangement plans showing deck configurations for various typical science missions.

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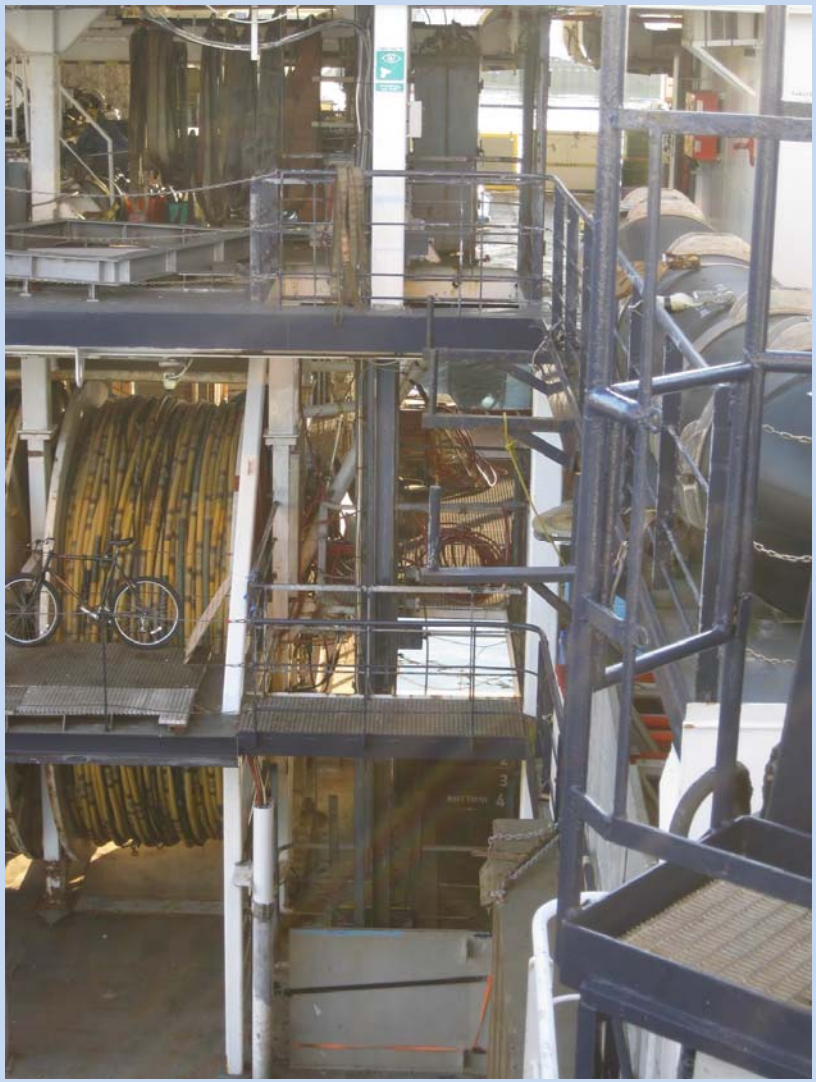
Views toward stern- Main, Paravane, Streamer, and OBS Decks



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Glosten Winch Study (cont.)

Specific Areas or Points of Interest:

- WINCH CONTROL HOUSE
- WINCH LOCATIONS
- MAGNETOMETER & PAM (Passive Acoustic Monitoring) WINCHES
- SINGLE TRAVERSING GOOSENECK and/or SPREADING OUT OF AIRGUN RAILS
- REMOVE P-FLOW LIFT AND INSERT DECKS

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Winch House Location Options

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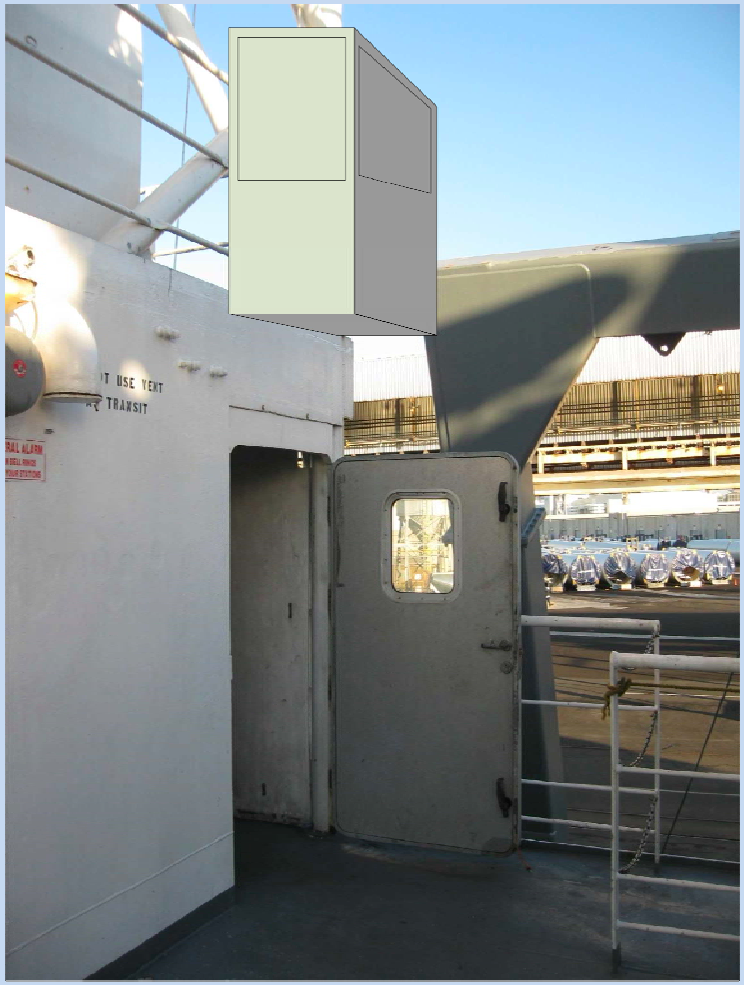
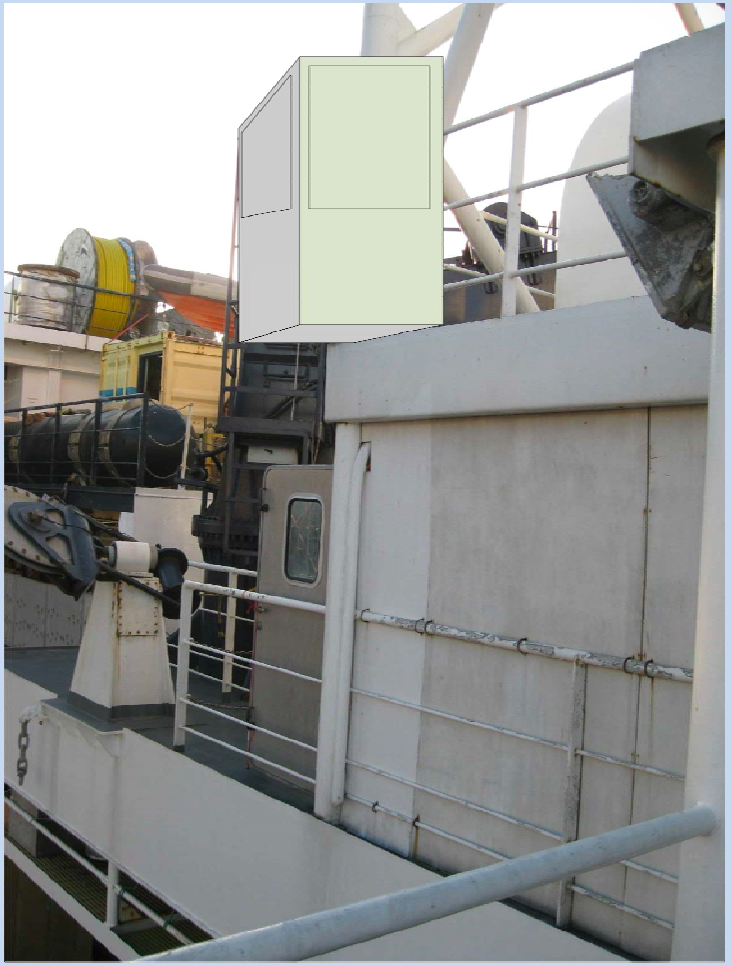
Winch House Location Options

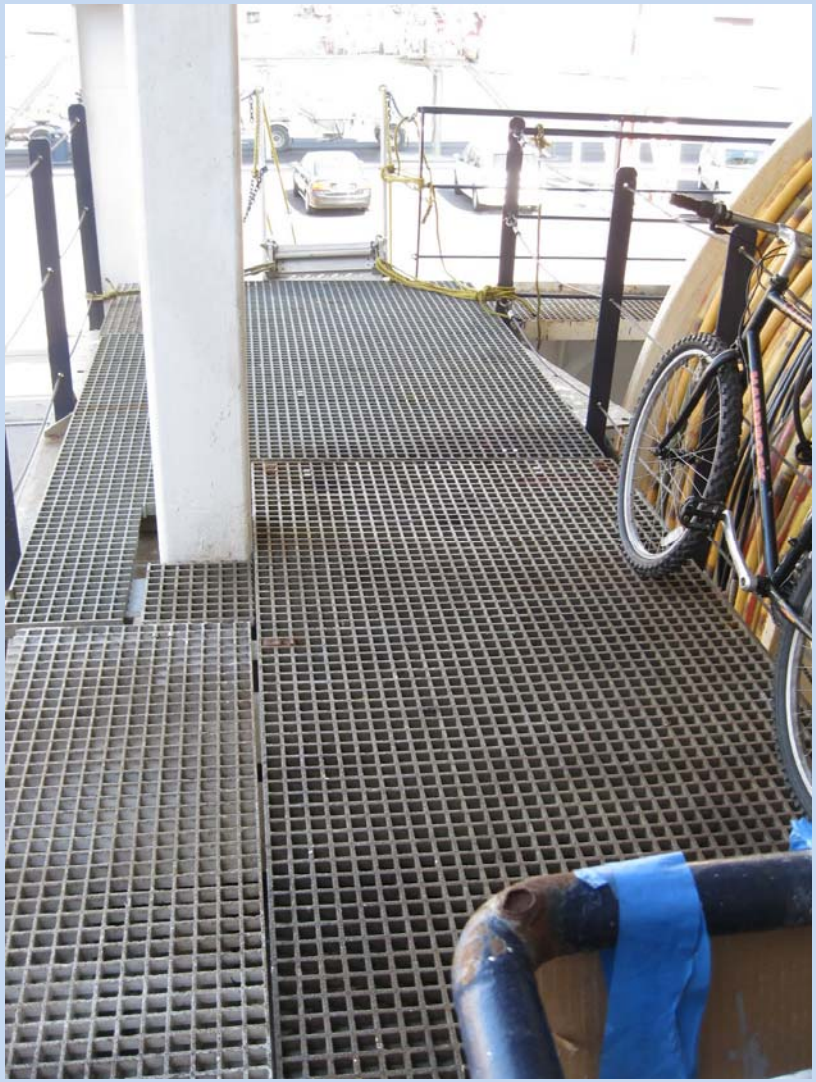
Booth Aft on Muster Deck



Booth Stbd Muster Deck

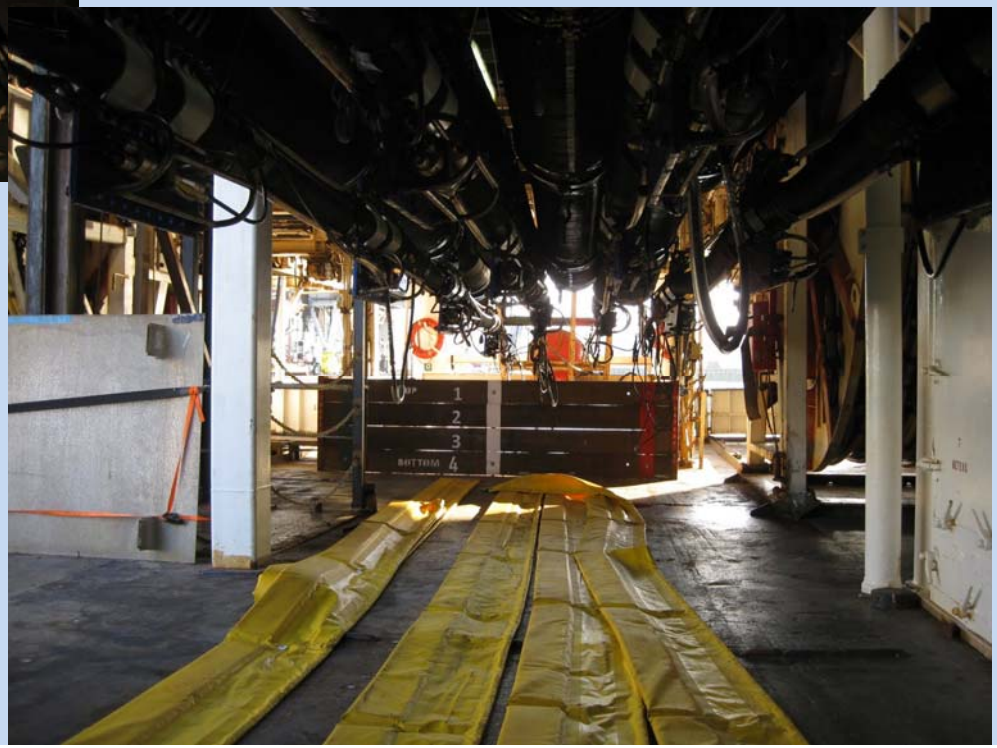


Possible Winch Locations:
Paravane and Streamer Decks



Above: Possible Installation locations for new PAM and Magnetomer Winches in overheads of Main Deck –Aft Port and Starboard

Below: View towards stern gun slip on Main Deck. Spread gun rails after P-Flow Lift removal.



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Removal of P-Flow Lift Scheduled for Fall 2010

P-Flow Lift – Paravane Deck (Left) and Streamer Deck (above)

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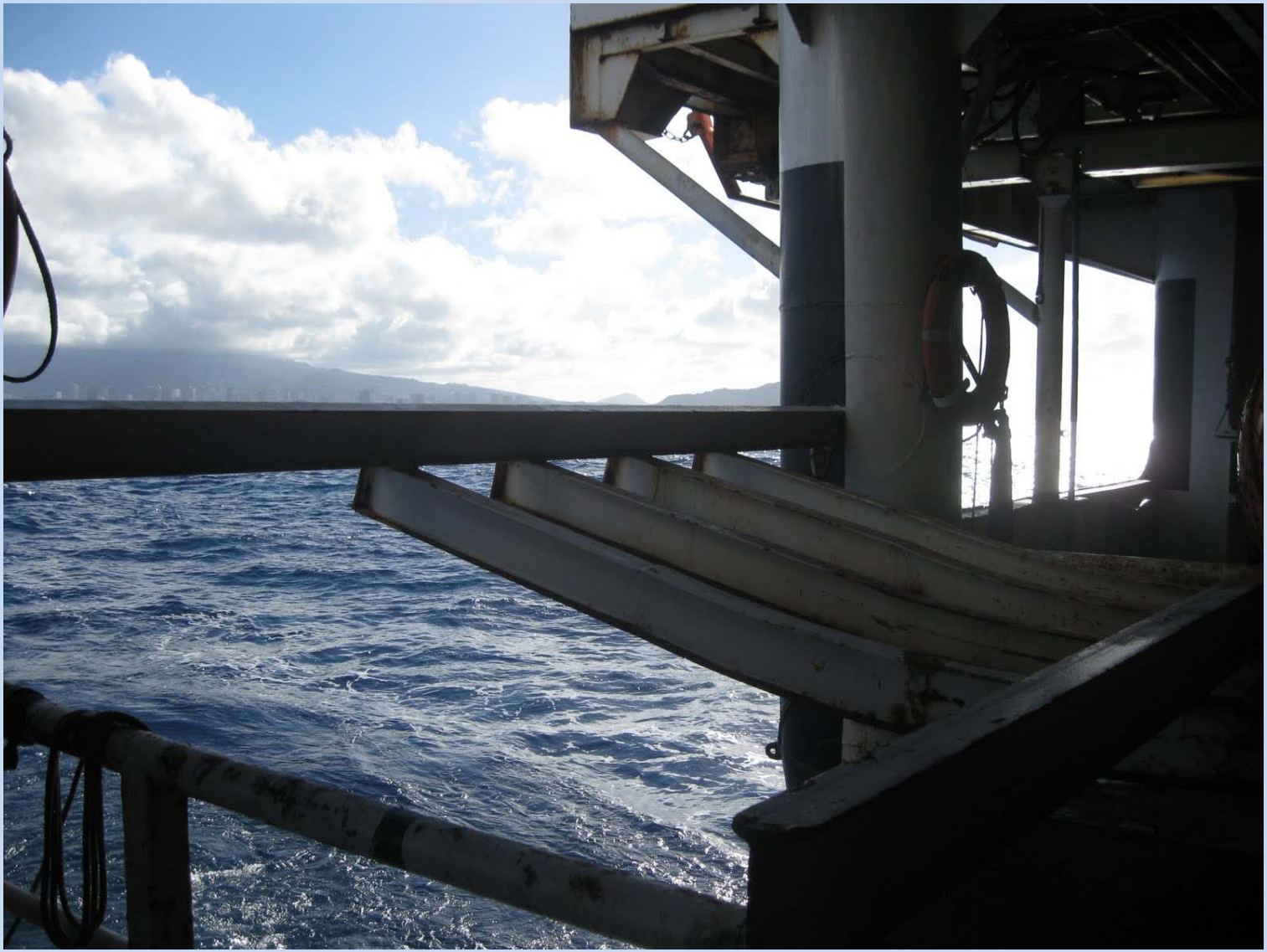
Air Gun Rails at Stern Slip



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Glosten Winch Study (cont.)

Usage of Stern Hydroboom for General Purpose Oceanography Activities?
Possible Modifications:

- FAIRLEADS
- DECK CUTOUTS
- RAMP GRATING
- OBSERVATION DECK CRANE
- REMOTE WINCH CONTROLS

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Winch House Location Options

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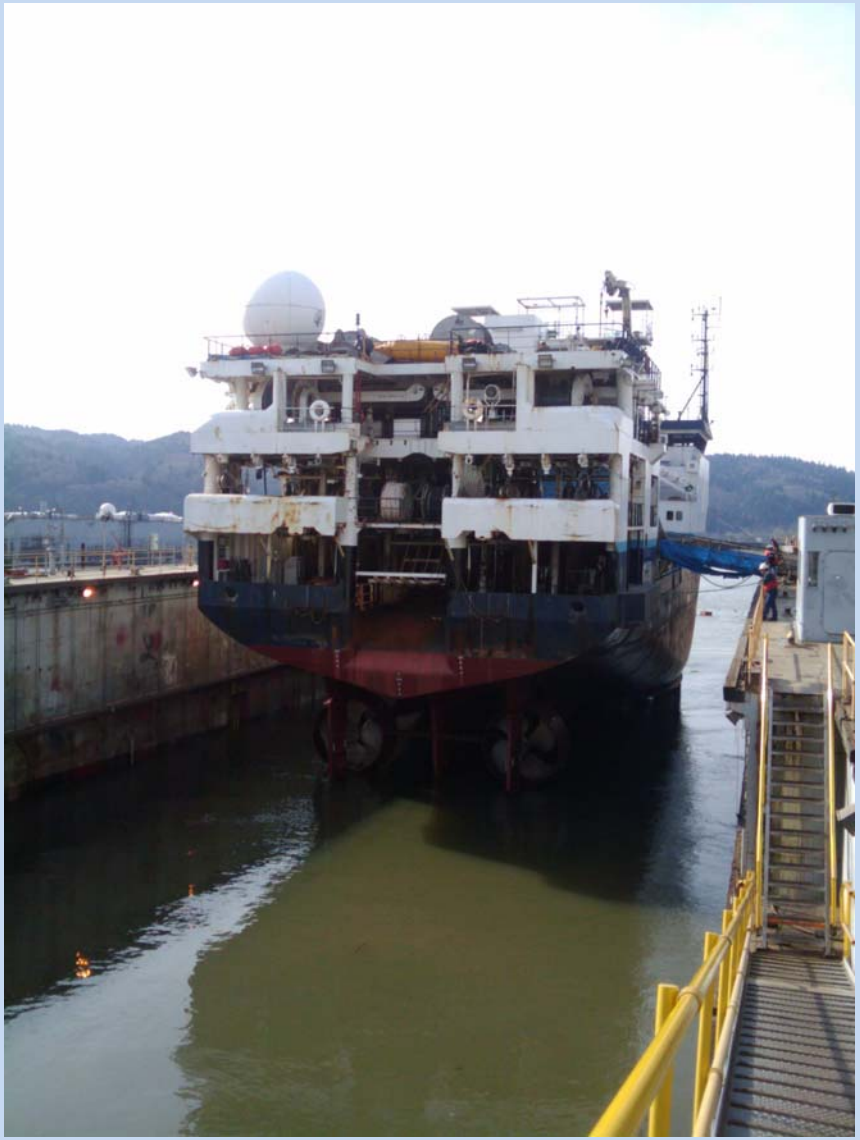
Langseth Stern Options



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Overview of OBS Deck

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Water on Deck.. Lots of Water At Times!

http://www.youtube.com/watch?v=R3mSrK4fo1Y

How best to mitigate for general purpose activities, equipment protection, and maintenance ???