R/V SIKULIAQ: Load Handling System (LHS) FIC Update June 2012


RESEARCH VESSEL SIKULIAQ
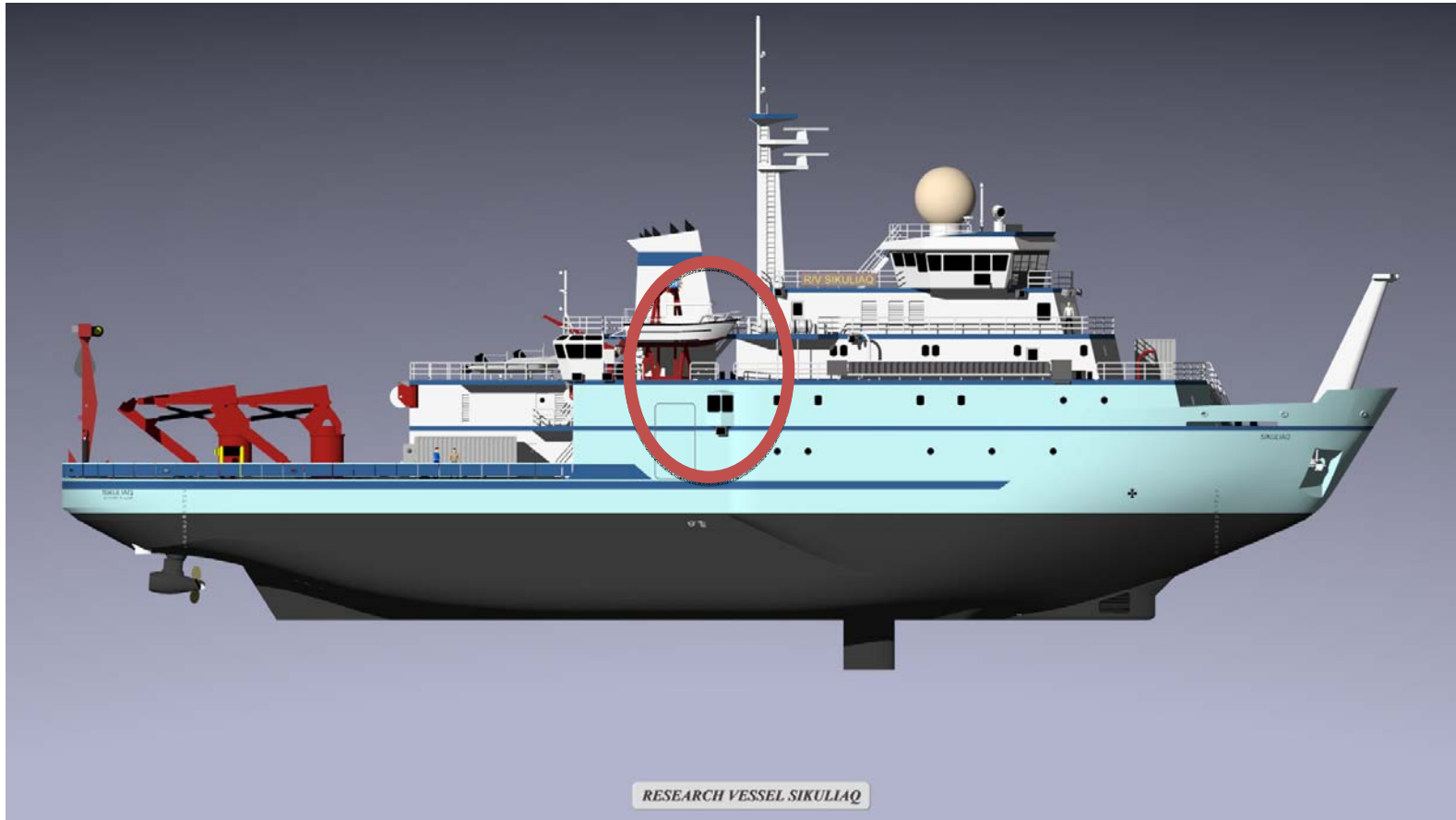
Marc Willis, OSU-COAS
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SIKULIAQ Shipyard Project Office

SIKULIAQ Load Handling System

The Load Handling System consists of:
• Overboarding boom
• Capable winches
• "Smart" control system

• Sensors are key
  - Proximity sensors in docking head
  - Tension sensors on wire
  - Motion sensors on ship

• **Proximity sensors** provide feedback for Auto-position mode

• **Tension sensors** provide feedback for Render/Recover mode and Auto-Position

• **Motion sensors** provide feedback for Motion compensation mode

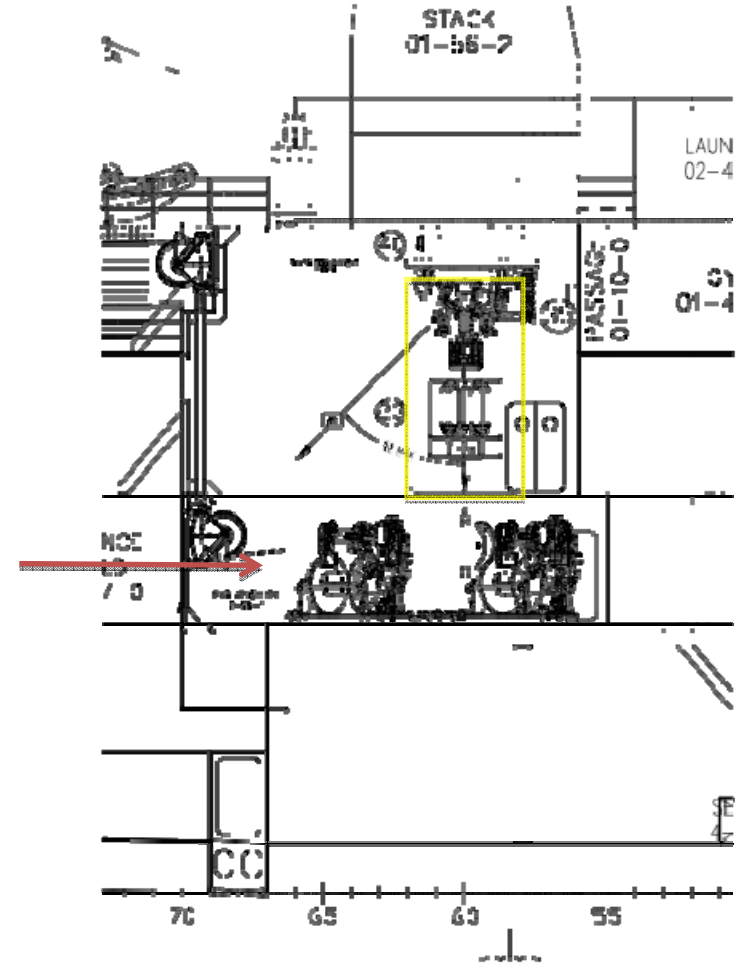• **Control software** glues all the parts together – the real "smarts"
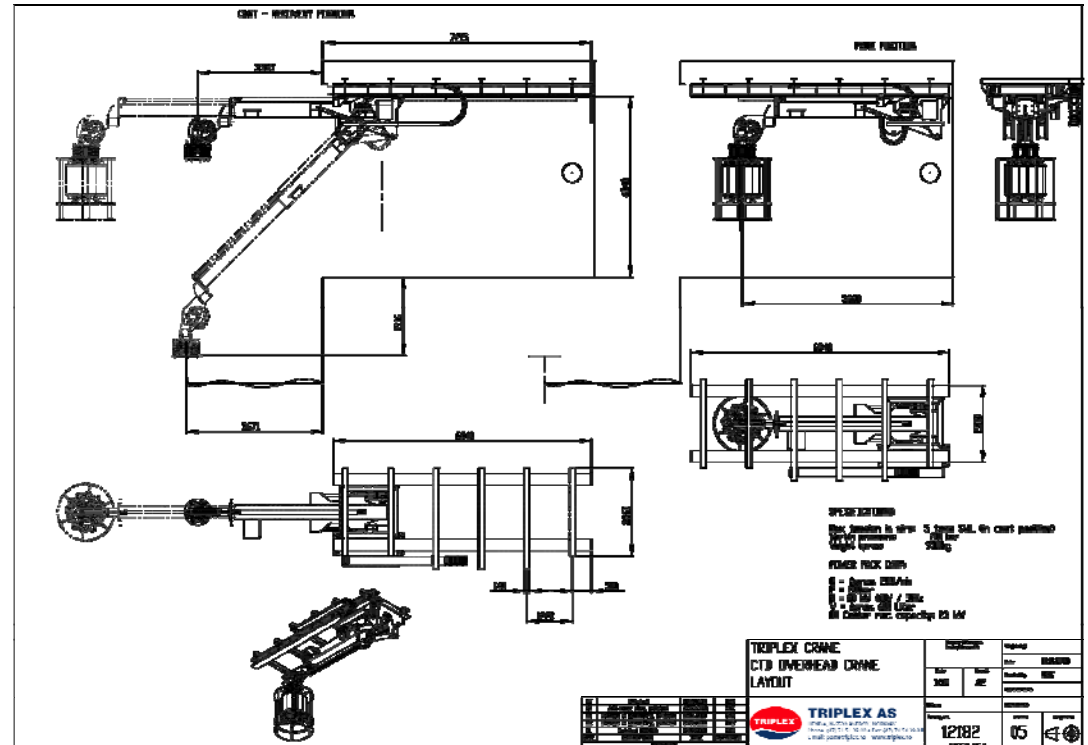
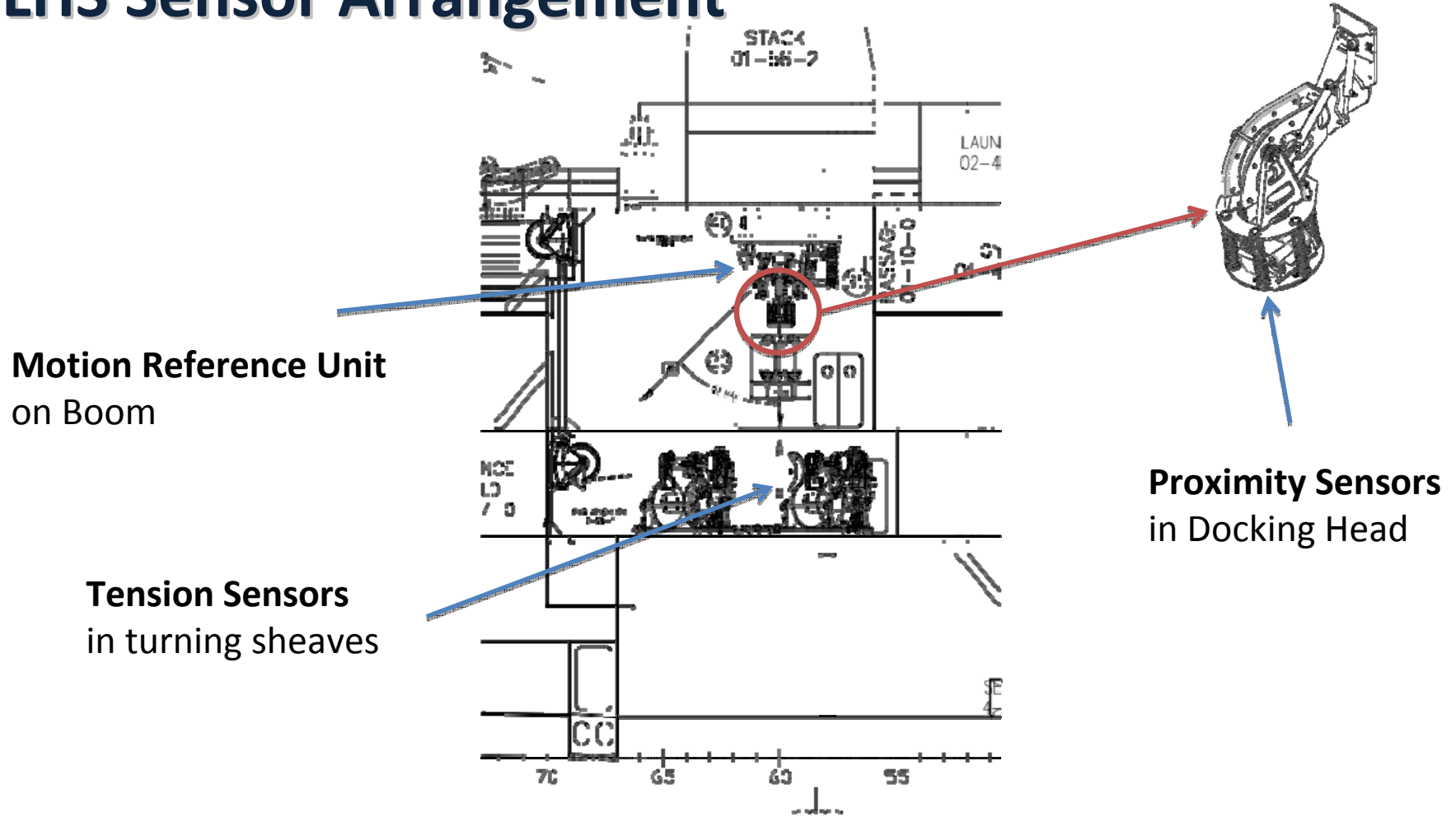**The overboarding boom is the "dumbest" part of the system – the magic is in the winches and control system**
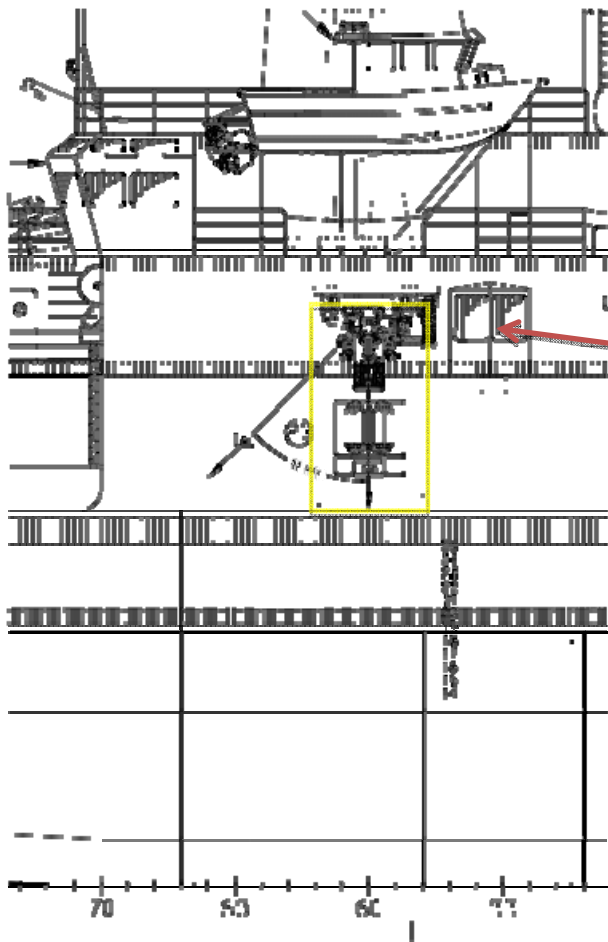
Winch Control Room

Forward Winch Room
• Both winches can be rotated to serve either A-Frame/crane or LHS

Outboard and Inboard Profiles

LHS Sensor Arrangement

Motion Reference Unit
on Boom

Proximity Sensors
in Docking Head

Tension Sensors
in turning sheaves

**Control Software** integrates sensors and winch/boom controls

LHS Boom

- Boom is patterned on the "Overhead Crane" concept in the NSF/ONR Load Handling Workshop Report.
- LHS Boom is located in the overhead of Baltic Room (02 level)
- Exits through side shell door
- Controlled locally and from Winch Control Room
- Overboards either Hydro and CTD Winch

BALTIC ROOM/
HANGAR
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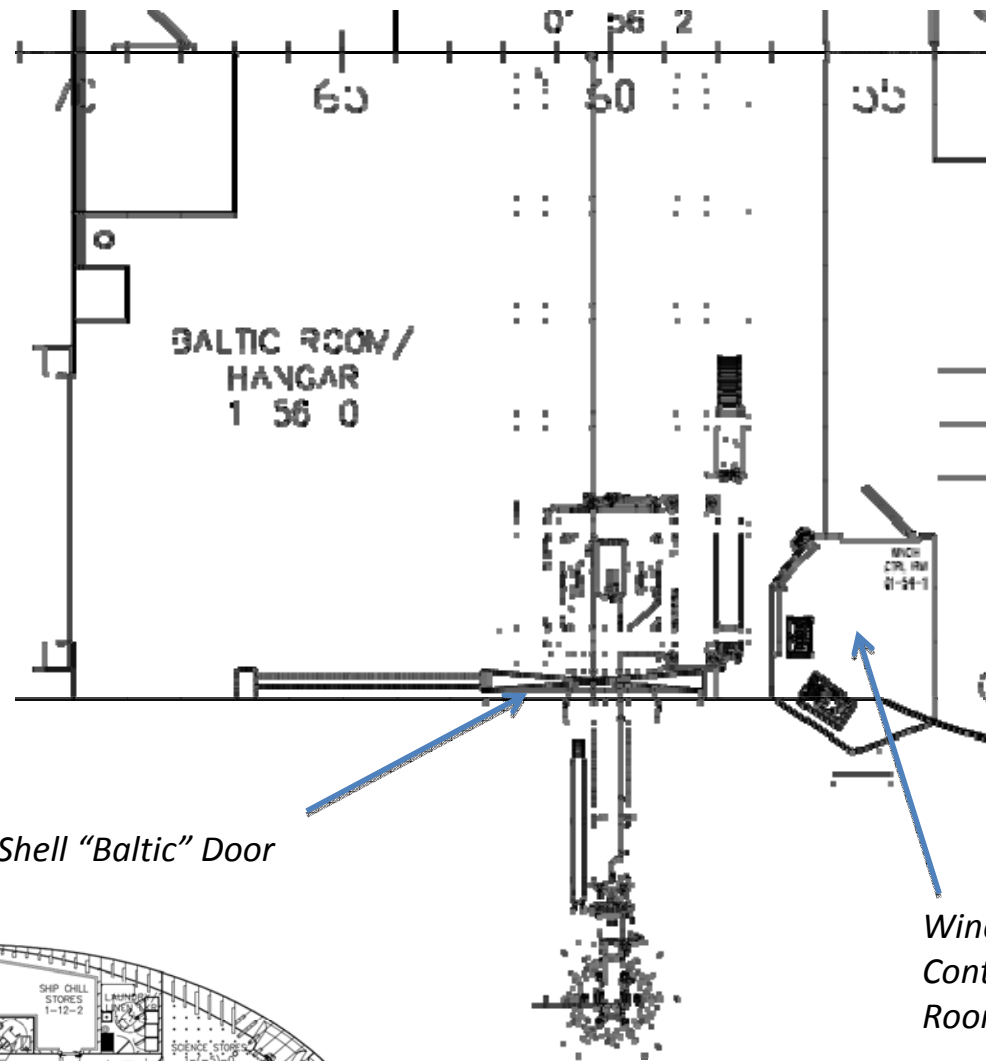
WINCH
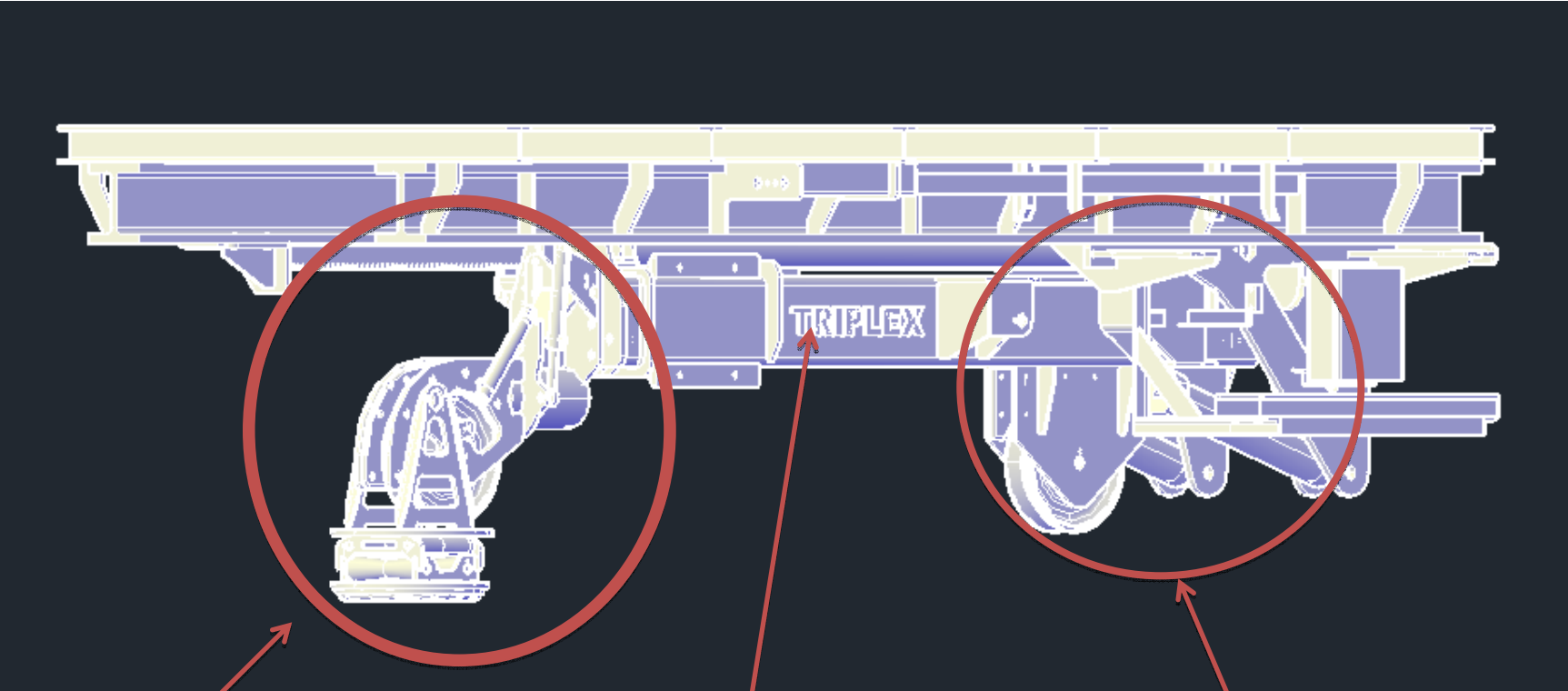CTRL RM
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Side Shell "Baltic" Door

Winch Control Room
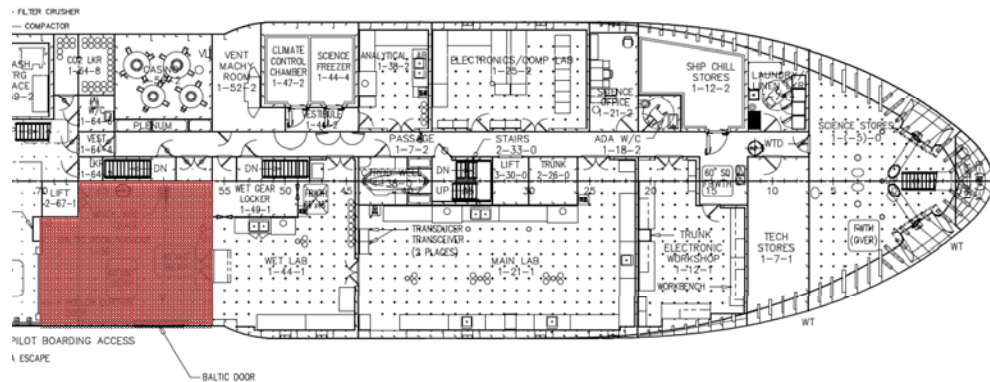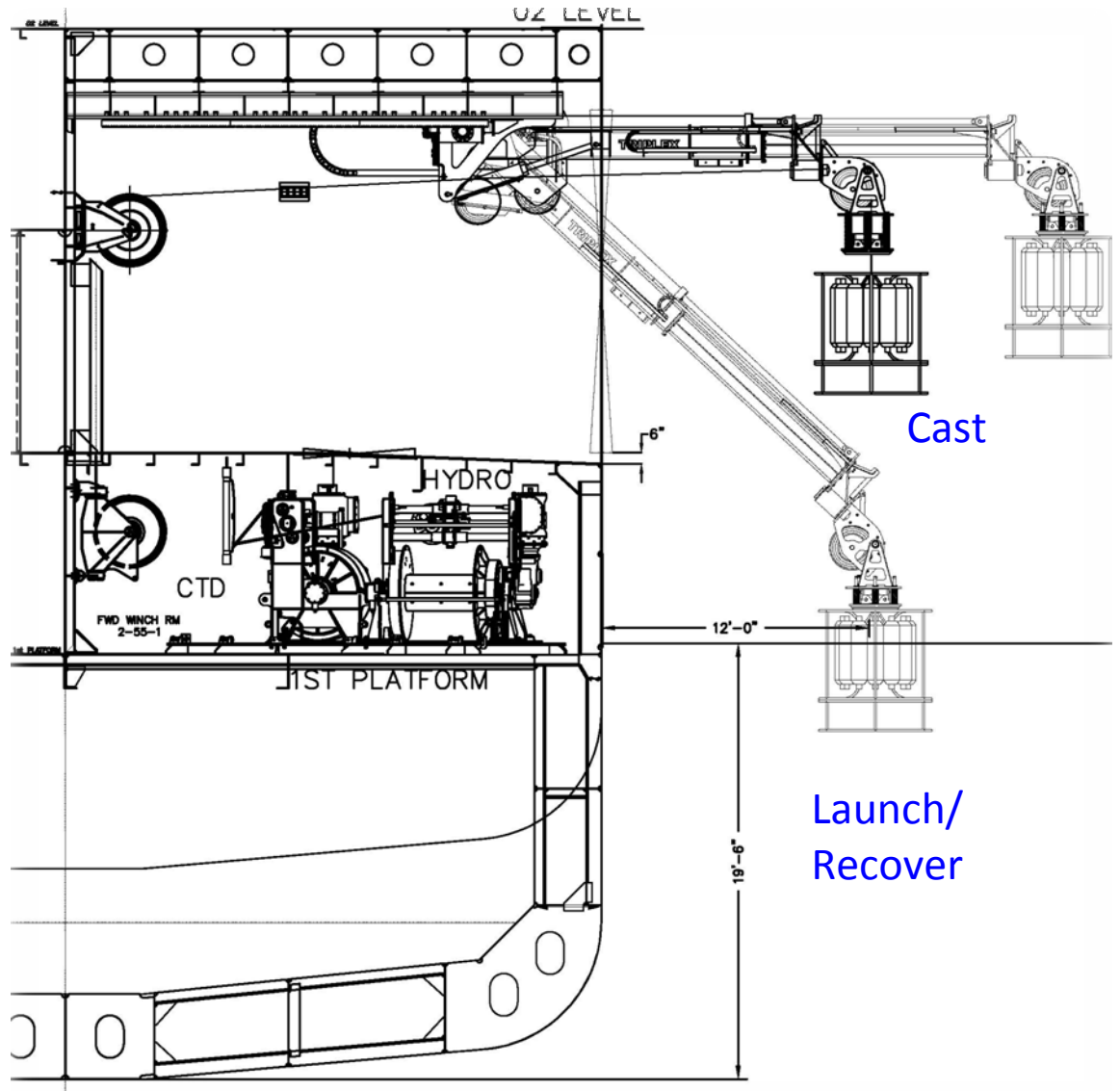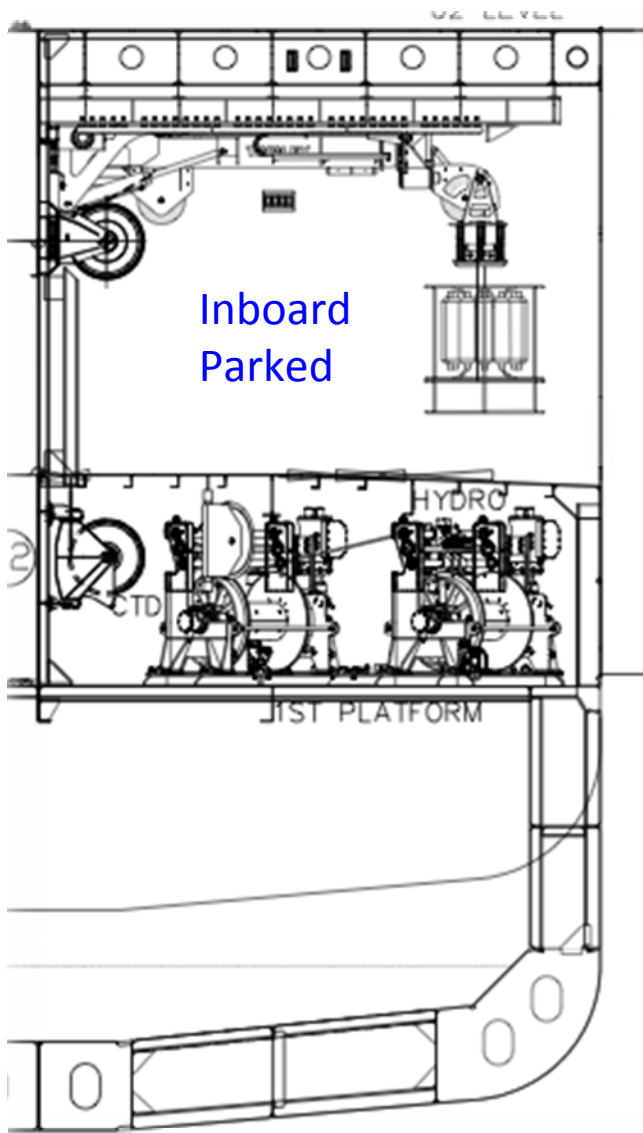
LHS Operating Positions

Major Components

Removable Docking Head

-Replacement docking heads for other equipment can be attached

Telescoping Boom

Base Carriage
 – carries inboard sheave and lowering cylinders
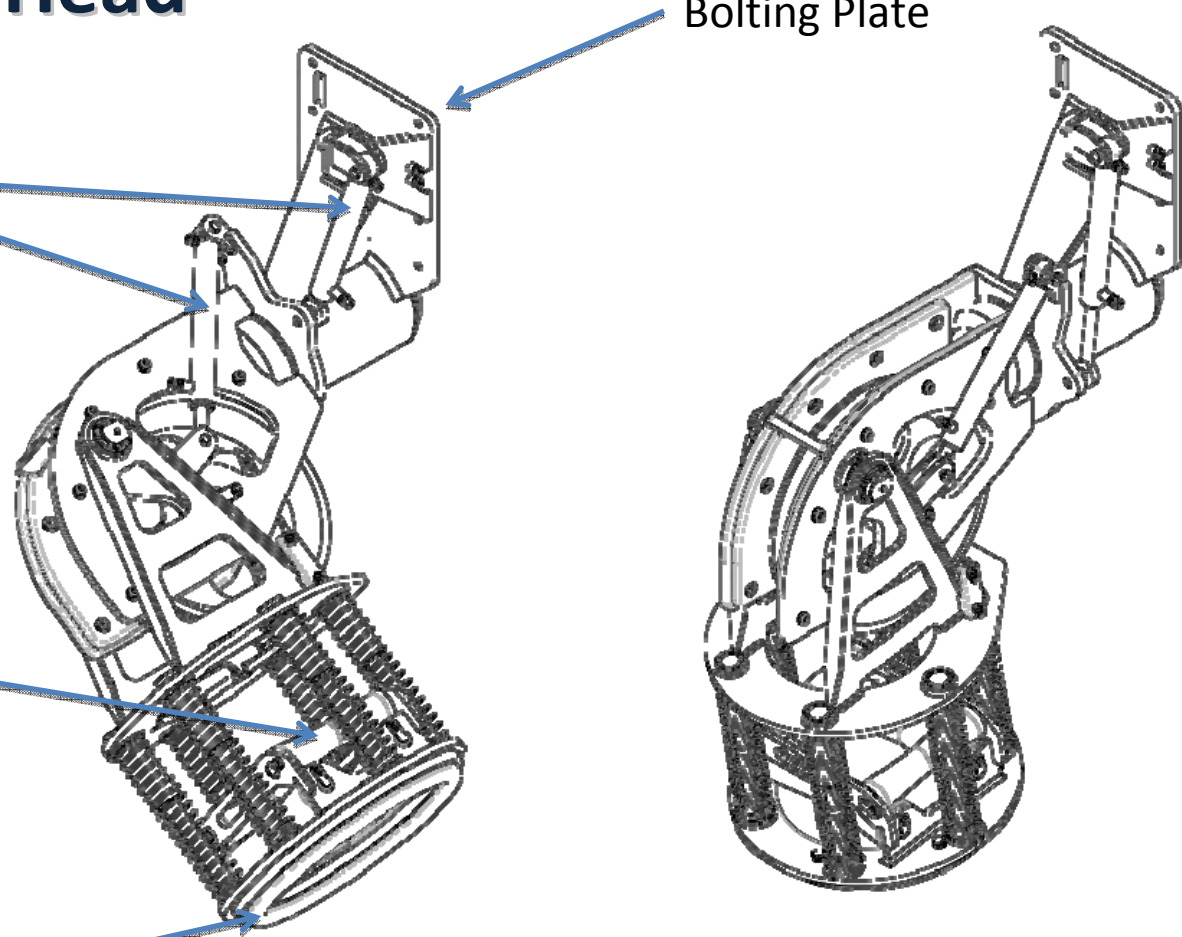- Moves boom inside Baltic Room.

LHS Docking Head

Bolting Plate

Damping
Cylinders
-Adjustable by
operator

Guide Rollers

Docking Collar

-Bolt-on, will be replaced
with custom bumper for
trials.

LHS Docking Head

Docking Collar
-Bolt-on, will be replaced with custom bumper for trials.

Guide Rollers

Damping Cylinders
-Adjustable by operator

LHS Boom under construction

Factory Testing, March 2012

- Testing was conducted at Rapp-Hydema NW, Seattle
- LHS boom was upside down for testing – not pratical to test in normal orientation
- Full load and motion tests were performed using a crane to supply load
- Test was satisfactorily completed
- LHS is now at the shipyard, and will be installed in the Baltic Room module within the next few weeks.

Factory Testing, March 2012

Moving load test, March 2012

For further information:

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