

Load Handling System Symposium (RVOC Meeting – April 2006)

- Two systems under production following “Functional Requirements” developed during the study:
 - *R/V SHARP*
 - *R/V KILO MOANA*
- Conceptually the same – different handling appliance only and size of winch.
- Field evaluations to begin after installation and systems in operation.

CTD Handling System (Caley Ocean Systems)

New Capabilities

- Motion Compensation by winch pay-in/pay-out – reduces heave of package in water column for better resolution and lowers cable strains (supposedly).
- Docking Head with “Auto-Tension” capability – no tag lines. Operator can set package on deck without assistance.
- “Tow Mode” (Auto Render) and cable cutter.

Issues To Be Evaluated

- *Cost* – was it worth it? (\$500 - \$750K)
- *Complexity* – can we handle it? (*no pun intended!*)
- *Motion Compensation* – does it work? Is it of benefit to BOTH vessel and science?
- *Docking Head* – Does it work? Is it safer?
- “*Tow Mode*” (Auto Render) – Does it work? Is it safer? How do we test? Can it satisfy USCG and ABS?
- *ABS Standards* – Comparison with same system under Sub-Chapter U. Weight savings? Greater Operational flexibility?

ABS Standards

*(ABS Rules for Building and Classing Underwater Vehicles, Systems and Hyperbaric Facilities (2002)
– Appendix 4; “Certification of Handling Systems”)*

- *Generally quite good – ABS Houston and London. Result is still a robust system.*
 - Typical “engineering” F.S. codified – not simply “... a minimum of 1.5;...” (Shear, compression, bending, etc.)
 - Dynamic effects considered using 1.75g factor for “unmanned operations”.
 - Modern capabilities can be incorporated – “Auto Render”

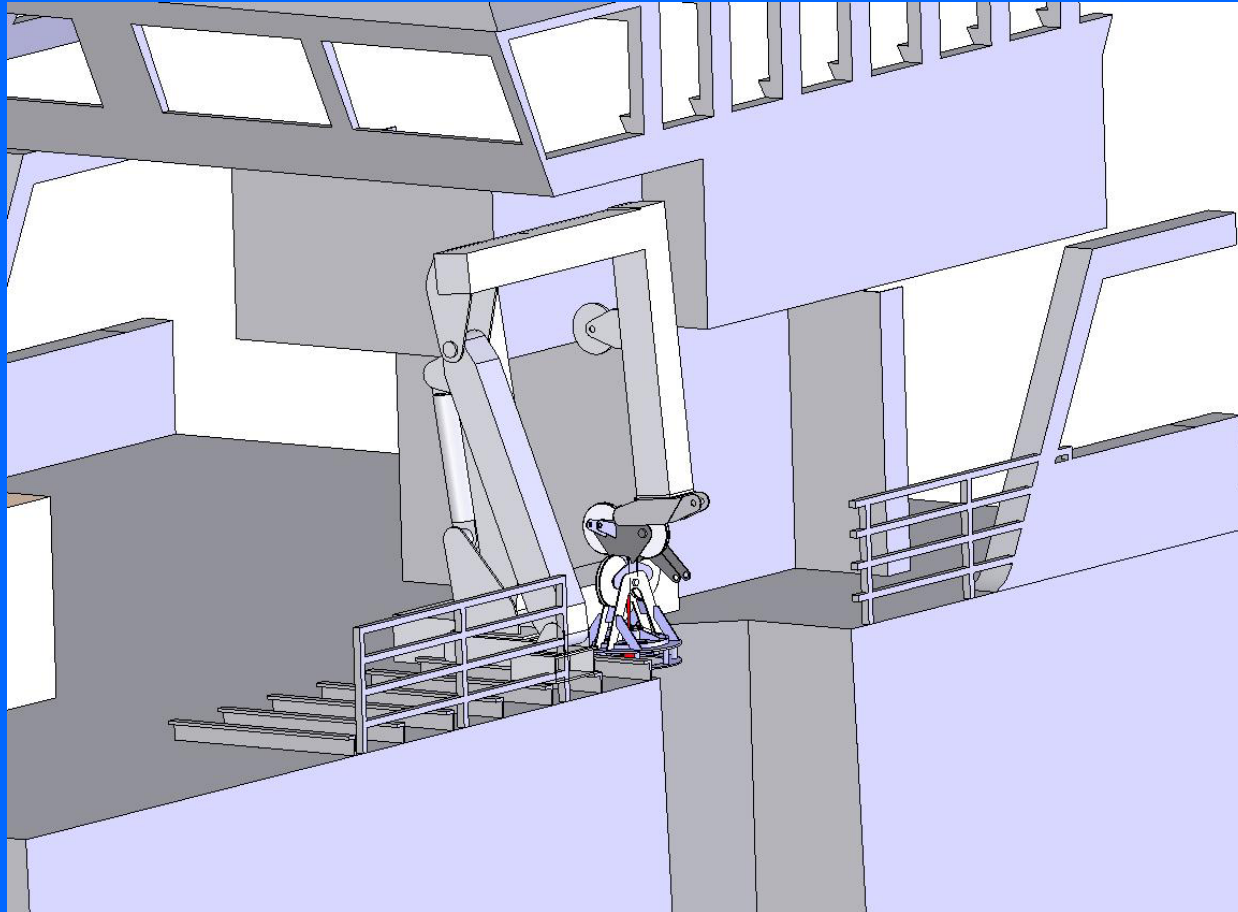
ABS Standards

- FUNDAMENTALLY DIFFERENT from Subchapter-U – Cable is NOT the “weak link” in the system. ABS view is that cable should never part. (4.7 FS on cable breaking strength)
- With Subchapter-U, there is a DIRECT LINK between cable breaking strength and structural design.
- NOT SO with ABS (or other classification society standards) – based on “Design Load” or “maximum expected load” = package, cable, drag, weight of entrained mud and water, etc.
- This has advantage on systems using strong cables for bandwidth or synthetics – but small “expected loads”.
- Would have similar results with systems like deep coring.

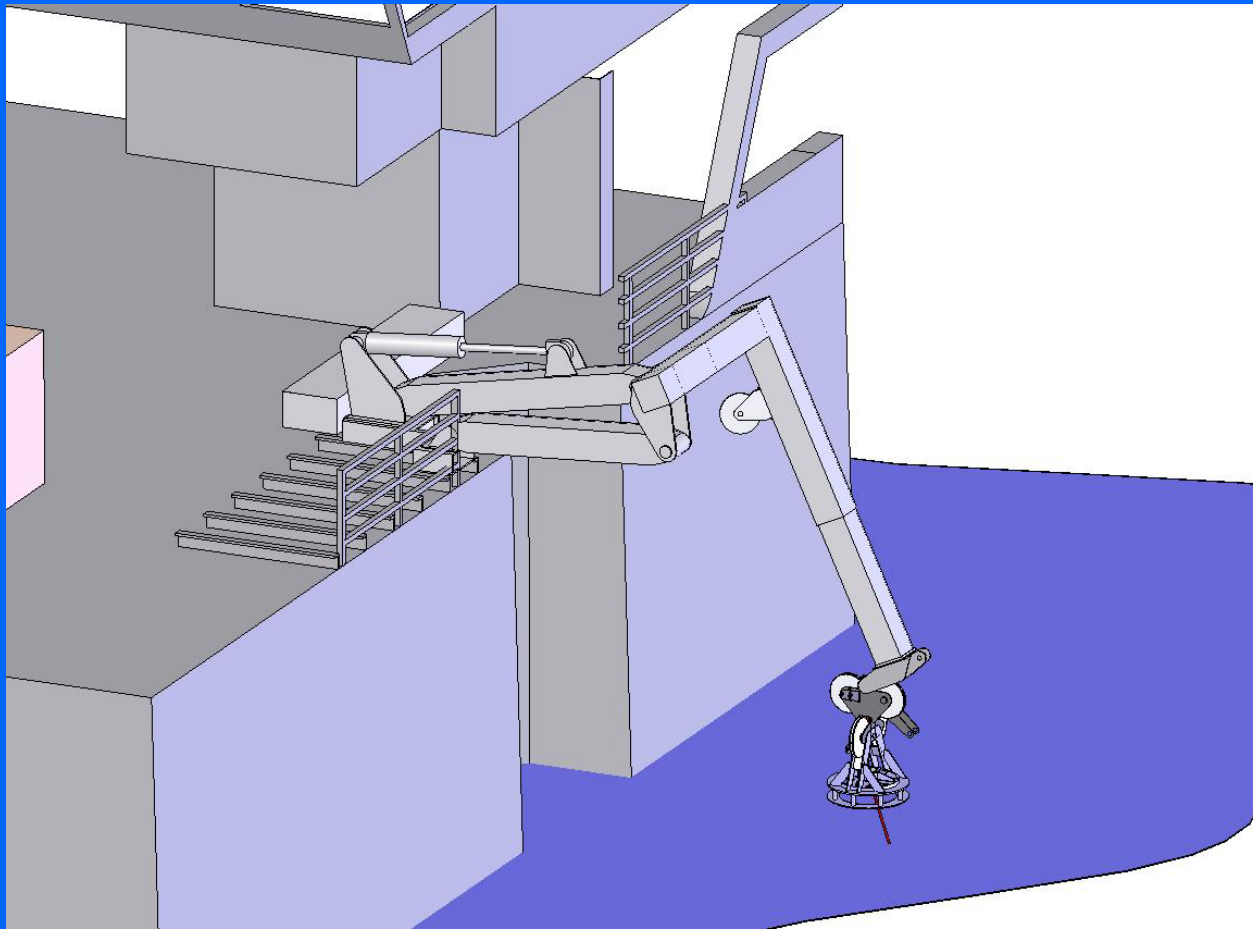
ABS Standards

- ONLY issue/problem for us is 4.7 FS on cable breaking strength – waiver requested with ABS Houston on R/V *SHARP* to reduce to 2.5 for “oceanographic research” following Lloyd’s model developed by UK. Probably OK for smaller vessels in UNOLS fleet.
- As discussed at Safety Meeting (04/24) – this CANNOT be the “end game” – will need further reduction for some operations on larger vessels (or “next generation” cables?)
- Procedural solution as opposed to structural solution?

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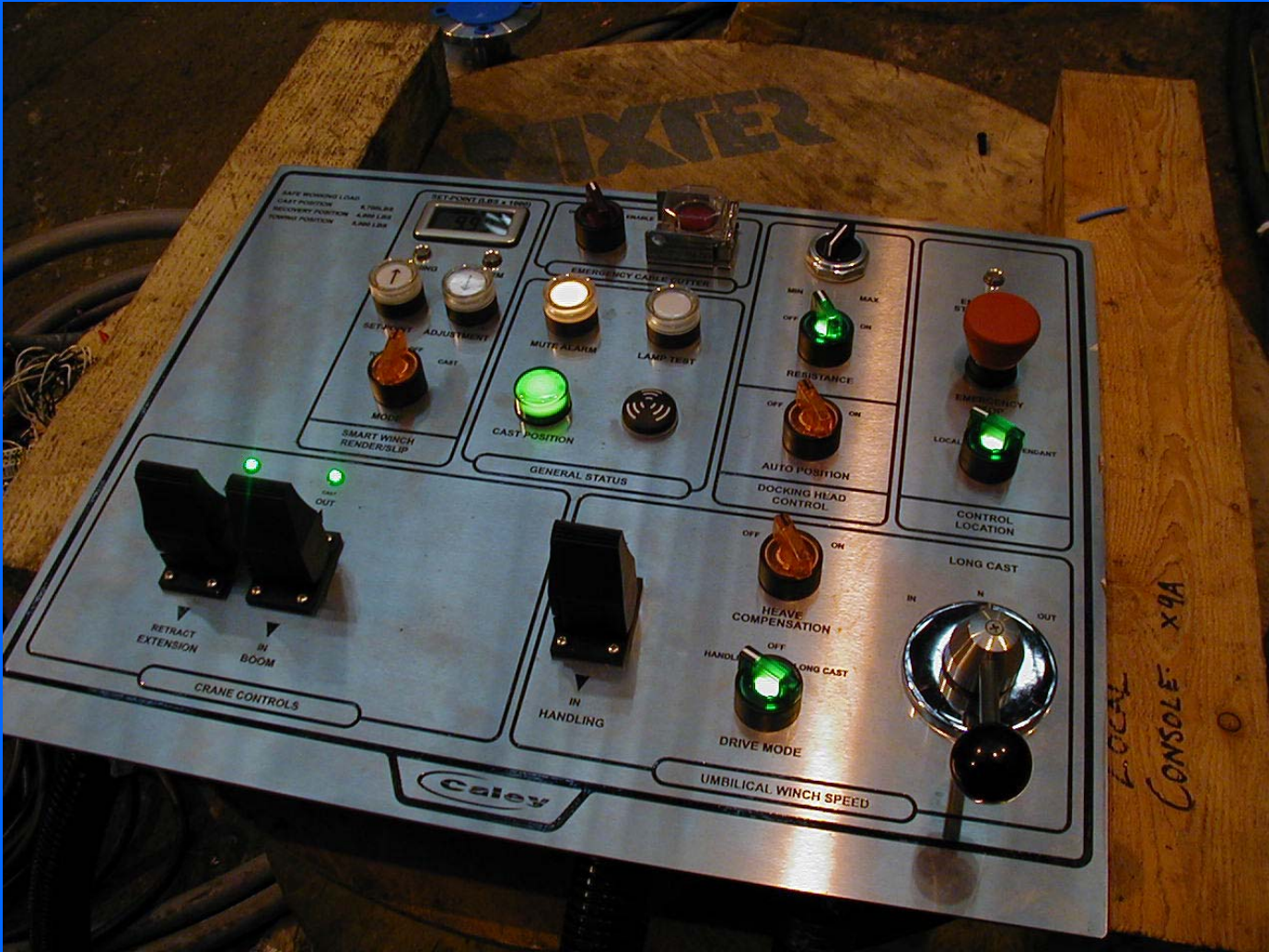
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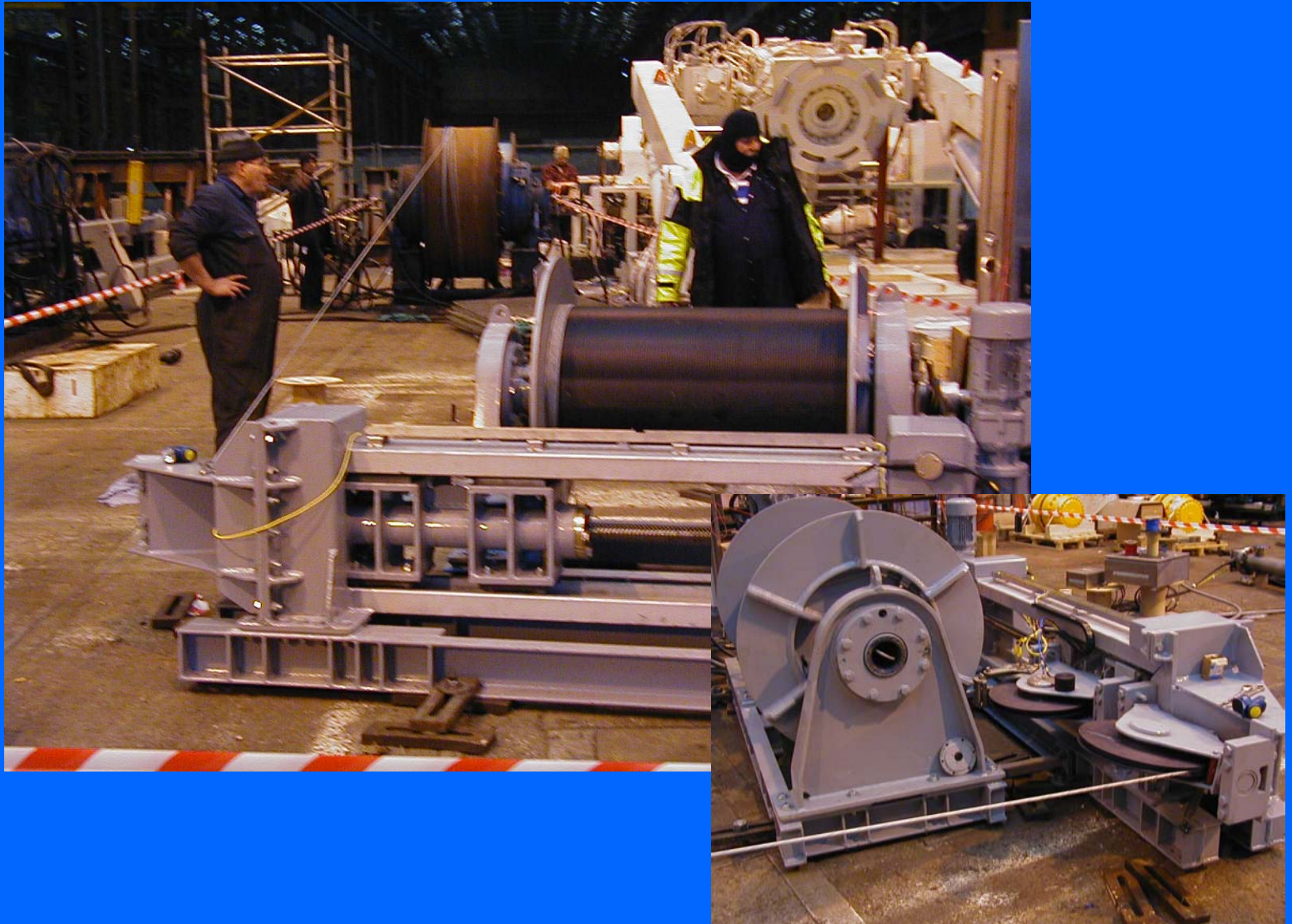
Handling Apparatus



Control Panel



Winch



Auxiliaries



Step Forward?

Time will tell . . .