EXPLICIT GOAL

Review of existing technologies and systems to develop a set of standard Functional Requirements (specs) to show “Proof of Concept” for new capabilities.

~ NOT to evaluate any particular vendor~
Load Handling System Symposium  
(INMARTECH Meeting – October 2006)

- Looked at numerous systems, vendors, and vessels both domestically (US) and world-wide.
- Talked with vessel operators and technical staff.
- Committee combined various features and capabilities into one set of “Functional Requirements”.
Two systems produced following “Functional Requirements” developed during the study *(Caley Ocean Systems, Ltd)*:

- **R/V SHARP** *(Delivered – funded by UD)*
- **R/V KILO MOANA** *(In progress)*

Conceptually the same – different handling appliance and size of winch.

**Final Phase** - Field evaluations after installation and systems in operation.
Load Handling System Symposium
(INMARTECH Meeting – October 2006)

New Capabilities

• Motion Compensation by winch pay-in/pay-out – reduces heave of package in water column for better data resolution and lower cable strain.

• Docking Head with “Auto-Position” capability – no tag lines. Operator can set package on deck without assistance.

• “Tow Mode” (Auto Render) – used for towing and in dealing with wire SWL issues.
Play Movies Here!
R/V HUGH R. SHARP
8/31/2006 19:40 GMT
Cast 10 (Mo-Comp OFF)
5 to 8 ft seas on stern

~ 2 m Vertical Deflection during descent

Bottles Tripped @ 46 m
~ 2 m Vertical Deflection
R/V HUGH R. SHARP
8/31/2006 20:04
Cast 11 (Mo-Comp ON)
5 to 8 ft seas on stern

- Mo-Comp Off
- Mo-Comp On
- Slow Creep Upwards on Package
- ~70% Reduction in Acceleration
- ~2 m Vertical Deflection
- Slow Creep Upwards on Package
- Bottle Tripped at 46 m
- ~0.5 Vertical Deflection
- 75% reduction from Cast 10
0.75 m Distribution
# CTD Accelerations

<table>
<thead>
<tr>
<th>% Improvement</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Average</th>
<th>*Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>51.7%</td>
<td>38.4%</td>
<td>76.8%</td>
<td>62.6%</td>
</tr>
<tr>
<td>Descent</td>
<td>60.2%</td>
<td>68.5%</td>
<td>124.5%</td>
<td></td>
</tr>
<tr>
<td>At Depth</td>
<td>47.2%</td>
<td>23.1%</td>
<td>205.9%</td>
<td>77.0%</td>
</tr>
<tr>
<td>Ascent</td>
<td>33.8%</td>
<td>39.8%</td>
<td>49.9%</td>
<td>65.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACCELERATIONS (m/s²)</th>
<th>Motion Compensation ON</th>
<th>Motion Compensation OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td>Overall</td>
<td>0.5700</td>
<td>-0.9000</td>
</tr>
<tr>
<td>Descent</td>
<td>0.4700</td>
<td>-0.4600</td>
</tr>
<tr>
<td>At Depth</td>
<td>0.5700</td>
<td>-0.9000</td>
</tr>
<tr>
<td>Ascent</td>
<td>0.4900</td>
<td>-0.5900</td>
</tr>
</tbody>
</table>

For each cast, depth ≥ 15m

*The standard deviation is defined as the average amount by which scores in a distribution differ from the mean, ignoring the sign of the difference.

**Data taken from two back-to-back CTD casts to the same depths. For comparison purposes, only data at or deeper than 15 meters were analyzed.

Thanks to: Tim McGovern, UH
Control Panel
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? **Appears so** – but:
  - **Need tests with greater depth/higher tensions**
- Docking Head – Does it work? Is it safer? **Appears so**.
- ABS Standards – Comparison with same system under Sub-Chapter U. Weight savings? Greater Operational flexibility? **In Progress**.
Step Forward?

Time will tell . . .
Final Word
(Related Subject)

- **DRAFT** UNOLS Wire Safe Working Load (SWL) standards currently under review by RVOC Safety Committee.
- Reviewed by RVTECH on October 16th
- Eventual Inclusion in RVSS
- Submission to ABS and US Coast Guard?