Load Handling System Symposium
(FIC Meeting – October 2006)

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~

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SECONDARY GOAL (On my part)

"MYTH BUSTING"

- *"You can't put the docking head in the water! It won't survive!"*

- *"Winch will be HUGE if winch pay-in/pay-out used for mo-comp! Can't handle accelerations! Won't work!"*

- *"You need to have a locking mechanism to capture the package! Anything else is unsafe!"*

Load Handling System Symposium
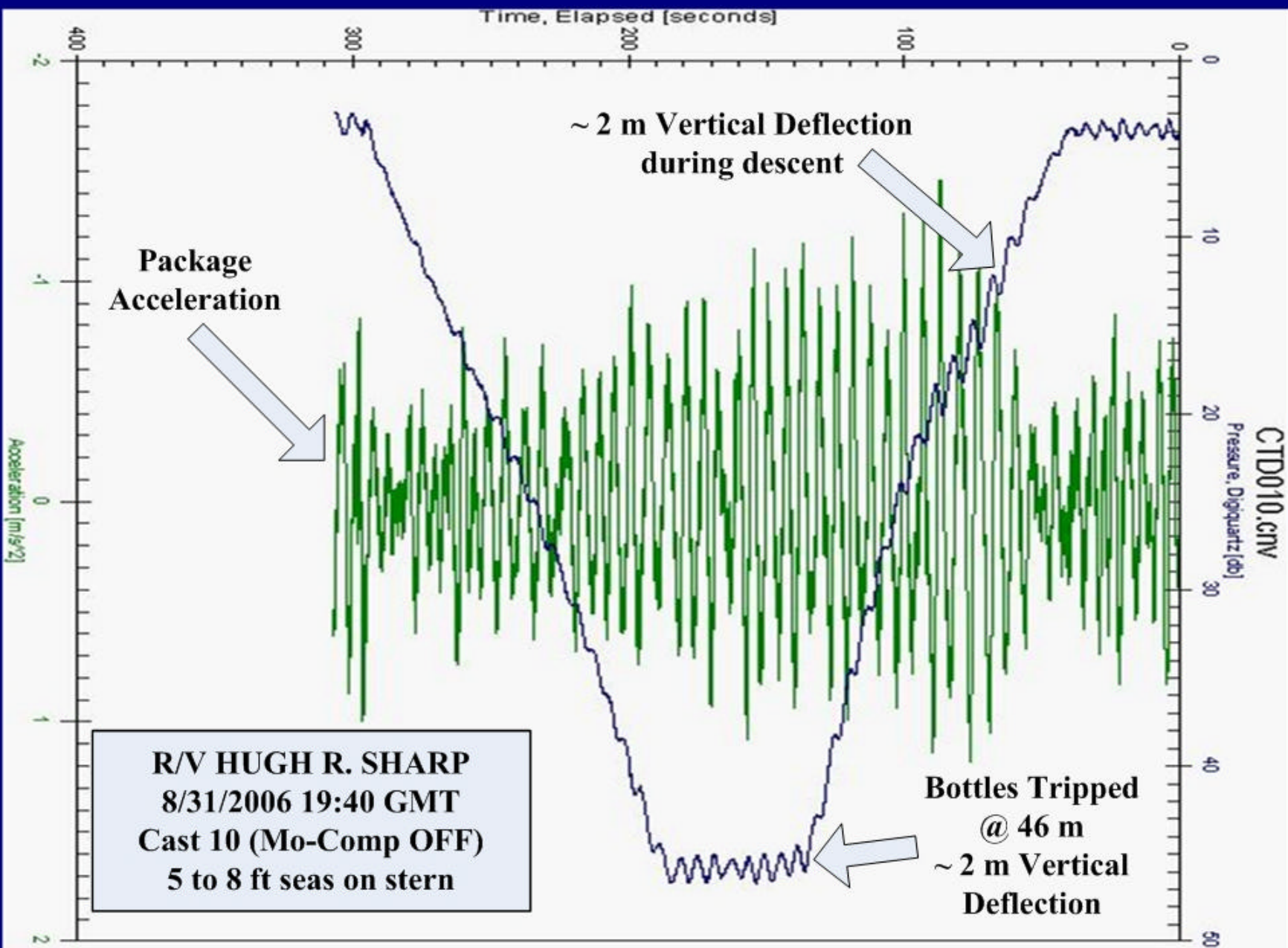## (FIC Meeting – October 2006)

- 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.

- <u>Final Phase</u> - Field evaluations after installation and systems in operation.

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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.
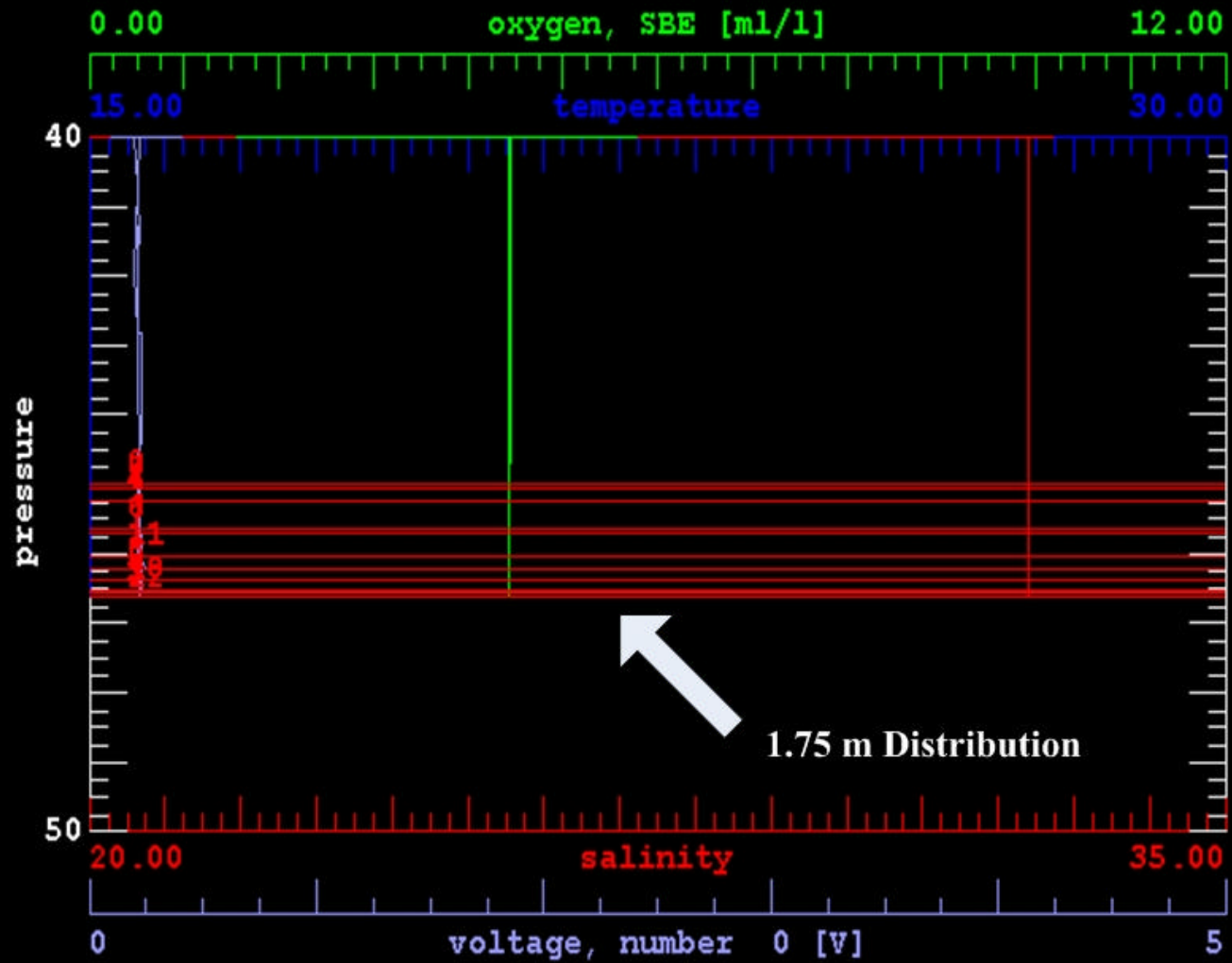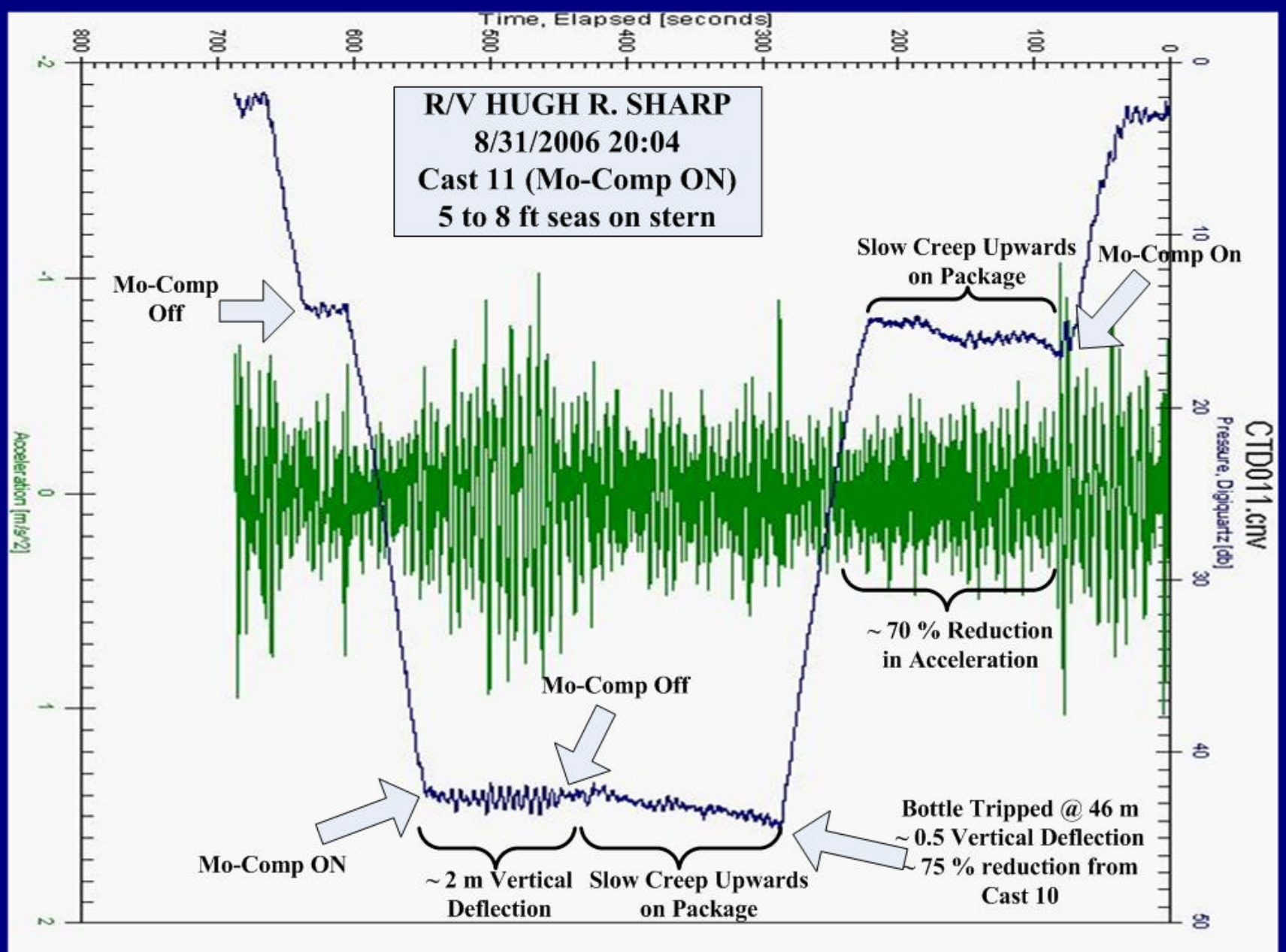
Play Movies Here!
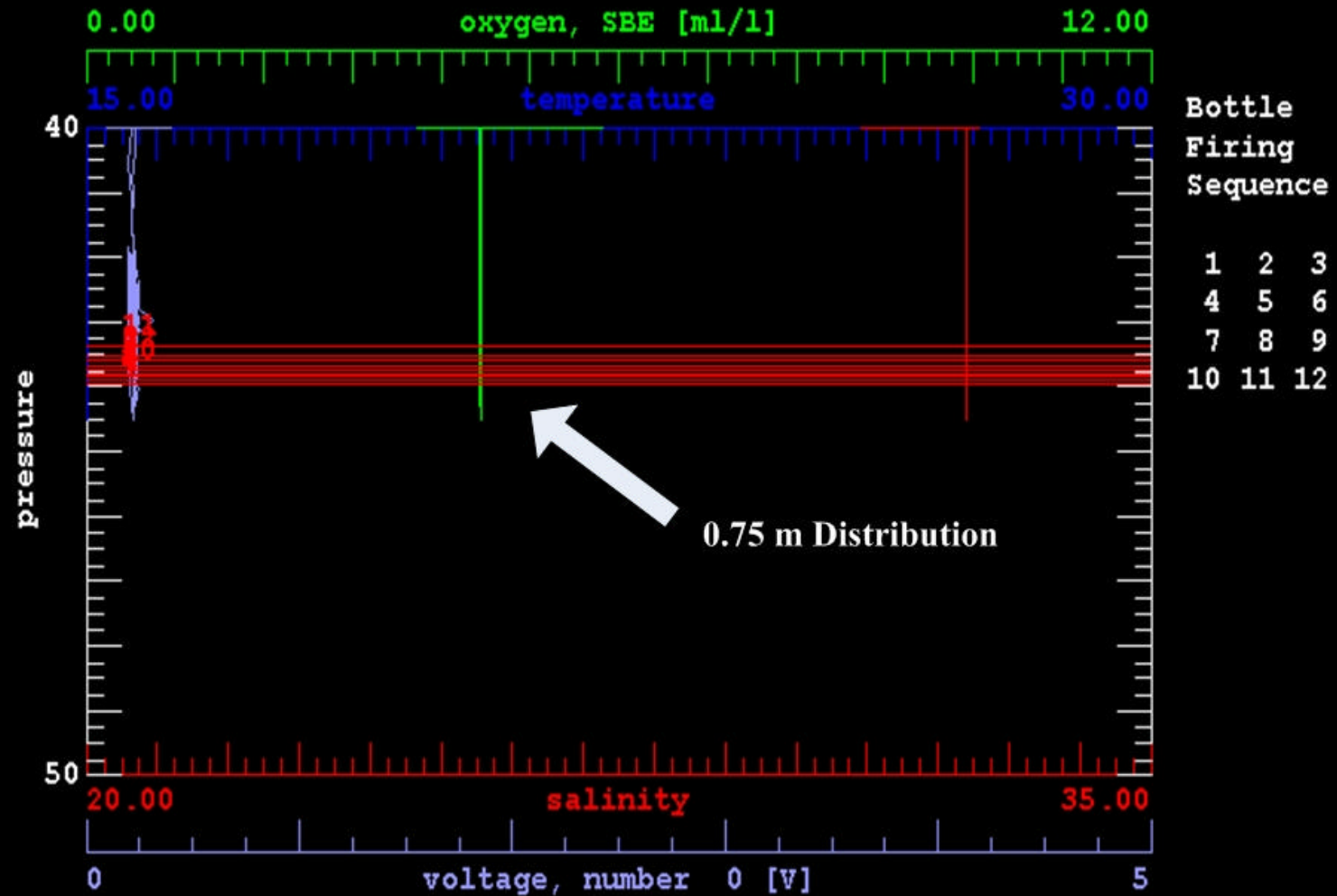
CTD Accelerations

% Improvement	Maximum	Minimum	Average	*Standard Deviation
Overall	51.7%	38.4%	76.8%	**62.6%**
Descent	60.2%	68.5%	124.5%	77.0%
At Depth	47.2%	23.1%	205.9%	65.9%
Ascent	33.8%	39.8%	49.9%	57.6%

Motion Compensation ON	Maximum	Minimum	Average	Standard Deviation
Overall	0.5700	-0.9000	-0.0011	0.1549
Descent	0.4700	-0.4600	0.0053	0.1352
At Depth	0.5700	-0.9000	-0.0047	0.1690
Ascent	0.49000	-0.59000	-0.00292	0.15019

Motion Compensation OFF	Maximum	Minimum	Average	Standard Deviation
Overall	1.1800	-1.4600	-0.0046	0.4136
Descent	1.1800	-1.4600	-0.0216	0.5868
At Depth	1.0800	-1.1700	0.0044	0.4959
Ascent	0.7400	-0.9800	-0.0058	0.3539

For each cast, depth ≥ 15m

ACCELERATIONS (m/s^2)

*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.

- "Tow Mode" (Auto Render) – Does it work? Is it safer? How do we test? Can it satisfy USCG and ABS? In Progress.

- 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