JMS

Naval Architects & Salvage Engineers

NATIONAL SCIENCE FOUNDATION SHIP INSPECTION PROGRAM

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2011 RVTEC MEETING

New Orleans, LA

Purpose

The major purposes of the NSF Ship Inspection Program are:

1) To assure that the capabilities of the research vessel and technical support meet accepted scientific community standards and expectations;

2) To assure the seaworthiness and safety of research vessels supported by NSF meet or exceed the standards set forth by the *UNOLS Research Vessel Safety Standards (RVSS)*, and applicable requirements of the International Maritime Organization, American Bureau of Shipping (ABS), the Code of Federal Regulations (CFR), and the U.S. Coast Guard;

3) To ensure NSF-owned ships as capital assets, are being adequately maintained;

4) To ensure NSF-funded science is scheduled on properly outfitted and maintained vessels.

Another Inspection Benefit

- **Spread concepts and experiences from one vessel to another as we conduct the inspections.**

Preinspection Information

- Electronic Format
- PCAs *since last inspection*
- Shipyard Reports
- NSF Ship Condition Form – new format!

NSF Ship Condition Form – new format!

- Blending of the data from the old ship condition form and the inspection report.
- Vessel will be asked to verify and update the spreadsheets contained in the form.
- Opportunity to comment in each section.

Common Findings

Appendix A Related Progress:

- Higher rate cable monitoring systems are coming into the fleet
- Some ships have the audible and visual alarms operating
- Most ships have posted cable SWL in clear view of the operators
- Some ships have weak links available.

Common Findings

Appendix A Related Looking For:

- Written qualifications for winch operators
- Formal training programs for winch operators (FS 2.5 and lower)
- Systematic programs to maintain and demonstrate tensiometer calibrations within 4% (FS 2.5)
- Implementation of weak links: Adjust for cable loads for any deep work.

Common Findings
Appendix A

- Some vessels not in accordance with Appendix A yet for winch wires and cables even at the 5.0 factor of safety.
- Revision 1 allows for sheaves and rollers to be as large as practicable at FS = 5.0.
- Revision 1 allows for rollers in the levelwind system with diameter criteria the same as sheave diameter.

Common Findings

Appendix A

- Calculation of estimated maximum load changed (Drag load added). When someone attains good estimates of drag it will be good to share with fleet.
- Develop your logs so they can stay with the tension member.
- We developed an Appendix A assist sheet to aid in attaining compliance.

Appendix A Assist Summary for Each Wire or Cable (draft 11/11 JMS/wec)					
Note: This is not all inclusive. See Appendix A Rev 1for requirements.	Select Applicable Column FS				
Requirement or Attribute	FS of 5.0 or higher	FS from 2.5 to 4.99	FS from 2.0 to 2.49	FS from 1.5 to 1.99	FS= ——
Post Cable/Wire SWL in clear view of the winch operator (good practice)	Applies	Applies	Applies	Applies	Y/N
General					
Determine Cable/Wire Safe Working Load (SWL) as: Assigned Breaking Load / Factor of Safety	Applies	Applies	Applies	Applies	Y/N
Tension Monitoring					
Have ability to keep load < SWL: May be calculated w/"q" factor at least 1.75 or from Tensiometer	Applies				Y/N
Have ability to keep load < SWL: Actual from monitoring system		Applies	Applies	Applies	Y/N
Tensionometer display at operator's station with 3 Hz resolution		Applies			Y/N
Tensionometer display at operator's station with 10 Hz resolution			Applies	Applies	Y/N
Tension continuously monitored using a tension trending graph			Applies	Applies	Y/N
Tensionometer logging at 3 Hz		Applies			Y/N
Tensionometer logging at 20 Hz			Applies	Applies	Y/N
Tensionometer Recalibration at least every 6 mo.		Applies	Applies	Applies	Y/N
Tension measuring system maintained with 4% accuracy		Applies			Y/N
Tension measuring system maintained with 3% accuracy			Applies	Applies	Y/N
Alarms					Y/N
Audible and visual tension alarms w/data logging Alarm at < ABL/2.8		Applies			
Audible and visual tension alarms w/data logging Alarm at <ABL/2.2			Applies		Y/N
Audible and visual tension alarms w/data logging Alarm at <ABL/1.7				Applies	Y/N
Alarm conditions automatically logged		Applies	Applies	Applies	Y/N
Sheaves and Fairlead Rollers					
Sheaves & Rollers: As large as practical	Applies				Y/N
Sheaves & Rollers: D/d ratio meet 40:1 or 400d1 whichever is greater		Applies	Applies	Applies	Y/N
Sheaves & Rollers: Groves as close to d as possible and no more than 1.5d		Applies			Y/N
Appropriate Sheaves: Groves per Ref A 1.1 (Groove size relative to nominal diameter of wire rope: 3/16" to 1/4" 3% to 6%; over 1/4" 2.5% to 5%)			Applies	Applies	Y/N
Deck Safety					
Good safety practices	Applies				Y/N
Establish danger zones / safety zones		Applies	Applies	Applies	Y/N
Warning notices posted			Applies	Applies	Y/N
Physical or visual barriers			Applies	Applies	Y/N
Doors and accesses secured			Applies	Applies	Y/N
Testing					
Tension testing up to SWL load every 2 years. Break testing not req'd at FS=5.0	Applies				Y/N
Break Testing every 2 yrs		Applies			Y/N
Break Testing every yr if 10% decrease in ABL or cutback		Applies			Y/N
Break Testing every yrs			Applies	Applies	Y/N
Break Testing every 6 mo. if 10% decrease in ABL or cutback			Applies	Applies	Y/N
Logbooks: UNOLS wire identifier: Cable Inventory/History and Running Use					
Logs stay with the wires transfer with the wire	Applies	Applies	Applies	Applies	Y/N
Log of Tension Testing to SWL	Applies				Y/N
Log of wire Break Testing		Applies	Applies	Applies	Y/N
Log Cutbacks	Applies	Applies	Applies	Applies	Y/N
Log Spooling Operations	Applies	Applies	Applies	Applies	Y/N
Log of Lubrication	Applies	Applies	Applies	Applies	Y/N
Wire Train Description	Applies	Applies	Applies	Applies	Y/N
Maximimum load for each cast by calculation or monitoring (and payout).	Applies	Applies	Applies	Applies	Y/N
Winch Operator					
Operator deemed competant in writing by master and owner	Applies				Y/N
Operator "Certified Competent" in writing by master and owner renewed annually.		Applies	Applies	Applies	Y/N
Master verify qualifications and designate approved operators.		Applies	Applies	Applies	Y/N
Training record for formal operator training program for winch, handling apparatus, and monitoring system.		Applies	Applies	Applies	Y/N

Common Findings

Handling Systems:

- Some vessels have not determined the ultimate design load (design capacity) of their frames. Must be 150% of the strongest cable or wire breaking strength. Will continue to be a requirement of inspected vessels even after Appendix B is approved.
- Some vessels have not established Safe Working Loads for deck sockets or put in place an associated periodic testing program. This will be important as Appendix B becomes implemented.

Common Findings

Appendix B General

- Some vessels are working toward it - Others just aware it will be coming.
- Presently in the DRAFT stage.
- Overboard Handling Systems Design in terms of wire and cable tension, not a single SWL

Getting started

Appendix B

- Workshop in February
- Recommend each vessel do at least some preliminary work prior to the workshop
  - Develop ideas if any further changes are needed to the Appendix before approval
  - If you are going upgrade an overboard handling system then you want to know which components limit the system capability and by how much.
  - Can coordinate with others to gather capability info on common components.

Getting started

Appendix B

- Identify, describe, and illustrate typical overboarding operations.
- Establish a notebook or file which includes each scenario which can be expanded in to the handling systems manual.

Getting started

Appendix B

- Identify each component in each scenario. Describe and illustrate how used and identify the geometry during use, and if the geometry changes during the scenario.
- Gather data for the component maximum capability document (MCD).
- May be available from:
  - Equipment provider or manufacturer
  - Ships plans
  - Same component on other vessels
  - May need a naval architect/engineer to analyze.

RV Atlantic Explorer MPT Placard

Block Placard - "Maximum Permissible Tension" placard on a block.

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Getting started

Appendix B

- Develop maximum capability document (MCD) of the system for each scenario.
- The system MPT will be to lowest of the component MPTs
- Determine how the system and components will be tested

Common Findings

- Hydraulic Hoses
  - Tags, Standards, Replacement Schedules

Common Findings: Hydraulic Hoses

- Tag provides the serial number of the item for cross reference in the Hose Log.
- Installation shall be done in a manner that will not cause damage to the hose or joint.
- The following information should be provided on the tag and/or log:
  - Hose serial number
  - Hydrostatic Test Pressure and Test Date
  - Service Life Date (Replacement Date)

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Other Common Findings

- Labs
  - Emergency Showers - location, flow rate, testing
  - Lighting, safety information
  - What power can be secured in an emergency, I.e. UPS
- Vans
  - Egress/Safety Equipment
  - Lashing Arrangement
- Chemical Use and Storage
- Overboarding equipment labeling of controls
- Scientific Equipment Operating Procedures Manual
- ADA

Common Findings

- In order to be more ADA capable vessels could make improvements in the following areas:
  - Incorporate more ADA awareness and requirements into the pre-cruise planning process.
  - Improve access to science berthing, mess deck, and labs.
  - Improve lighting, handrails, and retro-reflective tape in stairwells and egress routes.
  - Install visual alarms to augment audible alarms.
  - Remove obstacles in the passageways.

IDEAS TO SHARE:
RV SHARP Gas Detector

The vessel uses a relatively inexpensive Mine Safety Appliance [MSA] Altair 4 portable/personal gas detector for confined space entry and overhauling fire scenes. The meter detects LEL, CO, H2S, and O2.

The rubber over-molded housing is easy to grip, durable, and small enough to be lowered on a line into the tank or clipped to your shirt.

Most UNOLS vessels have a gas detector that was part of a group purchase several years ago. These units have a history of sensor failures and calibration issues.

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IDEAS TO SHARE:
RV SHARP Render / Recover

Render-Recover mode on trawl winches

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IDEAS TO SHARE:
RV SHARP ADA Features

The vessel was designed to incorporate ADA features. Watertight door thresholds can be removed for easier access on the Main Deck. A handicap accessible stateroom and head as well as labs and the mess deck are easily accessible on the Main Deck. The general alarm has visual beacons as well as an audible alarm.

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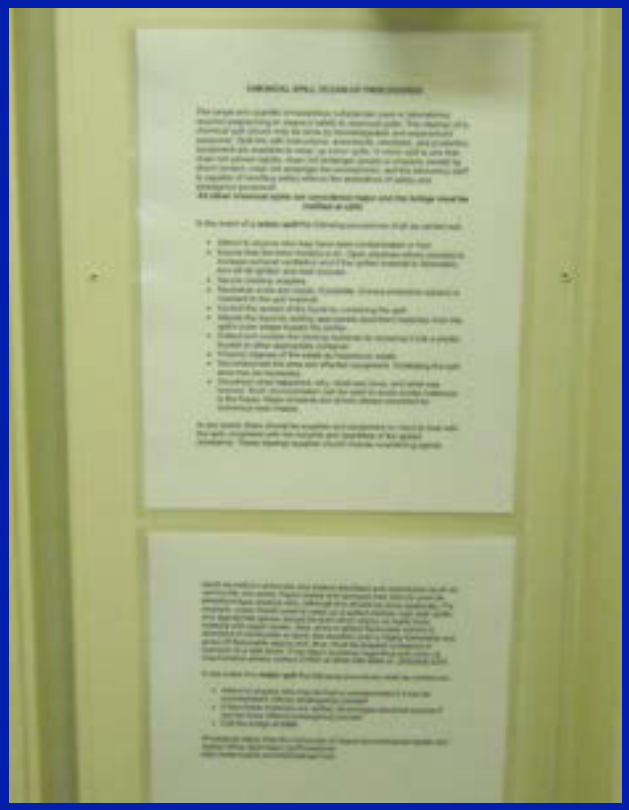
IDEAS TO SHARE:
RV KILO MOANA
Chemical Spill Procedures

Chemical Spill Procedures are clearly posted in the lab where chemicals may be used. The of “Chemical Spill Procedures” are informative without being overwhelming, and highlight the importance in preplanning for a potential spill.

The procedures are posted near the entry door.



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IDEAS TO SHARE:
RV CAPE HATTERAS
Markey Winch window replacment

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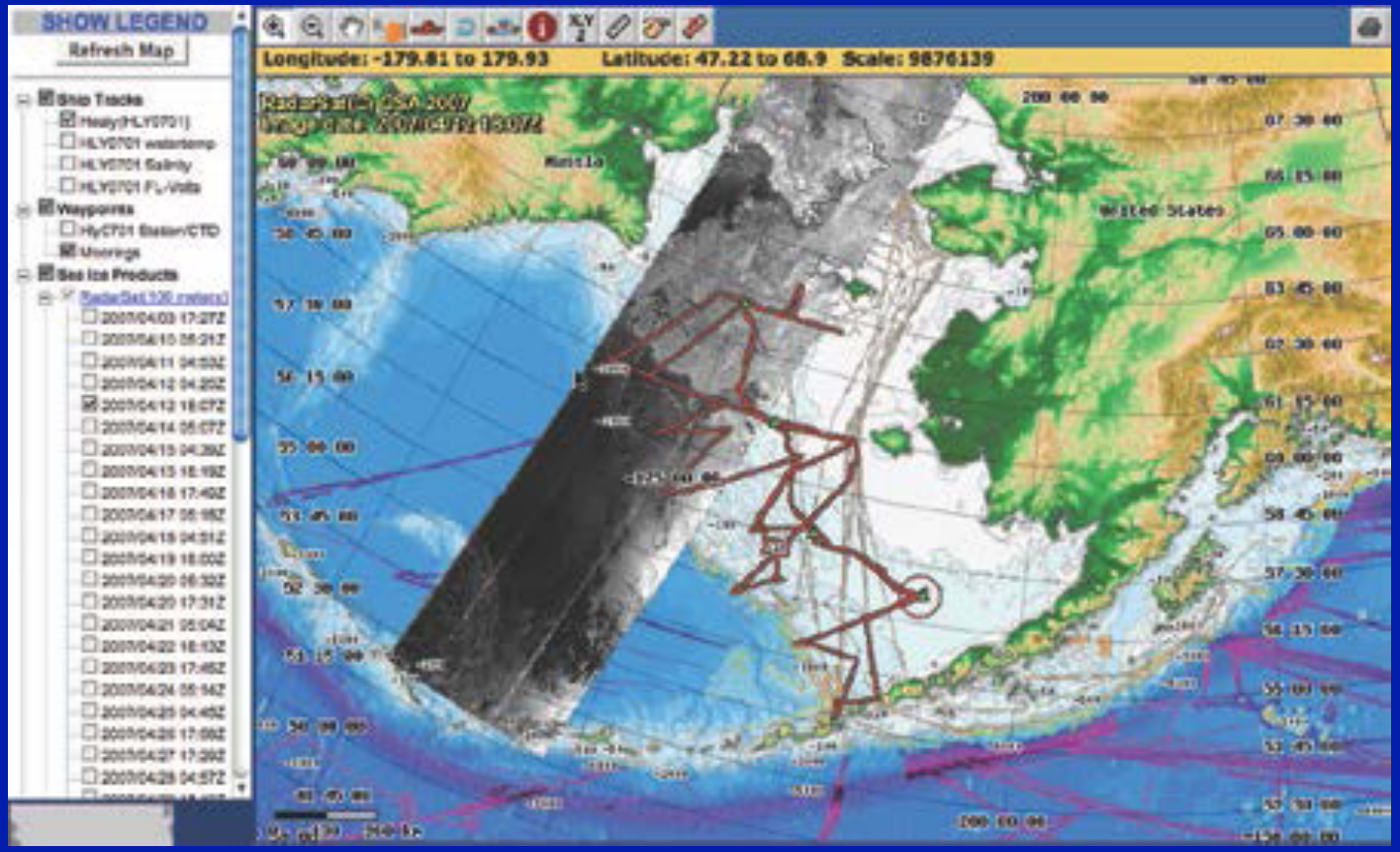
IDEAS TO SHARE:
USCGC HEALEY
Geospatial display of data



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IDEAS TO SHARE:
USCGC HEALEY
Crane operator protection

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IDEAS TO SHARE:
RV CAPE HATTERAS
Small winches to aid in tag line use

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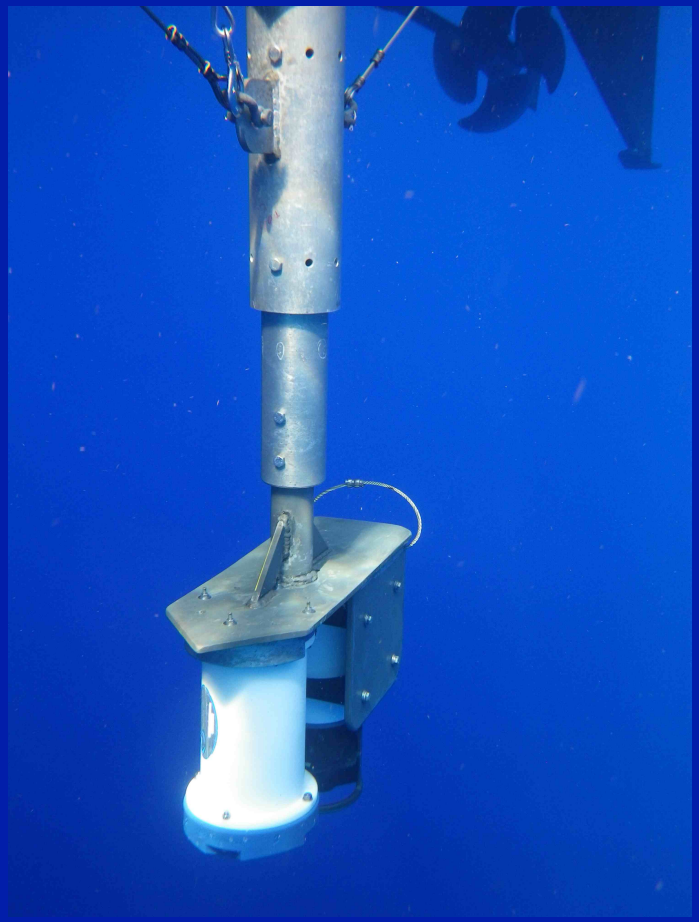
IDEAS TO SHARE:
RV WALTON SMITH
Swivel Pole System



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IDEAS TO SHARE:
RV WALTON SMITH
Method of attachments

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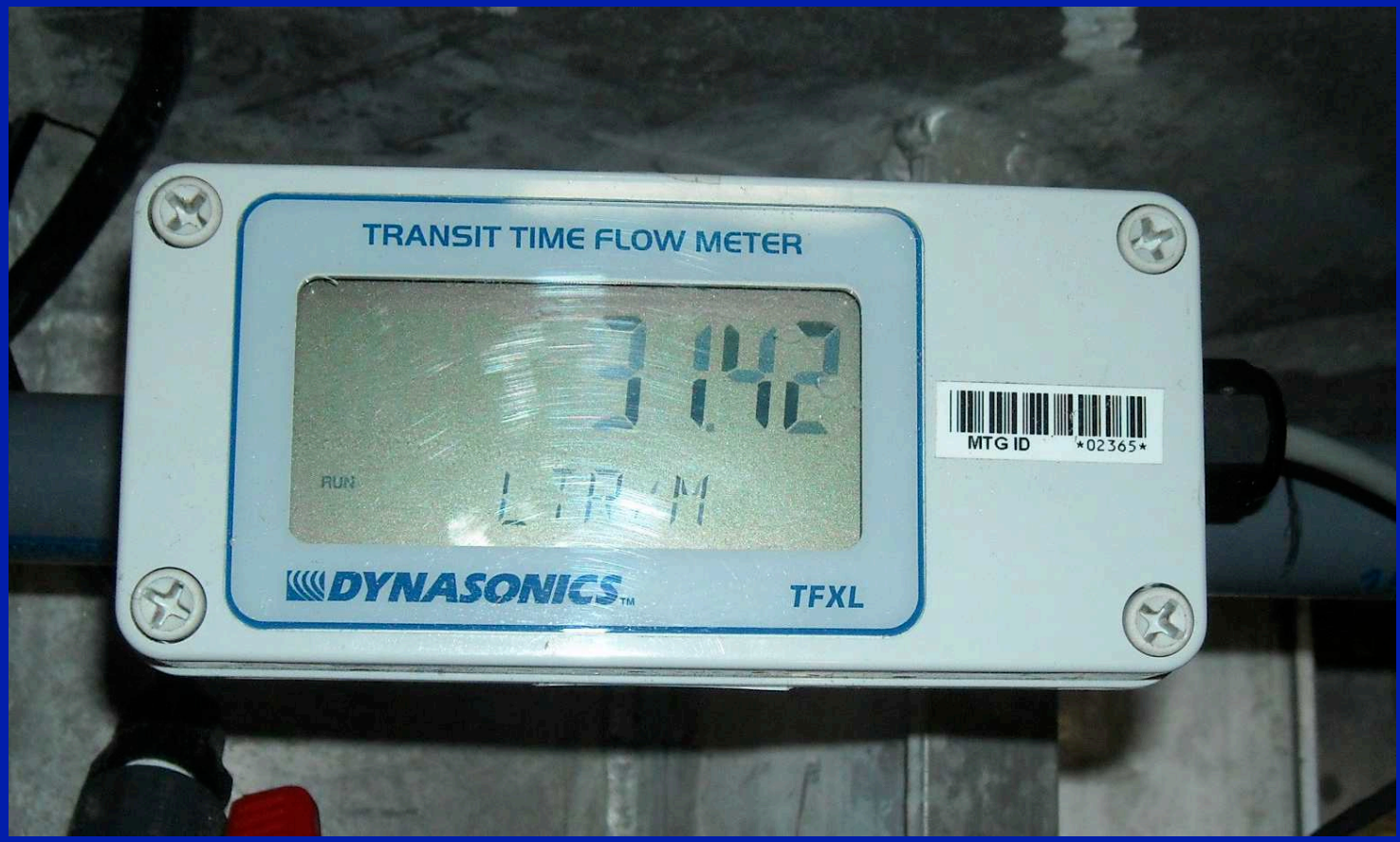
IDEAS TO SHARE:
RV WALTON SMITH
Non-penetrating flow meter



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Best Practices ("IDEAS TO SHARE") Observed During Inspections

- Dedicated Web Page:
- http://www.unols.org/committees/rvoc/ShipBestPractices/ShipInspectBestPractices.html

Questions?

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