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.
Recently Completed
RVSS Appendix A & B Compliance:

Appendix A

There are still vessels that are not in full compliance with Appendix A as of the inspection.

Common findings include
- Levelwind sheaves and rollers
- Recording maximum tension for each cast

Appendix B

Vessel crews are making progress toward compliance with Appendix B, but we have yet to see a complete package for a single overboarding scenario during an inspection.

Most vessel operators are making progress on the system and component MCDs.

15 July 2014

Naval Architects & Salvage Engineers
Marine Safety Alert: Lifting Gear

Overloaded Lifting Gear:

Several catastrophic failures of masts, booms, and lift cables have occurred on vessels that have resulted in loss of life and severe injuries.

The Coast Guard strongly recommends:

* Know the design limits of load bearing structures and winches, hoist, and haul components;
* Ensure they are inspected and tested on a regular basis;
* Evaluate and revise operational procedures as needed.

Appendix A & B!
RVSS Appendix A & B Compliance:

- Know the design limits of load bearing structures and winches, hoist, and haul components;
- Ensure they are inspected and tested on a regular basis;
- Evaluate and revise operational procedures as needed.

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One common weak area is the concept of “maintaining” accuracy within 4% or 3% depending on the factor of safety selected. There is a need for a standard protocol that may be shared within the fleet.
## Common Findings: Log Maximum Load for Each Cast

<table>
<thead>
<tr>
<th>Requirement or Attribute</th>
<th>Select Applicable Column FS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logbooks: UNOLS wire identifier: Cable Inventory/History and Running Use</td>
<td>FS of 5.0 or higher</td>
</tr>
<tr>
<td>Maximum load for each cast by calculation or monitoring.</td>
<td>FS from 2.5 to 4.99</td>
</tr>
<tr>
<td></td>
<td>FS from 2.0 to 2.49</td>
</tr>
<tr>
<td></td>
<td>FS from 1.5 to 1.99</td>
</tr>
</tbody>
</table>

One of the requirements in Appendix A is to log the maximum tension per cast. For the crews that record the tensions electronically into a data file (as most do), this is an extra step to post process the data and meet this criteria.
### Best Practices: Appendix A

**RV ATLANTIC EXPLORER:**

Logs both the payout per cast and payout at maximum load.

<table>
<thead>
<tr>
<th>Drop #</th>
<th>Drop Date &amp; Time</th>
<th>Maximum Tension Per Cast (Lbs)</th>
<th>Maximum Payout of Each Deployment (Meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5/5/12 13:45</td>
<td>2987</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>5/8/12 2:34</td>
<td>1859</td>
<td>1000</td>
</tr>
<tr>
<td>2</td>
<td>5/9/12 2:06</td>
<td>1568</td>
<td>2000</td>
</tr>
<tr>
<td>3</td>
<td>5/9/12 22:06</td>
<td>2368</td>
<td>4572</td>
</tr>
<tr>
<td>4</td>
<td>5/10/12 2:08</td>
<td>1364</td>
<td>1100</td>
</tr>
<tr>
<td>5</td>
<td>5/11/12 2:41</td>
<td>2050</td>
<td>4353</td>
</tr>
<tr>
<td>6</td>
<td>5/11/2012 5:14</td>
<td>1502.9</td>
<td>1811.5</td>
</tr>
<tr>
<td>7</td>
<td>5/11/2012 19:41</td>
<td>2312.3</td>
<td>4617</td>
</tr>
<tr>
<td>8</td>
<td>5/12/2012 3:07</td>
<td>2016.9</td>
<td>4200.3</td>
</tr>
<tr>
<td>9</td>
<td>5/12/2012 23:00</td>
<td>1604.7</td>
<td>2000</td>
</tr>
<tr>
<td>10</td>
<td>5/13/2012 13:15</td>
<td>2859.1</td>
<td>4614.8</td>
</tr>
</tbody>
</table>

*Naval Architects & Salvage Engineers*
## Common Findings: Sheave and Fairlead Roller Diameter

**Older Levelwinds limit FS to 5.0**

<table>
<thead>
<tr>
<th>Requirement or Attribute</th>
<th>Select Applicable Column FS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FS of 5.0 or higher</td>
</tr>
<tr>
<td><strong>Sheaves and Fairlead Rollers</strong></td>
<td></td>
</tr>
<tr>
<td>Sheaves &amp; Rollers: As large as practical</td>
<td>Applies</td>
</tr>
<tr>
<td>Sheaves &amp; Rollers: D/d ratio meet 40:1 or 400d1 whichever is greater</td>
<td>Applies</td>
</tr>
<tr>
<td>Sheaves: Groves as close to d as possible and no more than 1.5d</td>
<td>Applies</td>
</tr>
<tr>
<td>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%)</td>
<td></td>
</tr>
</tbody>
</table>
Common Findings: SWL Documentation

WLL or SWL identified on a block is not the same as max permissible tension. These blocks don't indicate if the WLL is for the tension member or for the shackle/block.
Best Practice: Sheaves

Clear indication of SWL expressed in terms of MPT.
Best Practices: Sheave Wrap Angle

RV SAVANNAH: Instrument blocks that measure the wrap angle in order to measure the tension in the cable.
RVSS Appendix B Compliance:

**RV SIKULIAQ: Testing in the towing position**

- Develop a test plan/procedure
- Include a line diagram
- Test the system (all components) as it is intended to be used

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Common Findings: Science Safety

More than just a preunderway safety brief is needed!

- Formally designate a Safety Officer
- Begin providing safety information prior to getting underway
- Provide general safety training information
  - RVOC Safety Training Manual & video
- Provide ship specific safety items
  - Use ship photos, PowerPoint or videos
- Include shipboard policies
  - Sexual harassment, drug & alcohol, environmental, etc.
- Reinforce in the Cruise Planning Manual, ship’s web site, in labs and in staterooms
Common Findings: Lithium Batteries

• Develop policy and procedures on how to handle lithium batteries.
• The procedures should cover
  – usage
  – storage
  – disposal
  – how to respond to emergencies
• Incorporate into the cruise planning process.
• Note: Lithium batteries should not be treated the same as lithium ion batteries. Typical portable extinguishers can be used to extinguish a lithium ion fire.
Need for a *methodical* approach to help use fuel as cost effectively as possible. Requires the ability to take dynamic action based on real-time performance data and known benchmarks. Shipboard Energy Efficiency Management Plan (IMO requirement >400GT) comprised of strategic and tactical actions.

- **Examples of strategic actions** that can be adopted:
  - Repowering
  - Advanced hull coatings
  - Optimized propeller and rudder design
  - Addition of stern wedges
  - Use of shaft generators

- **Examples of tactical actions** that can be adopted:
  - Speed management / real time fuel flow monitoring
  - Trim/draft optimization
  - Maintenance: Tune engine compression, u/w hull cleaning, etc..
  - Energy conservation
  - Provide crew and staff guidance and awareness training

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Common Findings: Shipboard Energy Efficiency Management Plan

- Identify energy saving solution on board, establish baseload and set targets
- Establish a system so that the energy efficiency measures can be measured and evaluated
- Evaluate the effectiveness of the implemented measures. Monitor ongoing performance
- Implement data collection and monitoring system (e.g., IMO EEOI)

Step 1: Planning & Energy Efficiency Assessment
Step 2: Implementation
Step 3: Monitoring of Implemented Measures
Step 4: Self-evaluation & Continuous Improvement

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Common Findings: Shipyard Documentation

- Lack of post-shipyard documentation/reports
  - Summary of what was accomplished
  - Records of clearances, NDT, etc.
- Incomplete NDT surveys
  - “portable” equipment that hasn’t moved in years (under winch foundations, A-Frame foundations, cranes
  - bilges, machinery foundations
  - internal structure – webs, flanges
- Need to maintain/update shell expansion plans
  - Document readings and plate renewal
Common Findings: ADA

• 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 from the main deck.
  – Improve markings to access the main deck from the science berthing area.
  – Improve lighting, handrails, and retro-reflective tape in stairwells and egress routes.
  – Install visual alarms to augment audible alarms.
  – Remove obstacles in the passageways.
Common Findings: Human Factors

Each control and control setting should be labeled. The label should describe the control function and the result of the control movement in words and/or symbols.

All deck equipment controls should be labeled consistently and be clearly visible by the operator with adequate lighting and a conspicuous format.
Best Practices: Human Factors
Best Practice: Hydraulic Hoses

- Tag provides the serial number of the item for cross reference in a Hose Log and installation date.
- The following information should be provided on the tag and/or log:
  - Hose serial number
  - Hydrostatic Test Pressure and Test Date
  - Installation or Replacement Date
Best Practices: Realistic Drills
Best Practices: MOB

POINT SUR Life-size MOB

BARNES Pre-rigged Davit

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Best Practices: Wet Lab Gas Detector

RV FALKOR: Installed gas sensor system that measures the level of multiple gases in the Wet Lab where the fume hood is located.

Oldham MX43
Best Practices: Sea Water Ice Machine

RV SAVANNAH:

Ice machine on aft deck makes ice from fresh or sea water

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Best PR Gimmick:

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Surge “Protective” Devices:

Most surge protects are designed for use ashore and will interrupt only the hot conductor.

A Delta wired circuit has two hot leads one at +/- 60 VAC, the other at +/- 60 VAC, simultaneously to provide the 120 VAC potential. Here lies the problem with inexpensive and older SPDs that only disconnect one "hot" terminal lead. The other "hot" terminal remains hot if the circuit breaker supplying the receptacle and SPD does not trip.

It should be noted that related issues (mismatches between Delta or WYE systems) have been reported with 120 VAC Uninterrupted Power Supplies purchased ashore and used onboard vessels. Such devices should be selected to match the power supply configuration.
Marine Safety Alert

Mustang Survival Inflatable PFD’s:

Certain Mustang Survival Inflatable PFDs with Hammar MA1 hydrostatic (HIT) inflation systems may not inflate and require a new re-arm kit to properly inflate by manual or automatic activation.

Naval Architects & Salvage Engineers
Marine Safety Alert

Confined Space Entry Dangers:

The Coast Guard strongly reminds all shipboard personnel and those associated with inspections, surveys or audits of vessels worldwide, that hazardous atmospheres are frequently present onboard vessels and pose a great risk to personal safety. Besides the use of a personal gas meter for immediate protection, all organizations should have policies and procedures in place that address accessing these areas and make available the appropriate safety equipment for personnel.

UNITED STATES COAST GUARD
U.S. Department of Homeland Security

MARINE SAFETY ALERT
Inspections and Compliance Directorate

CONFINED SPACE ENTRY DANGERS
Understanding Hazards

This Safety Alert serves as a reminder to Coast Guard personnel and the maritime community of the potential dangers of confined space entries. During two recent inspections, Coast Guard Inspectors’ gas meters alarmed, preventing a potential loss of life or serious injury.

In the first case, an inspector was on board a tank vessel to conduct a Port State Control Examination. In anticipation of the examination, the crew opened the hatch to the Freefall Lifeboat to let it air out. As the Inspector entered the lifeboat his gas meter alarmed and he quickly exited. Upon investigation, it was confirmed with ship’s equipment that Carbon Monoxide had collected in the lifeboat. Wind conditions had been blowing exhaust from the main stack into the lifeboat. Although not a confined space by OSHA or Coast Guard standards, the risks were the same.

In the second instance, while inspecting the #1 deep ballast tank on a deep draft container ship, an experienced marine inspector was going to climb through a box-like structure formed by floors and longitudinals in the #1 bay, just aft of the collision bulkhead. The “box” had only two lighting holes. Prior to entering the first lighting hole the inspector put his 4-gas meter through. It immediately alarmed for low O2. The inspector exited the ballast tank. While the ballast tank had been ventilated and was safe, the inspector failed to recognize that the “box” formed a confined space within a confined space and had not been cleared by the shipyard competent person.
Failure of Hand Portable Fire Extinguishers:

Investigators determined that the hose and discharge horn had been replaced at an earlier time. The end of the hose screws on to a diffuser on the side of the discharge valve/handle assembly of the extinguisher. The diffuser is a ported protrusion on the male end of a ninety degree fitting. On the side of the protrusion are orifices through which the CO₂ flows. The examination revealed that the spherical end of the protrusion, which contains no orifices, bottomed out against the orifice in the connection fitting that leads to the hose and horn assembly. The flow of CO₂ was thus completely blocked.
Entanglement Accidents:

According to U. S. Bureau of Labor statistics, in 2012 commercial fishing was the second most dangerous occupation in the country, with over 117 fatalities per 100,000 workers. This alert serves to remind commercial fishing vessel owners, operators, and crew members of the dangers associated with working around moving deck machinery, rigging, and equipment.

The Coast Guard strongly recommends that vessel owner/operators evaluate their vessels for the presence of moving, rotating, reciprocating or articulating machinery hazards, and implement documented common-sense policies, procedures, and safety measures:

- Never wear loose fitting clothing, jewelry or personal gear in the vicinity of such equipment.
- Keep long hair tied back to avoid entanglement.
- Install and maintain guards and protective equipment to prevent personnel contact.
- Post appropriate hazard signs.
- Never energize machinery unless certain that all personnel are well clear.
- Follow proper lock-out/tag-out procedures when working near or on such equipment, and ensure it has been verified that local or remote motor controls have been tagged-out or disabled and completely de-energized.
- Develop procedural safeguards that eliminate, as far as practicable, personnel’s need to be in proximity to hazardous machinery when in operation.
- Regularly conduct onboard safety training to emphasize safety procedures and the hazards of machinery, include deck and engine department, cargo equipment, and tools.
- Always be vigilant for new risks and dangers presented to your crews and passengers.

This alert is for informational purposes only and does not relieve any domestic or international safety, operational, or material requirement. Developed by the Fifth Coast Guard District, Portsmouth, VA. Questions may be addressed to LCDR Ken Morton, (757) 396-6264, or may be forwarded to safety@uscg.mil.
Recreational and Medicinal Marijuana Use Policies for Maritime Transportation Workers:

The U.S. Coast Guard is providing this notice to ensure that mariners, marine employers, Medical Reviewing Officers and the public are knowledgeable of the continuing prohibition of marijuana use by those serving in safety-sensitive positions in the maritime transportation industry.

It is important to note that marijuana remains a drug listed in Schedule I of the Controlled Substances Act. It remains unacceptable for any safety-sensitive employee serving in the maritime industry and subject to drug testing under the Department of Transportation’s drug testing regulations to use marijuana. The Department of Transportation’s Drug and Alcohol Testing Regulation – 49 CFR Part 40 – does not authorize the use of Schedule I drugs, including marijuana, for any reason.

As such, Medical Review Officers will not verify a drug test as negative based upon learning that the employee used “recreational marijuana” or “medicinal marijuana”. Furthermore, mariners/employees that hold a Merchant Marine Credential and fail a drug test due to recreational or medicinal marijuana usage, will be subject to administrative action against their credential in accordance with federal regulations.
Congratulations!
Best Grub, Cleanest Bilge &
Fastest MOB Recovery Winners
Congratulations!
Best Grub, Cleanest Bilge & Fastest MOB Recovery Winners

Hey ya'll!
Today we'll be cooking with butter.

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Questions?

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