

NATIONAL SCIENCE FOUNDATION SHIP INSPECTION PROGRAM



2024 RVOC MEETING



Naval Architecture
Marine Engineering
Marine Surveying
Salvage Engineering

NSF Ship Inspection Program: Purpose

The Ship Inspection Program constitutes both a “condition” and “assistance” survey to ensure overall safety and operational effectiveness in support of oceanographic research. The program objectives are to ensure that:

- The vessels are compliant with the University-National Oceanographic Laboratory System (UNOLS) *Research Vessel Safety Standards* (RVSS) and applicable regulatory requirements;
- The vessels are being properly maintained as a capital asset when compared with other similar vessels within the Academic Research Fleet based on a standardized NSF evaluation system;
- The vessels are capable of effectively conducting NSF-sponsored research cruises. In particular, that the scientific equipment and systems are both fully operational and state-of-the-art with those being utilized within the scientific community and industry; and
- The vessel operators are able to effectively pursue a continuous maintenance and improvement program.

The inspections also provide NSF with current information and documentation that assists in developing funding objectives for maintaining the vessels and the scientific equipment in a high degree of operational readiness to meet oceanographic research objectives.

NSF Ship Inspection Program: Purpose

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

An association of Institutions
for the coordination and support
of university oceanographic facilities

UNOLS Office
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543

UNOLS
12/5/73

URGENT

December 7, 1973

Memorandum to UNOLS Members

Subject: Ship Inspection Program

1. As you know, the NAVY/NSF Panel on Ship Operations, Conversion and Construction, has proposed that the ship inspection program be revitalized and expanded. The (draft) plan for this is enclosed.
2. This was carefully discussed by RVOC at its recent meeting and a position was set forth. The attached report was prepared as a UNOLS position on the SOCC plan. Will you please review this and advise me of any comments you can offer. The SOCC Panel has requested an early response.
3. A copy of this is being distributed to RVOC members so that they may be prepared to consult with you.


R. P. Dinsmore
Executive Secretary, UNOLS

RPD/lcc

Encl.

Attachment: RECOMMENDED STATEMENT OF PURPOSE FOR
ACADEMIC SHIP INSPECTION PROGRAM

The purpose of the Academic Ship Inspection Program is:

- (1) To assess the material condition of Federally owned and funded ships and equipment in order to protect the interests of the Federal Government.
- (2) To evaluate and update the condition and suitability of ships to meet their intended missions in order to provide Federal program managers, laboratory directors, and UNOLS with planning information for ship repairs, conversions, and replacements.
- (3) To assist operating institutions in the maintenance of ship and equipment through the expert consultation services afforded by the inspection personnel and processes.

Appendix A & B:

Training Week Comments

- Exclusions for small overboarding systems of a couple hundred pounds (hand tended perhaps)?
- Future plans to include high voltage considerations in the RVSS such as a ROV on the cable?
- Develop standardized forms such as running use log.
- Develop standard procedures such as maintaining the tension monitoring system within 3% tolerance limits.
- Clarify the 20 Hz time series data requirements and usage. The Appendix A requirement is to be “capable”, it does not state to do it, nor does it say what to do with the data or how long to keep it.
- Appendix A assist sheet has been updated to include synthetic tension members.
- Include an OHS summary in the OHS Manual that succinctly describes the system capabilities and limitations.

NSF Ship Inspection Program

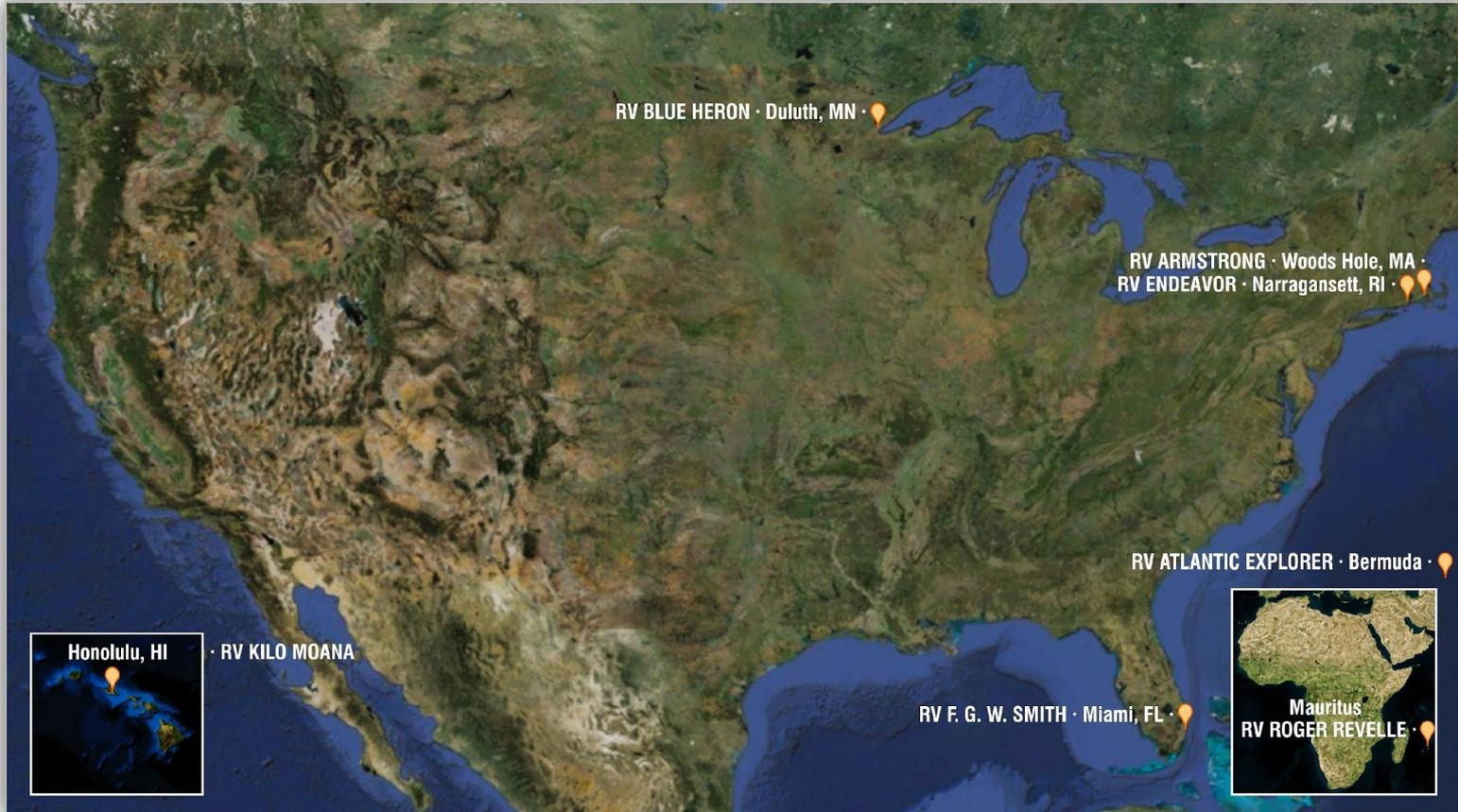


NSF Ship Inspection Program: Purpose

- Each institution has their own way of doing business, accomplishing the same goal with different models. But there's a wide disparity of vessel operations resources across the UNOLS membership.
- A key component of the NSF Ship Inspection Program is to facilitate communication between institutional groups and disseminate best practices and lessons learned throughout the community.
- Scientists benefit by uniformity within the ARF.



Recent Inspections Completed



Appendix A & B:

Most Common Findings

- **OHS Manuals - Only 1 vessel inspected in the past year had developed any OHS Manuals.**
- Extenuating Circumstances Plan (SOP). *Operators shall develop a procedure on how, and under what circumstances, the vessel will safely continue operations in the event the operating requirements are not met.*
- Procedures to maintain the tension monitoring system within 3% tolerance limits.
- Formal operator training and certification renewed annually so that each operator receives training on the winch, the overboarding apparatus, and the tension monitoring system.
- Visible and physical danger areas on the aft deck and overboarding areas to secure the areas during operation.
- An entry must be made in the official logbook prior to departure attesting that the ship's weight handling gear is in compliance with the applicable requirements.
- Keeping up to date with wire and cable lubrication per the Wire Pool Maintenance Policy.

Appendix A & B:

Most Common Findings

B.5.3 OHS OPERATOR'S MANUALS

An OHS Operator's Manual must be maintained for each OHS (except for those combining portable and fixed equipment). Each Operator's Manual must contain at a minimum:

- A detailed description of the OHS layout, including:
 - o The location of each major component.
 - o The orientation of each major component in each OHS configuration.
 - o The geometry of the tension member in each OHS configuration.
 - o The overall dimensions of each major component.
 - o The weight of major portable components.
 - o System particulars (i.e. operating order or considerations, not duplicating component manuals. Example: Turn on A-Frame HPU then Winch HPU, or operate equipment synchronized as described in A-Frame manual and Winch Manual).
- OHS test procedures.
- Procedural safety requirements.
- Operator training procedures.
- References to individual component manuals or data sheets as applicable.
- Routine maintenance procedures should be documented or referenced.

Appendix A & B:

Most Common Findings

OHS Operator's Manual

R/V Sally Ride CTD-11V OHS
Revision 12/21/2022



Section 0:

Operational Summary and Capability

The CTD-11V OHS onboard R/V Sally Ride is designed for towing and station-keeping operations.

The tension member used with this OHS:

Tension Member	Lowest FS	Safe Working Tension (SWT)	Nominal Breaking Load (NBL)	Typical Test Breaking Load (TBL)
.322" dia. cable	2.0	5,000 lbf	10,000 lbf	12,500 lbf

The capabilities of the OHS components:

Component	Design Line Tension (DLT)		Safe Working Tension (SWT)	
	Towing	Station Keeping	Towing	Station Keeping
Markey CAST-6-125 Winch ²	12,000 lbf	12,000 lbf	12,000 lbf	12,000 lbf
Smith Berger Model 222 Guide Sheave ³	16,000 lbf	16,000 lbf	16,000 lbf	16,000 lbf
Allied CTD-11V handling apparatus ^{4,5}	16,000 lbf (in a 30° cone)	16,000 lbf (in a 30° cone)	11,100 lbf (in a 30° cone)	11,100 lbf (in a 30° cone)

The overall capabilities of this OHS:

Safe Working Tension (SWT)	
Towing	Station Keeping
5,000 lbf	5,000 lbf

Best Practices: Lithium Batteries



Storage Considerations

- Climate control and ventilation.
- Structural fire protection surrounding the batteries.
- Fire detection and/or suppression capability.
- Storage container must be well secured but the ability to be removed from space is advantageous.

Charging

- Battery charging should be restricted to regularly occupied spaces or other spaces with continuous monitoring such as smoke detection.
- Devices and batteries should be removed from the charger once they are fully charged.
- When replacing batteries and chargers for an electronic device, ensure they are specifically designed and approved for use for that device.

Best Practices: Lithium Batteries

CG-CVC Policy Letter 20-03 CARRIAGE OF LITHIUM-ION BATTERIES ON SMALL PASSENGER VESSELS

Subj: CARRIAGE OF LITHIUM-ION BATTERIES ON
SMALL PASSENGER VESSELS

16711/Serial No. 768
CG-CVC Policy Letter 20-03
October 29, 2020

multiple chargers at the same time ("daisy chain" of power strips), water ingress into batteries, battery damage, or failure to follow manufacturer's instructions for charging or use.²

5. **POLICY.** OCMI and MIs should determine how portable Li-ion batteries are used on board a SPV and assess if the storage, charging, or use of these batteries creates potentially hazardous conditions. This policy is limited to small battery applications including portable batteries or battery powered equipment such as rechargeable batteries for diving equipment, cameras, cell phones, video and audio recording devices, lights, computers, portable radio communications (handheld VHF radios), electric scooters, skateboards and bicycles, and portable power tools.

This policy does not cover Li-ion battery installations used for propulsion or electrical power on commercial vessels. These installations must be approved by the Coast Guard Marine Safety Center as per [CG-ENG Policy Letter 02-19: Design Guidance for Lithium-ion Battery Installations Onboard Commercial Vessels](#).

- a. If Li-ion batteries are on board a SPV, MIs should assess the storage, charging and use, during the course of a routine inspection:
- (1) Storage.
 - (a) Li-ion batteries and devices should be securely stored in a dry and cool location away from combustible material.
 - (2) Charging.
 - (a) Battery charging should be restricted to regularly occupied spaces or other spaces with continuous monitoring such as smoke detection.
 - (b) Li-ion batteries should not be charged in paint lockers or hazardous areas.
 - (c) Charging stations should be single outlet use without linking or combining together multiple power strips or extension cords ("daisy chains").
 - (d) Prior to charging, batteries should be inspected for signs of damage, such as bulging/cracking, hissing, leaking, rising temperature, or smoking. Immediately remove a device or battery from service and place it in an area away from flammable materials if any of these signs are present.
 - (e) Lithium-powered devices and batteries should be removed from the charger once they are fully charged.
 - (3) Use and Maintenance.

² OSHA Safety and Health Information Bulletin (SHIB 06-20-2019) [Preventing Fire and/or Explosion Injury from Small and Wearable Lithium Battery Powered Devices](#)

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- (a) Li-ion batteries, chargers, and associated equipment should be tested in accordance with an appropriate test standard (e.g., UL 2054), rated for their intended use, and, where applicable, certified by a [Nationally Recognized Testing Laboratory \(NRTL\)](#).³
- (b) The vessel owner or operator should follow the manufacturer's instructions for use, storage, charging, and maintenance of Li-ion batteries.
- (c) Batteries should be purchased from the device's manufacturer or a manufacturer authorized reseller. When replacing batteries and chargers for an electronic device, ensure they are specifically designed and approved for use for that device.
- (d) Damaged Li-ion batteries and devices should be removed from service. Signs of damage include, but are not limited to: bulging, cracking, dents, punctures, heat, sound of gas venting, and/or smoking. If batteries are damaged, they should be immediately removed from service, placed in a fire resistant container (e.g. metal drum) with sand or other extinguishing agent, and disposed of in accordance with local, state, and federal regulations. A local battery recycling center should be contacted for disposal instructions.

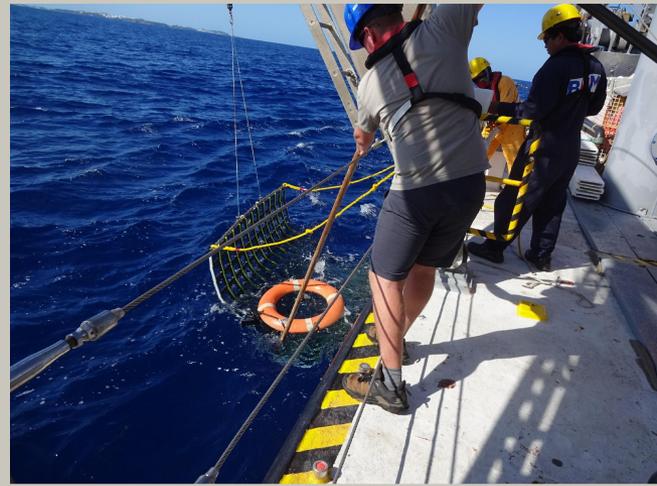
- b. The MI should verify that the crew understands how to extinguish small Li-ion battery fires, which may include purchasing, installing, and training the crew on the use of ABC dry chemical extinguishers, Class D fire extinguishers (for lithium-metal), or dirt or sand as a smothering agent based on the manufacturer's guidance. During the safety brief, it is recommended that passengers are advised of safe charging locations and any Li-ion battery restrictions on board. This may include procedures for passengers to immediately stow portable batteries upon embarkation in designated locations and for the crew to verify that batteries brought on board meet an applicable UL standard.
- c. If a MI witnesses an unsafe practice or improper installations on board, for example, "daisy chaining," charging in hazardous locations, use of damaged batteries, or use of burnt, frayed, or exposed wiring, the condition should be documented on a CG-835V using one of the following regulatory cites:

- (1) 46 CFR §§ 176.840/ 115.840 Additional test and inspections (Def Code: 99101),
- (2) 46 CFR §§ 176.830/ 115.830 Unsafe Practices (Def Code: 09298),
- (3) 46 CFR §§ 183.340/ 120.340 Cable and Wiring Requirements (Def Code: 02108),
- (4) 46 CFR §§ 176.806/ 115.806 Electrical (Def Code: 09209), or
- (5) 46 CFR §§ 177.405/ 116.405 Fire Hazards (Def Code: 07199).

Failure to mitigate or properly manage severe unsafe electrical or fire hazards may be grounds for issuance of a Code 30, detainable deficiency.

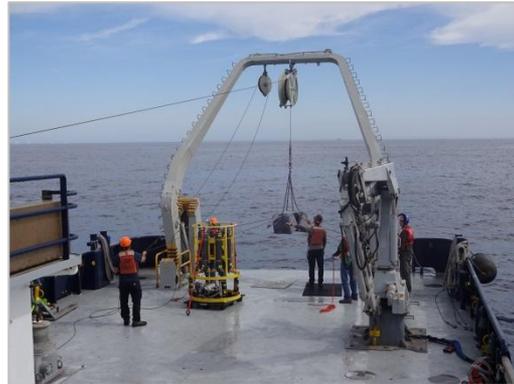
³ For a list of NRTLs, please go to: <https://www.osha.gov/dts/otpsa/nrtl/nrtl-list.html>

Congratulations - Best Grub, Cleanest Bilge, & Best MOB Drill Annual Awards



Summary

- A culture of safety at the deck plate level can only be achieved if it is clear that safety is a priority and commitment at the funding agency level.
- The NSF Ship Inspection program is one of many elements that have contributed to an outstanding record of safety and operational readiness across the ARF.



Questions?



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