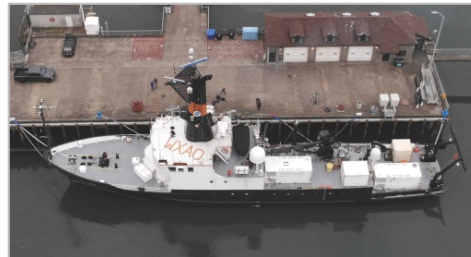
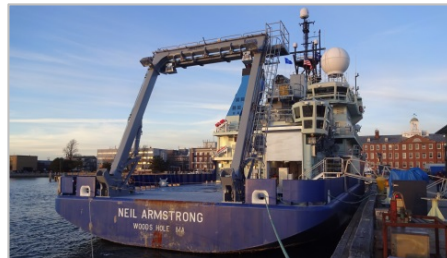


NATIONAL SCIENCE FOUNDATION SHIP INSPECTION PROGRAM



2020 UNOLS COUNCIL MEETING



Naval Architecture
Marine Engineering
Marine Surveying
Salvage Engineering

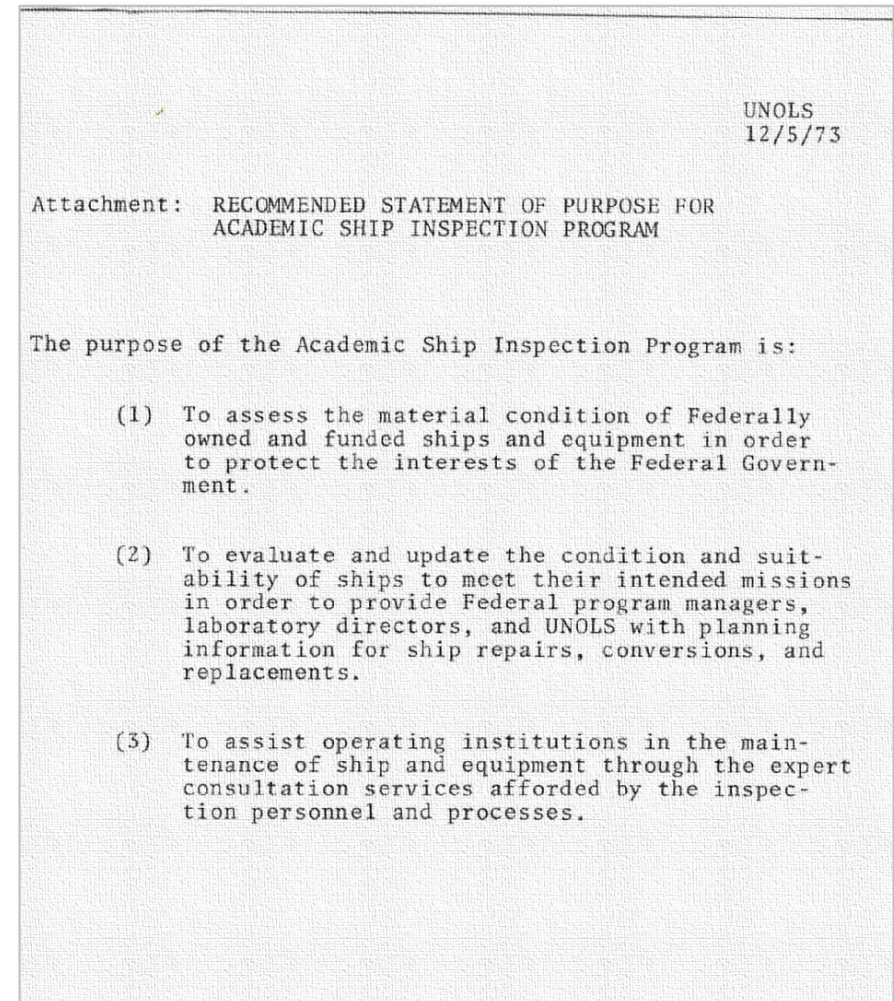
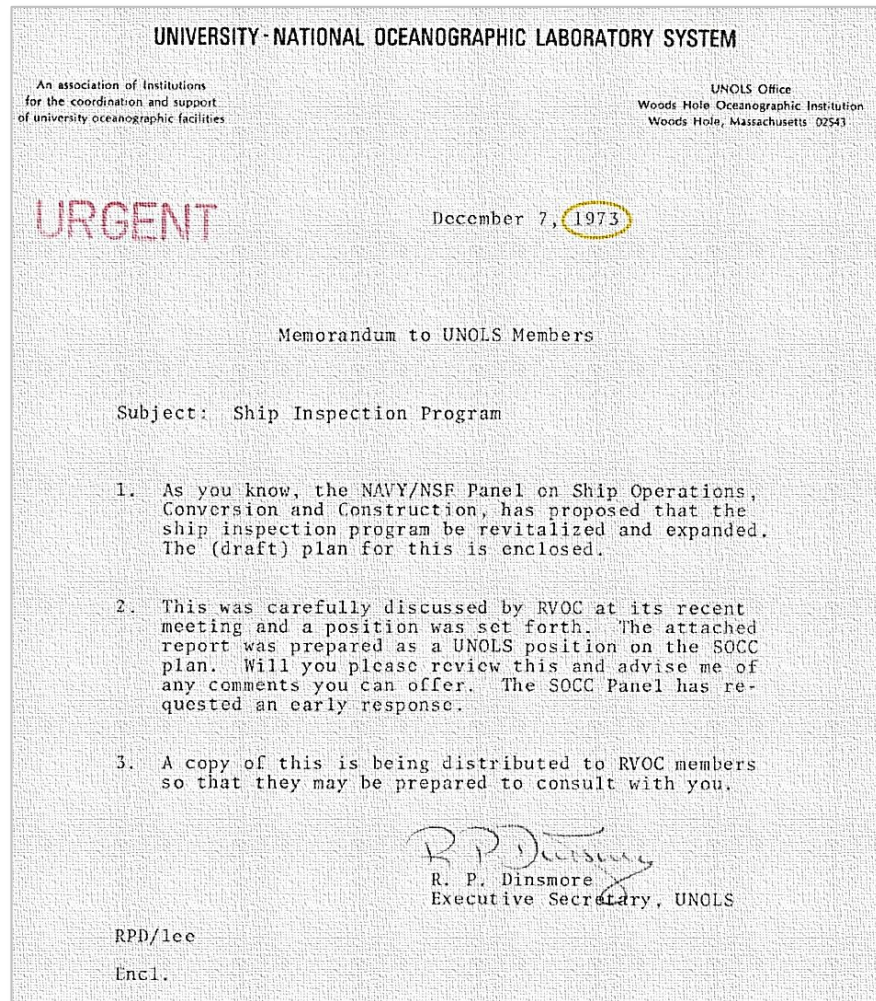
NSF Ship Inspection Program: Purpose

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



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 fleet.

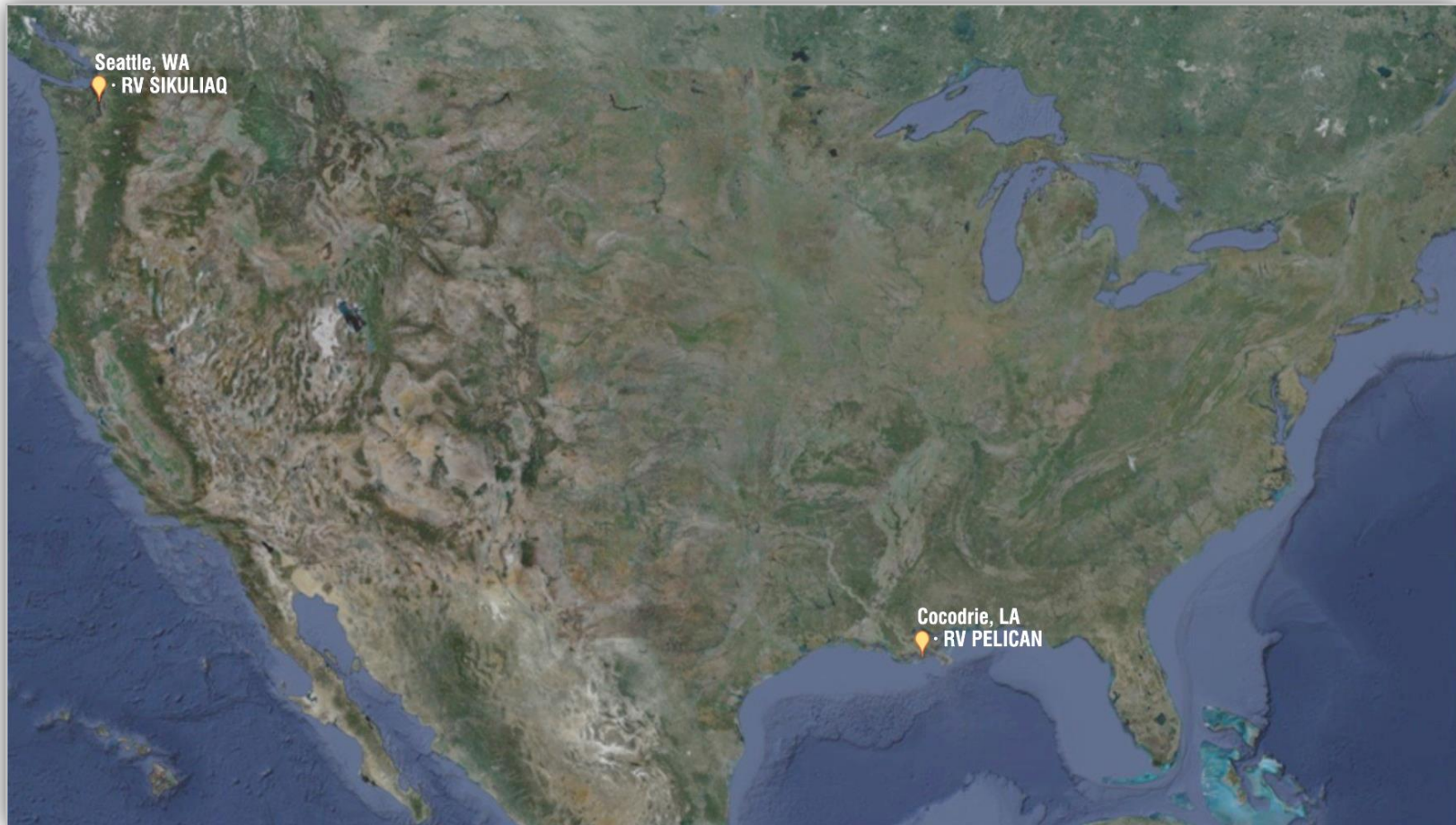


JMS Background

- Over 180 ship inspections conducted for NSF since 1997.
- 3-person team comprised of naval architects and marine engineers with sea-going backgrounds.
- In addition to NSF, research vessel customers include NOAA, USGS, EPA, other UNOLS members and international research vessel operators.
- Additionally, JMS brings a perspective of commercial workboat operators.



Inspections Completed in 2020

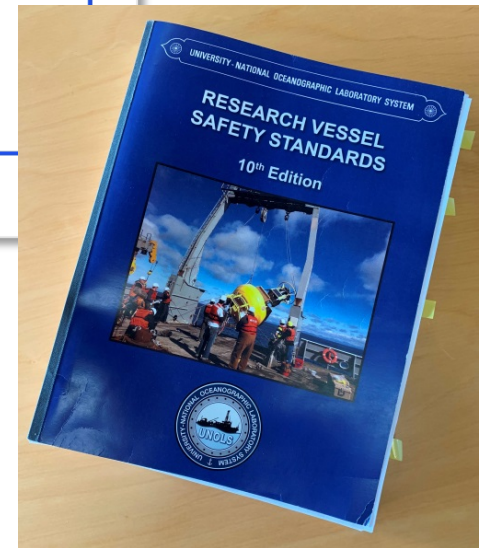
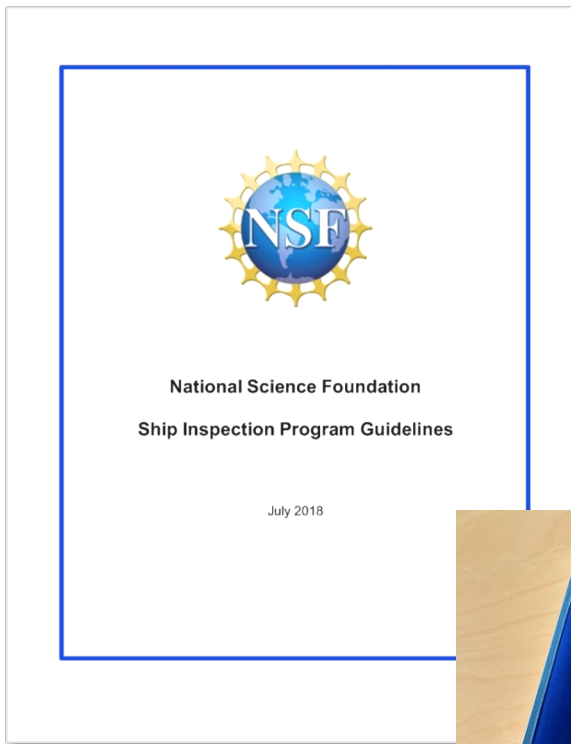


Inspections Due in 2021



NSF Ship Inspection Program: Scope

Inspections are conducted on a two year cycle on all NSF and institutionally owned vessels in the Academic Research Fleet (ARF). Navy-owned vessels are inspected in cooperation with INSURV. The inspection includes the ship's hull, tanks, decks, propulsion machinery, auxiliary and electrical systems, navigation and communication equipment, habitability, pollution control, safety and a comprehensive assessment of the scientific instrumentation, handling systems and workspaces. The inspection includes a dockside and at sea component to exercise all ship systems, scientific capabilities and emergency procedures including crew training.



NSF Ship Inspection Program: Ship Preparation

2. SHIP PREPARATION

General

This section provides information on the material and documentation required by the Inspection Team either before or during the inspection.

Documents

The following information or documents will be provided to the Inspection Team at least **ten working days prior to the inspection** via electronic mail or electronic media storage device:

1. A complete and up-to-date NSF Ship Condition Form (SCF)
2. Up-dated response from the last NSF inspection
3. A list of any outstanding ABS or USCG inspection discrepancies
4. A list of any major vessel or science equipment that is expected to be out of commission or otherwise unavailable during the inspection.
5. Internet address of the vessel's Cruise Planning Manual in the SCF
6. List of names and titles of institutional shore side personnel and senior crew/techs attending the inspection
7. Recently completed crew and technician training and certifications as well as projections for in the next twelve months
8. USCG or ABS Stability Letter
9. Load Line Certificate
10. Tonnage Certificate(s)
11. USCG Letter of Designation as Oceanographic Research Vessel (if applicable)
12. USCG Certificate of Inspection (if applicable)
13. Most recent ABS Survey Report
14. Ship's One-Line Electrical Drawing (if available electronically)
15. Hydraulic One-Line Drawing (if available electronically)
16. Ship's General Arrangement Drawing (if available electronically)
17. Ship's Tank Arrangement Drawing (if available electronically)
18. Fire & Safety Plan (if available electronically)
19. All Post Cruises Assessment Reports (PCAR) since the previous inspection
20. Tank Inspection Plan
21. List of each winch/wire and frame/boom/LARS configuration with the oceanographic equipment or weight available for deployment during the inspection
22. Lists of cooperative or shared-use equipment and procedures for requesting their use
23. Most recent radioisotope contamination report (SWAB test)
24. Summary of work completed during the last shipyard period
25. Last audiotape report and up-to-date shell expansion plan

The following documents should be available throughout the inspection:

1. Stability booklet and electronic stability program as applicable.
2. Booklet of general plans
3. Life raft inspection documents
4. Fire extinguisher and suppression systems inspection reports
5. Last USCG Survey Reports (as applicable)
6. Last ABS Survey Reports (as applicable)
7. STCW records
8. FCC Station License (ship and office)
9. Owner's Certificate
10. Last ABS dry dock report (if applicable)
11. Electrical Circuits Megger Report
12. Lube Oil and Fuel Oil Analysis Reports

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13. Shipboard Oil Pollution Plan and Non-Tank Vessel Response Plan
14. Garbage Management Plan and record book
15. Ballast Water Management Plan and records
16. Maintenance Plan and records, including Computerized Maintenance and Management System (CMMS) and minimum available spares inventory
17. Emergency Procedures Manual
18. ISM policy, procedures, and records (as applicable)
19. Operating manuals for all ship and science support equipment and instrumentation
9. OHS tension member logs showing maximum tension per cast in accordance with RVSS Appendix A

For underway tests, the following equipment should be available:

1. Trawl/Core winch; with bottom trawl, dredge, corer, grab, or weight (~25% of wire SWL)
2. Hydrographic winch; weight (~25% of wire SWL)
3. CTD winch; CTD with rosette with bottles and sensors. If a CTD is not available, provide weight (~25% of cable SWL)

Science Equipment

The following documents should be available on board for use by the Science Support Equipment Surveyor:

1. Specifications and drawings for winches, cranes and handlings systems, including all documents demonstrating compliance with RVSS Appendix A and 46 CFR 189.35
2. Winch and wire records:
 - Winch, crane and handling system maintenance records
 - Crane and handling system load test records
 - Published wire and cable Safe Working Loads
 - Wire and cable running use logs
 - Wire and cable inventory logs
3. Sensor and instrumentation calibration records
4. Hazardous Material Log and related Material Safety Data Sheets (MSDS)
5. Scientific diving manual (as applicable)
6. Copies of the most recent crane and frame SWL testing records
7. Records of annually updated OHS training showing compliance with RVSS Appendix A for OHS systems where tension members are operating below a factor of safety of 5.0. Formal training showing each operator receives training on the winch, the overboarding apparatus, and the tension monitoring system
8. OHS tension monitoring system records showing compliance with RVSS Appendix A for maintaining the tension monitoring system within 4%/3% tolerance limits for OHS systems where tension members are operating below a factor of safety of 5.0

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Safety and Operations

Pier side:

- Review of stability documentation.
- Inspection of safety equipment condition and maintenance procedures.
- Inspection of habitability spaces.
- Review of medical resources.

Underway:

- Review Safety Briefing and underway checklists and procedures.
- Demonstrate operation of navigation equipment.
- Demonstrate operation of communications systems.
- Conduct fire and man overboard drills.
- Demonstration of anchor handling gear.



Engineering Systems

Pier side:

- Review the material condition, operating procedures and maintenance records for all main propulsion, electrical and auxiliary machinery.
- Inspect the watertight integrity and condition of available tanks, voids and machinery spaces.
- Verify operation of overspeeds, audible and visual alarms, remote shutdowns and machinery monitoring systems.



Underway:

- Conduct full power run and vessel maneuvering trials.
- Airborne noise measurements are taken during full power run in manned spaces including the bridge, staterooms, labs, machinery spaces, and working decks.



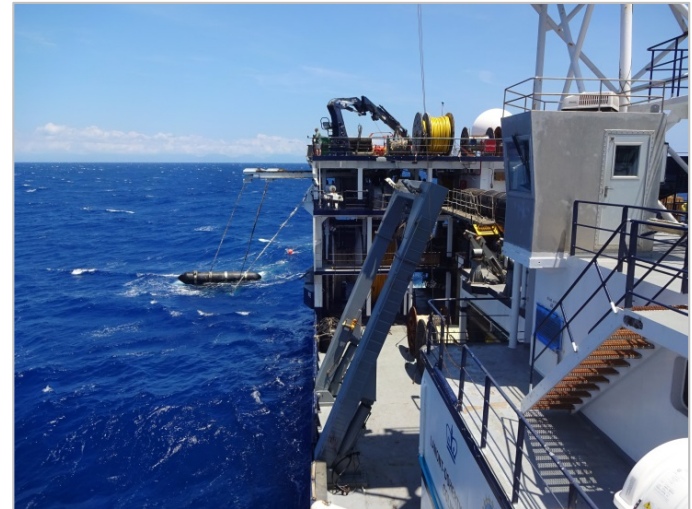
Oceanographic Systems

- Review the material condition and operating procedures for all installed and portable oceanographic equipment available to support science investigators.
- Inspect laboratory material condition and outfitting.
- Observe operation of shipboard instrumentation and review associated documentation and calibration records.
- Review post cruise assessments and corrective actions taken with crew and marine tech teams.
- Review shore side facility including storage, winch pool and van pool as applicable.



Oceanographic Systems, cont'd

- Several deployments and recoveries with each winch and overboard handling apparatus are conducted in as deep water as practicable.
- Deck cranes used for overboarding or small boat launching are exercised for at-sea performance.
- Installed science echo sounders (3.5 kHz, 12kHz, multibeam systems, etc.) and Acoustic Doppler Current Profilers (ADCP's) are operated while underway.
- Science seawater systems (clean and flow-through) are operated.
- Meteorological system is operated.
- Data acquisition systems (surface mapping, meteorological, underwater radiated noise monitoring, etc.) are operated continuously while underway.

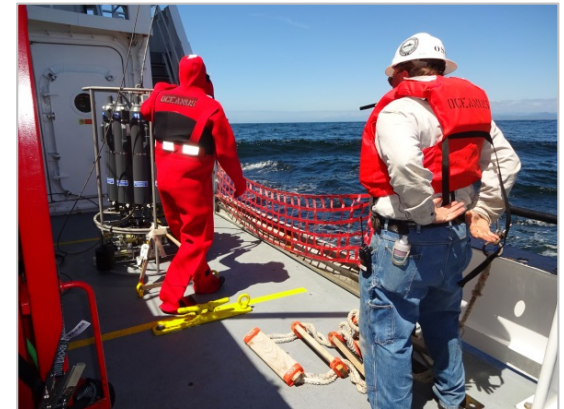
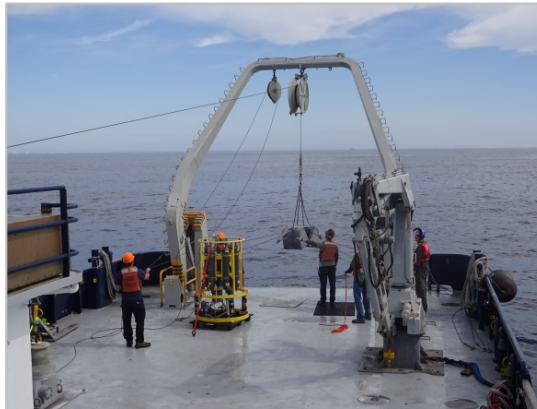


Best Part of the Inspection Program - Best Grub, Cleanest Bilge, & Best MOB Drill Annual Awards



In 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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