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NATIONAL SCIENCE FOUNDATION SHIP INSPECTION PROGRAM

2011 RVOC MEETING

SAN DIEGO, CA

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.

Preinspection Information

- Electronic Format
- PCA *since last inspection*
- Appendix A Worksheet
- Shipyard Reports
- NSF Ship Condition Form – new format!

Common Findings

- Appendix A
- Appendix B
- Labs
  - Lighting, safety information
- Vans
  - Egress/Safety Equipment
  - Lashing Arrangement
- Human Factors
- Hydraulic Hoses
  - Tags, Standards, Replacement Schedules

Common Findings

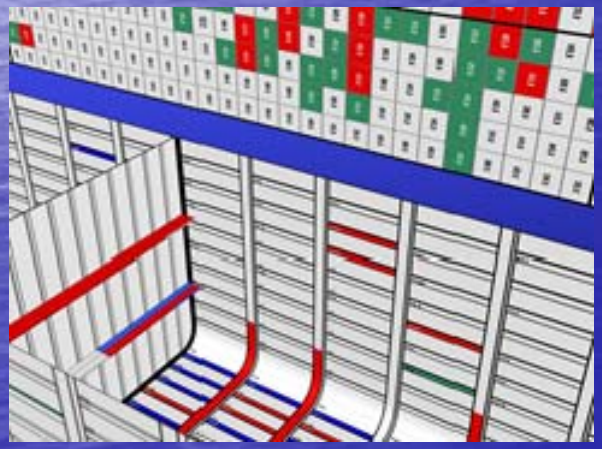
- Emergency Procedures and Drills
- Crew Endurance Management
  - The ability to maintain performance within safety limits while enduring job-related physical, psychological and environmental challenges
  - http://www.uscg.mil/hq/cg5/cg5211/cems.asp
- Maintenance and Inspection
  - Policy, inventory of equipment, designated responsible person(s), qualifications of personnel conducting maintenance, schedule of maintenance, specific inspection and maintenance procedures, logs and records of inspection and maintenance, and procedures for identifying, tracking and correcting deficiencies

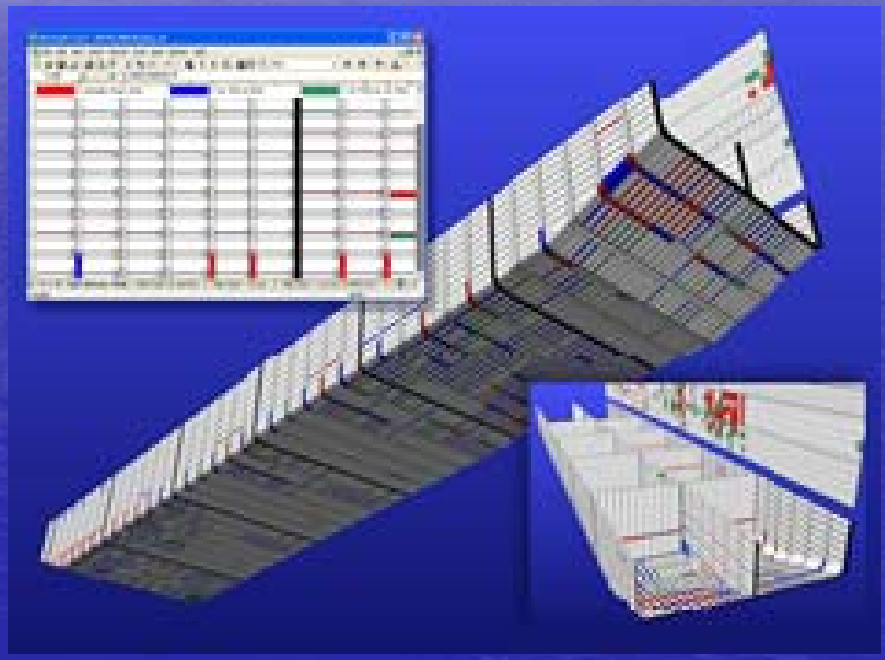
Common Findings

- EPA Vessel General Permit
  - http://www.uscg.mil/hq/cg5/cg522/cg5224/vgp.asp
  - http://cfpub.epa.gov/npdes/home.cfm?program_id=350
- Use of Plastic (PVC) Pipe
  - MTN 01-10
- Shipyard Reports
  - Preinspection Copy
  - Records of clearances, NDT, etc
- Accuracy of Stability Programs

Common Findings

- NDT Reports and Accurate Shell Expansion Plans to Document Readings and Plate Renewal





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Common Findings

- Training
  - Training in the use of Stability Program
  - Medical PIC
  - Advanced Firefighting
  - Winch and Crane Operators
- Electronics
  - Back up sources of power for critical equipment
  - One-Line Diagram
  - DC Distribution Panels

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 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.

Best Practices: Workboat Davit

The vessel has a dedicated davit for the workboat similar to SOLAS rescue boat davits. Most UNOLS vessels store their work boat on the port side of the vessel and use a starboard side or centerline crane to launch and recover it. This requires several people with tag lines passing the vessel across multiple decks and around many obstructions including the stack, vans, railings, etc. A dedicated davit allows for a faster and safer deployment by fewer crew members. It also allows the work boat to be deployed over the port side while the vessel is moored starboard side to.

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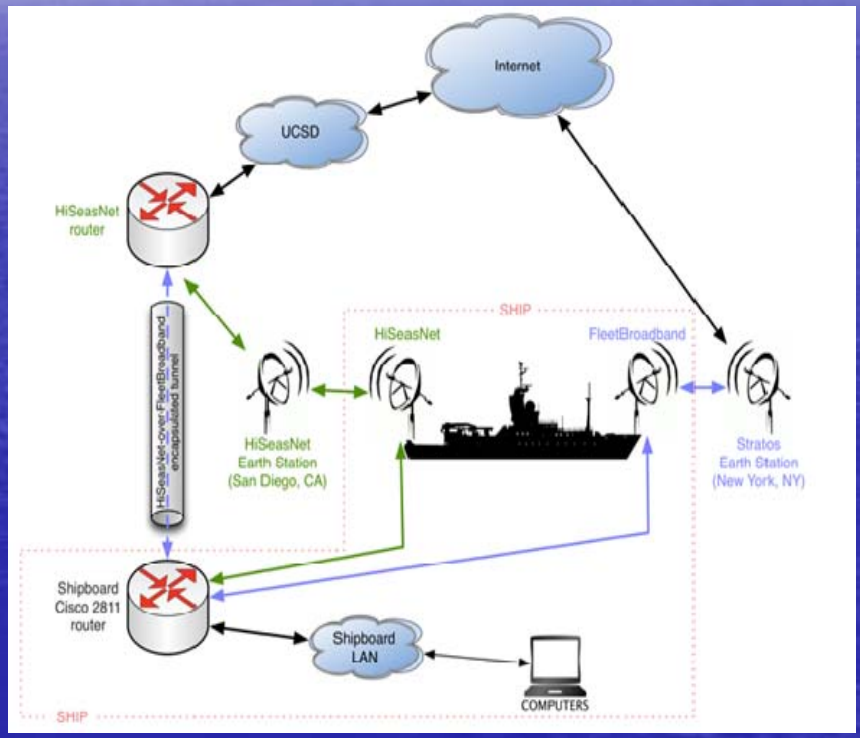
Best Practices: Internet Connectivity

The R/V NEW HORIZON has both HiSeasNet and FleetBroadband capabilities. The Tech group has designed and installed a router system which transitions seamlessly between the two services in the event a connection is lost. The switching between HiSeasNet and FleetBroadband is unnoticed by the user. The R/V SPROUL has a similar router system that provides seamless transition between the vessel's FleetBroadband and cellular modem.



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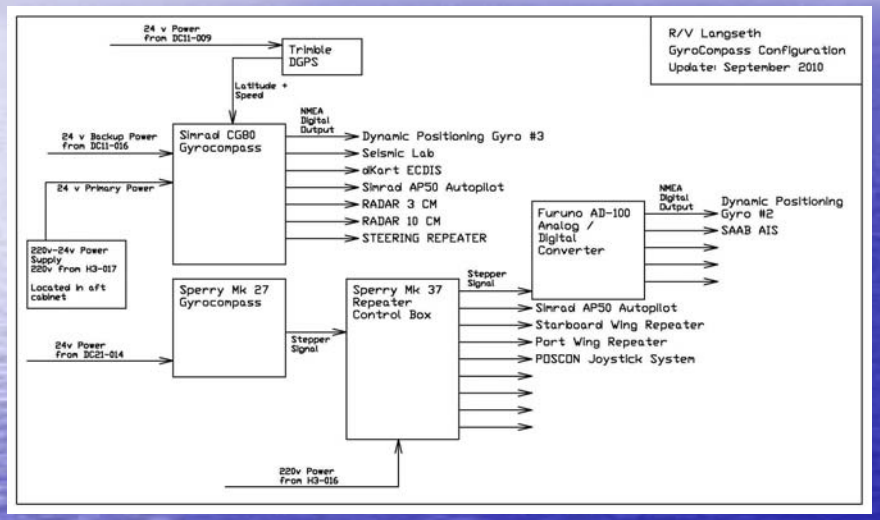
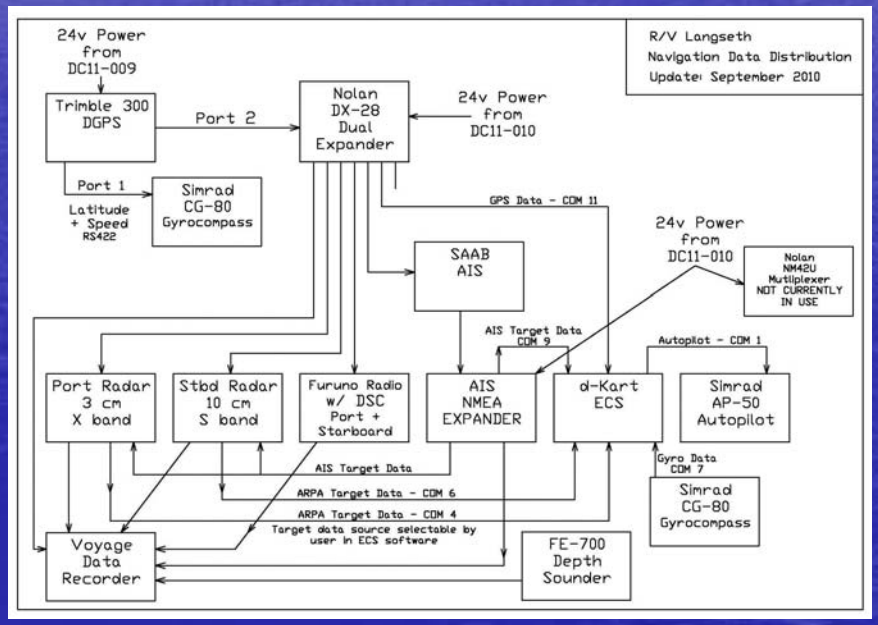
Best Practices: System Diagrams





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Best Practices: Winch Monitoring

Both the R/V NEW HORIZON and R/V SPROUL have a lab view based Data Acquisition System that is interfaced with the newly installed LCI 90i winch monitoring system. The data acquisition system receives and logs data directly from the LCI 90i and displays tension, payout, line speed, and provides a line tension trending graph to capture maximum and minimum tensions. This data can be accessed in real time from any computer terminal on the data acquisition system. The R/V NEW HORIZON has a computer terminal inside the winch control station that can be used in conjunction with the LCI 90i display screen.

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Best Practices: 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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Best Practices: 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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Best Practices: Shipyard Summary

The WECOMA's documentation and records of the most recent shipyard period is exemplary. A binder is organized to contain a complete detailed specification, all relevant correspondence with the shipyard and vendors, all pricing information, record and reports of all tests and measurements, a narrative summary of what was accomplished and lessons learned.

Best Practices: Deep Fat Fryer

The aft generator (3406 CAT) on the R/V CAPE HATTERAS is capable of running on used cooking oil. The used cooking oil is held in an empty/unused tank (~400 gallon capacity) located in the engine room port side aft. The oil is filtered (10 micron) before being transferred into the holding tank and then again via the fixed generator fuel oil filter. The generator is started and warmed up on diesel fuel. The used cooking oil is heated via generator jacket water heat exchanger to ~180 degrees before being delivered to the engine. A three way valve arrangement is used to switch from diesel fuel to used cooking oil. Prior to shutdown, the engine is switched back to diesel fuel to prevent the "trumpeting" of the fuel oil injector nozzles and fouling of the supply lines.

The generator was modified April of 2008. Approximately 300 gallons of used cooking oil have run through the generator's engine, providing ~4 days of power. The cooking oil was used only while the vessel was at the dock. The R/V CAPE HATTERAS found that the logistics and supply consistency were the biggest challenge of the operation. The HATTERAS crew continues to gather (small scale) used cooking oil.

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Questions?

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