



Naval Architects & Salvage Engineers

**NATIONAL SCIENCE FOUNDATION
SHIP INSPECTION PROGRAM**



**2013 RVOC MEETING
Ted Colburn**

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.



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Completed Since Last RVTEC



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Upcoming: Red Dots



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RVSS Appendix A Compliance:

Appendix A Assist Summary for Each Wire or Cable

Appendix A Assist Summary for Each Wire or Cable (updated 3_14_2012 JMS/rwc)						
Requirement or Attribute	Select Applicable Column FS					Comments
	FS of 3.0 or higher	FS from 2.5 to 4.99	FS from 2.0 to 2.49	FS from 1.5 to 1.99	FS=	
Note: This is not all inclusive. See Appendix A Rev 1 for requirements.						
Fuel Cable/Wire SRL 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	Applies				Y/N	
May be calculated as "g" factor at least 1.75 or from Tensionometer						
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 30 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 2% accuracy			Applies	Applies	Y/N	
					Y/N	
Alarms						
Audible and visual tension alarms while logging	Applies					
Alarm at +ABL (2.0)			Applies		Y/N	
Audible and visual tension alarms while logging						
Alarm at -ABL (2.2)				Applies	Y/N	
Audible and visual tension alarms while logging						
Alarm at +ABL (1.7)	Applies	Applies	Applies		Y/N	
Alarm conditions automatically logged						
Sheaves and Fairlead Rollers						
Sheaves & Rollers: As large as practical	Applies				Y/N	
Sheaves & Rollers: Dia ratio meet 40:1 or 4000:1 whichever is greater		Applies	Applies	Applies	Y/N	
Sheaves: Grooves as close to 0 as possible and no more than 1 full groove diameter per 100% of C.T.	Applies				Y/N	
(Groove size relative to nominal diameter of wire rope: 3/16" to 1/4" 2% 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 access secured			Applies	Applies	Y/N	
Testing						
Tension testing up to SRL load every 2 years	Applies				Y/N	
Break testing not req'd at FS=5.0						
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 yr			Applies	Applies	Y/N	
Break Testing every 6 mo. if 10% decrease in ABL or cutback			Applies	Applies	Y/N	
Logbooks: UNOS 3 wire identifier, Cable Inventory/History and Running Log						
Logs stay with the wire 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	
Maximum load for each cast by calculation or monitoring (not payout)	Applies	Applies	Applies	Applies	Y/N	
Winch Operator						
Operator deemed competent in writing by master and owner	Applies				Y/N	
Operator "Certified Competent" in writing by master and owner renewed annually	Applies	Applies	Applies	Applies	Y/N	
Master verify qualifications and designate approved operators	Applies	Applies	Applies	Applies	Y/N	
Training record for formal operator training program for winch, handling apparatus, and monitoring system	Applies	Applies	Applies	Applies	Y/N	



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Common Findings: Maintaining Accuracy

Need procedure for periodically verifying accuracy.

Requirement or Attribute	Select Applicable Column FS			
	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
Tension Monitoring				
Tension measuring system maintained with 4% accuracy		Applies		
Tension measuring system maintained with 3% accuracy			Applies	Applies



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Common Findings: Sheave and Fairlead Roller Diameter

Older Levelwinds limit FS to 5.0

Requirement or Attribute	Select Applicable Column FS			
	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
Sheaves and Fairlead Rollers				
Sheaves & Rollers: As large as practical	Applies			
Sheaves & Rollers: D/d ratio meet 40:1 or 400d1 whichever is greater		Applies	Applies	Applies
Sheaves: Groves as close to d as possible and no more than 1.5d		Applies		
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



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Common Findings: Log Maximum Load for Each Cast

Log maximum load for each cast. Applies to all factors of safety

Requirement or Attribute	Select Applicable Column FS			
	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
Logbooks: UNOLS wire identifier: Cable Inventory/History and Running Use				
Maximum load for each cast by calculation or monitoring.	Applies	Applies	Applies	Applies

Consider also logging payout per cast and payout at maximum load

Consider reference to drum end of tension member



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Maximum Tension Per Cast

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

ATLANTIC EXPLORER



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RVSS Appendix B Compliance:

System level

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

Appendix B Assist Sheet for Overboard Handling Systems (updated 2_9_2013 JMS/wec)			
This assist sheet is to access progress toward compliance with RVSS Appendix B by the compliance date of 7/15/2014			
Page 1 System Level			
Overboard Handling System Operator's Manual	Reference	Y or N or NA	Comment
For each Overboard Handling System (OHS) Configuration	B.3.1		
System Title/Description		Y / N / NA	
System Illustration or photograph (more detail required in OHDD)		Y / N / NA	
List of Components with identifying Model & Serial #s		Y / N / NA	
System Overboard Handling System Data Document (OHDD)	B.7.3	Y / N / NA	
System Maximum Capability Document including system Maximum Permissible Tension (MPT)	B.0.6	Y / N / NA	
Operational Limit Document (Top Level Check of Assigned Breaking Load* (ABL) to System MPT).	Attachment A2 Attachment A5	Y / N / NA	
OHS Testing procedures	B.6 Attachment A5	Y / N / NA	
OHS Test Logs	B.6 Attachment A5	Y / N / NA	
OHS Training and Operator Qualification Requirements	Attachment A5	Y / N / NA	
OHS Inspection Procedures	B.2.16 & B.6 Attachment A5	Y / N / NA	
OHS Operational and Safety Precautions	B.3.& B.7.2 Attachment A5	Y / N / NA	
OHS Emergency procedures	B.3.7 Attachment A5	Y / N / NA	
Flow Chart with path highlighted and annotated where applicable	Attachment A2	Y / N / NA	

* Attachment A2 shows assigned breaking load (ABL) which is likely lower than NBL. Consider the greater of NBL or Tested Breaking Load (TBL).

Suggestions: Please contact Ted@JMSnet.com



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Testing in
towing
position



Assisting Progress toward compliance with RVSS Appendix B Component Level

Appendix B Assist Sheet for Overboard Handling Systems (updated 2_9_2013 JMS/wec)			
This assist sheet is to access progress toward compliance with RVSS Appendix B by the compliance date of 7/15/2014			
Page 2 Component & Sub-System Level			
For each Overboard Handling System (OHS) Component in the OHS System Configuration Component MCD Booklet for each component used including:	Reference	Y / N / NA	
Component Maximum Capability Document (MCD) including:	B.5	Y / N / NA	
(1) Component Maximum Permissible Tension (MPT)	B.5	Y / N / NA	
(2) Component proof or analysis of the MPT, or Manufacturer's Certification	B.3 & B.4	Y / N / NA	
(3) Applicable Geometry	B.05 & B.5 & B.06	Y / N / NA	
(4) Component OHDD	B.3.7	Y / N / NA	
Additional contents as applicable			
(5) Footprint and bolt pattern	B.5 Attachment A5	Y / N / NA	
(6) Attachment loadings	B.5 & B.6 Attachment A5	Y / N / NA	
(7) Ship system interface requirements such as electrical power, hydraulics, data transfer	Attachment A5	Y / N / NA	
(8) Testing procedures	B.6.1 Attachment A5	Y / N / NA	
(9) Test Logs	B.6 Attachment A5	Y / N / NA	
(10) Component weight	B.7.2 Attachment A5	Y / N / NA	
(11) Overall dimensions	Attachment A5	Y / N / NA	
(12) Equipment Operator's Manual	B.5 & B.10.1 Attachment A5	Y / N / NA	
(13) Training and operator qualification requirements	B.0.5 Attachment A5	Y / N / NA	
(14) Inspection procedures	B.6 Attachment A5	Y / N / NA	
(15) Preventative maintenance	B.0.5 Attachment A5	Y / N / NA	
(16) Operational and Safety precautions	B.6 Attachment A5	Y / N / NA	
(17) Emergency procedures	Attachment A5	Y / N / NA	
(18) For portable components additionally:	B.3.2 & B.6.3 Attachment A5		
Sub-component inventory list		Y / N / NA	
Delivery check-off list		Y / N / NA	
Installation instructions		Y / N / NA	

Suggestions: Please contact Ted@JMSnet.com

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.



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Common Findings: Science Safety

More than just a preunderway safety brief is needed!

- Welcome aboard
- Shipboard policies
 - Sexual harassment, drug & alcohol, environmental, etc.
- General safety training information
 - RVOC Safety Training Manual & video
- Ship specific safety items
 - Use ship photos, PowerPoint or videos
- Reinforce in the Cruise Planning Manual, ship's web site, in labs and in staterooms



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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.



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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.



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Maximum Permissible Tension

Clear indication of SWL expressed in terms of MPT.



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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



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Revelle: Spare transducer Connect Box



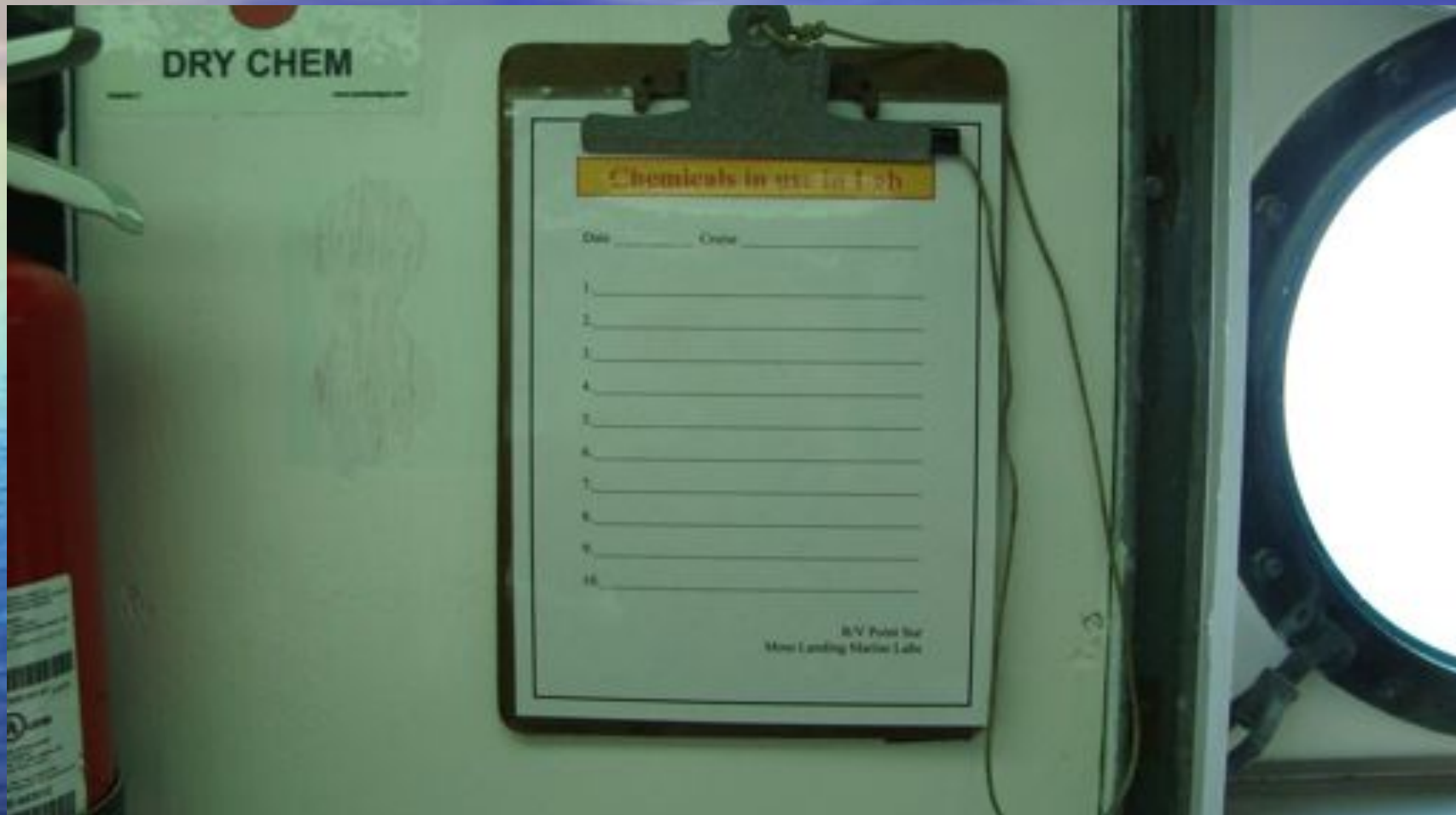
Point Sur: Brake Label



Revelle: Chemical Locker



Point Sur: Chemical Use in Lab



Sharp: Freezer Usage Label

R/V HUGH R. SHARP

USAGE LOG 2012

SEA WATER & NONTOXIC REAGENTS

LIP, RIGHT REFRIGERATOR/FREEZER DRY LAB

CAUTION FLAMMABLE and/or COMBUSTIBLE LIQUIDS PROHIBITED

NO FOOD or DRINK

Cruise Number	Chief Scientist	Dates	Contents
120909	J. Johnson	2-20-12	Water
120909	J. Johnson	2-21-12	Water
120909	J. Johnson	2-22-12	Water
120909	J. Johnson	2-23-12	Water
120909	J. Johnson	2-24-12	Water
120909	J. Johnson	2-25-12	Water
120909	J. Johnson	2-26-12	Water
120909	J. Johnson	2-27-12	Water
120909	J. Johnson	2-28-12	Water
120909	J. Johnson	2-29-12	Water
120909	J. Johnson	2-30-12	Water
120909	J. Johnson	3-1-12	Water
120909	J. Johnson	3-2-12	Water
120909	J. Johnson	3-3-12	Water
120909	J. Johnson	3-4-12	Water
120909	J. Johnson	3-5-12	Water
120909	J. Johnson	3-6-12	Water
120909	J. Johnson	3-7-12	Water
120909	J. Johnson	3-8-12	Water
120909	J. Johnson	3-9-12	Water
120909	J. Johnson	3-10-12	Water
120909	J. Johnson	3-11-12	Water
120909	J. Johnson	3-12-12	Water
120909	J. Johnson	3-13-12	Water
120909	J. Johnson	3-14-12	Water
120909	J. Johnson	3-15-12	Water
120909	J. Johnson	3-16-12	Water
120909	J. Johnson	3-17-12	Water
120909	J. Johnson	3-18-12	Water
120909	J. Johnson	3-19-12	Water
120909	J. Johnson	3-20-12	Water
120909	J. Johnson	3-21-12	Water
120909	J. Johnson	3-22-12	Water
120909	J. Johnson	3-23-12	Water
120909	J. Johnson	3-24-12	Water
120909	J. Johnson	3-25-12	Water
120909	J. Johnson	3-26-12	Water
120909	J. Johnson	3-27-12	Water
120909	J. Johnson	3-28-12	Water
120909	J. Johnson	3-29-12	Water
120909	J. Johnson	3-30-12	Water
120909	J. Johnson	3-31-12	Water

Sharp: Separate Chemical Storage Lockers - Base



Sharp: Separate Chemical Storage Lockers - Acid



Revelle: Eye Wash



Revelle: Emergency Shower



Langseth: Hydraulic Systems Emergency Stops



Point Sur: LED Lab Lights



Point Sur: Dimmers for LED Lab Lights



Waters of the United States/Annex V of the MARPOL TREATY IS SO
International Law for a cleaner, safer marine environment. Violation of these
requirements may result in civil penalty up to \$25,000, fine and imprisonment.

U.S. Lakes, Rivers, Bays, Sounds and 3 miles from shore	3 to 12 miles ILLEGAL TO DUMP Plastic Dunnage, Spill	12 to 25 miles ILLEGAL TO DUMP Plastic	Outside 25 miles ILLEGAL TO DUMP
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Point Sur: Stateroom LED Light



Blue Heron: Load Limits



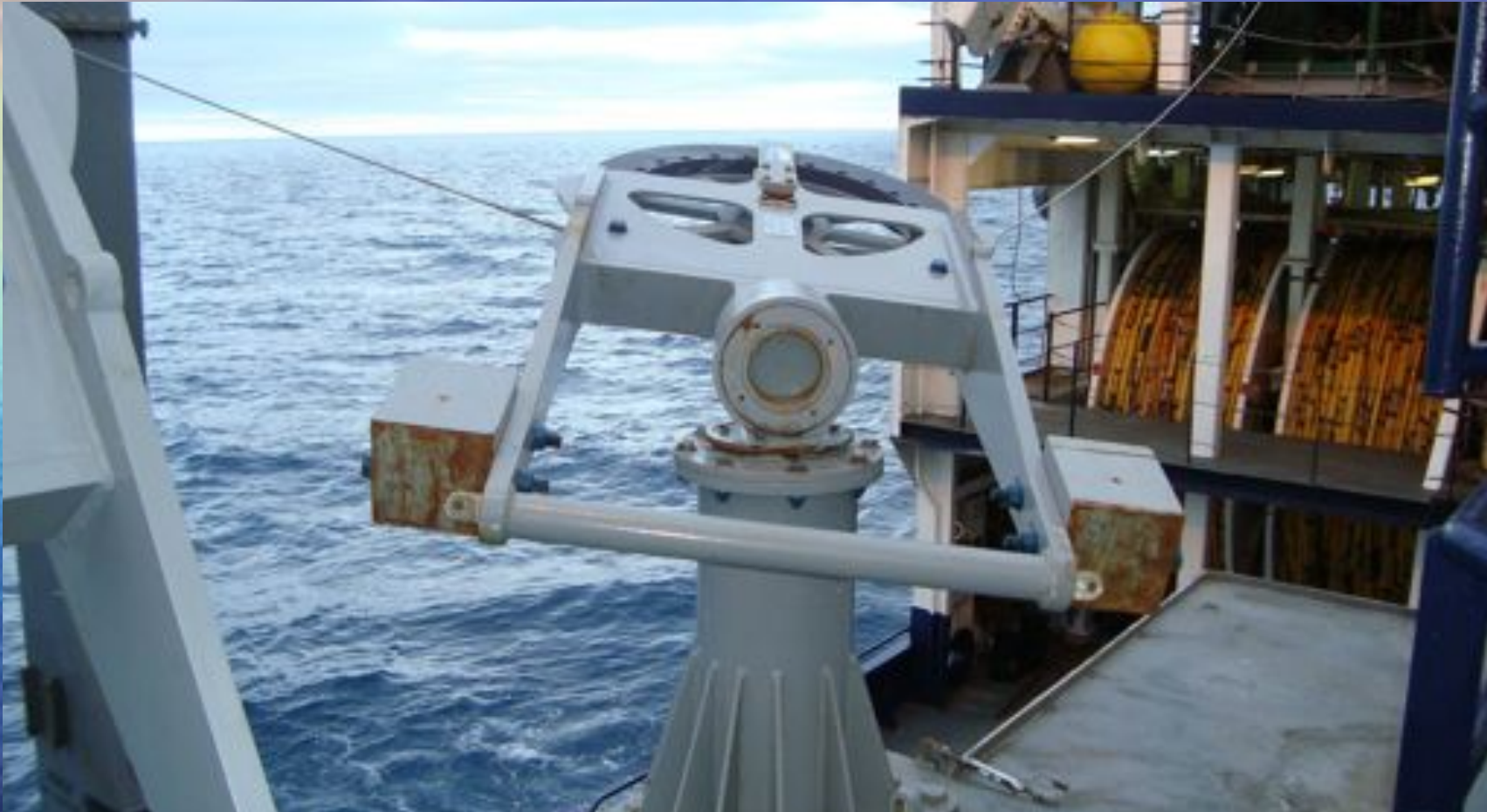
Revelle: No Bait



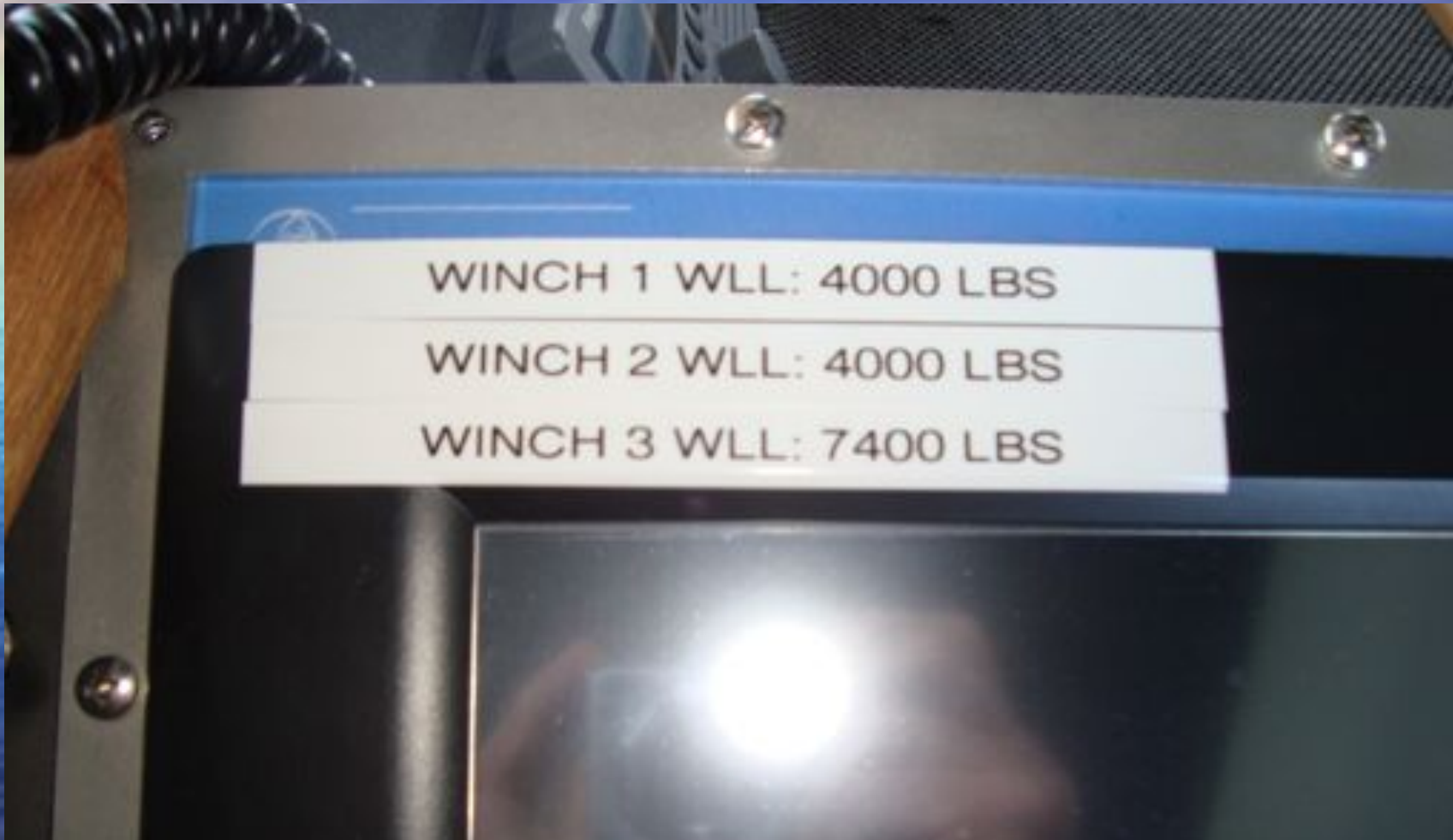
Revelle: Right to Know Center



Langseth: Turning Block



Point Sur: WLL at Operators Station



Pelican: SWL at Operator's Station



Blue Heron: SWL Posted on Winch



Endeavor: Boat Capstan on Pedestal



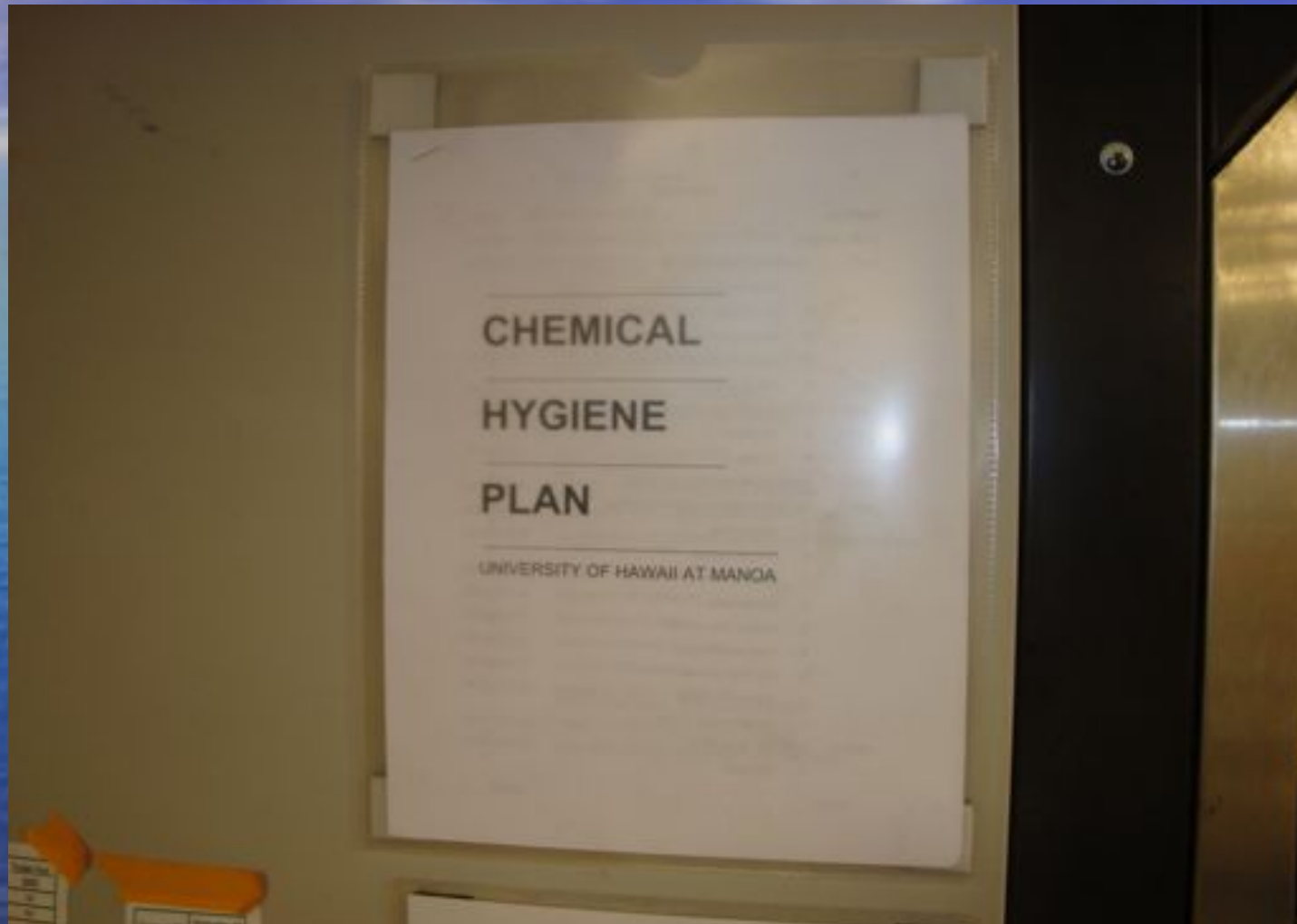
New Horizon: Winch and Other Data on iPad



Kilo Moana: Emergency Brake Added



Kilo Moana: Chemical Hygiene Plan



Point Sur: Spill Kit



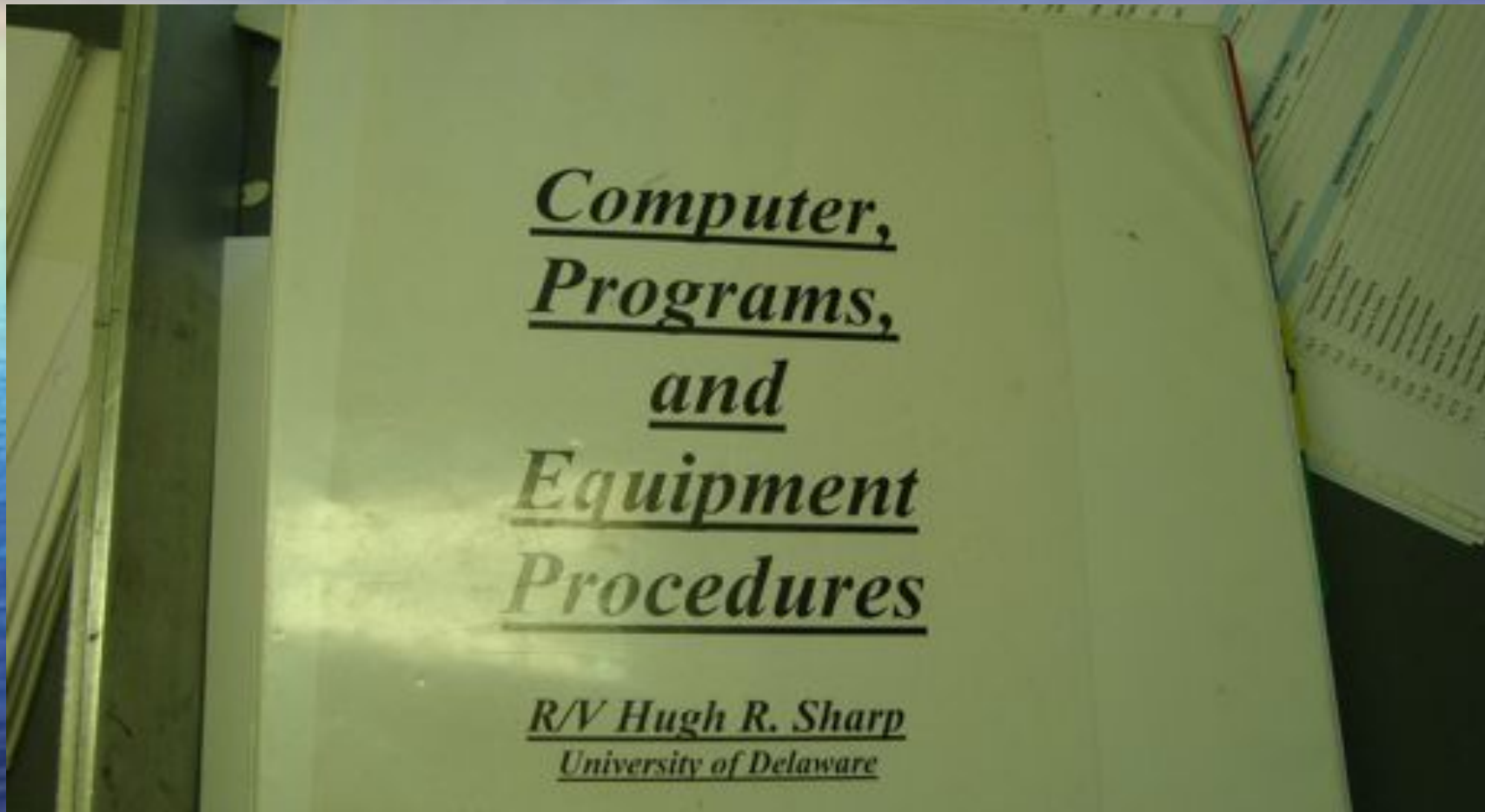
Revelle: Test Two-Block



Revelle: Expansion System on Through Hull Probe



Sharp: Science System Procedures Manual



Surge Protective Devices

Marine not Household



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

MARINE SAFETY ALERT

Inspections and Compliance Directorate

April 30, 2013
Washington, DC

03-13b

Surge Protective Devices Onboard Vessels (correction with additional information)

We've all seen them and used them. Surge protective devices (SPDs), more commonly known as surge protectors or power strips help protect our expensive electronic devices from being damaged from excessive currents and allow us to simultaneously deliver power to multiple devices. This safety alert addresses the use of certain electrical protection devices onboard vessels and the inherent risks they may cause. Most commercially available SPDs are designed for use ashore and will interrupt only the hot conductor when a surge occurs. What does that mean for the ship owner/operator? It means that while these devices may provide protection in our homes and offices, these same devices may be a fire risk onboard vessels.

A marine casualty investigation of two separate stateroom fires onboard a U.S. Flag Container ship revealed that the sources of the fires were attributed to the use of SPDs plugged into a lighting circuit. It was discovered that a ground had developed on another circuit that was connected to the same distribution panel providing power to the staterooms. This ground created an imbalance of voltage between the two power conductors supplying the SPDs which caused excessive currents, overheating, and subsequently, a fire. In this instance, even if the SPDs automatically tripped as designed, only one power conductor would have been secured while the other would continue to provide power, possibly shorting to the device's ground wire and the structure of the vessel.



Problems with Mustang Inflatable PFDs



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

MARINE SAFETY ALERT

Assistant Commandant for Marine Safety, Security and Stewardship

October 4, 2012
Washington, DC

Alert 3-12

PROBLEM WITH MUSTANG INFLATABLE PFDs

The Coast Guard has become aware of certain Mustang Survival Inflatable PFDs with Hammar MA1 hydrostatic (HIT) inflation systems which may not inflate and require a new re-arm kit to properly inflate by manual or automatic activation. This safety alert identifies which products are affected. Certain inflatable PFDs may be subject to delayed or non-inflations. To determine if you are impacted please follow the instructions below.

<u>USCG Approval</u>	<u>Mustang Product</u>
N/A	MA7214 HIT inflatable re-arm kit
N/A	MA7218 HIT inflatable re-arm kit for LIFT
160.076/8611/0	MD0450 Inflatable Vest PFD with LIFT
160.076/5204/0	MD0451 Inflatable Vest PFD with LIFT (no harness)
160.076/5201/0	MD3183 Deluxe Inflatable PFD with HIT
160.076/8608/0	MD3184 Deluxe Inflatable PFD with HIT (with harness)
160.076/5300/0	MD3188 Inflatable Work Vest/PFD with HIT
160.053/118/0	MD3188 Inflatable Work Vest/PFD with HIT

RECREATIONAL INFLATABLE TYPE I PFD

Confined Space Entry



UNITED STATES COAST GUARD

U.S. Department of Homeland Security

MARINE SAFETY ALERT

Inspections and Compliance Directorate

August 30, 2013
Washington, DC

Alert 08-13

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.¹

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 lightening holes. Prior to entering the first lightening 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.

Overloaded Lifting Gear



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

MARINE SAFETY ALERT

Assistant Commandant for Prevention Policy

June 20, 2012
Washington, DC

Alert 02-12

OVERLOADED LIFTING GEAR ON FISHING VESSELS

Recently, several catastrophic failures of masts, booms, and lift cables have occurred on purse seine fishing vessels that have resulted in loss of life and severe injuries. Over the years many casualties have occurred onboard all types of fishing vessels attempting to haul in catches that exceeded the capacity of their winches, hoists, and associated equipment. These types of casualties are not unusual. This alert serves to remind all purse seine fishing vessel owners/operators and other fishing segments to ensure safe use of the haul equipment particularly matching the size and the capacity of the nets to the rated size and capacity of the winch/haul/hoist equipment, taking into account safety factors for various species, and other concerns such as the variable platform that a rolling fishing vessel and variable catch presents.



Owners / operators, and vessel insurers must ensure that vessel winch, haul and hoist systems are not modified by crew members to increase the lifting capacity beyond the rated design which in some cases can be done very easily. Such boosting of hydraulic systems must be prohibited and certain components should be protected with special seals. The machinery should be properly maintained and records kept in a historical log. It is imperative that owners / operators ensure every load bearing structure and its associated components are maintained in original condition, that they will be operated as designed using all appropriate safety margins for anticipated working

conditions. All such equipment will experience fatigue over time and as result must be inspected and monitored routinely. Bearings, limit switches, brakes, safety devices, sheaves, cables and other components, should be routinely inspected by certified organizations.

Questions? Suggestions?

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