

NATIONAL SCIENCE FOUNDATION SHIP INSPECTION PROGRAM



2019 RVTEC MEETING
Ted Colburn



Naval Architecture
Marine Engineering
Marine Surveying
Salvage Engineering

Recently Completed

- RV Armstrong
- RV Walton Smith
- RV Hogarth
- RV Sally Ride
- RV Weatherbird II
- RV Oceanus
- RV Atlantic Explorer
- RV Thompson
- RV Savannah

Upcoming Inspections

- RV Pelican
- RV Sharp
- RV Sikuliaq
- RV Sproul
- RVIB Palmer
- RV Kilo Moana
- RV Langseth
- RV Revelle
- RV Rachel Carson
- RV Blue Heron
- RV Endeavor

Observations & Areas for Improvement:

- **Appendix A - UNOLS Rope and Cable Safe Working Standards**
- **Appendix B - Overboard Handling Systems**
- **Marine Safety Alert – LED Lighting Potential Interference with VHF-FM and AIS**
- **Marine Safety Alert – Confined Spaces**

RVSS Appendix A Compliance:

Appendix A Assist Summary for Each Wire or Cable

Vessel _____ Date _____ Tension Mbr _____ Winch _____ Length _____ NSF Reel # _____

Appendix A Assist Summary for Each Wire or Cable (updated 9 28 2019 JMS/wec)						
Note: This is not all inclusive. See Appendix A RVSS Edition 10 for requirements.						
Requirement or Attribute	Select Applicable Column FS					Comments
	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	FS=	
Post Cable/Wire SWL in clear view of the winch operator (RVSS 8.6)	Applies	Applies	Applies	Applies	Y/N	
General						
Determine Cable/Wire Safe Working Load (SWL) as:	Applies	Applies	Applies	Applies	Y/N	
Assigned Breaking Load / Factor of Safety					Y/N	
Lubricate tension member <12 months (A.5.8)					Y/N	
Fresh Water Wash (lesser of: end of cruise or < 1 month) (A.5.9)					Y/N	
Develop Extenuating Circumstance Procedure (A.8.4)	Applies	Applies	Applies	Applies	Y/N	
Tension Monitoring						
Have ability to keep load < SWL:	Applies				Y/N	
May be calculated w/"g" factor at least 1.75 or from Tensionometer					Y/N	
Have ability to keep load < SWL: Actual from monitoring system		Applies	Applies	Applies	Y/N	
Tensionometer display at operator's station with 3 Hz refresh rate		Applies	Applies	Applies	Y/N	
Tensionometer display at operator's station with 10 Hz refresh rate			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 20 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 3% accuracy			Applies	Applies	Y/N	
Alarms						
Audible and visual tension alarms w/data logging		Applies			Y/N	
Alarm at < ABL/2.8					Y/N	
Audible and visual tension alarms w/data logging			Applies		Y/N	
Alarm at < ABL/2.2					Y/N	
Audible and visual tension alarms w/data logging				Applies	Y/N	
Alarm at < ABL/1.7					Y/N	
Alarm conditions automatically logged		Applies	Applies	Applies	Y/N	
Sheaves and Fairlead Rollers						
Sheaves & Rollers: As large as practical	Applies				Y/N	
Sheaves & Rollers: D/d ratio meet 40:1 or 400d1 whichever is greater		Applies	Applies	Applies	Y/N	
Sheaves: Groves as close to d as possible and no more than 1.5d		Applies			Y/N	
Sheaves: Groves per Ref A 1.1					Y/N	
(Groove size relative to nominal diameter of wire rope:			Applies	Applies	Y/N	
3/16" to 1/4" 3% to 6%;					Y/N	
over 1/4" 2.5% to 5%)					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 accesses secured			Applies	Applies	Y/N	
Testing						
Tension testing up to SWL load every 2 years.	Applies				Y/N	
Break testing not req'd at FS=5.0					Y/N	
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: UNOLS wire Identifier; Cable Inventory/History and Running Use						
Logs stay with the wires 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 and payout for each cast by calculation or monitoring.	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	Y/N	
Master verify qualifications and designate approved operators.		Applies	Applies	Applies	Y/N	
Training record for formal operator training program for winch, handling apparatus, and monitoring system.		Applies	Applies	Applies	Y/N	

Suggestions: Please contact Ted@JMSnet.com



Naval Architecture
Marine Engineering
Marine Surveying
Salvage Engineering

RVSS Appendix A Compliance:

Appendix A criteria some operators struggle with:

–Extenuating Circumstances Plan

–Ship operators and their seagoing staff must understand that if, by force of circumstance or by the desire to maintain scientific operations while on a cruise, when they do not meet the operating requirements as described in tables 8.1 through 8.4, they are embarking on a potentially dangerous activity. The consequences of this activity could be loss of valuable equipment, damage to the vessel and its fixed equipment, and, in the worst case, injury to personnel. 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.

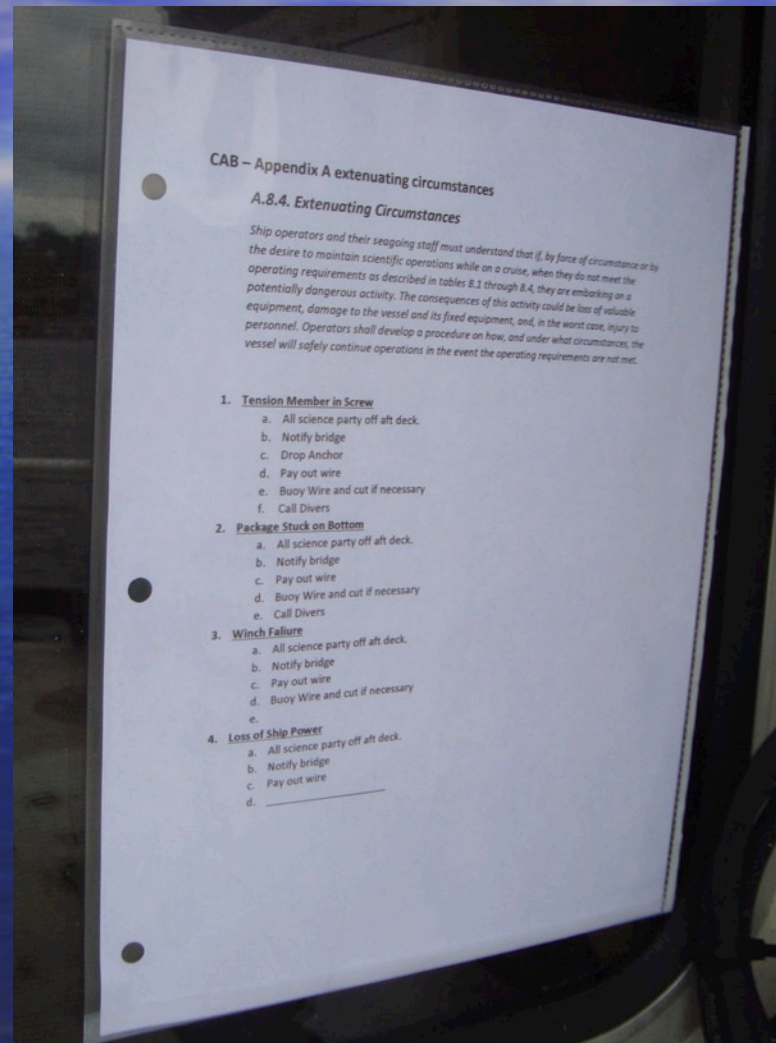
Appendix A

Extenuating Circumstance Procedures

- 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 .
- Potential scenarios you may want to consider while overboarding science gear including:
 - Worsening sea state
 - Tension member in propeller
 - Package stuck on the bottom
 - Winch failure / electronic control failure
 - Loss of ship's power.

RVSS Appendix A:

Extenuating Circumstance Procedure posted



RVSS Appendix A Compliance:

Appendix A criteria some operators struggle with:

–One element of Tension Monitoring when factor of safety is less than 5.0.

–The tension measuring system must be “maintained” with an accuracy of 4%/3% of the applied load.

Maintaining Accuracy

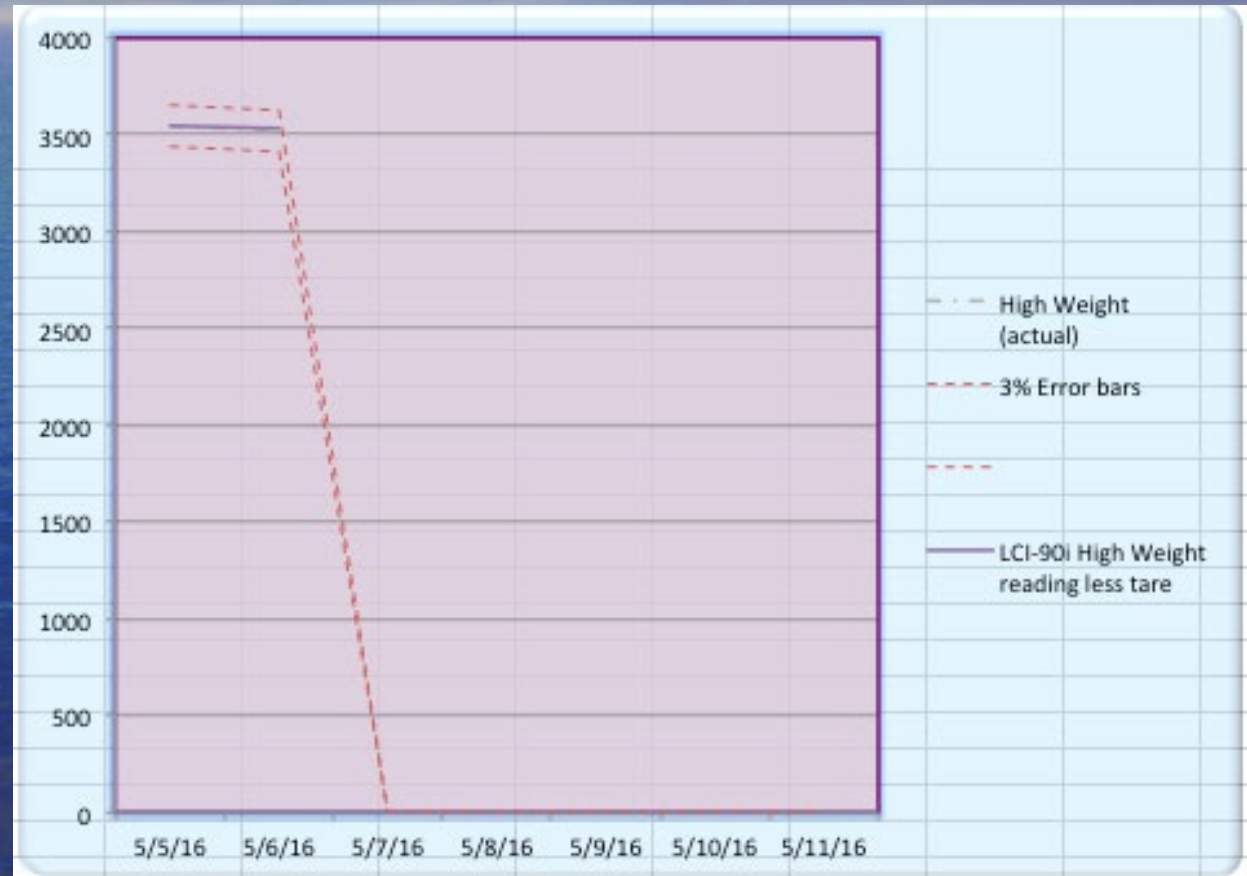
Requirement or Attribute	Select Applicable Column FS			
	FS of 5.0 or higher	FS from 2.5 to 4.99	FS from 2.0 to 2.49	FS from 1.5 to 1.99
Tension Monitoring				
Tension measuring system maintained with 4% accuracy		Applies		
Tension measuring system maintained with 3% accuracy			Applies	Applies

“Maintaining” accuracy within 4% or 3% depending on the factor of safety selected.

Recalibrating every 6 months does not satisfy this requirement

Equipment Requirements: Tension Monitoring

Is the monitoring system staying within tolerance limits?



RVSS Appendix A Compliance:

Appendix A criteria some operators struggle with:

- Deck Safety when factor of safety is less than 5.0
- The Operator should identify “Danger Zones” around ropes and wires under tension.
- To the extent possible, given the nature of operations involved, all personnel shall be excluded from these zones such that a sudden failure cannot result in injury.
- Warning notices should be displayed at points of access indicating the danger.
- Physical and/or visual barriers should be erected as needed.
- Existing doors and accesses to the area should be secured when possible

RVSS Appendix A Compliance:



RVSS Appendix A Compliance:

Appendix A criteria some operators struggle with:

- Winch Operator Qualifications when factor of safety is less than 5.0**
- The Winch Owner must certify that all Winch Operators are competent. By “Certified Competent” it is meant that the Owner must have written documentation in place showing that the operator has been through and successfully passed a formal owner/operator developed training program on the winch, handling apparatus, and monitoring system.
- The system vendor or the Owner, depending on the complexity of the system, may conduct a formal training program.
- The certification must be renewed annually.
- The master shall verify qualifications and designate the approved winch operators.
- If there are configuration changes to controls or to the hardware then the operator qualifications must be refreshed and documented.

Overboard Handling Systems:

The BIG picture still applies:

The Overboard Handling System (OHS) should be designed to withstand and operate in excess of the breaking strength of the strongest section of tension member to be used in any condition of loading with an appropriate factor of safety.

Note that 46 CFR 189.35 does not specifically allow for weak links or render capability.

RVSS Appendix B:

UNOLS Overboard Handling Systems – Design and Operation Standards

The design and operation standards in this appendix are based on the requirements of the United States Code of Federal Regulations, 46 CFR Subpart 189.35 - Weight Handling Gear installed on oceanographic vessels.

46 CFR 189.35 legally applies only to U.S. inspected vessels. However, it is UNOLS policy that the standards in this appendix are applicable to overboard handling systems in all UNOLS vessels.

RVSS Appendix B:

- Onboard OHS and components are properly installed, secure for sea and do not violate approved trim and stability information.
- Suitable safety guards are installed.
- Operating limitations are posted.
- Only qualified operators are permitted to operate OHS, training is documented, and qualified operators are designated by the master of the vessel in writing.
- When gear is being operated, the minimum number of necessary persons are in the immediate area, and comply with all safety requirements.
- Equipment and records are maintained.
- Prior to a vessel's departure, an entry is made in the official logbook that the ship's weight handling gear is in compliance with the applicable requirements.

RVSS Appendix B:

OHS Appendix B assist sheets are available with great thanks to Aaron Davis, West Coast Winch Pool, for developing these.

They are set up as four sheets as follows:

OHS CHECKLIST

COMPONENT CHECKLIST

MARINE SUP REQS FOR NEW EQUIPT

PRE-CRUISE REQUIREMENTS FOR PI

Each checklist is organized in logical groups.

RVSS Appendix B:

Appendix B Assist Sheets for Overboard Handling Systems (REV 3-5-19) are annotated based on applicability as follows:

* == A recommendation, not a requirement

**==A recommendation for uninspected vessels, but required on inspected vessels.

***==Not required for systems combining portable and fixed equipment.

RVSS Appendix B: Partial Checklist

COMPONENT CHECKLIST

REV 3-5-19

COMPONENT NAME			
Requirement	Reference	Y / N / N/A	Comment
COMPONENT DESIGN			
Components withstand and operate in excess of the Design Line Tension (DLT).	B.2		
The factor of safety for all metal structural parts is 1.5 or more to yield (the yield strength of the material is at least 1.5 times the calculated stresses resulting from application of a load equal to the DLT).	B.2		
Suitable assumptions are used to determine the loading conditions. The most adverse loading condition are considered.	B.2		
Guards prevent personnel injuries from rotating equipment, pinch points, hazardous cable runs and other hazards.	B.2.2.1, B.3.1, B.7.2		
Signalling devices warn personnel of unexpected equipment startup.*	B.2.2.2		
Emergency stops are accessible and placed at all operator stations as well as locally to the equipment.*	B.2.2.3		
The electrical system accommodates lock out/tag out.*	B.2.2.4		
The electrical system has a fused disconnect or circuit breaker.*	B.2.2.4		
Manual operating devices require constant operator intervention.*	B.2.2.5		
Dead man style controls, i.e., spring centered joysticks without friction locks, prevent inadvertent operation.*	B.2.2.5		
Interlocks prevent inadvertent operation.*	B.2.2.5		
INSTALLATION AND INITIAL TESTING			
The component is properly installed.	B.7.2		
The component is installed in accordance with the manufacturer's requirements.	B.3.1		
Installation was supervised by a qualified person.	B.7.1		
The installation doesn't violate approved trim and stability limitations.	B.3.1		
Operating limitations are posted in an appropriate manner.	B.3.1, B.7.2		

RVSS Appendix B: OHS Checklist

COMPONENT DESIGN

COMPONENT NAME

INSTALLATION AND INITIAL TESTING

LABELLING

ROUTINE OHS TESTING

DOCUMENTATION

OHS TRAINING

OHS OPERATION

RVSS Appendix B: OHS Checklist

OHS DESIGN

OHS NAME

INSTALLATION AND INITIAL TESTING

LABELLING

ROUTINE OHS TESTING

DOCUMENTATION

OHS TRAINING

OHS OPERATION

RVSS Appendix B: OHS Manuals

A detailed description of the OHS layout
The geometry of the tension member in each OHS configuration.
Overall dimensions of each major component.
The weight of major portable components.
System particulars
OHS test procedures.
Procedural safety requirements.
Operator training procedures.
Routine

LED Lighting Potential Interference of VHF-FM Radio and AIS Reception. The alert contains a test procedure



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

MARINE SAFETY ALERT
Inspections and Compliance Directorate

August 15, 2018
Washington, DC

Safety Alert 13-18

Let us enlighten you about LED lighting!
Potential interference of VHF-FM Radio and AIS Reception.

The U.S. Coast Guard has received reports from crews, ship owners, inspectors and other mariners regarding poor reception on VHF frequencies used for radiotelephone, digital selective calling (DSC) and automatic identification systems (AIS) when in the vicinity of light emitting diode (LED) lighting on-board ships (e.g., navigation lights, searchlights and floodlights, interior and exterior lights, adornment).

Confined Space Entry
Half of the deaths are the rescuers
Follow procedures before going into
the transducer well or similar spaces
Learn the rescue procedures.



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

MARINE SAFETY ALERT

Inspections and Compliance Directorate

April 12, 2019
Washington, DC

Safety Alert 04-19

Confined Spaces: Silent & Invisible Killers

This is a reminder that despite decades of work by to improve confined space entry by maritime safety organizations, training institutions, and vessel owners/operators, the risks have not been eliminated.

Questions?



Naval Architecture
Marine Engineering
Marine Surveying
Salvage Engineering