

NATIONAL SCIENCE FOUNDATION SHIP INSPECTION PROGRAM



2022 RVTEC MEETING
Ted Colburn



Naval Architecture
Marine Engineering
Marine Surveying
Salvage Engineering

Completed 2022

- RV ATLANTIS
- RV WALTON SMITH
- RV SPROUL
- RV THOMPSON

Upcoming Inspections

RV SALLY RIDE

RV KILO MOANA

RV ARMSTRONG

RV REVELLE

Inspection process in brief

- NSF sends a pre-inspection information request to the vessel's operator.
- We come aboard, usually 3 from JMS
 - Blake – operations, safety, & habitability
 - Bill – hull, mechanical, & Electrical
 - Ted - science support
- And one or more NSF representatives

Inspection process in brief

- One day (or two) in port and one at sea
- Operate all systems where reasonable
 - Exercise systems various modes and safety's
 - We don't require operation if ship's personnel are not comfortable
 - Review material condition and procedures
- Provide an exit brief
- Provide a brief letter summary
- Deliver a report

Observations & Areas for Improvement:

- **Appendix A - UNOLS Rope and Cable Safe Working Standards**
- Appendix A assist sheet is available

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: Assigned Breaking Load / Factor of Safety	Applies	Applies	Applies	Applies	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: May be calculated w/"g" factor at least 1.75 or from Tensionometer	Applies				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 Alarm at < ABL/2.8		Applies			Y/N	
Audible and visual tension alarms w/data logging Alarm at < ABL/2.2			Applies		Y/N	
Audible and visual tension alarms w/data logging Alarm at < ABL/1.7				Applies	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 400d:1 whichever is greater		Applies	Applies	Applies	Y/N	
Sheaves: Grooves as close to d as possible and no more than 1.5d		Applies			Y/N	
Sheaves: Grooves 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	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. Break testing not req'd at FS=5.0	Applies				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



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RVSS Appendix A Compliance:

Appendix A criteria some operators struggle with:

- **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

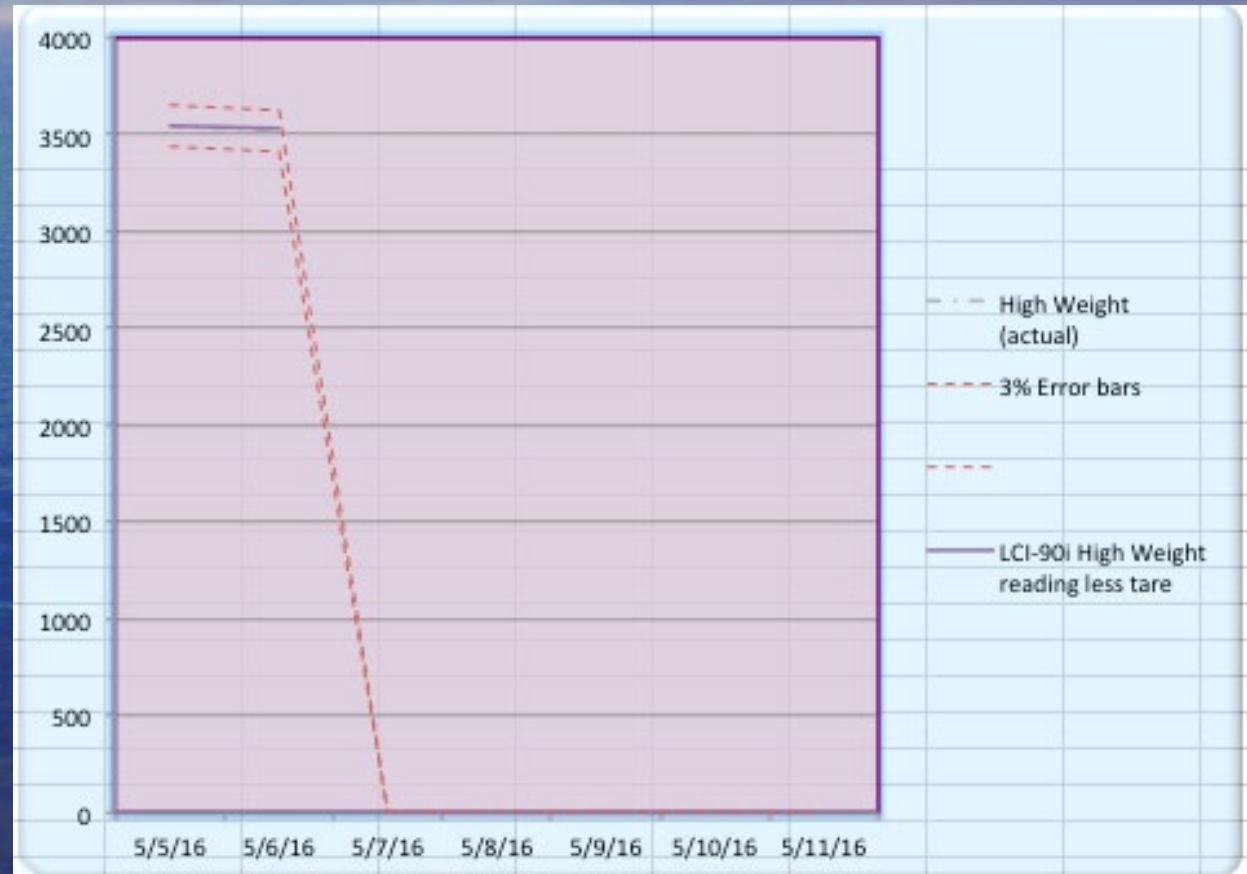
Requirement or Attribute	Select Applicable Column FS			
	FS of 5.0 or higher	FS from 2.5 to 4.99	FS from 2.0 to 2.49	FS from 1.5 to 1.99
Tension Monitoring				
Tension measuring system maintained with 4% accuracy		Applies		
Tension measuring system maintained with 3% accuracy			Applies	Applies

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

Recalibrating every 6 months does not satisfy this requirement

Tension Monitoring

Is the monitoring system staying within tolerance limits?



RVSS Appendix A Compliance:

Appendix A criteria some operators struggle with:

–Extenuating Circumstances Plan

–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.

RVSS Appendix A Compliance:



RVSS Appendix A

- Log maximum payout and load for each cast by calculation or monitoring .
- It's also worth recording the payout where the maximum load occurred. If referenced from drum end, the location won't change with cut backs.

Wire Deployment Log:				RV Sikuliaq				
Cruise ID	Cast ID	Duration (HH:MM)	Max Wire Out (m)	Max LineSpeed (m/min)	Max Tension (lbs)	Time (@ max tension)	WireOut (@ max tension)	Events
SKQ201401S	1	2:23	1,011.1	51.0	1,802.9	11/27/14 23:43	-4.9	CTD
SKQ201401S	2	2:00	1,000.9	51.0	1,843.0	12/1/14 19:18	-9.5	CTD
SKQ201401S	3	1:30	1,000.0	54.2	1,642.6	12/2/14 13:44	-9.8	CTD
SKQ201401S	4	0:50	252.6	58.1	1,602.6	12/2/14 15:48	217.2	CTD
SKQ201401S	5	0:55	293.0	61.2	2,003.2	12/3/14 23:07	-4.6	CTD
SKQ201401S	6	1:45	1,385.2	51.0	2,003.2	12/4/14 1:28	-6.5	CTD
SKQ201401S	7	1:20	1,489.9	60.9	1,682.7	12/4/14 2:34	-11.0	CTD
SKQ201401S	8	1:42	1,232.3	60.9	2,003.2	12/6/14 7:03	-5.5	CTD
SKQ201401S	9	2:29	1,477.0	61.6	2,003.2	12/9/14 8:18	-6.1	CTD & wire wash

Observations & Areas for Improvement:

- **Appendix B - Overboard Handling Systems**
- OHS Appendix B assist sheets are available with thanks to Aaron Davis, West Coast Winch Pool, for developing these

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 Compliance:

The BIG picture:

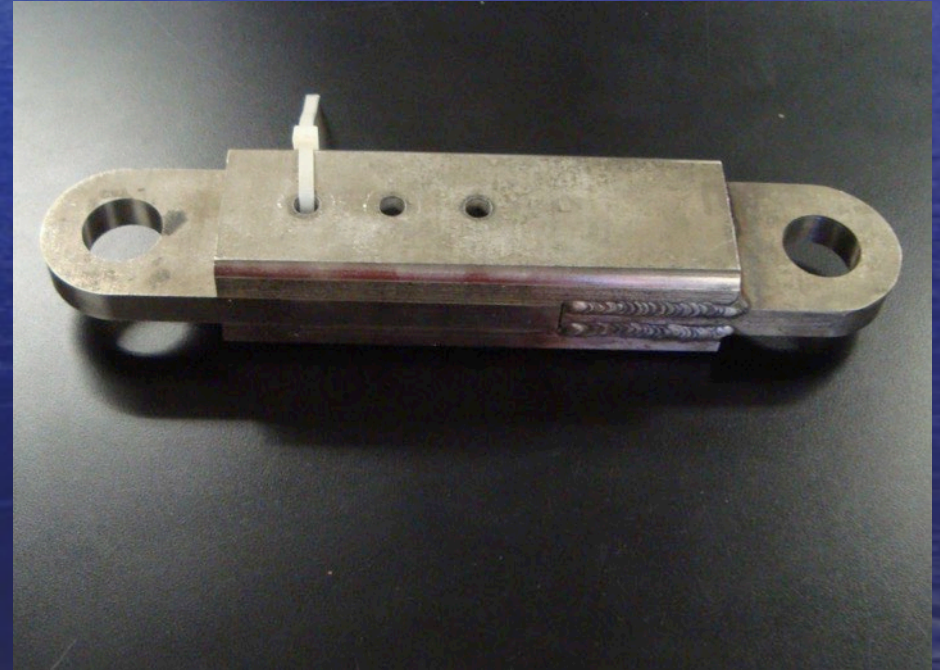
For inspected vessels:

The Overboard Handling System (OHS) should be designed, maintained, tested, and operated to be strong enough to part the tension member before the OHS fails.

For uninspected vessels:

The Overboard Handling System (OHS) should be designed, maintained, tested, and operated to be strong enough to part the tension member, weak link, or activate render before the OHS fails.

Weak Links: Walton Smith & Palmer (SIO Style)



Appendix B Test Plans:



RV SIKULIAQ: Testing in the towing position

Develop a test plan/procedure

Include a diagram

Test the system (all components) as it is intended to be used

Alternate test methods allowed.

RV SAVANNAH: Cracks observed

Cracks observed
after through
system testing.

This shows the
structure after
repair.

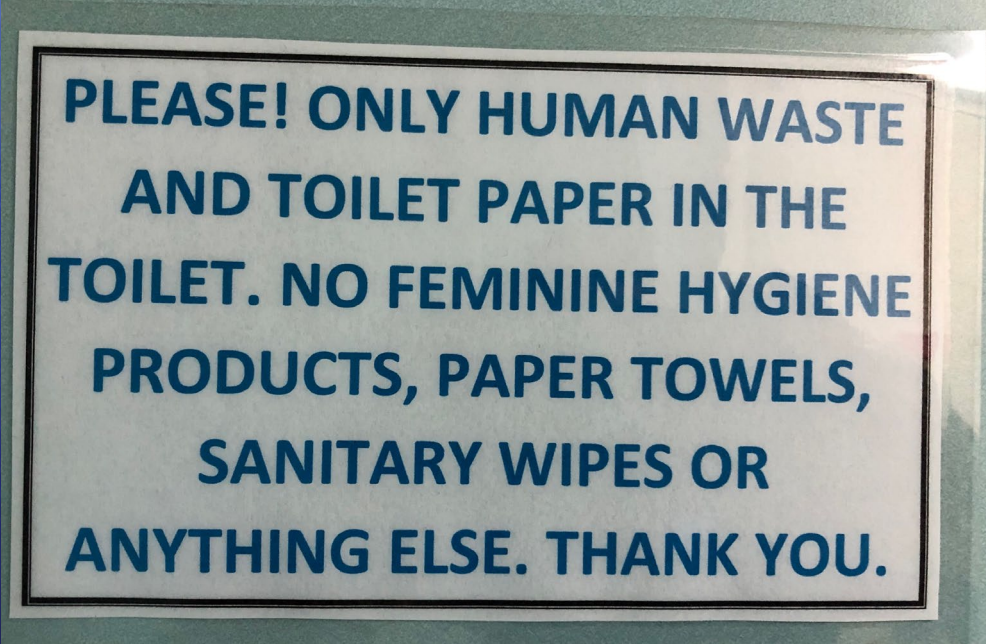


RV SAVANNAH: Testing After Repair



Cruise Planning: What to know before coming aboard?

- Prepare those coming aboard before they pack.
- Reduce Anxiety
- ie. Are Feminine Hygiene envelopes in heads and where to dispose of them?



**PLEASE! ONLY HUMAN WASTE
AND TOILET PAPER IN THE
TOILET. NO FEMININE HYGIENE
PRODUCTS, PAPER TOWELS,
SANITARY WIPES OR
ANYTHING ELSE. THANK YOU.**

Questions? Suggestions?

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