NSF UNOLS WIRE POOL

Eric Trotto, *NSF Wire Pool Manager*

Barbara Callahan, *Wire Testing Coordinator*

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INTRODUCTION
Eric Trotto

- Worked at WHOI (Mooring Lab, Physical Oceanography) since 2014
- Training with Rick Trask (Wire Pool Manager) since January 2024
- Transitioning to Wire Pool Manager officially in January 2025

One Wire Pool, 2 storage locations

UC San Diego | SCRIPPS INSTITUTION OF OCEANOGRAPHY

WOODS HOLE OCEANOGRAPHIC INSTITUTION

Inventory of commonly used tension members

- Wire Ropes: ¼”, ½”, 9/16”
- Cables: .322”EM, .680 Coax, .681” power optic

Other tension members

- Synthetics: 9/16” Plasma HiCo

NSF Wire Pool

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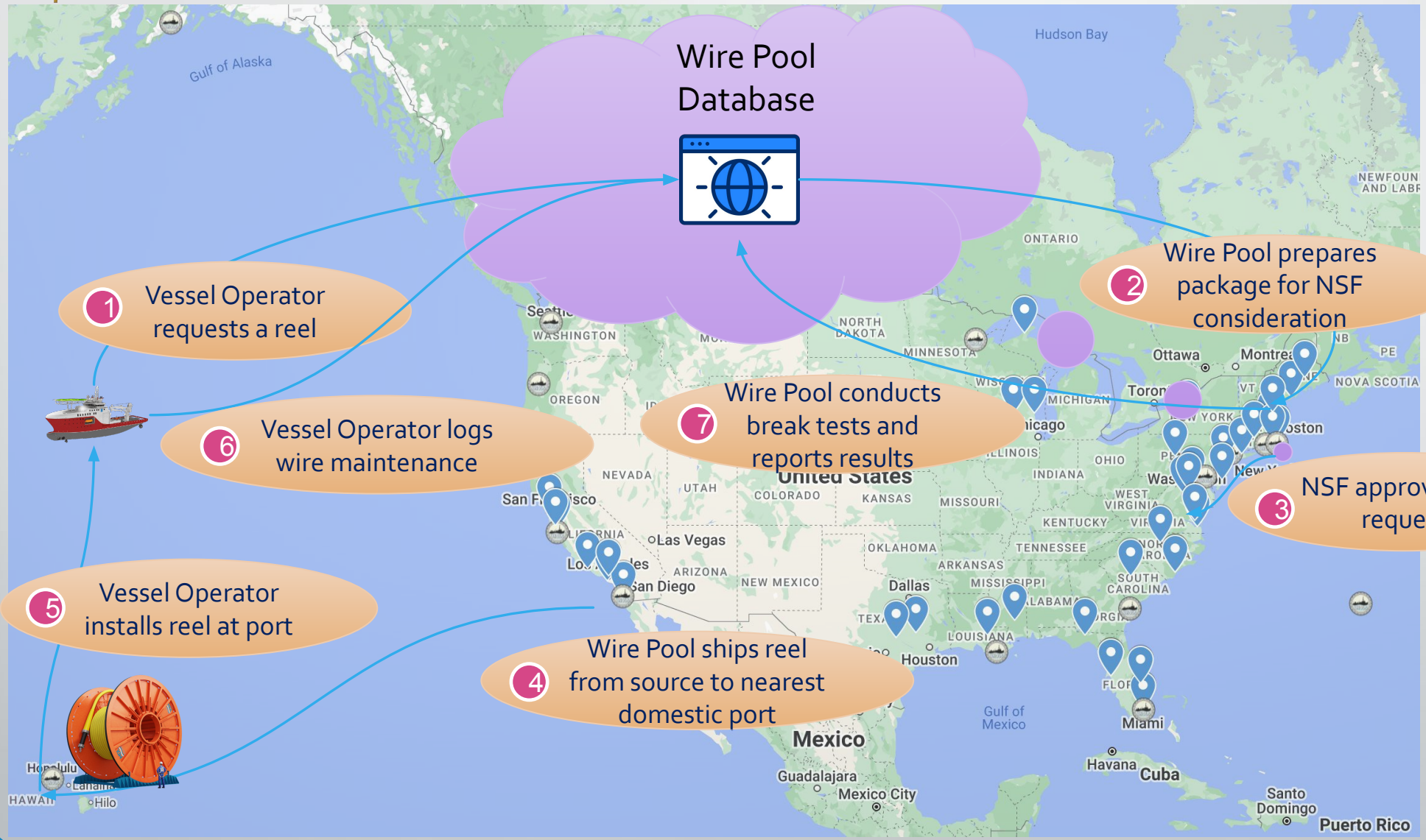
UNOLS Institution Designation

Member

Operator

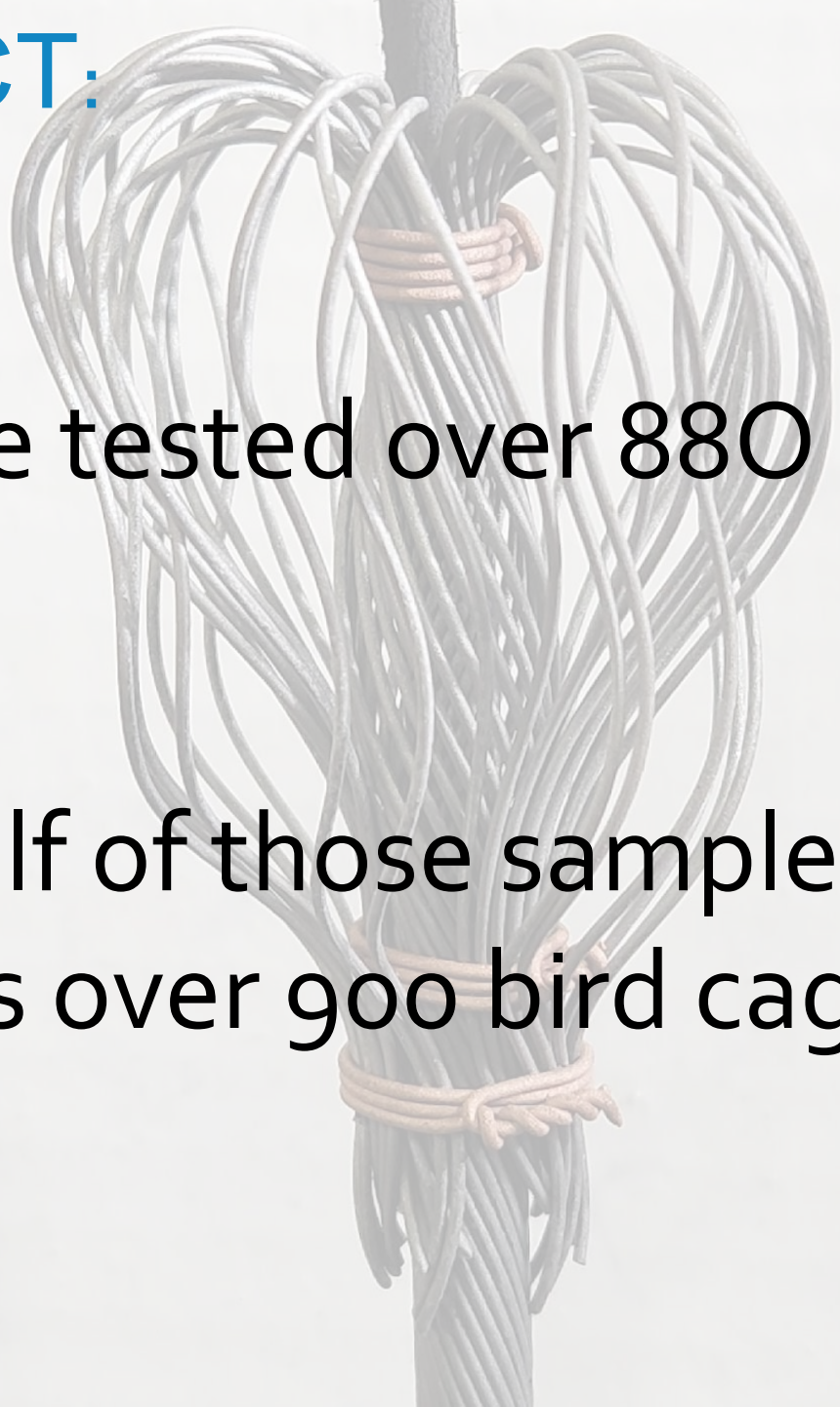


- Testing your wire
- Testing your terminations
- Wire Logs & Wire Pool Recommendations

TESTING YOUR WIRE

- The Wire Pool tests 50 to 75 wire samples per year from 26 UNOLS vessels
- When the Wire Pool receives a break test sample and a break test request, a work order is generated, and the vessel's wire is in the queue for testing
- The Wire Pool will send you an email that the sample has arrived

FUN FACT:



- We have tested over 880 samples since 2011
- Over half of those samples were .322 cable so that's over 900 bird cage terminations!

TESTING YOUR WIRE

.322 Cable

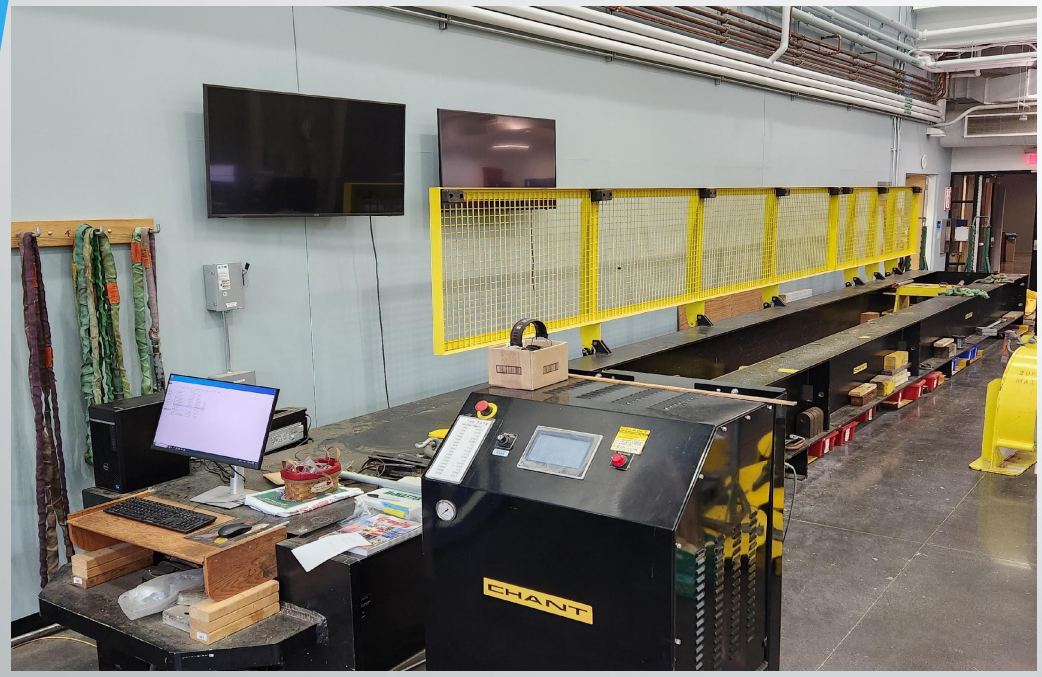
¼” 3 x 19 Wire Rope

3/8”, ½”, & 9/16 3 X 19 Wire Rope

.680 / .681 Cable

TESTING YOUR WIRE

Hydraulic Tensile Machines: break tests, pull tests, & cycle tests



10K lbs. & 150K lbs.

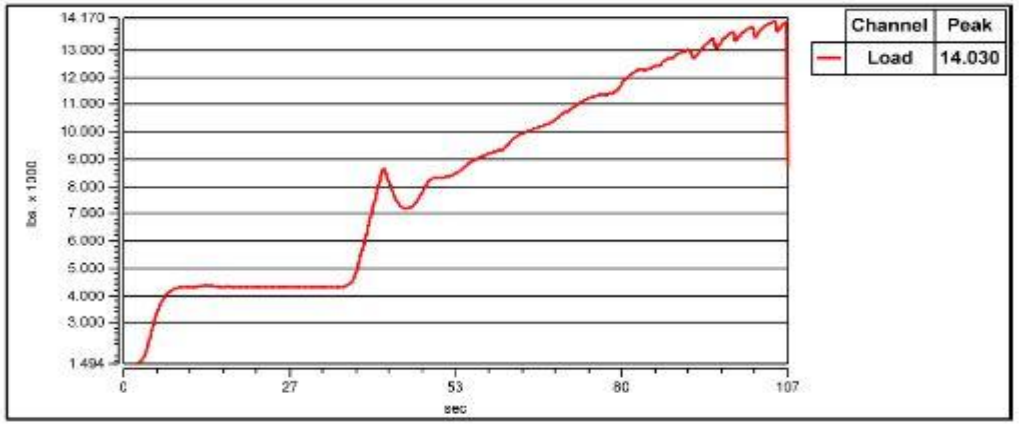
150K lbs.

TESTING YOUR WIRE
Break Test Certificate

NSF UNOLS Wire Pool
Woods Hole, MA 02543
508-289-2395

CERTIFICATE OF WIRE BREAK TEST

NSF Reel No.: NSF- 20 - C189
Manufacturer Reel No.: WP24005
Test Date: 2/22/2024
Wire size and type: .322
Institution: WHOI
Vessel: R/V Armstrong
TestID: 5883
Termination 1: Poured socket termination
Termination 2: Poured socket termination



Manu. Min. Break Load (NBL) lbs: 10000
Test Results (Max Load) lbs.: Mid span break

Break Notes: A 5-ton swivel used on one end. Both poured socket terminations done by Wire Pool,

Barbara Callahan
Operator Barbara Callahan

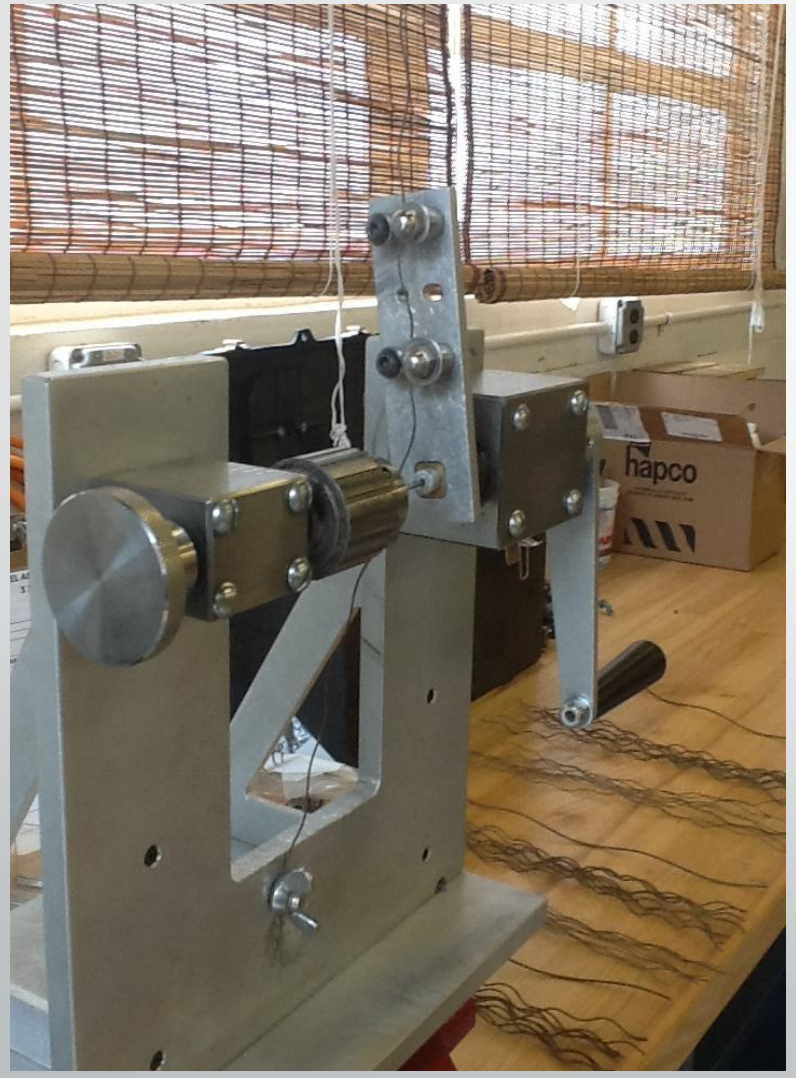
TESTING YOUR WIRE

The E-Kink Test

- Performed on every sample
- Accepted by the manufacturer of .322, .680 & .681 cables
- Can indicate wire degradation

TESTING YOUR WIRE

The Mandrel Wrap Test



- Performed on all 3x19 wire rope samples
- Standard test recognized by manufacturer
- Can indicate wire degradation

- Testing your wire
- Testing your terminations
- Wire Logs & Wire Pool Recommendations

TESTING YOUR TERMINATIONS

- In 2018, WHOI hosted INMARTECH. We had a breakout session where we tested 2 samples with common terminations: one terminated by the vessel, and the other terminated by the Wire Pool
- Learned the TBL for the vessel terminated samples broke lower than the NBL
- The terminations Wire Pool uses are not necessarily what vessels use
- Vessels benefit from knowing what their termination can withstand

TESTING YOUR TERMINATIONS

RVSS (A.5.2 Method of Determining TBL)

Vessels send (2) samples of their tension member to be tested

- One sample with one or both of the ends terminated by the vessel
- One sample with no terminations for re-testing if necessary
- Vessel will enter (2) break test requests

- Testing your wire
- Testing your terminations
- Wire Logs & Wire Pool Recommendations

WIRE LOGS & WIRE POOL RECOMMENDATIONS

- RVSS requires you submit a wire log at time of break test request (A.5.2)
- Wire Logs are a part of the Wire Pool's evaluation and could be checked during an NSF ship inspection

WIRE POOL RECOMMENDATIONS

Reel information NSF-07-T39 | Edit reel |

Manufacturer Reel ID: BBS1148-04

Original delivery pool: East Coast Location
Date received in pool: Nov-2-2007
Drum type:
Original length: 9,146 m
Original (shipping) weight:
Comments:

Wire size: 9/16
Wire type: 3x19
Purchase order num: M210984
Manufacturer: WRCA
Manu. Design No.: 3x19AA
Grant num: OCE-0555000
Nominal break load: 32500

Status: | View | Edit info (no new event) |

Location: Woods Hole Oceanographic Institution
Pool wire comment:

Vessel: Atlantis

Event history Add a new event: Select

Event code	Date	Status	Curr length (m)	Vessel	TBL (lbs)	Ekink % failed	Mandrel % failed	Min Sheave	Groov Code	Mon Freq	FS
Cut back (removed unusable wire)	Oct-4-2019		8,540								
Test results *with recommendation	Sep-16-2019				35450						
Test results *with recommendation	Aug-9-2019				31425	0.0%	3.0%				
Wire Log	Jul-31-2019										
Safe workload	Jul-15-2019							26.00	A	20.0	2.0
Safe workload	Jul-15-2019							26.00	A	20.0	1.5
Safe workload	Jul-15-2019							26.00	A	20.0	5.0
Safe workload	Dec-14-2018							26.00	A	20.0	2.0
Safe workload	Nov-15-2018							26.00	A	20.0	1.5
Lubrication	Aug-13-2018										
Lubrication	Jul-27-2018										

WIRE POOL RECOMMENDATIONS

Wire Pool recommendation

Recommendation:

Enter/edit recommendation

The wire broke at 31,425 lbs at the compressed sleeve termination done by the vessel. The mandrel wrap test had (2) wires break which represents 3% of the total cross sectional area. The e-kink test had no breaks. Since the wire did break below the manufacturers breaking strength of 32,500 lbs, we could re-test from the sample provided. please submit a new break test request if you would like the wire tested again.

Break test for 9/16 3x19 NSF-07-T39

Edit results

Break test location: UNOLS Wire Pool
Log test number:
Test operator: Barbara Callahan
Work order number: 19151
Test requested by: Barbara Callahan
Test date: Aug-9-2019
Manufacturer's marker tape number (if any):
Manufacturer's nominal breaking load (lbs): 32500.0
Tested breaking load (lbs): 31425
Assigned breaking load (lbs): 31425
Termination 1: PouredSocketTermination
Termination 2: CompressedSleeveTermination
Comments: Broke at compressed sleeve termination done by vessel.
Modified by: Barbara Callahan
Modified date: Aug-12-2019
No break test images uploaded
View Break Test Report

E-kink Broken wire report for 9/16 3x19 NSF-07-T39

E-kink test date: Aug 9, 2019

Edit ekink

Broken wires	Inner wire (27 wires)	Outer wire (27 wires)	Center wire (3 wires)
Total broken wires	0	0	0
Total metallic cross sectional area of the wire rope: 0.13933			
Cross sectional area of broken wires	0.0000	0.0000	0.0000

Total % cross sectional area failed during e-kink test: **0.00%**
Comment:

Mandrel Broken wire report for 9/16 3x19 NSF-07-T39

Mandrel test date: Aug 9, 2019

Edit mandrel

Broken wires	Inner wire (27 wires)	Outer wire (27 wires)	Center wire (3 wires)
Total broken wires	1	1	0
Total metallic cross sectional area of the wire rope: 0.13933			
Cross sectional area of broken wires	0.8574	2.4555	0.0000

Total % cross sectional area failed during mandrel test: **3.31%**
Comment:

Thank you!

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