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KONGSBERG

Service Report

CUSTOMER:	VESSEL/FACTORY/SITE:	DATE:
WHOI	R/V ATLANTIS	30 JUNE – 02 AUGUST 2015
LOCATION: WOODS HOLE, MA	ENGINEER/Technician	SERIAL/FILE No:
	CHUCK HOHING	118
WORKORDER / PO	ACCOUNT/PROJECT No:	SYSTEMS:
EM122 SERVICE		EM122 1X1

Main Purpose of Visit

- EM122 TX transducer impedance testing and to investigate why TX36 boards are failing.

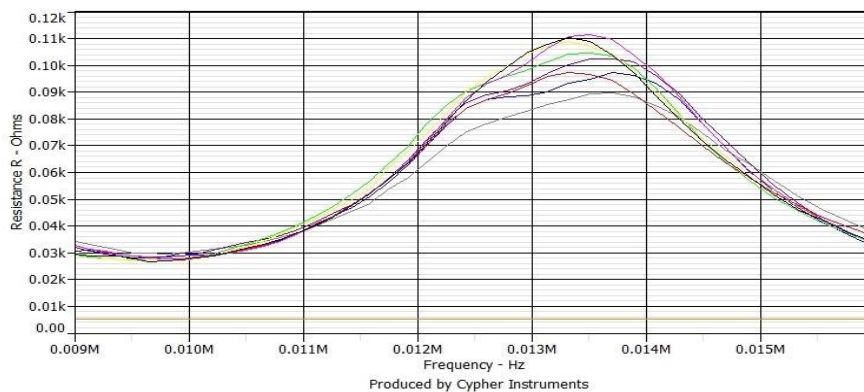
Daily Overview

- 07/30/2015
 - Travel day – Seattle to Boston. Boston to Woods Hole.
- 07/31/2015
 - Tested all 48 TX modules with the Multibeam Transducer Analyzer.
- 08/01/2015
 - TX36 board troubleshooting. Modified TX beam weight files to turn off 7 shorted TX channels.
- 08/02/2015
 - Travel day – Woods Hole to Boston. Boston to Seattle.

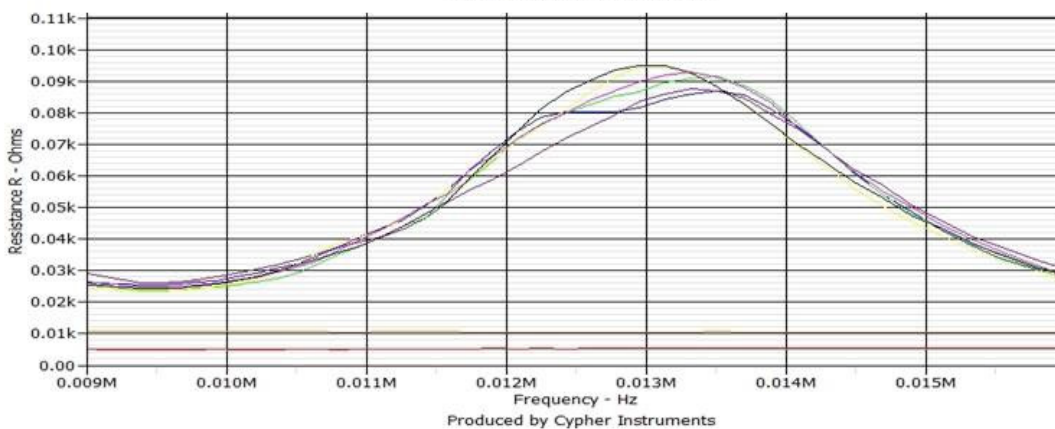
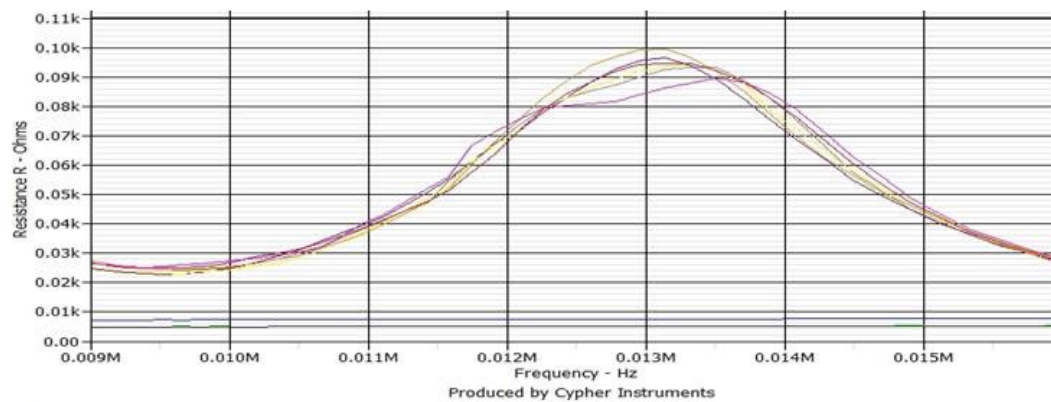
Technical Report

- Results of the TX transducer impedance tests.
 - TX module 13 has a single shorted channel: channel 4. This module and module 14 are connected to TX36 #7. TX36 #7 has no errors.
 - TX module 23 has 6 shorted channels: Channels 3,4,9,10,15,16. These channels all share a common ground. This module and module 24 are connected to TX36 #12. Two TX36 boards that were used in this slot now have faulty high voltage bridge 1 caused by transmitting into the shorts.

TX Module 13 with shorted channel 4



TX Module 23 with 6 shorted channels



- Results of TX36 board troubleshooting
 - From prior troubleshooting by the Atlantis survey crew we knew boards #12 and #20 were reporting a failed high voltage bridge (BR 1) in the BIST tests. A failed BR 1 will cause numerous channels to show as "low voltage" in the "TX Channels" BIST. The board in position 20 was previously damaged while in slot 12.
 - TX36 #24 was found to have 5 channels reporting "low voltage". This board does not have a failed high voltage bridge.
 - Through a telnet connection to the EM122 TRU all of the "Detailed TX channels" BIST were run. This test shows the actual impedance values of all 864 TX channels. Only boards 12, 20 and 24 showed bad channels; all other channels reported as "OK". For example this is the result from TX36 #12:

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Transmitter impedance rack: 0 Slot: 12
Ch: 0 Z=70.0 (-2.5 deg) OK at f=11.7 kHz Umag=12.0
Ch: 1 Z=69.2 (-5.4 deg) OK at f=11.7 kHz Umag=11.8
Ch: 2 Z=6.8 (35.8 deg) Low Voltage at f=11.7 kHz Umag=4.4
Ch: 3 Z=177.1 (0.0 deg) Low Voltage at f=0.0 kHz Umag=1.5
Ch: 4 Z=69.2 (-5.0 deg) OK at f=11.7 kHz Umag=12.1
Ch: 5 Z=67.7 (-5.4 deg) OK at f=11.7 kHz Umag=11.7
Ch: 6 Z=72.5 (-8.4 deg) OK at f=11.7 kHz Umag=12.3
Ch: 7 Z=154.4 (0.0 deg) Low Voltage at f=0.0 kHz Umag=1.4
Ch: 8 Z=249.5 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.4
Ch: 9 Z=205.9 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.2
Ch: 10 Z=242.5 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.3
Ch: 11 Z=391.3 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.3
Ch: 12 Z=743.2 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.4
Ch: 13 Z=821.3 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.4
Ch: 14 Z=350.0 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.2
Ch: 15 Z=340.7 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.2
Ch: 16 Z=68.5 (-5.2 deg) OK at f=11.7 kHz Umag=12.3
Ch: 17 Z=67.9 (-1.4 deg) OK at f=11.7 kHz Umag=12.5
Ch: 18 Z=68.8 (-4.2 deg) OK at f=11.7 kHz Umag=12.1
Ch: 19 Z=70.4 (-3.4 deg) OK at f=11.7 kHz Umag=12.1
Ch: 20 Z=70.6 (-1.7 deg) OK at f=11.7 kHz Umag=12.5
Ch: 21 Z=70.9 (-3.7 deg) OK at f=11.7 kHz Umag=12.5
Ch: 22 Z=68.9 (-5.2 deg) OK at f=11.7 kHz Umag=12.0
Ch: 23 Z=65.5 (-0.5 deg) OK at f=11.7 kHz Umag=12.0
Ch: 24 Z=48950.0 (0.0 deg) Low Voltage at f=0.0 kHz Umag=1.5
Ch: 25 Z=4141.7 (0.0 deg) Low Voltage at f=0.0 kHz Umag=1.6
Ch: 26 Z=1948.2 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.7
Ch: 27 Z=3418.8 (180.0 deg) Low Voltage at f=0.0 kHz Umag=1.7
Ch: 28 Z=383.3 (0.0 deg) Low Voltage at f=0.0 kHz Umag=1.8
Ch: 29 Z=409.6 (0.0 deg) Low Voltage at f=0.0 kHz Umag=1.8
Ch: 30 Z=754.8 (0.0 deg) Low Voltage at f=0.0 kHz Umag=1.7
Ch: 31 Z=332.6 (0.0 deg) Low Voltage at f=0.0 kHz Umag=1.6
Ch: 32 Z=69.1 (-5.4 deg) OK at f=11.7 kHz Umag=12.1
Ch: 33 Z=73.1 (-7.3 deg) OK at f=11.7 kHz Umag=12.2
Ch: 34 Z=68.9 (-4.4 deg) OK at f=11.7 kHz Umag=12.3
Ch: 35 Z=66.9 (-5.1 deg) OK at f=11.7 kHz Umag=11.6

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- I modified the TX beam weight files to turn off the one shorted channel in Slot 6 (actual board 7) and the six channels in Slot 11 (actual board 12). This was done by uploading the file from the TRU using FTP, modifying the file, saving it and then downloading it back to TRU. The original file and the modified file have been saved. If and when the modules get replaced then the modified file can be replaced with the original.

Summary

- TX module 13 is s/n 3406 and TX module 23 is s/n 3442.
- There are presently 3 faulty TX36 boards installed in the TRU: TX36 #12 (s/n 211131), TX36 #23 (s/n 211543), TX36 #24 (s/n 212173). TX36 #23 was originally board #20 but was moved to be near the end of the TX array.
- There are 7 bad TX channels out of 864 channels. 6 channels (Module 23) are in the center of the TX array and may therefore have greater impact on performance.
- The results of the TX impedance tests will be sent to Norway and we will wait for their analysis and recommendations.
- Due to the faulty TX36 boards the "TRU Power Test", "TX36 Test" and "TX Channels" BIST in SIS will fail. However the EM122 is still operational. The system pinged at the dock and no errors were reported.

1. Signatures.

DATE: 08/04/2015	KM Representative signature: Printed: Chuck Hohing	Work Accepted on behalf of Customer signature: Printed:
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