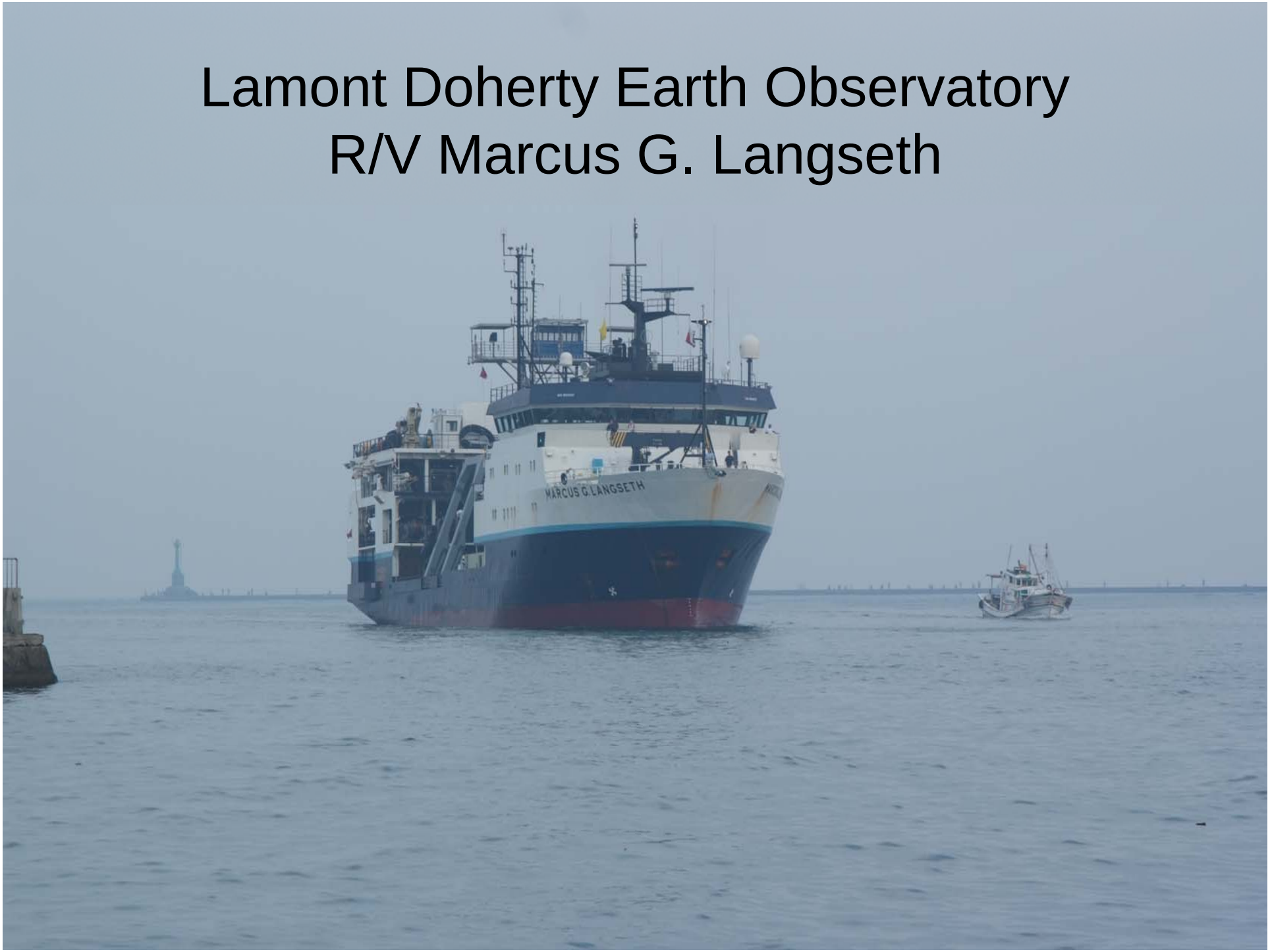
Lamont Doherty Earth Observatory
R/V Marcus G. Langseth



2009 Schedule

- 260 Operating Days
- 7 Science Legs:
  - MGL 0902 D. Bohnenstiehl 10 moorings Lau Basin- 10 days. General purpose cruise.
  - MGL 0903 D. Weins E. Lau Basin Spreading Center OBS with sound source only- 47 days.
  - MGL 0905-08 K. McIntosh Taiwan- Taiger 2D MCS, OBS. Four legs 114 days. 54 days funded by NTU and CGS of Taiwan.
  - MGL 0910 D. Toomey- Endeavor Ridge OBS and Sound Source only. 34 days.
  - Extended Continental Shelf Survey- Canceled.

2009 Langseth Down Time

Maritime
- Engine
  - Engine Control - Upgrade Scheduled
  - Hydraulics - Spare Parts – Operational Experience
- Permits

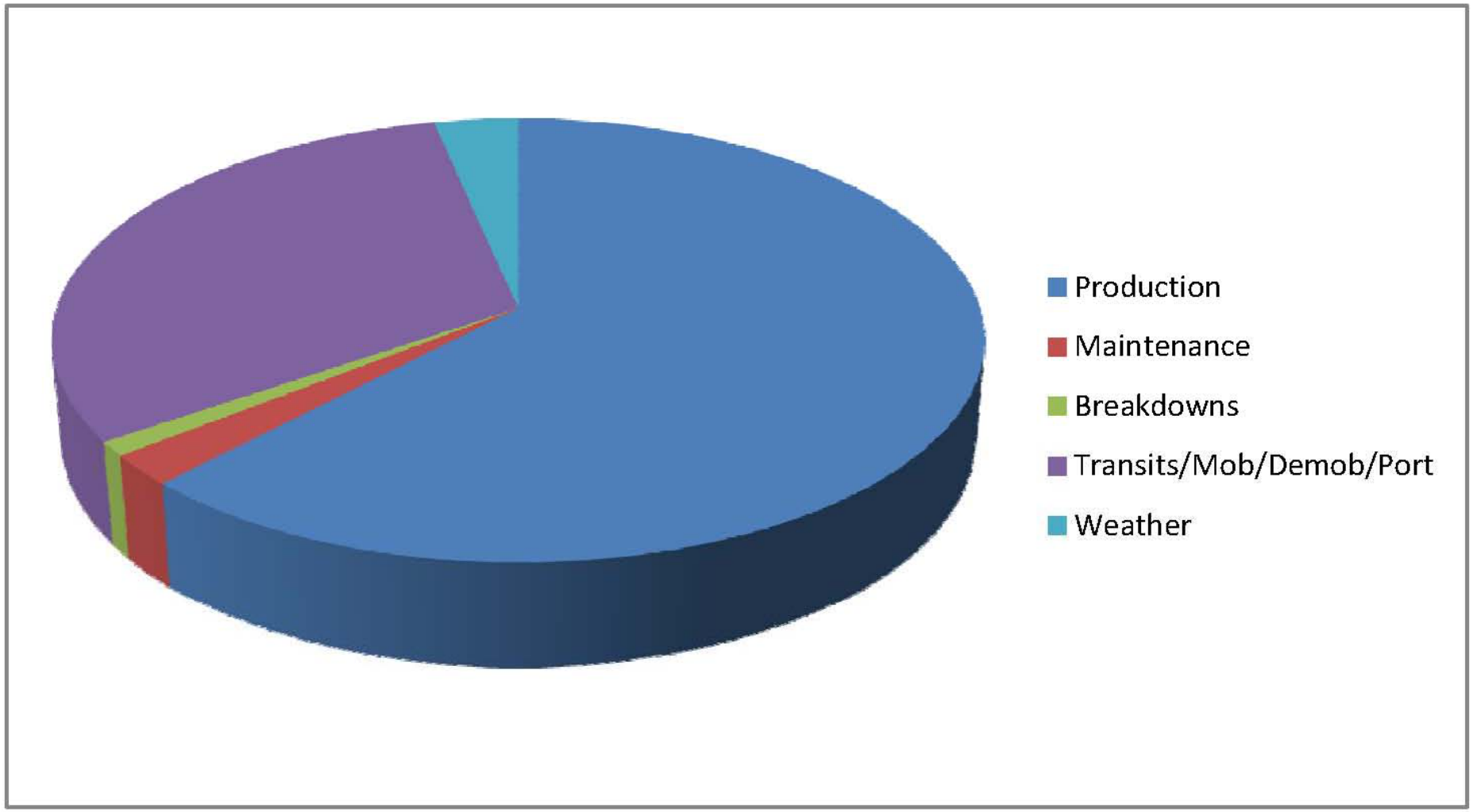
Science Ops
- Streamer Incident - Chase Boats – Equipment Loss
- Source Umbilicals - Replacement
- Systems
  - Gun Control
  - Navigational Systems
  - Recording Systems
  - EM122

Mammal
- Shut Downs
- Permit Restrictions

Fishing Vessels

Permit Restrictions

09 Review of Operations



Cruise Number: MGL0902 100% or More

Cruise Number: MGL0903 100% or More

Cruise Number: MGL0903 There was an unexpected strong sense of common purpose to achieve the science objectives.

Cruise Number: MGL0905 50%-74% - EEZ

The seismic equipment produced high quality seismic data, and the marine technicians are professional and willing to provide needed help.

Cruise Number: MGL0906 75%-99%

I was fairly impressed with the personnel aboard the Langseth. As noted above, this is a very capable ship and I am happy to have access to it. However, it can be operated at a higher level and acquire even better data.

Cruise Number: MGL0907 Of the 20 instruments, we recovered 18

Cruise Number: MGL0908 75%-99% weather and mechanical problems.

I would first like to say that the R/V Langseth is the best academic seismic platform that I am aware of and I am very happy to have access to it and take advantage of its capabilities. With that said, however, the usage of the ship during this cruise fell a bit below its capabilities. The biggest problem was the inconsistent performance of the source arrays. During this cruise, the streamer had an increased number of noisy channels.

Cruise Number: MGL09010 100% or More

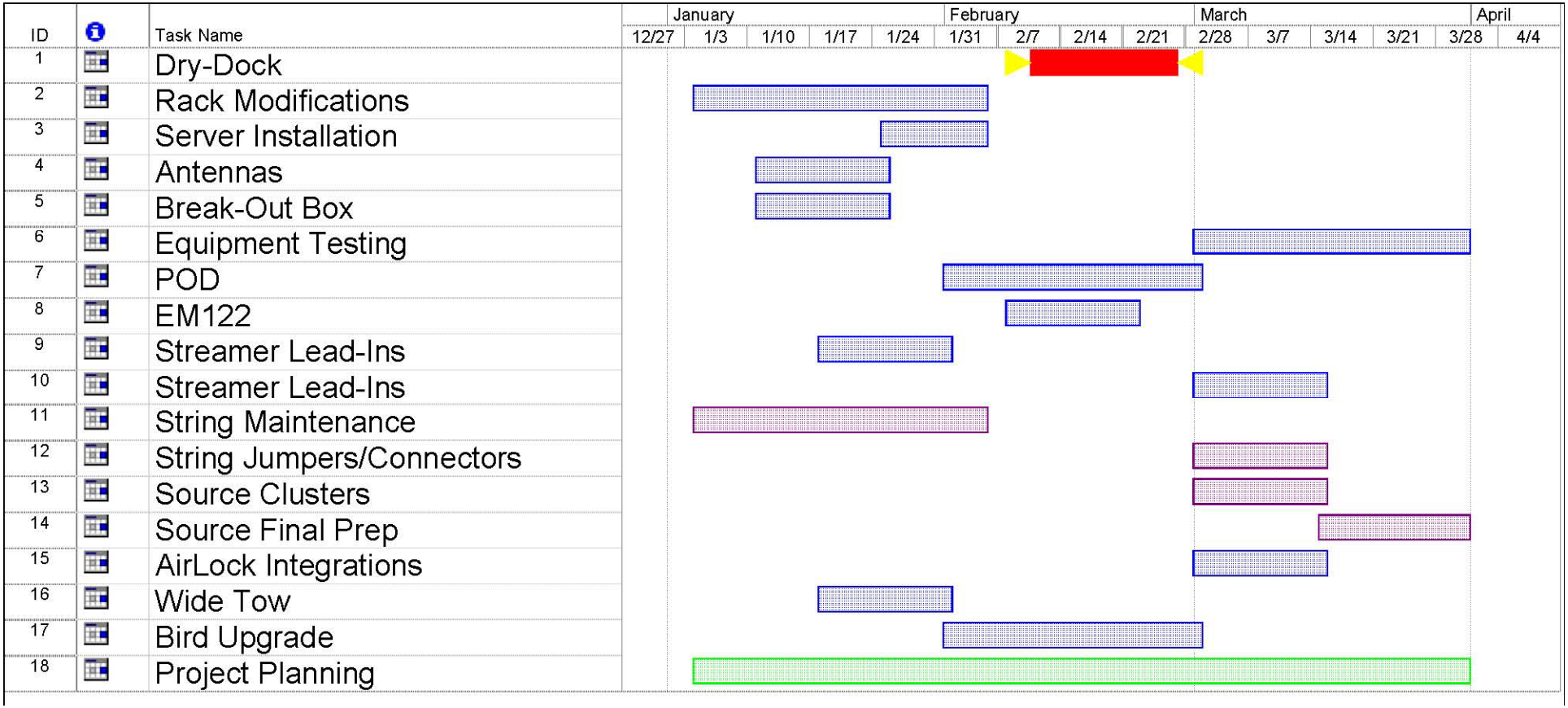
We were extremely pleased with the scientific equipment aboard the Langseth. The seismic operations and capabilities are impressive.

MARINE TECHNICIANS: We had superb support from all of the science techs. Anthony Johnson and David Martinson were particularly valuable in terms of cruise planning, decision making and understanding the seismic data logging on MGL. Any questions we had, they were on them quickly, efficiently and, more importantly, came back with suggestions and options. Very professional, very conscientious. We greatly appreciated their demeanor and professionalism. Like having other chief scientists on board. Except that in this case they were more realistic!

2009-2010 Maintenance Period

- Drydock, drop rudders, pull shafts
- Replace bowthruster with over hauled unit
- Seismic compressors and Caterpillar diesels overhaul
- Engine and main gear overhaul.
- Upgrade to engine controls, pitch controls, ER alarm system
- Replace Bridge Radars, SVDR installsd
- Steering system upgrade and modification
- Fleet Broadband installation
- Magnetometer and PAM Winch replacement

2009-2010 Maintenance Period



2010 Schedule

- 173 Operating Days
- 3 Science Legs:
  - D. Weins Marianas OBS, Sound Source, Multibeam- 47 days. No foreign clearance. Marine mammal permitting. Precruise planning scheduled for early January.
  - J. Korenaga- Shatsky Rise OBS, 2D MCS w/ 6km streamer– 50 days. No foreign clearance. Marine mammal permitting.
  - D. Shillington- Alaska Peninsula, OBS, Hybrid 3D with two 8km Streamers- 37 days. No foreign Clearance. Marine mammal permitting. Held first precruise planning meeting in December.

2010 Proposed Instrumentation

1- Processing, Computing and Logging Servers.
2- MCS Streamer Tow Leader Re-Terminations.
3- Sound Source Jumper Rearrangement.
4- MCS Streamer Repairs.
5- MCS Streamer Recovery Devices.
6- 75kHz ADCP.
7- Sound Source Module Connections .

2010 Proposed SSSE Equipment

1- Streamer winch control valves & wireless control.
2- Incinerator
3- Anti fouling system for SW piping.
4- Replacement for main deck articulated crane.
5- Oceanographic winch.
6- Vibration analysis/monitoring
7- Reverse osmosis unit.

EM122 1º x 1º

Transducer Array

48 Modules

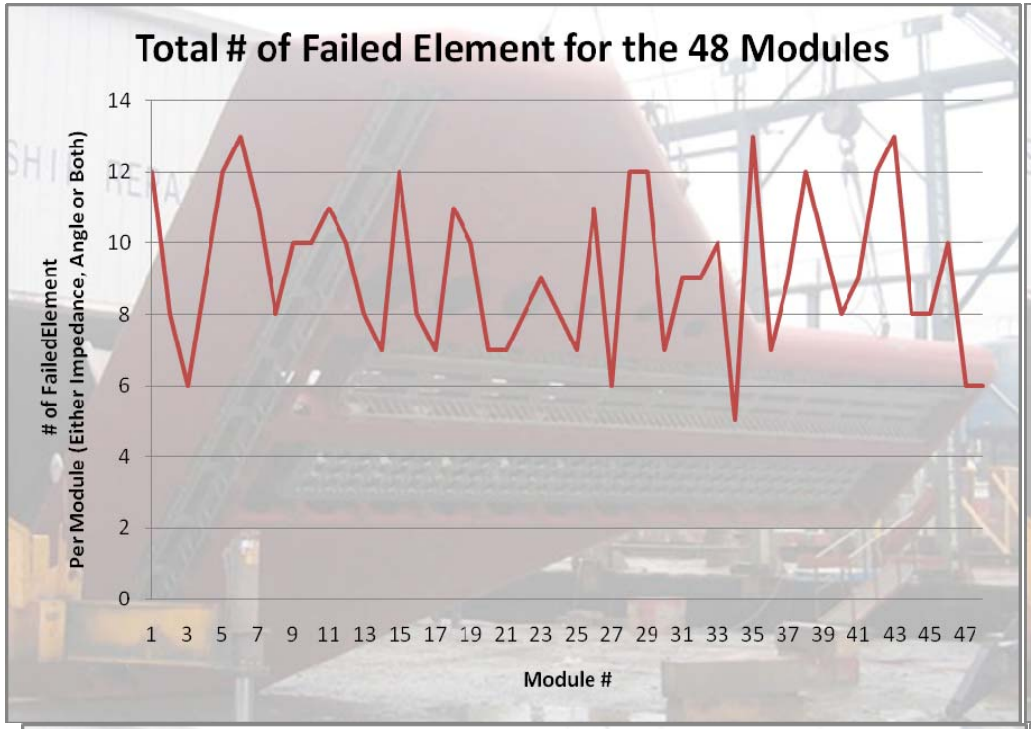
each with 18 Elements

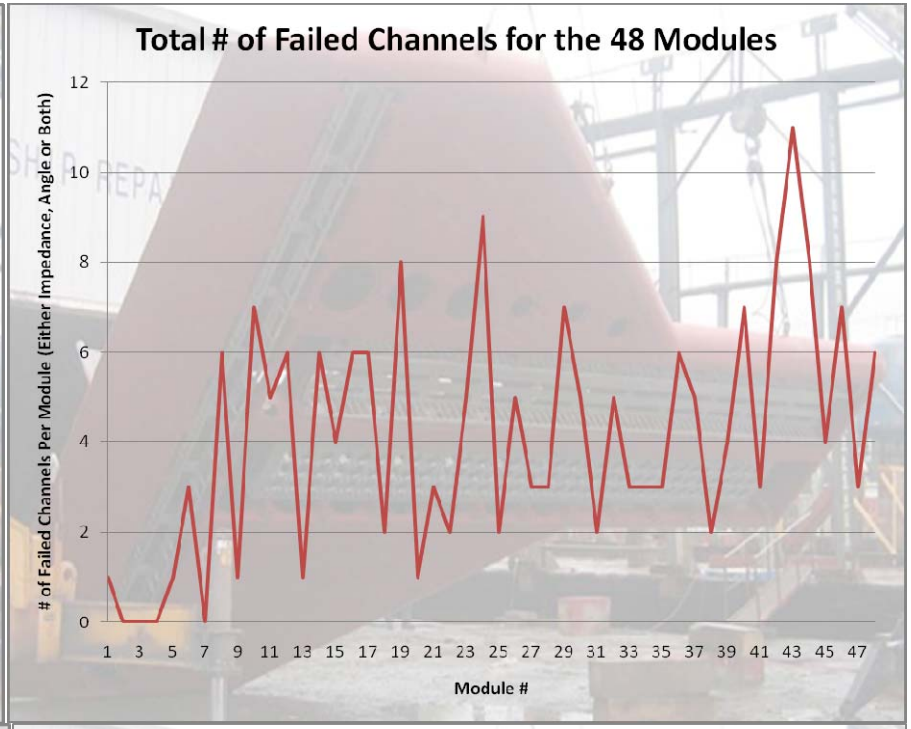
Receive Array

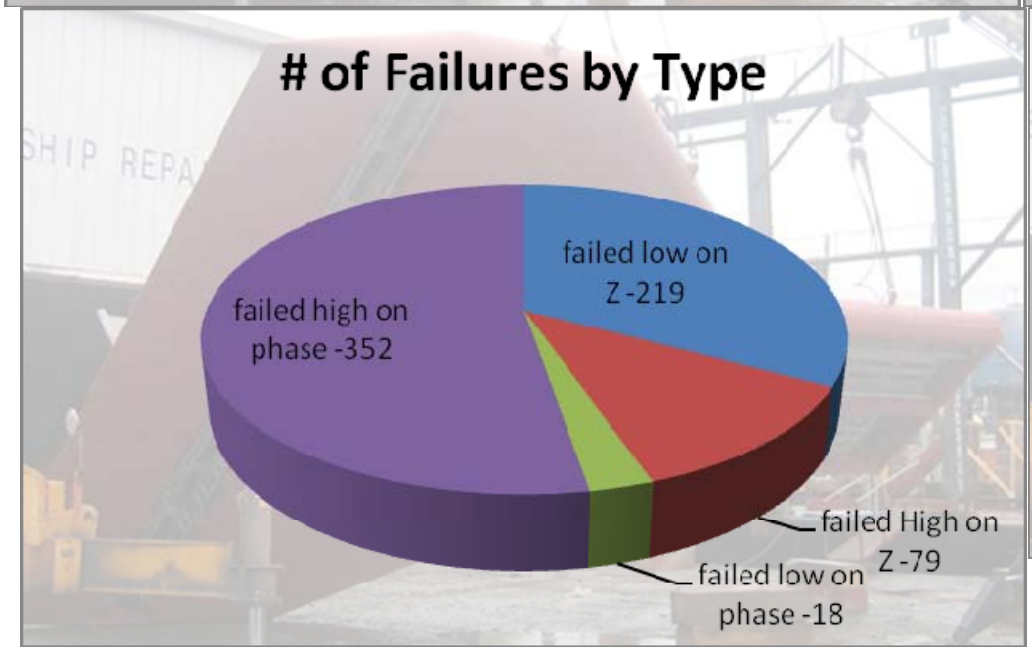
16 Modules

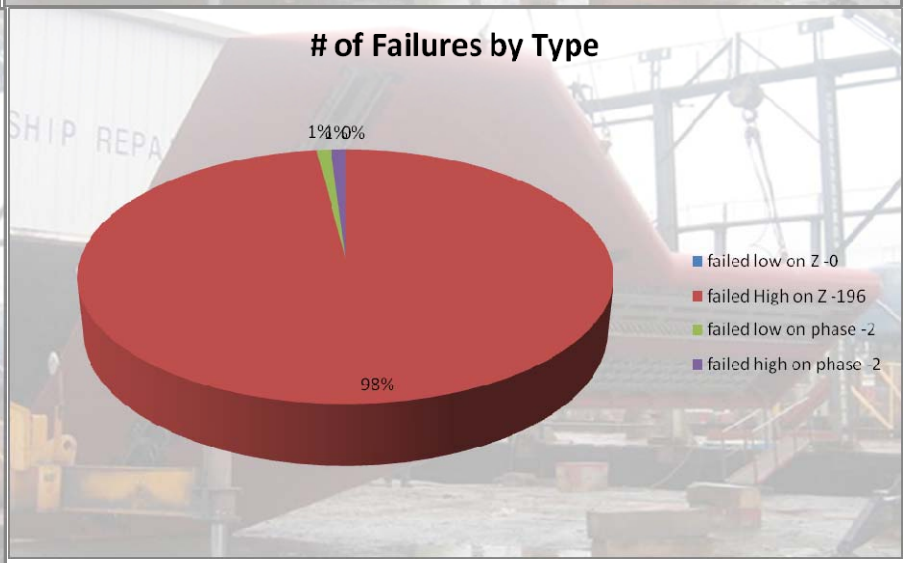
each with 8

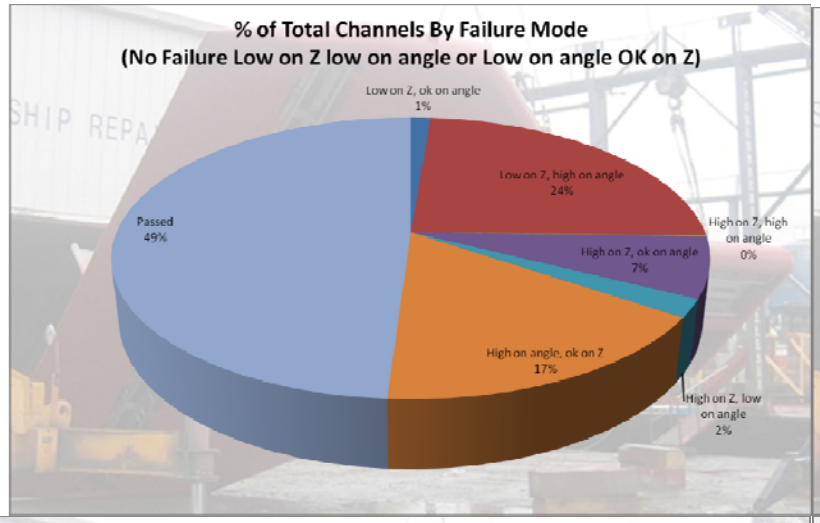
Transducer Staves

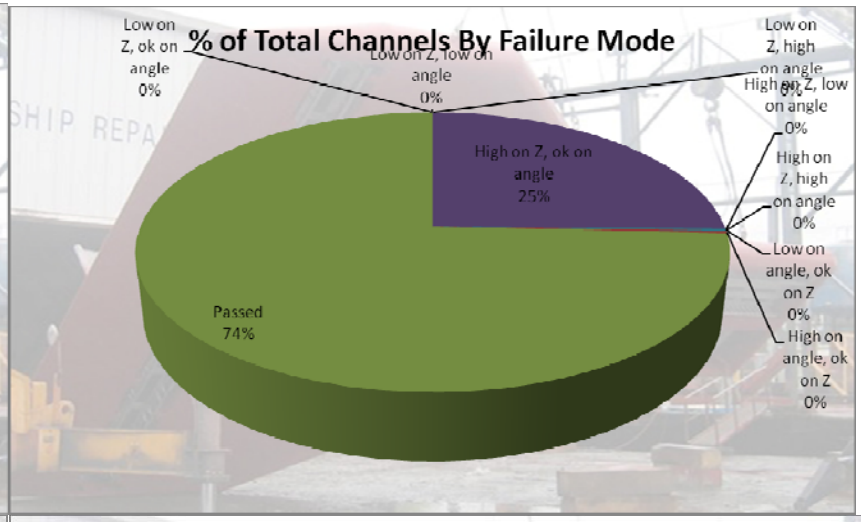

Total # of Failed Element for the 48 Modules
# of FailedElement Per Module (Either Impedance, Angle or Both)
0
2
4
6
8
10
12
14
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
Module #

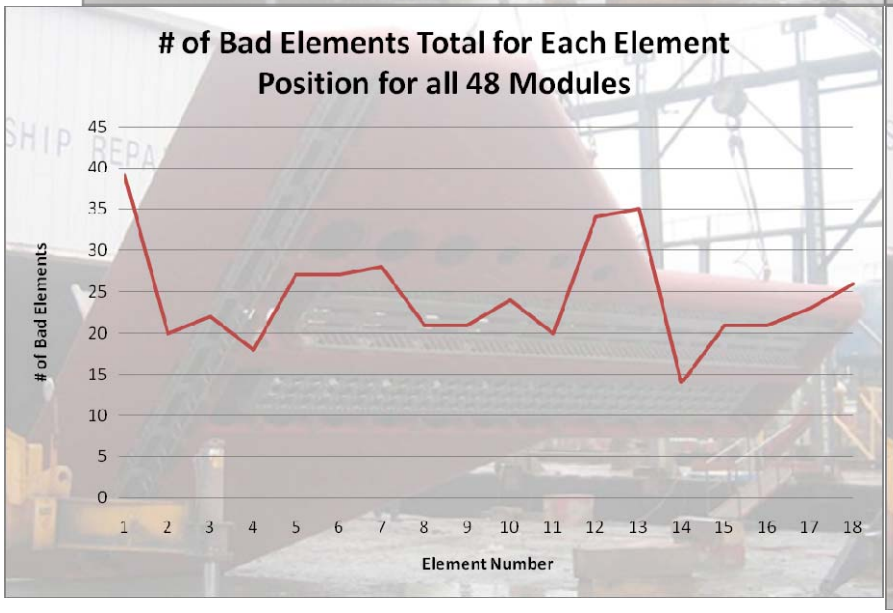

Total # of Failed Channels for the 48 Modules
# of Failed Channels Per Module (Either Impedance, Angle or Both)
0
2
4
6
8
10
12
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
Module #

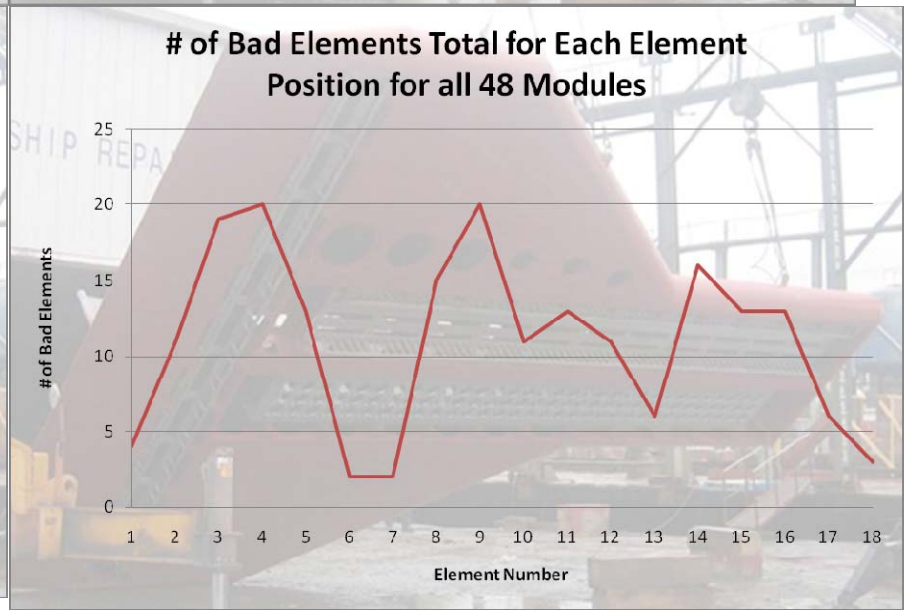

# of Failures by Type
failed low on Z -219
failed high on phase -352
failed High on Z -79
failed low on phase -18

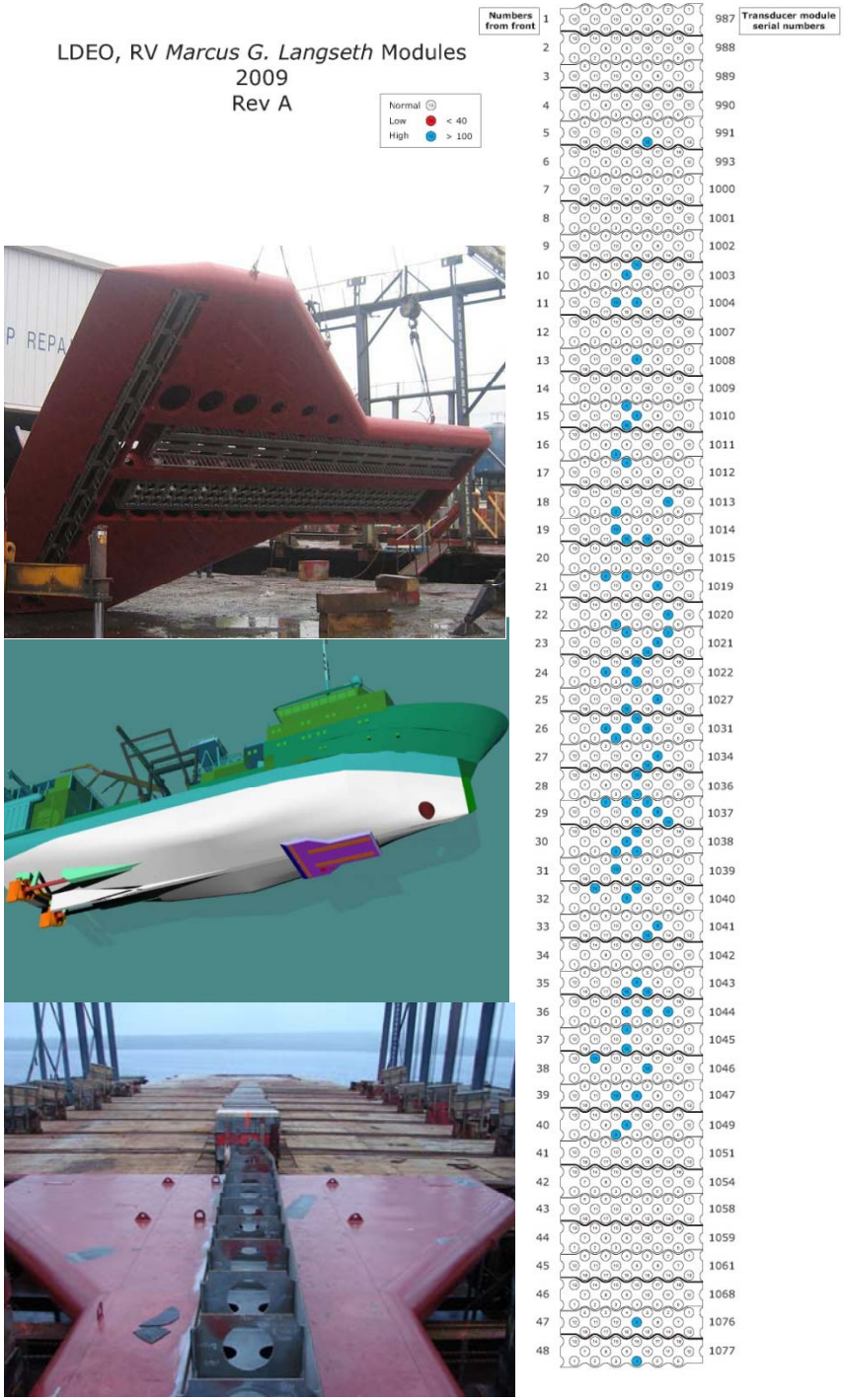

# of Failures by Type
1%
1%
0%
98%
failed low on Z -0
failed High on Z -196
failed low on phase -2
failed high on phase -2

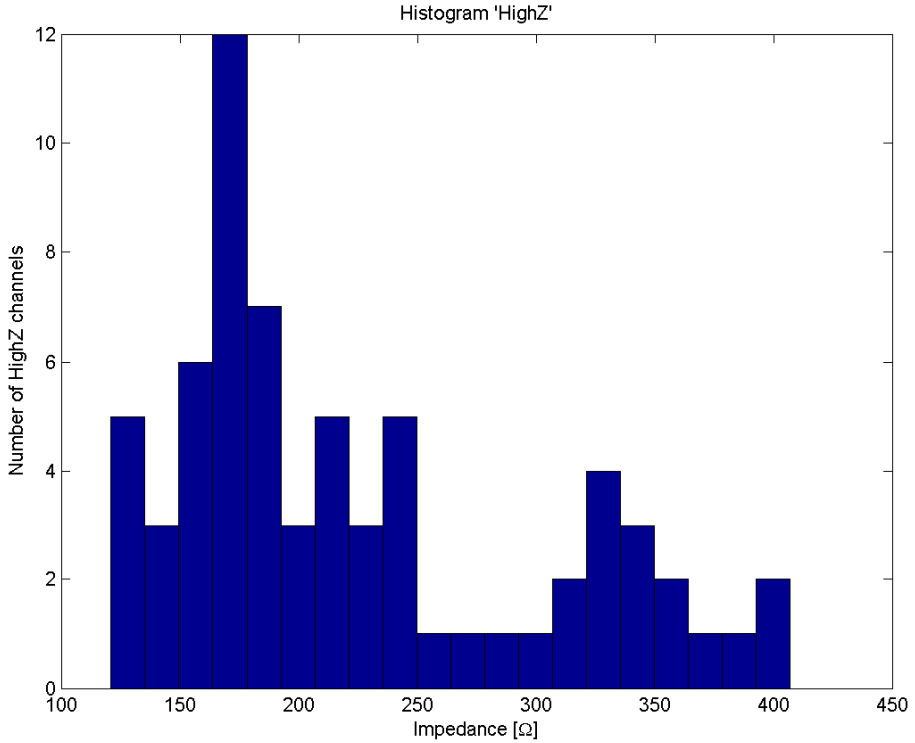

% of Total Channels By Failure Mode
(No Failure Low on Z low on angle or Low on angle OK on Z)
Low on Z, ok on angle
1%
Low on Z, high on angle
24%
High on Z, high on angle
0%
High on Z, ok on angle
7%
High on angle, ok on Z
17%
High on Z, low on angle
2%
Passed
49%


% of Total Channels By Failure Mode
Low on Z, ok on angle
0%
Low on Z, low on angle
0%
Low on Z, high on angle
0%
High on Z, low on angle
0%
High on Z, high on angle
0%
High on Z, ok on angle
25%
Low on angle, ok on Z
0%
High on angle, ok on Z
0%
Passed
74%

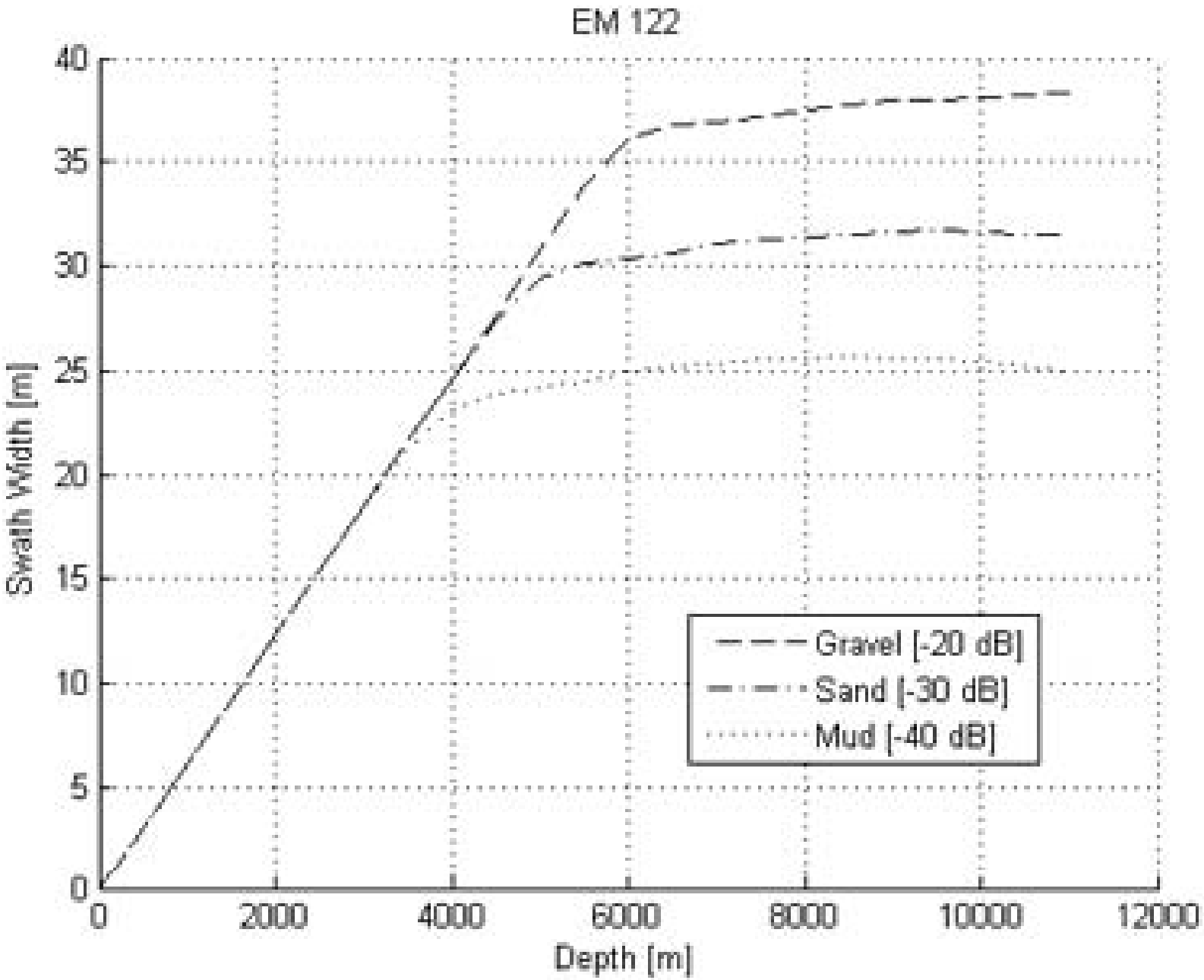

# of Bad Elements Total for Each Element Position for all 48 Modules
# of Bad Elements
45
40
35
30
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Element Number


# of Bad Elements Total for Each Element Position for all 48 Modules
# of Bad Elements
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Element Number





We will assume these errors are due to breakage of interconnection wiring in these “old” TX modules and simulate the effect on source level and beam pattern.


EM 122
Swath Width [m]
Depth [m]
0
5
10
15
20
25
30
35
40
0
2000
4000
6000
8000
10000
12000
Gravel [-20 dB]
Sand [-30 dB]
Mud [-40 dB]

EM 122, Reduced 1 dB