OFFICE OF MARINE OPERATIONS
TECHNICAL SERVICES

MISSION PLANNING

(The view from inside the weeds!)

MISSION PLANNING STEPS

- Schedulers Meetings
- Permits & Clearances:
  - Foreign
  - Mammal
- Pre-cruise planning efforts
  - Con-calls
  - Meetings
  - Science Support Plan (SSP)

Science Support Plan

R/V Marcus G. Langseth

The Gallifrey Mission
June 10th – August 9th 2014
Cruise no. MGL14-12
For
Dr. Peter Capaldi (TARDIS)

Date:	December 7, 2013 (Rev. 1)
Compiled By:	Jeff Rupert
	Robert Steinhaus
	David Martinson

Distribution list:

Copy:	Receiver:	Date
1	Chief Scientist	
2	NSF Ship Operations Program Manager	
3	NSF Technical Services Program Manager	
4	Vessel, Chief Science Officer	
5	Vessel, Captain/Chief Engineer	

CONTENTS

PAGE

ENAM Lines V4
ENAM Lines V4 - Marcus G Langseth 1x8000

General Information

Project Name	ENAM Lines V4
Scenario Name	ENAM Lines V4 - Marcus G Langseth 1x8000
Vessel Name	Marcus G Langseth
Start Of Mobilization	11/25/2013 13:42
Start Of Production	11/25/2013 13:42
Vessel Time	11/25/2013 13:42
Client Name	N/A
Area Name	N/A
Comment	

Acquisition Configuration

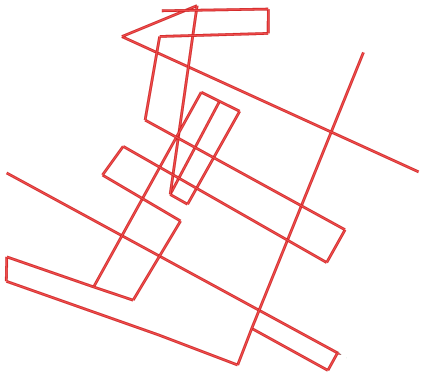
Equipment Configuration	
Streamers	1
Sources	1
Separation	0.00
Streamer Spread	0.00
Extra Spread (m)	100.00
Total Spread (m)	100.00
Streamer Length (m)	8000.00
Total Length (m)	8500.00
Performance	
Turn Radius (m)	0.00
Online Speed (knots)	4.20
Offline Speed (knots)	4.20
Turning Speed (knots)	4.20
Safe Draft (m)	22.00
Contract	
Run In (m)	0.00
Run Out (m)	0.00
Max Missed Shots	8
Line Change Limit	8:00
Configuration Statistics	
Expected Shot Interval (s)	17.4
Min Circle Duration	0:00
Min Normal Line Change	0:00

Basic Allowances

Infill Rate	0.00 %
Infill Efficiency	100.00 %
Downtime Rate	10.00 %
Standby Rate	10.00 %

Objects

Circular Objects	0
Polygonal Objects	1



Preplots

Preplots	35
Heading(s)	298.6, 118.6, 208.8, 298.9, 22.0, 202.0, 201.1, 290.9, 289.5, 1.1, 109.1, 28.9, 116.6, 207.9, 8.1, 247.6, 114.6, 294.6, 67.6, 188.1, 119.5, 29.2, 296.4, 208.9, 108.6, 30.9, 300.6, 35.8, 119.8, 298.8, 9.9, 88.4, 0.1, 269.1
SPI (m)	37.50
Total Length (km)	5981.72 (not including runouts)
Average Length (km)	170.91
Spacing (m)	N/A
Area (Sq. km)	130862.0 (avg length x spacing x preplots)

Incomplete Lines

Type	Total	Average Length (km)	Total Length (km)	% Length Total
All	35	175.18	6131.33	—
Prime	35	175.18	6131.33	100.00 %
Infill	0	0.00	0.00	0.00 %
Reshoot	0	0.00	0.00	0.00 %

Completed Lines

Type	Total	Average Length (km)	Total Length (km)	% Length Total
All	0	0.00	0.00	—
Prime	0	0.00	0.00	0.00 %
Infill	0	0.00	0.00	0.00 %
Reshoot	0	0.00	0.00	0.00 %
(DNP)	0	0.00	0.00	0.00 %

Useful Numbers

% Complete	0.0 %
% Prime Complete	0.0 %
% Prime Incomplete	100.0 %

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Office of Marine Operation (OMO)
MCS/OBS Operational Presentation

12/9/13

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Office of Marine Operation (OMO)
Timing Guidelines Source Only

1. First Source Deployment – 4 hours
2. Subsequence Source Deployments – 1.5 hours
3. Source Retrieval – 1.5 hours
4. Turning – 5 Deg a min or ~1.5 km Radius or 3k between lines
5. Maximum Speed 5.5 Kts
6. Minimum Water Depth – 22m
7. Preventive Maintenance – 2 hours every 12 hours
8. 20% Technical Downtime for Instruments, Source Air Leaks, and MMO Issues
7. 6.0 Kts max speed through the water

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Timing Guidelines 2D MCS

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1. First Deployment Streamer – 24 hours
2. Subsequent Streamer Deployments – 12 hours
3. Streamer Retrieval – 4 hours
4. First Source Deployment – 4 hours
5. Subsequent Source Deployments – 1.5 hours
6. Source Retrieval – 1.5 hours
7. Turning – 5 deg a min or ~2.5 km radius or 5 k between lines
8. Maximum Speed 5.2 Kts with 6 km streamer – 4.3 Kts with 8 km streamer
9. Minimum Water Depth – 22m
10. Preventative Maintenance Source – 2 hours every 12 hours
11. Preventative Maintenance Streamer –18 hours every 14 days
12. 20% Technical Downtime for Instruments, Source Air Leaks, and MMO Issues
13. With 6km cable, max speed is 5.2 kts through the water
14. With 8km cable, max speed is 4.8 kts through the water

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Timing Guidelines 3D MCS

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1. First Deployment Streamer – 72 hours
2. Subsequence Streamer Deployments – 24 hours
3. Streamer Retrieval – 18 hours
4. First Source Deployment – 4 hours
5. Subsequence Source Deployments – 1.5 hours
6. Source Retrieval – 1.5 hours
7. Turning – 3 Deg a min or ~2.5 km Radius or 6k between lines
8. Maximum Speed 4.8 kts with 6 km Streamer or 4.5kts with 8 km streamer
9. Minimum Water Depth – 22m
10. Preventive Maintenance Gun – 2 hours every 24 hours
11. Preventive Maintenance Streamer – 24 hours every 14 days
12. 20% Technical D/T for Instruments, Source Air Leaks, and MMO Issues
13. 30% Infill
13. Max speed is 4.5kts (through the water)

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SurvOPT Display

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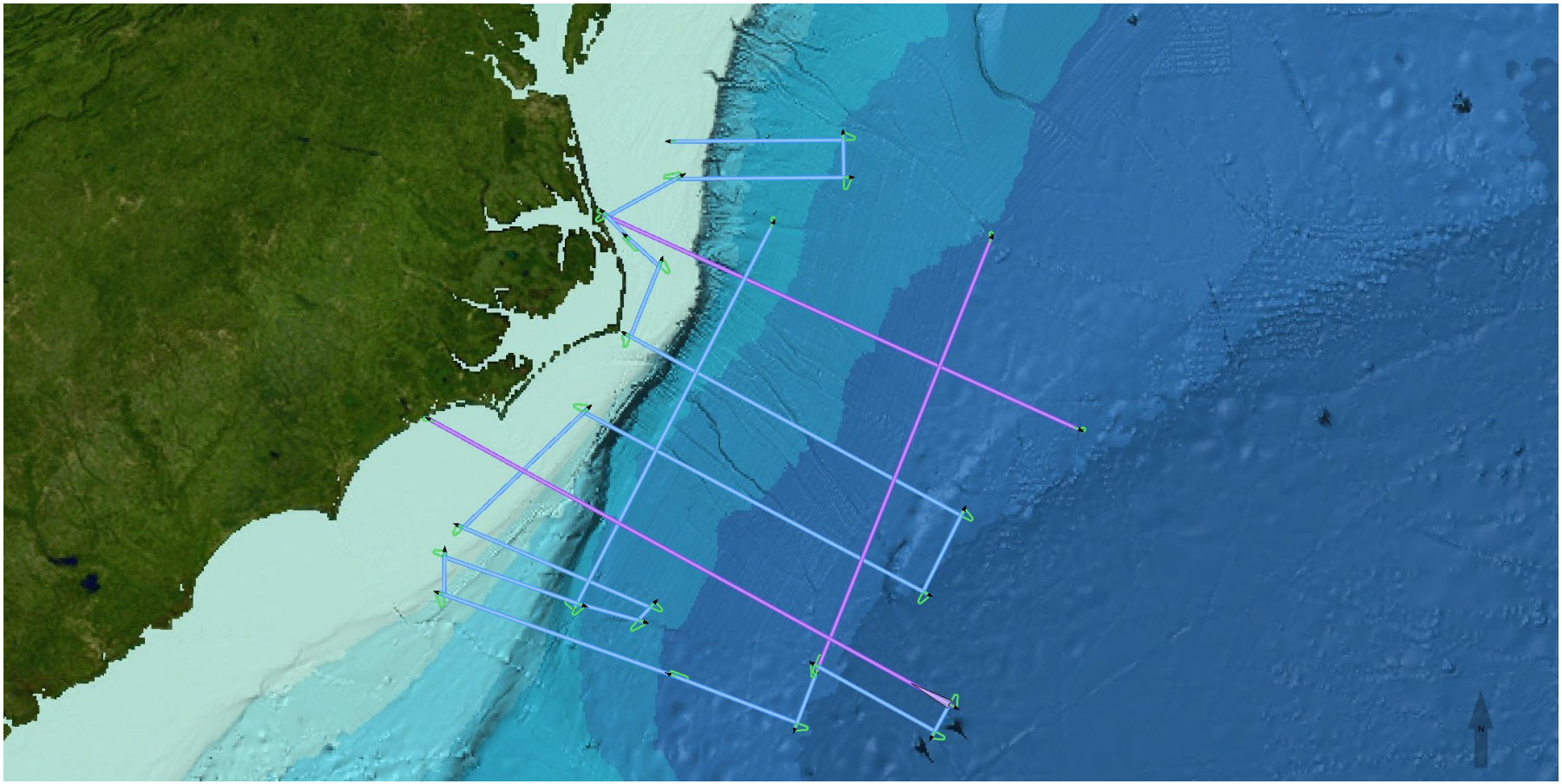

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SurvOPT Output to Google Earth

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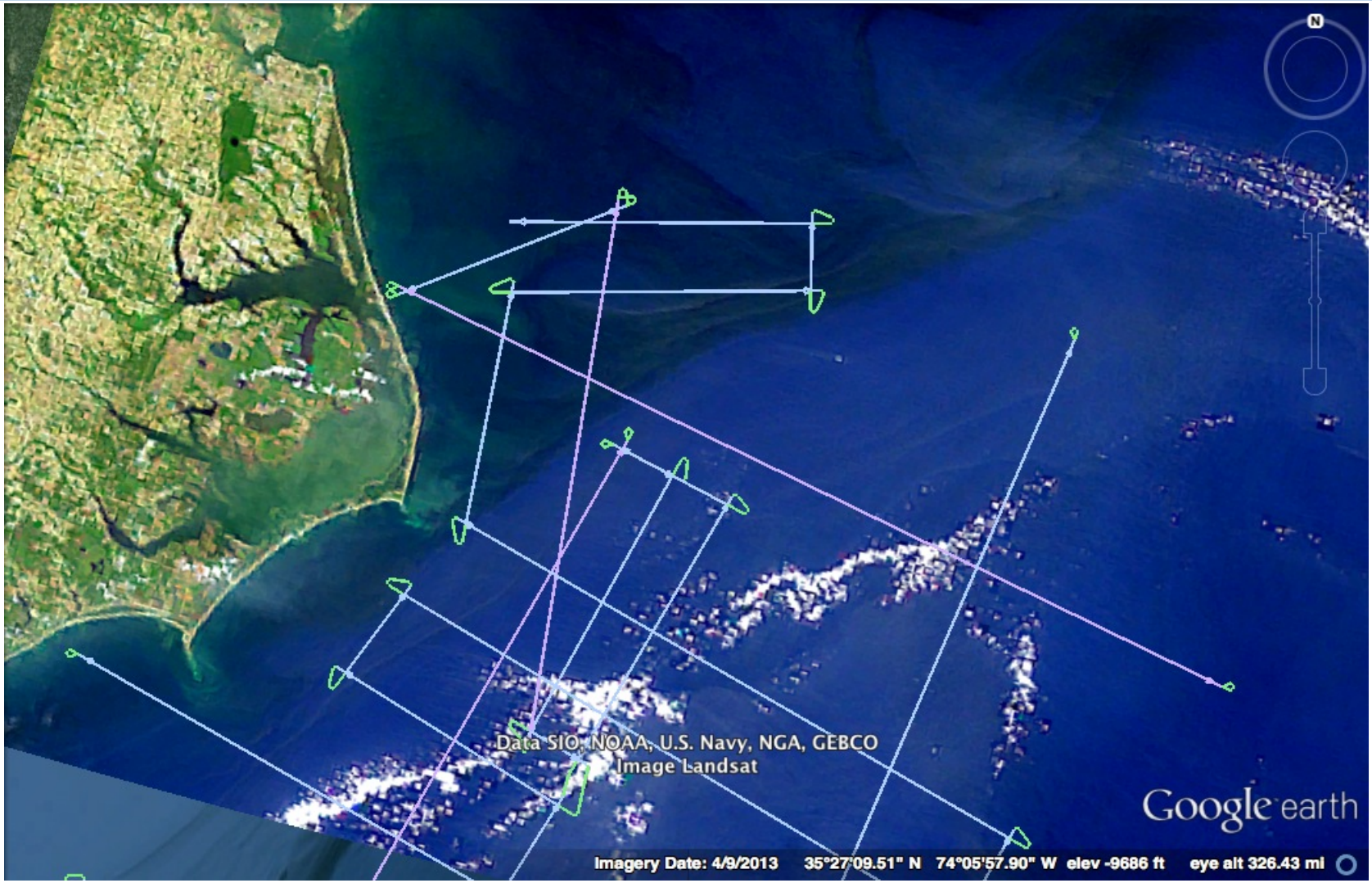

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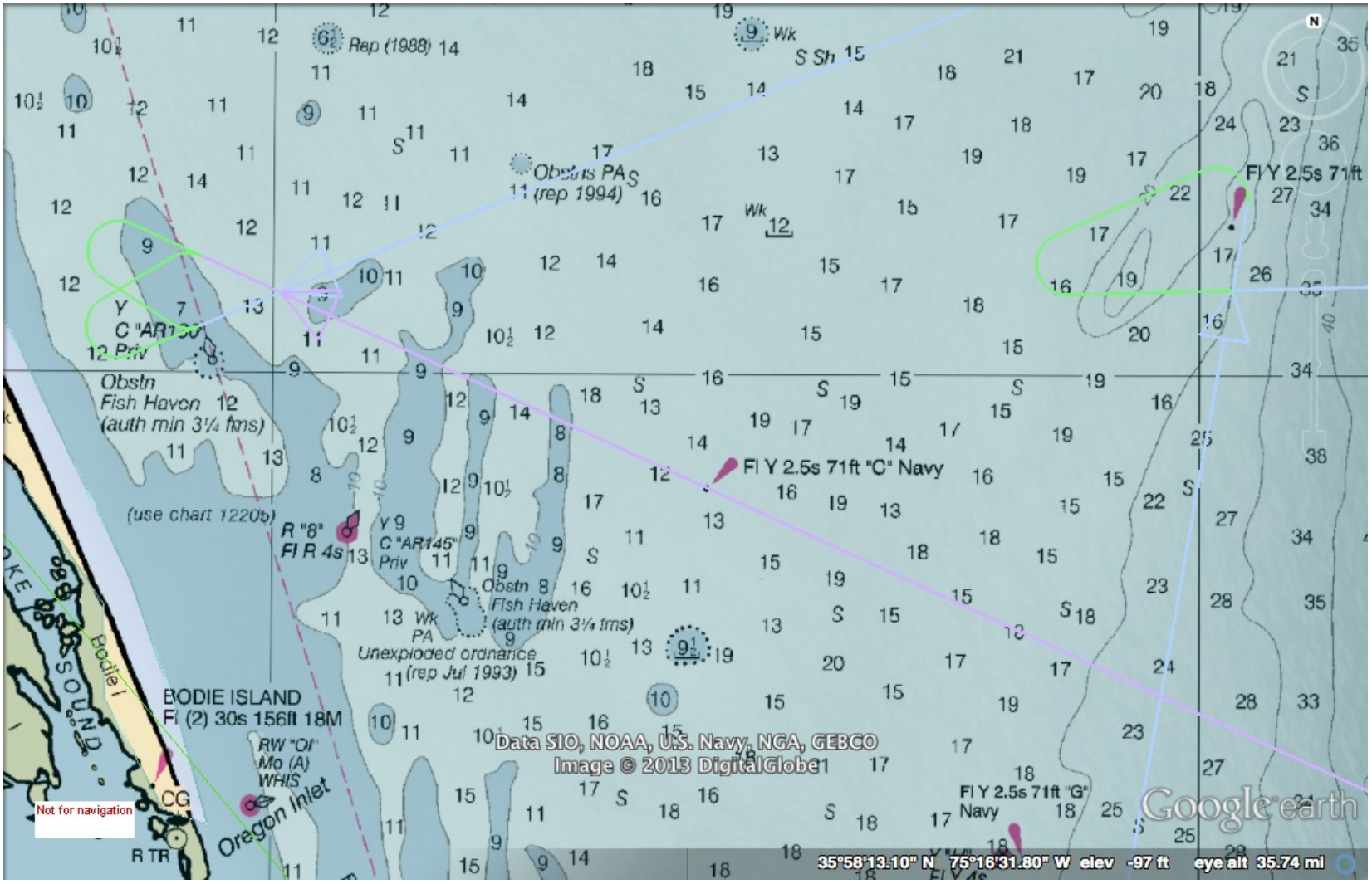

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Office of Marine Operation (OMO)
2D MCS Towed Array

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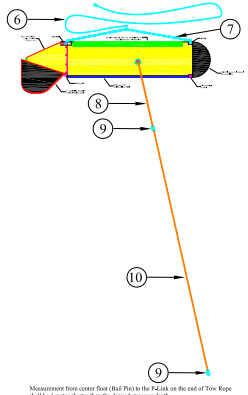
POS	Type	Model	Supplier	SWL
1	1 1/2" Alloy Bolt Type Anchor Shackle	G-2130	Crosby	17 Tons
2	34mm Chisel Spelter Socket	G-417	Crosby	34 Tons
3	30mm Dyform Wire Rope with Jacket	6x36 IWRC	Bridon	28 Tons
4	30mm Open Spelter Socket	G-416	Crosby	34 Tons
5	2 1/4" Master Link Assembly	A-345	Crosby	17 Tons
6	12mm 3-Strand Synthetic rope	Plasma	Cortland	3.3 Tons
7	1/2" SS Long Link Chain		WCW Rope	1.8 Tons
8	44mm 3-Strand Synthetic rope/Cable/tie	Plasma	Cortland	10 Tons
9	36mm Stainless Steel Pear link (Quick Link)	DQ30SSO	The Blue Line	12 Tons
10	36mm 3-Strand Synthetic Rope	Plasma	Cortland	10 Tons
11	32mm 3-Strand Synthetic rope.	Plasma	Cortland	17.8 Tons
12	1" Long Link Galvanized Chain		WCW Rope	10 Tons
13	36mm 3-Strand Synthetic Rope w/ Fitting	Plasma	Cortland	10 Tons
14	1 1/2" SS (Assorted) Cable Stopper	AS150K	Cortland	68 Tons
15	1 Alloy Master Link	A-342	Crosby	11 Tons

POS	Type	Model	Supplier	SWL

Not used in this Configuration

Not used in this Configuration

PV2000 & PV3000 Lead-In float rigging



Measurement from center float (Bail Pin) to the P-Link on the end of Tow Rope shall be 1 meter shorter then the desired streamer depth.

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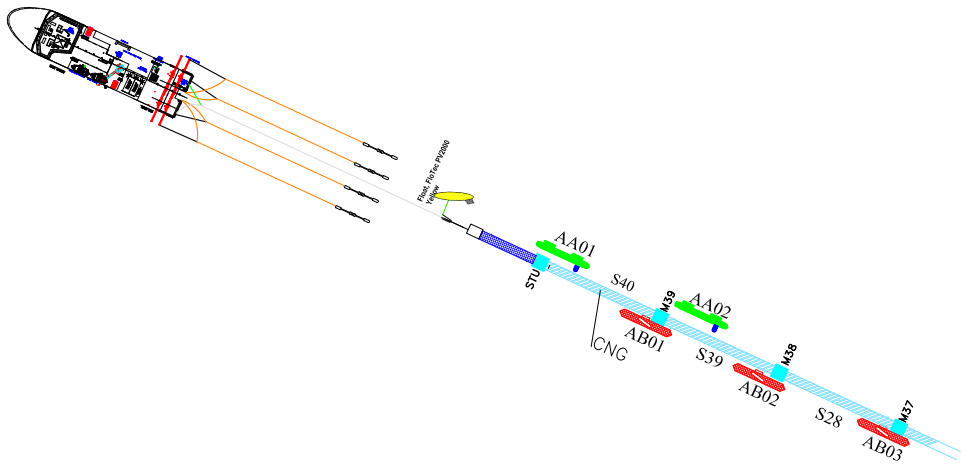
R/V Marcus G Langseth
MGL_Single_Streamer

Sub-Array 1 Umbillical paid out: 192 m - Bell to Tow Point 152 - Towed off Boom 27m Rope
Sub-Array 2 Umbillical paid out: 194 m - Bell to Tow Point 154 - Towed off Boom 30m Rope
Sub-Array 3 Umbillical paid out: 196 m - Bell to Tow Point 156 - Towed off Boom 30m Rope
Sub-Array 4 Umbillical paid out: 195 m - Bell to Tow Point 155 - Towed off Boom 27m Rope
Tow Point on Lead-ins are Located 12.5m from Bell Housing
Lead in 1 : 260 m - Total Lead-in Deployed
Lead in 1 : 227.5m - Tow Point to Soft Tow Point
Soft Tow Rope : 15m with 15 links of 1" Chain in a Y-harness



NB: All lengths of spread ropes are including hardware

Version	Created by	Verified by	Changed/Updated	Date
1	RJS	DM	Updated to MGL 2D Configuration	2014-06-15

LDEO Columbia University
61 Route 9W
Palisades, New York 10964

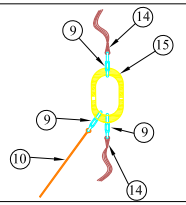
Vane Harness / Primary Tag Line Connection

Not used in this Configuration

Mid Connection Point for Primary Tag Line

Not used in this Configuration

Outer-Leadin Connection



Inner-Leadin Connection

Not used in this Configuration

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3D MCS Towed Array

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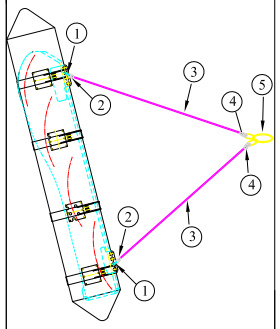
POS	Type	Model	Supplier	SWL
1	1-1/2" Alloy Bolt Type Anchor Shackle	G-2130	Crosby	17 Tons
2	38mm Closed Spelter Socket	G-417	Crosby	34 Tons
3	38mm Dyform Wire Rope with Jacket	6x36 IWRC	Bridon	28 Tons
4	38mm Open Spelter Socket	G-416	Crosby	34 Tons
5	2 3/4" Master Link Assembly	A-345	Crosby	17 Tons
6	32mm 12-Strand Synthetic rope	Plasma	Cortland	3.3 Tons
7	1/2" RS Long Link Chain		WCW Rope	1.8 Tons
8	36mm 12-Strand Synthetic rope/Spelter	Plasma	Cortland	10 Tons
9	36mm Stainless Steel 3x2 ml (Quick Link)	DQ30SSO	The Blue Line	12 Tons
10	36mm 12-Strand Synthetic Rope	Plasma	Cortland	10 Tons
11	32mm 12-Strand Synthetic rope	Plasma	Cortland	17.8 Tons
12	1" Long Link Galvanized Chain		WCW Rope	10 Tons
13	36mm 12-Strand Synthetic Rope w/ Fitting	Plasma	Cortland	10 Tons
14	1 1/2" All (Assembl) Cable Stopper	AS150K	Cortland	68 Tons
15	1 Alloy Master Link	A-342	Crosby	11 Tons

POS	Type	Model	Supplier	SWL

15 Barovane equiped with 6x36 Dyform Wire Rope Legs with 2 3/4" Master Link Assembly

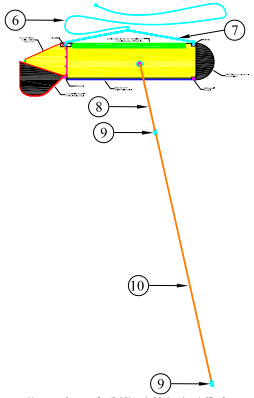


Present rigging (Comments)
Both deflectors are rigged
Front upper/Low : 5800 mm
Aft upper /Low : 5500 mm

Spread rope lengths :
S1-S2 / S3-S4 Plasma 12 Strand Ø24 mm

Gun Seperation :
75 m centre to centre, 10 meter between each string in source
Source spread rope 1-2 = 6.5m incl. hardware
Source spread rope 3-4 = 6.5m incl. hardware

PV2000 & PV3000 Lead-In float rigging



Measurement from center float (Bail Pin) to the S-Link on the end of Tow Rope shall be 1 meter shorter then the desired streamer depth.

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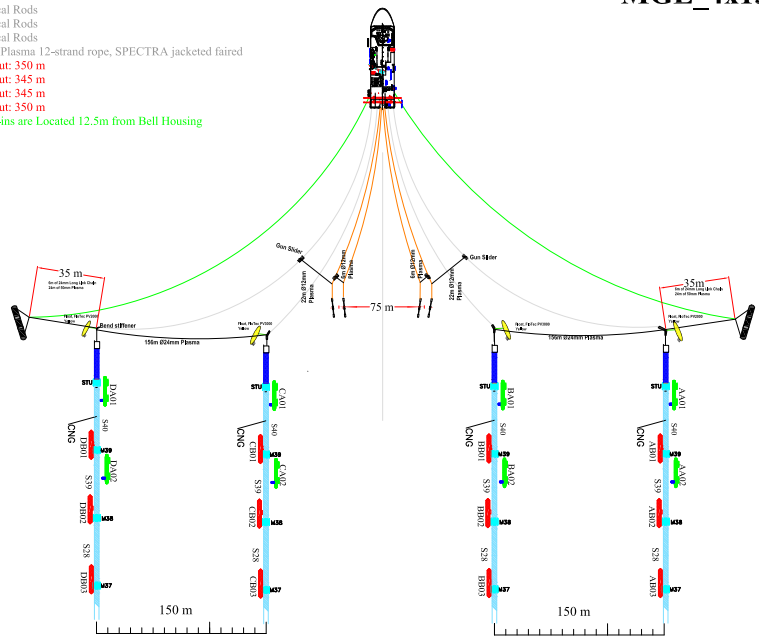
R/V Marcus G Langseth
MGL_4x150m_3D

Widetow Starboard: 470 m -32 mm Plasma 12-strand rope, SPECTRA jacketed faired
Lead in 1 : 465 m - PMI Helical Rods
Lead in 2 : 450 m - PMI Helical Rods
Lead in 3 : 450 m - PMI Helical Rods
Lead in 4: 465 m - PMI Helical Rods
Widetow Port: 470 m -32 mm Plasma 12-strand rope, SPECTRA jacketed faired
Sub-Array 1 Umbillical paid out: 350 m
Sub-Array 2 Umbillical paid out: 345 m
Sub-Array 3 Umbillical paid out: 345 m
Sub-Array 4 Umbillical paid out: 350 m
All Main Tow Points on Lead-ins are Located 12.5m from Bell Housing



NB: All lengths of spread ropes are including hardware

Version	Created by	Verified by	Changed/Updated	Done
1	RJS	DM	Updated to MGL 3D Configuration	24-10-10

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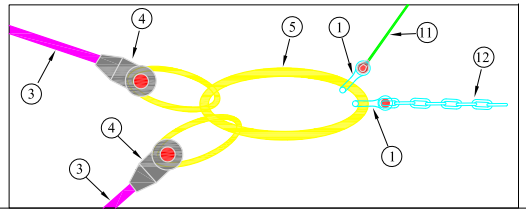
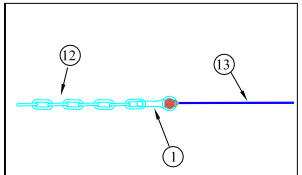
61 Route 9W
Palisades, New York 10964

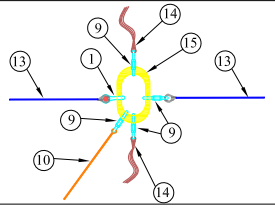
Vane Harness / Primary Tag Line Connection



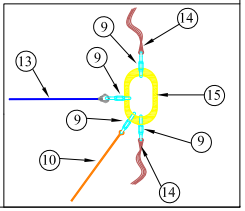
Mid Connection Point for Primary Tag Line



Outer-Leadin Connection



Inner-Leadin Connection



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Office of Marine Operation (OMO)
P-Cable Concept Hybrid Towed Array

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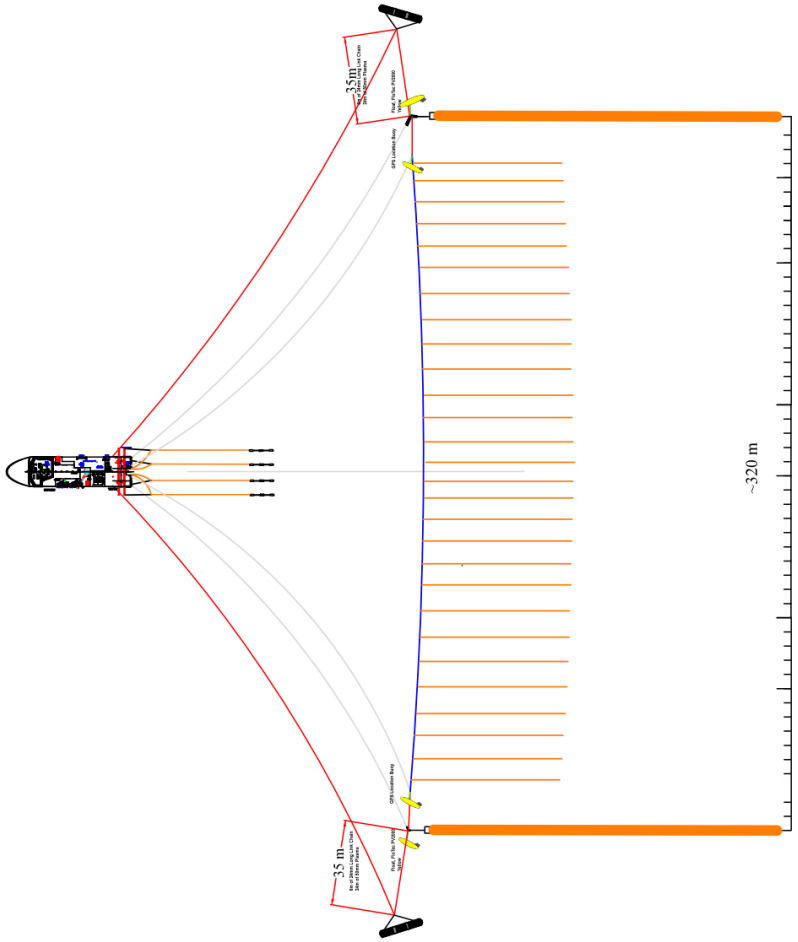

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Office of Marine Operation (OMO)
Navigation, Positioning, and Control

Navigation and positioning is accomplished via three main systems, Spectra, Digicourse II, and Posnet.
Spectra is the overall controller of the seismic acquisition sequence of events.
Spectra provides the control signals to collect the compass data from Digicourse, the GPS positioning data from the Posnet units mounted on each source sub-array and on each tail buoy.
Spectra also issues “fire-command” to the Digishot gun controller and initiates the recording cycle on the Syntrak 960 MCS system.
Spectra records to a UKOOA p294 file format information from the following systems:

>Posnet rGPS data
>Gyro data
>Centerbeam depth data (EM122)
>Digicourse bird depth, heading, and wing angle data
>Water velocity data
>DGPS data from three DGPS systems

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Office of Marine Operation (OMO)
Data Access and Data Handling

1. Finalized separation and upgrade of Science network
   > Science network backbone now all 10G bandwidth
   > Improved NRT access to data mirrors
   > USB 3 data offload capability will be added to Langseth servers

2. Upgrade of serial data hardware and network
   > Provides NRT to nearly all serial data strings via serial string rebroadcasters, UDP, and TCP broadcasts
   > New MET equipment installed with vastly improved displays

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