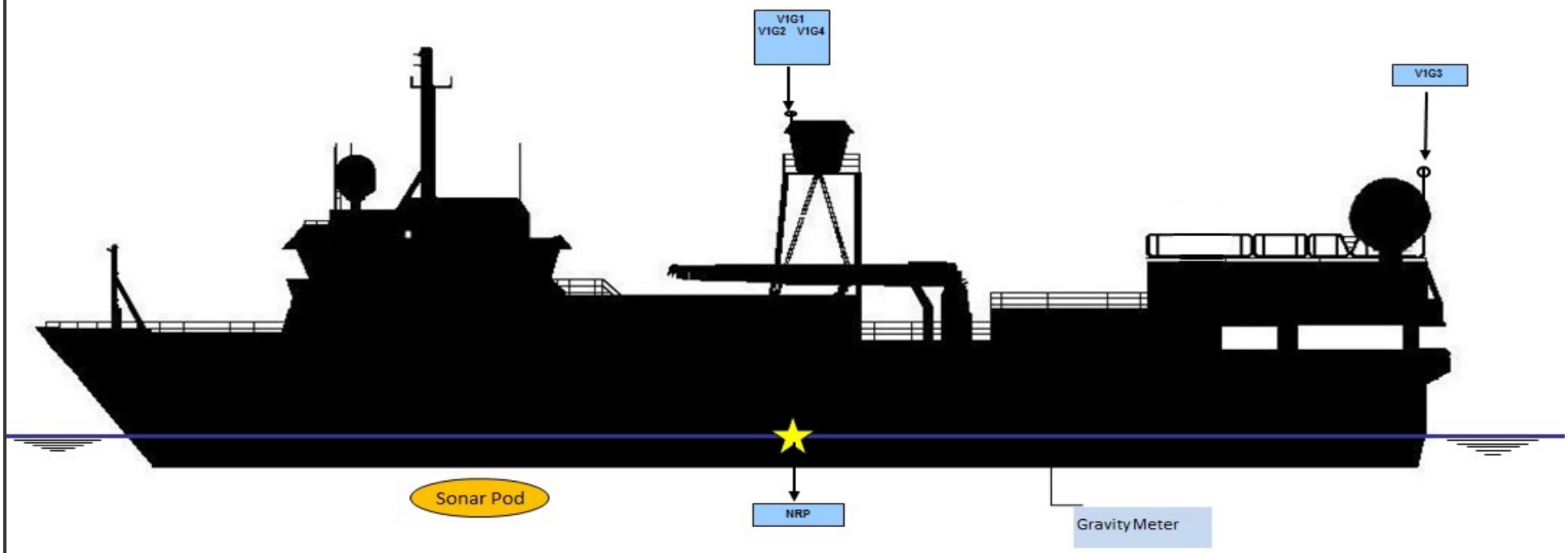
Company: Columbia University - Lamont-Doherty Earth Observatory
Vessel: R/V Marcus G. Langseth
Client: Dr.Stephen Jones, University of Birmingham

Project: MGL2411
Area: Chain Transform Fault
Scope: MCS Seq001-Seq033
Start Date: 20-Nov-24

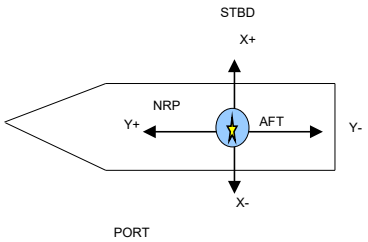
R/V Marcus G. Langseth - Vessel Sensor Offsets



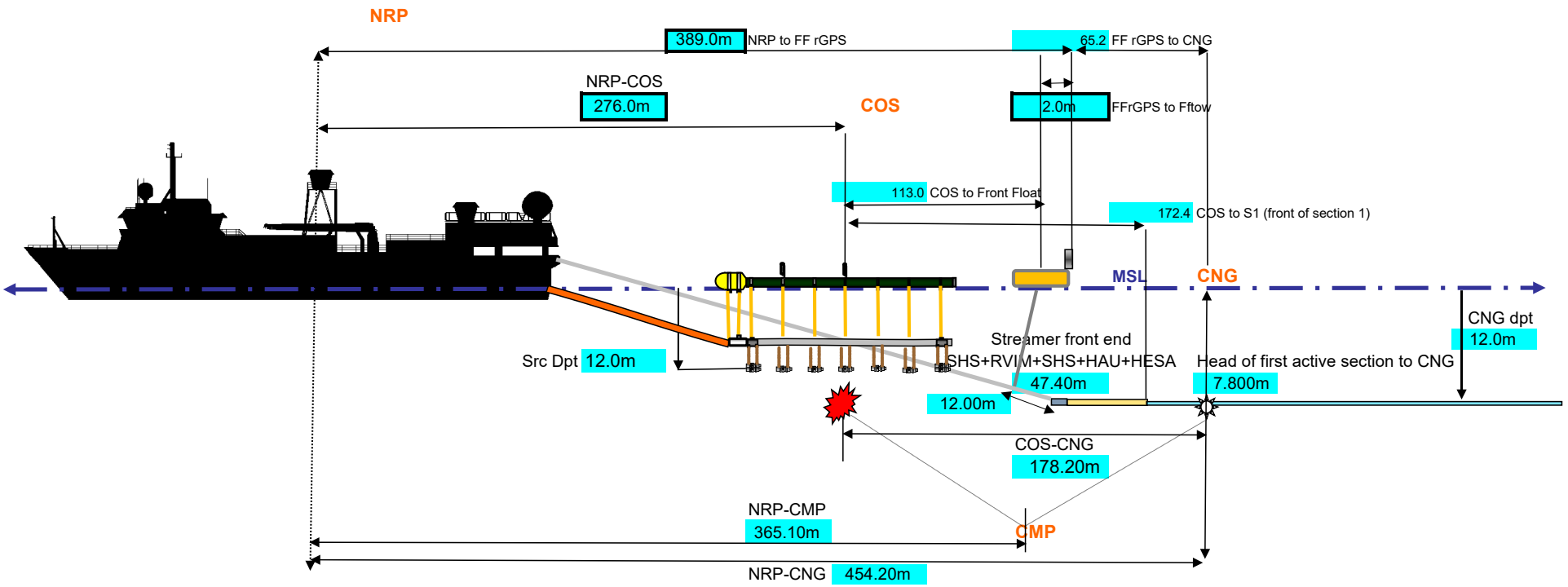
Negative values are above water line

All measurements in meters

			STBD/PORT (X)	FORE/AFT (Y)	UP/DOWN (Z)
NRP	NAVIGATION REFERENCE POINT		0.00	0.00	0.00
V1G1	SeaPath 330	Orca	-1.24	-1.25	-16.78
V1G2	C-Nav3050 MMO Tower	Orca	0.00	0.00	-16.90
V1G3	C-Nav3050 Stern	Orca	-1.95	-31.83	-14.50
V1G4	Pos MV	Orca	2.39	12.75	-16.90
	PosMV Output position is IMU mounted in stbd drylab				
V1R2	BuoyLink 4DX		-2.75	-1.40	-19.20
Sonar Pod	EM122 Knudsen ADCP		0.00	20.20	7.49
	EM122 Center Beam offset (in Spectra)		0.00	13.4	7.49
MRU	Seapath MRU		2.39	12.75	-4.30
BGM	Bell Gravity Meter		0.00	-13.10	1.10



R/V Marcus G. Langseth - Towing Offsets



NRP	**N**av **R**eference **P**oint			
COS	**C**entre of **S**ource			
CNG	**C**entre of **N**ear **G**roup	**Trace #**	**1**	**Of S1**
CMP	**C**ommon **M**id-**P**oint			
MSL	**Mean Sea Level**			
NRP-Stern	**29.2m**			
NRP-COS	**276.0m**			

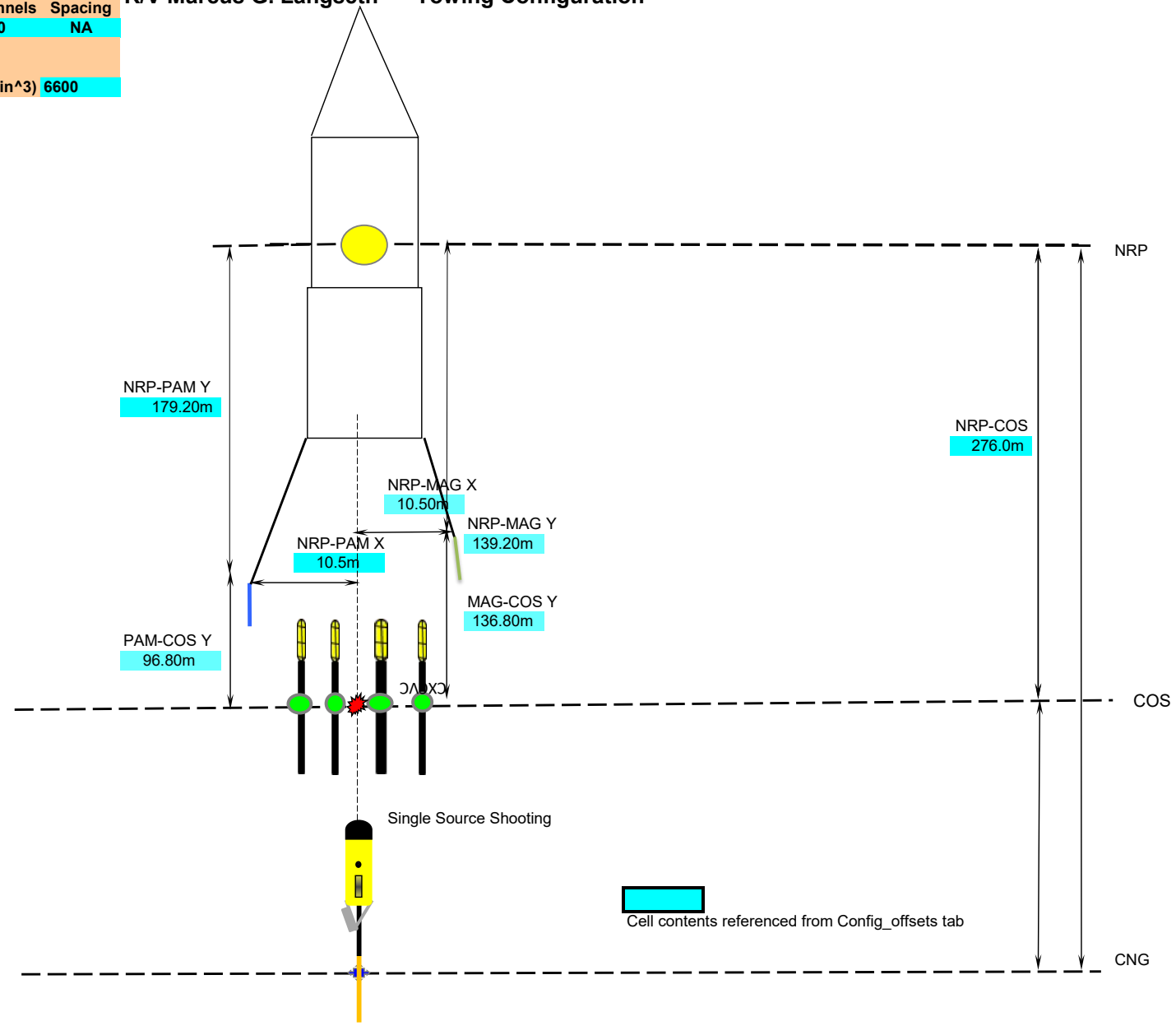
All measurements in meters

Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Towing Configuration

	# Streamers	Length	Channels	Spacing
SEAL	0	0	0	NA

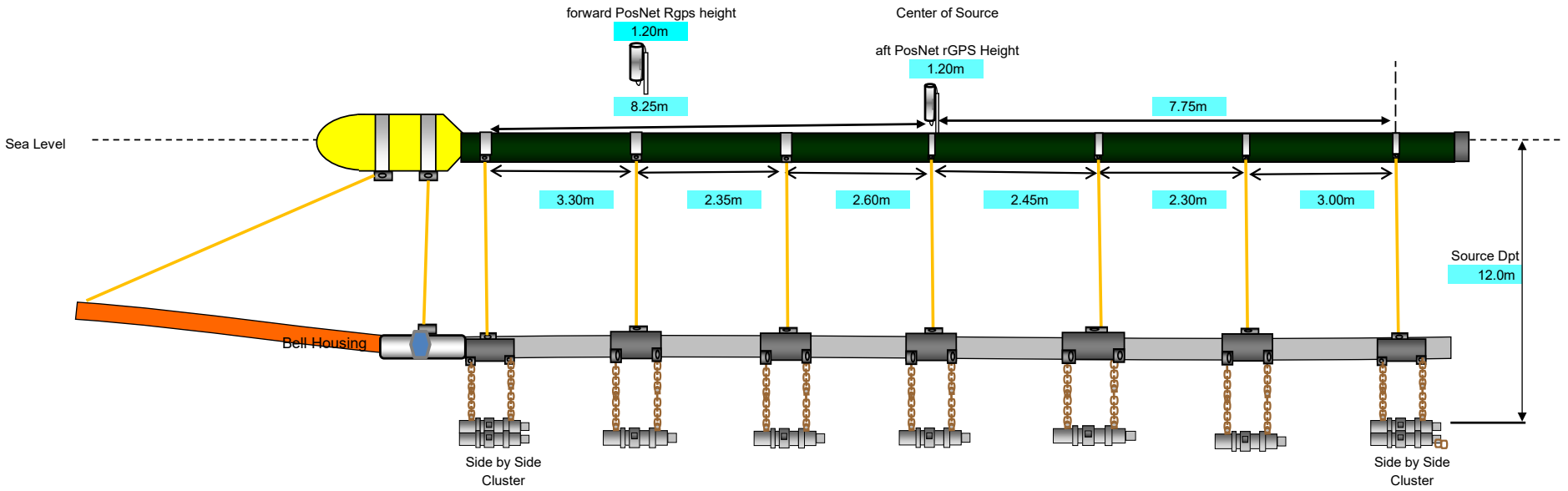
# Gun Strings Used	4	Vol (in^3)	6600



NOT to Scale

Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Gun Array Offsets



Gun volumes by number		
Gun	Volume	Status
Gun 1	360 cu. in.	Primary
Gun 2	360 cu. in.	Primary
Gun 3	40 cu. in.	Primary & Mitigation
Gun 4	180 cu. in.	Primary
Gun 5	90 cu. in.	Primary
Gun 6	120 cu. in.	Primary
Gun 7	60 cu. in.	Primary
Gun 8	220 cu. in.	Primary
Gun 9	220 cu. in.	Primary

Array total volume (without spares) is 6600 cu. in. Total volume/string (without spare) 1650 cu. in.

Guns (1 & 2) & (8 & 9) in a horizontal cluster.

Gun clusters have 0.75m between guns and hang 0.95m from center of hanger

Horizontal Clusters are 1m from gun port to gun port

Single guns hang from hanger 1.15m

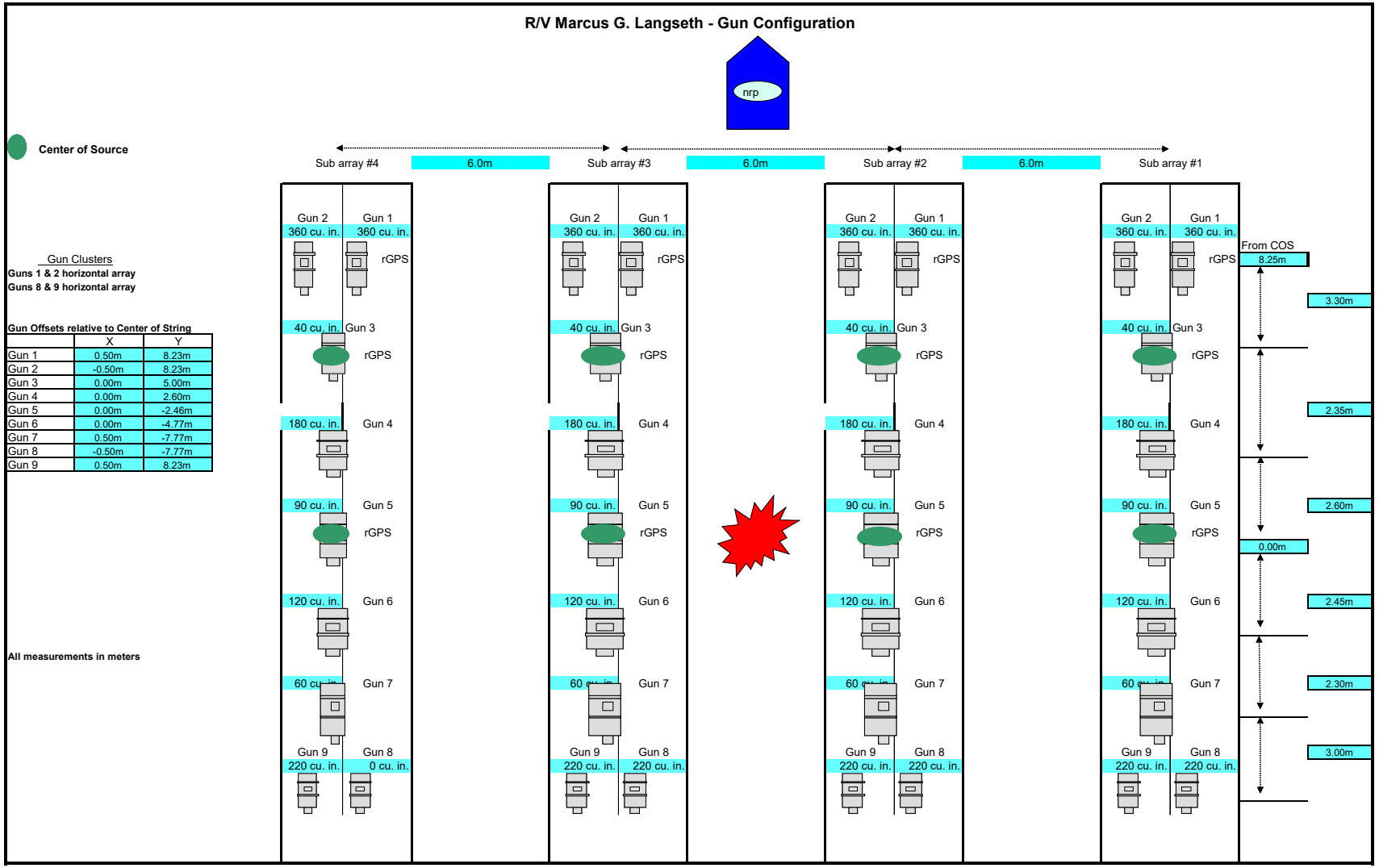
All gun volumes, numbering, locations, and offsets were inspected and verified by Chief Source Mechanic.

All measurements in meters

NOTE: drawing not to scale

Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Gun Configuration



Gun Clusters

Guns 1 & 2 horizontal array

Guns 8 & 9 horizontal array

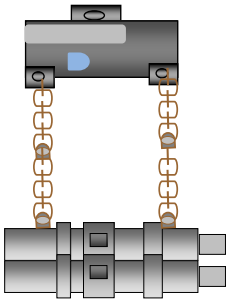
Gun Offsets relative to Center of String

	X	Y
Gun 1	0.50m	8.23m
Gun 2	-0.50m	8.23m
Gun 3	0.00m	5.00m
Gun 4	0.00m	2.60m
Gun 5	0.00m	-2.46m
Gun 6	0.00m	-4.77m
Gun 7	0.50m	-7.77m
Gun 8	-0.50m	-7.77m
Gun 9	0.50m	8.23m

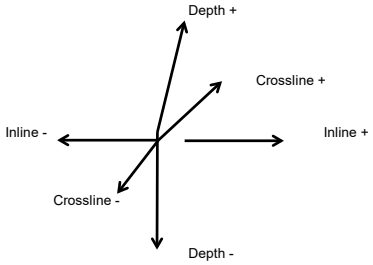
All measurements in meters

Distances in Meters

Gun Plate



Center of ports between guns 1 and 2 is the reference point



Hydrophone Offsets

Gun String 1				
Plate	Phone	Inline	Crossline	Depth
1	1	0.00	0.00	1.00
2	2	3.30	0.00	1.00
3	3	5.65	0.00	1.00
4	4	8.25	0.00	1.00
5	5	10.70	0.00	1.00
6	6	13.00	0.00	1.00
7	7	16.00	0.00	1.00

Gun String 2				
Plate	Phone	Inline	Crossline	Depth
1	1	0.00	0.00	1.00
2	2	3.30	0.00	1.00
3	3	5.65	0.00	1.00
4	4	8.25	0.00	1.00
5	5	10.70	0.00	1.00
6	6	13.00	0.00	1.00
7	7	16.00	0.00	1.00

Gun String 3				
Plate	Phone	Inline	Crossline	Depth
1	1	0.00	0.00	1.00
2	2	3.30	0.00	1.00
3	3	5.65	0.00	1.00
4	4	8.25	0.00	1.00
5	5	10.70	0.00	1.00
6	6	13.00	0.00	1.00
7	7	16.00	0.00	1.00

Gun String 4				
Plate	Phone	Inline	Crossline	Depth
1	1	0.00	0.00	1.00
2	2	3.30	0.00	1.00
3	3	5.65	0.00	1.00
4	4	8.25	0.00	1.00
5	5	10.70	0.00	1.00
6	6	13.00	0.00	1.00
7	7	16.00	0.00	1.00

Depth Transducer Offsets

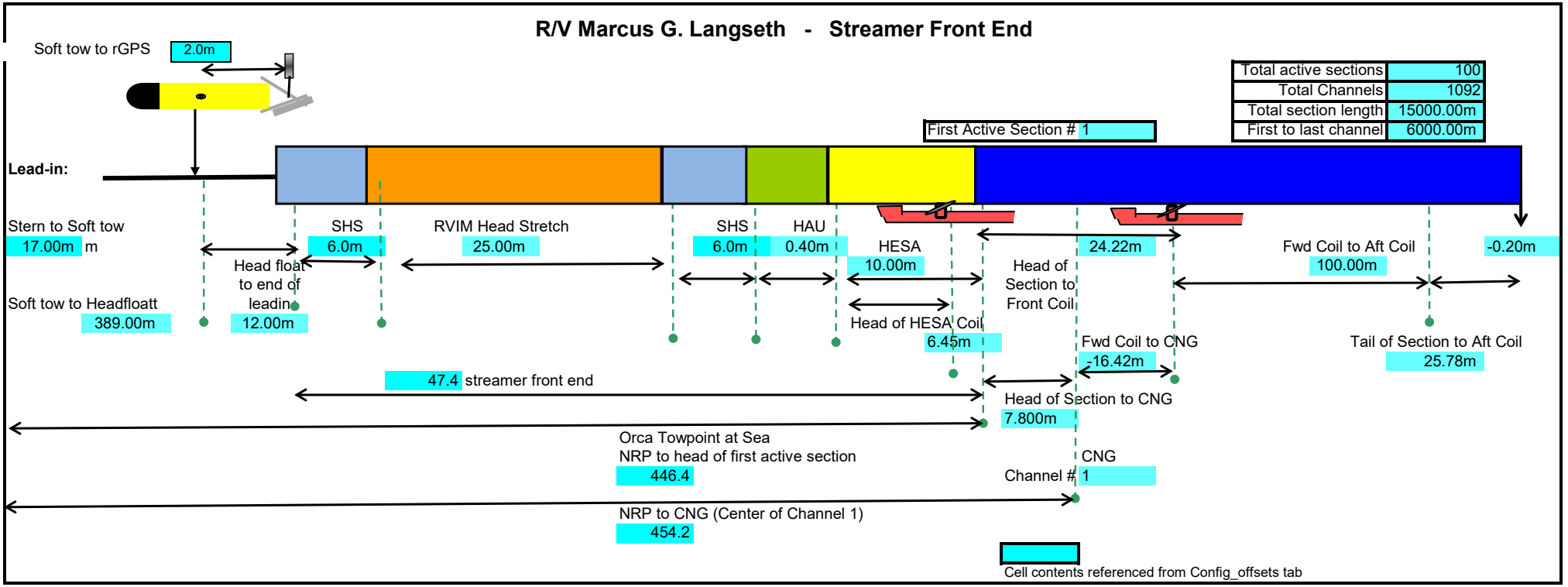
Gun String 1				
Plate	DT	Inline	Crossline	Depth
1	1	0.00	0.00	1.20
2				
3	2	5.75	0.00	1.08
4				
5				
6				
7	3	16.30	0.00	1.23

Gun String 2				
Plate	DT	Inline	Crossline	Depth
1	1	0.00	0.00	1.20
2				
3	2	5.75	0.00	1.08
4				
5				
6				
7	3	16.30	0.00	1.23

Gun String 3				
Plate	DT	Inline	Crossline	Depth
1	1	0.00	0.00	1.20
2				
3	2	5.75	0.00	1.08
4				
5				
6				
7	3	16.30	0.00	1.23

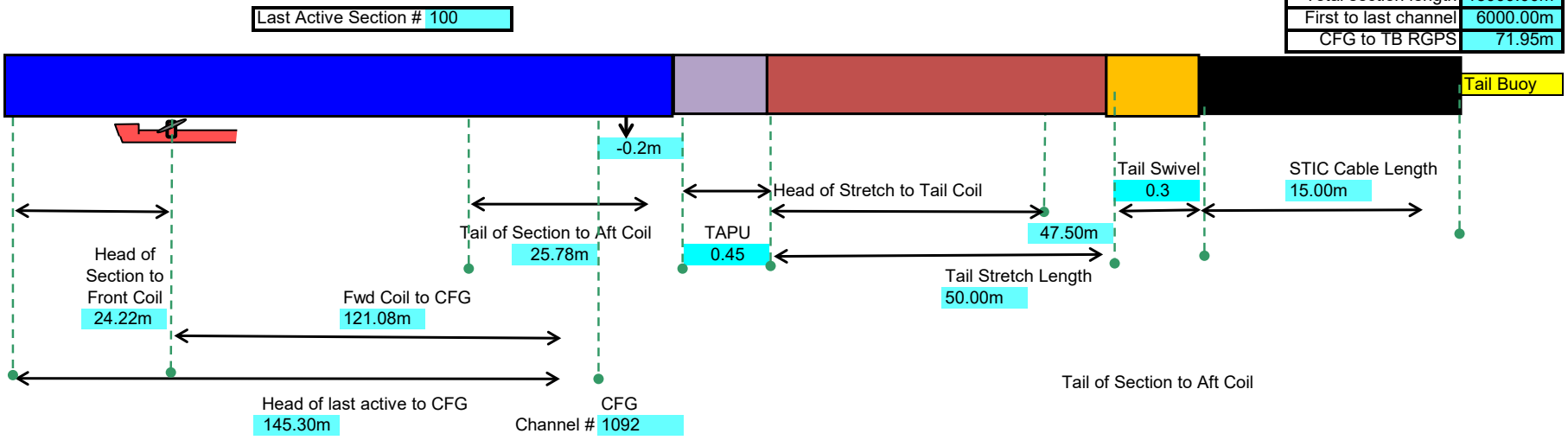
Gun String 4				
Plate	DT	Inline	Crossline	Depth
1	1	0.00	0.00	1.20
2				
3	2	5.75	0.00	1.08
4				
5				
6				
7	3	16.30	0.00	1.23

R/V Marcus G. Langseth - Streamer Front End



R/V Marcus G. Langseth - Streamer Tail End

Total active sections	100
Total Channels	1092
Total section length	15000.00m
First to last channel	6000.00m
CFG to TB RGPS	71.95m

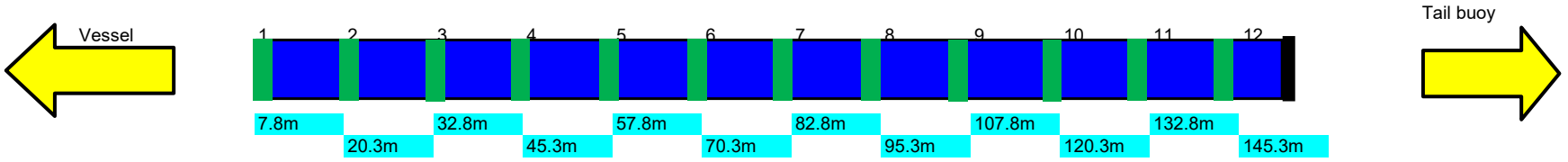


Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Hydrophone Offsets

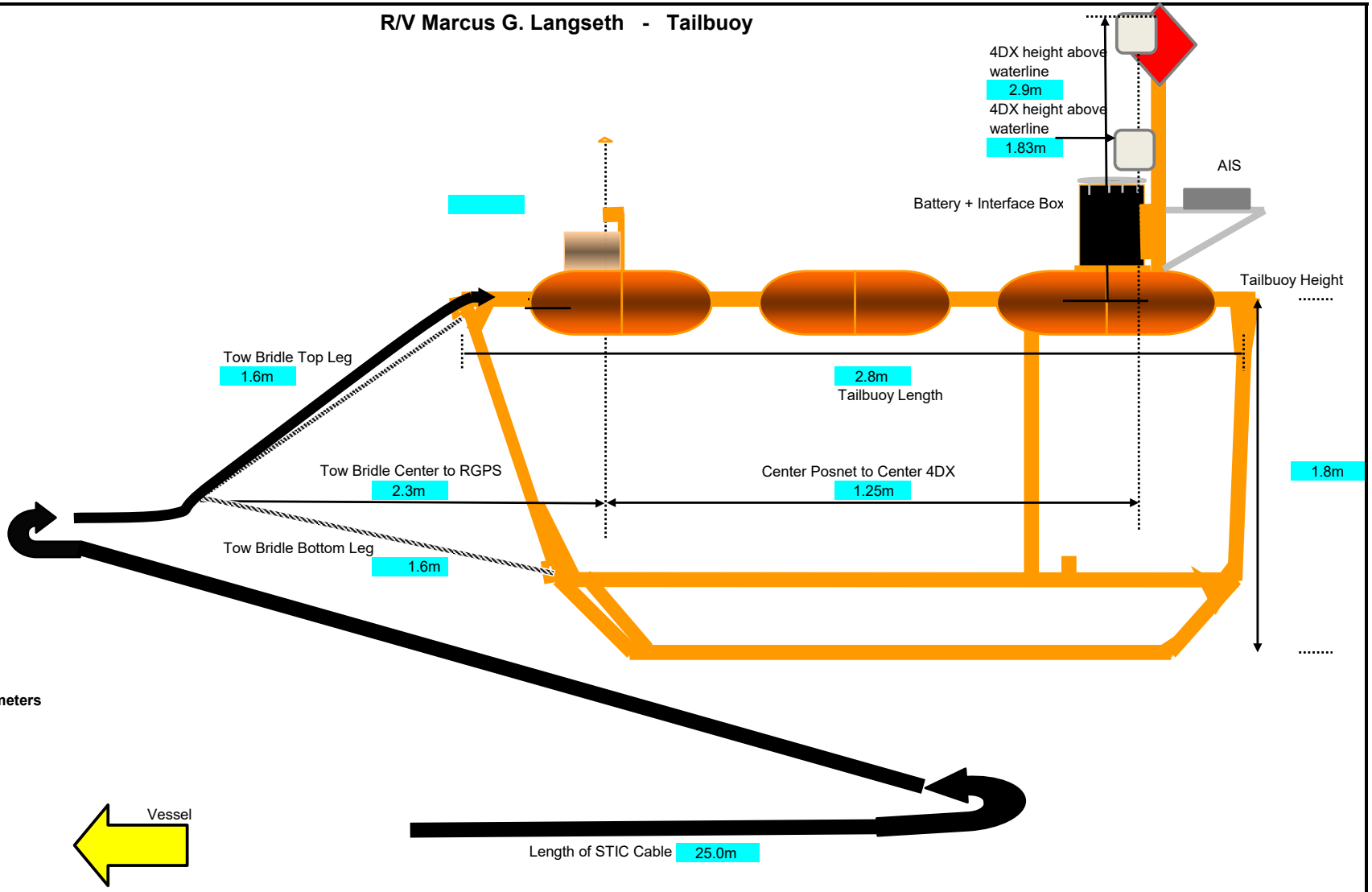
Sercel 150meter SSAS

Number of SSAS Sections	100
Channels per active section	12
Total channels	1092



Cell contents referenced from Config_offsets tab

R/V Marcus G. Langseth - Tailbuoy



All measurements in meters

Cell contents referenced from Config_offsets tab

Job Specific		
NRP to COS Y	276	276.6
NRP to COS X	0	
Source Depth	12	
Streamer Depth	12	
# streamer sections	100	80
# channels	1092	960
CNG Channel #	1	
CFG Channel #	1092	960
#MCS Streamers	1	
lead-in: NRP to head float	389	329
MCS Streamer Sep.	0	
Gun volume total	6600	
Volume per string	1650	
# of guns used	36	
# Gun Strings	4	
gun string separation	0	
PAM Y from stern	110	
PAM X - (outside of stern rail) PORT	3	
Stern to MAG Y	110	
Stern to MAG X - (outside of stern rail) STBD	3	
FIVGPS to FTow	2	

Derived Offsets (formula)	
NRP to CMP	365.1
COS-CNG	178.2
CNG-CFG	-13637.5
NRP-Mag Y	139.2
NRP-Mag X	10.5
NRP to tail buoy RGPS	15591.14
Total Length of Streamer sections	15099
PAM-COS Y	138.8
PAM-COS X	10.5
NRP-PAM Y	139.2
NRP-PAM X	10.5
NRP-CNG	454.2
Soft to length, stern to bridle	17
Max RVM 17.5m-25m	25
LAUM 0.3386 x 14 modules	4.7404
SSCU 0.474 x (2 modules)	0.948
TAPU 0.4526	0.4526

Derived Offsets (formula)	
Towing Offsets Tab	
NRP-COS	276
NRP-CNG	454.2
COS-CNG	178.2
COS-CNG	178.2
CNG Channel #	1
NRP-Stern	29.2
Distance from Head of first section to CNG	7.8
Source Depth	12
Streamer Depth	12
Front End Length	47.4
Head of first section to headfloat	47.4

Derived Offsets (formula)	
Towing Configuration TAB	
NRP-COS	276
NRP-CNG	454.2
COS-CNG	178.2
NRP-Pcable CNG	0
COS-Pcable CNG	4.7404
P-Cable Streamer Sep	2
NRP-PAM Y	139.2
NRP-PAM X	10.5
PAM-COS Y	138.8
PAM-COS X	10.5
# Gun Strings	4
gun volume	6600
Gun separation	0
# 3D Streamers	1
2D Streamer Ch Spacing	12.5
Number 2D Channels	1092
2D Streamer Length	15000
2D Streamer Sep	0
NRP-MAG X	10.5
NRP-MAG Y	139.2

Derived Offsets	
Acoustic Overhead TAB	
G1T1	0
G2T1	0
G3T1	0
G4T1	0
S1T1	0
S1T2	0
S1T3	0
S1T4	0
S1T5	0
S1T6	0
S1T7	0
S2T1	0
S2T2	0
S2T3	0
S2T4	0
S2T5	0
S2T6	0
S2T7	0
S3T1	0
S3T2	0
S3T3	0
S3T4	0
S3T5	0
S3T6	0
S3T7	0
S4T1	0
S4T2	0
S4T3	0
S4T4	0
S4T5	0
S4T6	0
S4T7	0
Front to TB	15099
S1T1-S1T2	0
S1T3-S1T4	0
S1T4-S1T5	90.777

Derived Offsets (formula)	
Gun array offsets	
Bracket distance 1-2	5
Bracket distance 2-3	3.3
Bracket distance 3-4	2.35
Bracket distance 4-5	2.8
Bracket distance 5-6	2.45
Bracket distance 6-7	2.3
Bracket distance 7-8	3
SourceGPS-COS Y	8
COS - Acoustic Y	8
vGPS height above water	1.2
G1 Volume	360
G2 Volume	360
G3 Volume	40
G4 Volume	180
G5 Volume	90
G6 Volume	120
G7 Volume	60
G8 Volume	220
G9 Volume	220
G10 Volume	0
G-Depth 1	0.95
G-Depth 2	0.95
G-Depth 3	1.15
G-Depth 4	0.95
G-Depth 5	0.75
G-Depth 6	1.15
G-Depth 7	1.15
G-Depth 8	1.15
G-Depth 9	0.95
G-Depth 10	0
G10 to Acx Z	0
Surface to Acx	12
Fwd bracket to COS	8.25
Aft bracket to COS	7.75

Derived Offsets	
Streamer Front End	
Stern-forepoint at sea	389
forepoint at sea to end of lead-in	12
SHS Length	6
rvim length	25
HAU/STU length	0.4
HESA Lgth	10
Fwd Coil to Aft Coil	100
Head to First RX	7.8
Fwd Coil to CNG	-16.423
Head to Fwd Coil	24.223
Tail to Aft Coil	25.777
CNG Channel #	1
Center of streamer to Acx transducer	-0.2
First Section #	1
# channels	1092
section length	15000
# sections	100
channel spacing	12.5
First to last	6000
HESA Head to aft coil	6.45

Derived Offsets	
Streamer Tail End	
Head to Fwd Coil	24.223
Tail to Aft Coil	25.777
Head to CFG	145.3
Coil to Coil	100
TAPU Lnath	0.45
Fwd Stretch Length	50
Twisted Lngth	0.3
STIC Length	10
Last active	100
# channels	1092
# sections	100
total section length	15000
First to last	6000
Stretch Coil	
Center of streamer to Acx transducer	-0.2
channel spacing	12.5
CFG #	1092
Fwd coil to CFG	121.977
CFG to TB/RGPS	71.95
Stretch head to fwd coil	2.5
Stretch head to aft coil	47.5

Derived Offsets	
Streamer complete	
#Sections	100
# Channels	1092
First to last	6099
Total section length	15099

Derived Offsets	
Hydrophone Offsets	
Channel 1	7.825
2	20.325
3	32.825
4	45.325
5	57.825
6	70.325
7	82.825
8	95.325
9	107.825
10	120.325
11	132.825
12	145.325
# channels	12
# Active's	108
Total Channels	1092

Derived Offsets	
Tailbuoy offsets	
RGPS height above water	1
TB length	2.6
TB height	1.83
RGPS-ACX	0
Bridle-RGPS	2.25
Top Leg	1.55
Bottom Leg	1.6
STIC	25
ACX below water line	0

Fixed Positions Streamer	
NRP to Stern	29.2
tow point at sea to end of lead-in	12
STU/impulse length	0.4
Coil to coil	100
head of section to coil	24.223
tail of section to coil	25.777
channel spacing	12.5
NRP to Port/STBD Rail	7.5
Head to First RX	7.8
Head to Last RX	148.3
Channels per section	12
Center of section to Acx transducer	-0.2
First Section Number	1
HAU/HAPU Length	0.4
RVM length	25
HESA Length	10
Active Section Length (SSAS)	150
TES tail stretch length	50
STIC	19
TES Fwd Coil	2.5
TES Aft Coil	47.5
HESA Aft Coil	6.45

Guns						
Source GPS Aft - COS Y	0				G1 X	0.2
Source GPS Fwd - COS Y	0				G1 Y	8.23
Bracket distance 2-3	3.3				G2 X	-0.2
Bracket distance 3-4	2.35				G2 Y	8.23
Bracket distance 4-5	2.8				G3 X	0
Bracket distance 5-6	2.45				G3 Y	8
Bracket distance 6-7	2.3				G4 X	0
Bracket distance 7-8	3				G4 Y	2.6
COS - Acoustic Y	0				G5 X	0
vGPS height above water line	1.2				G5 Y	0
G1 Volume	360	G-Depth 1	0.95		G6 X	0
G2 Volume	360	G-Depth 2	0.95		G6 Y	-2.46
G3 Volume	40	G-Depth 3	1.15		G7 X	0
G4 Volume	180	G-Depth 4	0.95		G7 Y	-4.77
G5 Volume	90	G-Depth 5	0.75		G8 X	0.5
G6 Volume	120	G-Depth 6	1.15		G8 Y	-7.77
G7 Volume	60	G-Depth 7	1.15		G9 X	-0.5
G8 Volume	220	G-Depth 8	1.15		G9 Y	-7.77
G9 Volume	220	G-Depth 9	0.95		G10 X	0.5
					G10 Y	8.23
					G11 X	-0.5
					G11 Y	8.23
					G12 X	0
					G12 Y	0
					G13 X	0
					G13 Y	2.6
					G14 X	0
					G14 Y	0
					G15 X	0
					G15 Y	-2.46
					G16 X	0
					G16 Y	-4.77
					G17 X	0.5
					G17 Y	-7.77
					G18 X	-0.5
					G18 Y	-7.77

Acoustics referenced to CNG or COS	
G1T1	0
G2T1	0
G3T1	0
G4T1	0
S1T1	0
S1T2	0
S1T3	0
S1T4	0
S1T5	0
S1T6	0
S1T7	0
S2T1	0
S2T2	0
S2T3	0
S2T4	0
S2T5	0
S2T6	0
S2T7	0
S3T1	0
S3T2	0
S3T3	0
S3T4	0
S3T5	0
S3T6	0
S3T7	0
S4T1	0
S4T2	0
S4T3	0
S4T4	0
S4T5	0
S4T6	0
S4T7	0