



BLOCK C-M-541



SERVICE REPORT – PSV SIEM GIANT (STATION #43 – New Position)

Client:	Total E&P do Brasil
Client Document Number:	SG-CM541-20-141
Oceaneering Document Number:	200392-Oil-RPT-141-R0
Project Name:	C-M-541 Field Development – ROV & Survey Inspections
Vessel:	PSV Siem Giant
Location:	Campos Basin

Rev	Reason For Issue	Author	Reviewed	Approved	Rev Date
0	Issued for Information	SR/GA	LP/BT	EC	27-03-2020



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REVISION HISTORY:

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C-M-541 BLOCK EBS (Station #43 – New Position)	
FIELD	LOCATION(S)
C-M-541	Campos Basin

1. INTRODUCTION

1.1. Project Overview

Total E&P do Brasil (Total) has contracted Oceaneering – Marine Production Systems do Brasil (OII) to provide ROV & Survey services for Umbilical, Flowlines and Risers Inspections (UFR) and Field Operations Development at LAPA Field (Production phase) and Block C-M-541 (Exploration phase).

The deep offshore block C-M-541 under exploration is situated in the pre-salt Campos Basin in approximately 3,000m water depth.

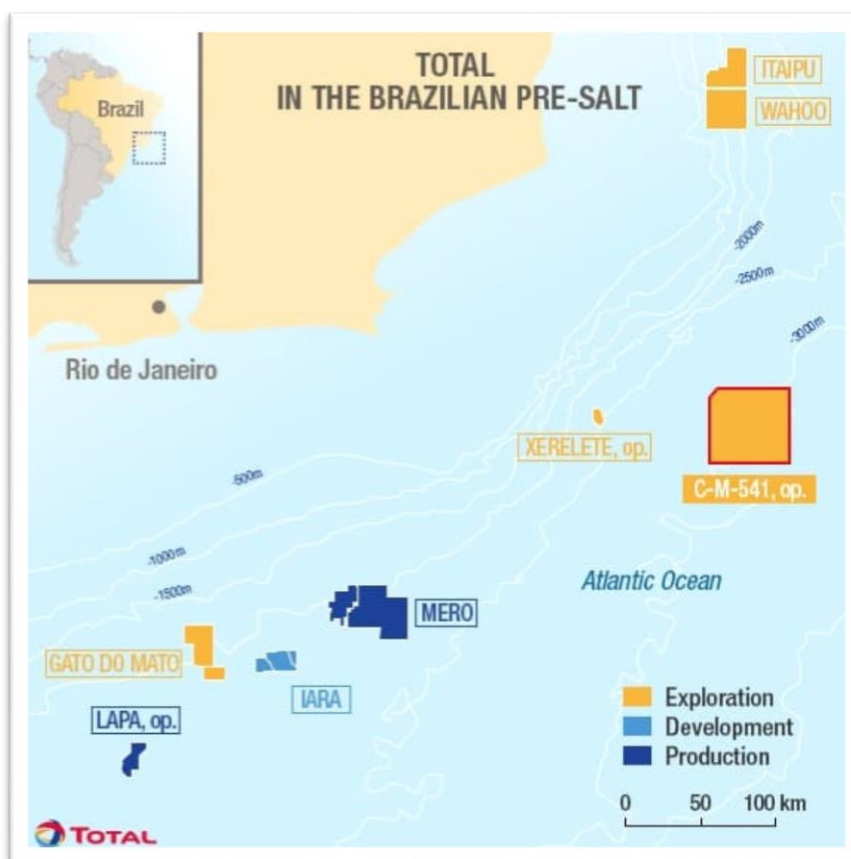




Figure 1 – TOTAL E&P in Brazilian Pre-Salt

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1.2. Scope of Document

The purpose of this document is to present a detailed summary of operations and results acquired by Oceaneering on board of PSV Siem Giant, during the Environmental Baseline Survey (EBS) at Block C-M-541, in search features such as carbonate formation, or any other marine or anthropogenic features that may affect further activities in this area.

1.3. Scope of Work

The Scope of Work comprises in perform a General Visual Inspection (GVI) denominated Environmental Baseline Survey (EBS) in some pre-selected stations and points at the Block C-M-41 in order to present to the environmental agencies and organizations.

Instructions were received by client, and proposed coordinates for each survey were indicated on map, as showed below: This report focuses on Station # 43_New Position only, that is the new position for the Station #43 after an adjustment to stay in depths at maximum 3000 meters. The new position is located 549 meters on the bearing 248° from the original one.

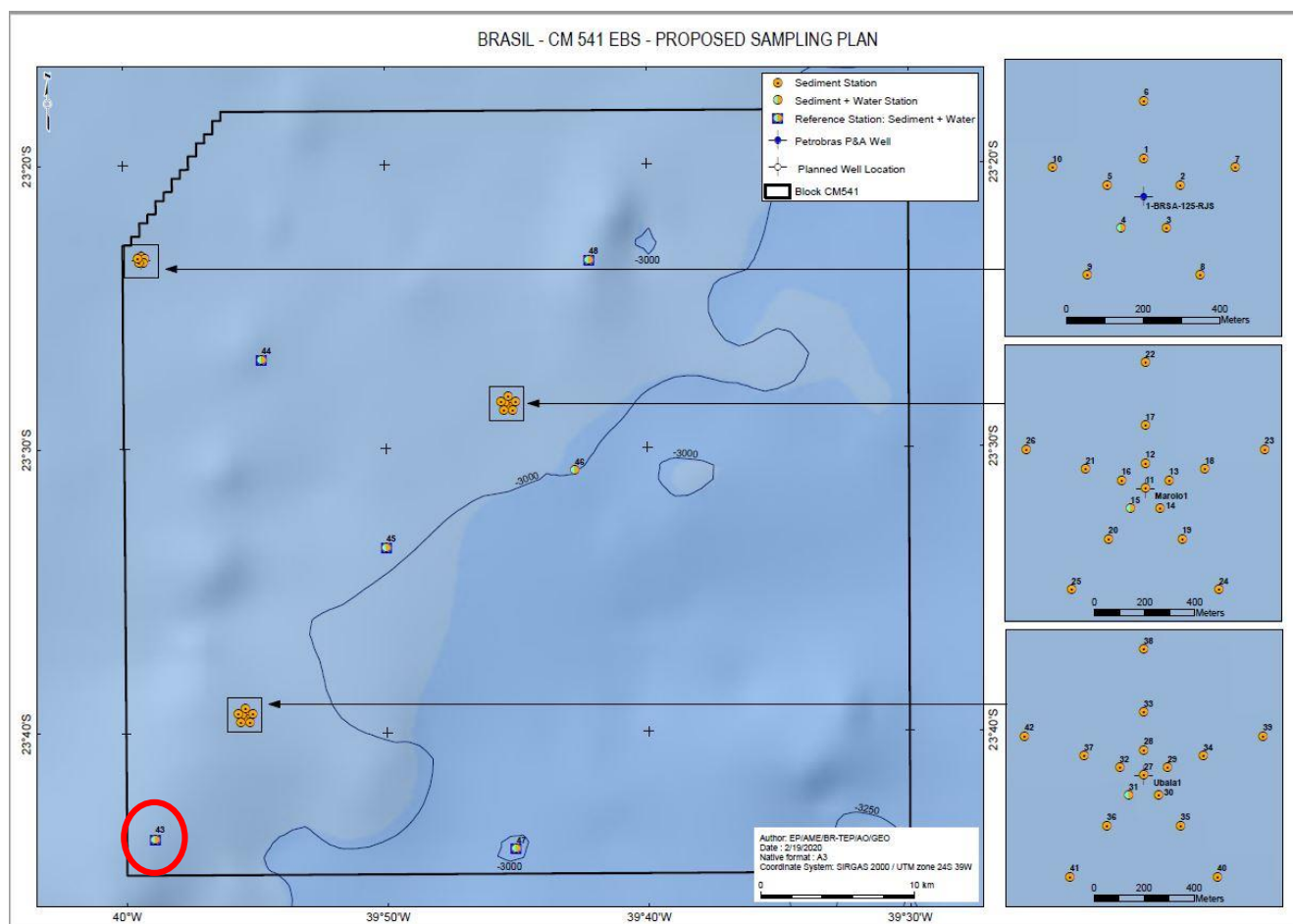




Figure 2 – EBS – Proposal Sampling Plan at Block C-M-541

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2. OPERATIONAL PLAN

It was proposed by the client that this inspection should be performed by ROV on paths along Cardinal Directions (N, NE, E, SE, S, SW, W and NW), and as well a running circles radius around the center point of each station.

The acquisition of images for the baseline survey followed lines around the center of each of the nine stations, similar to the example in the figure below:

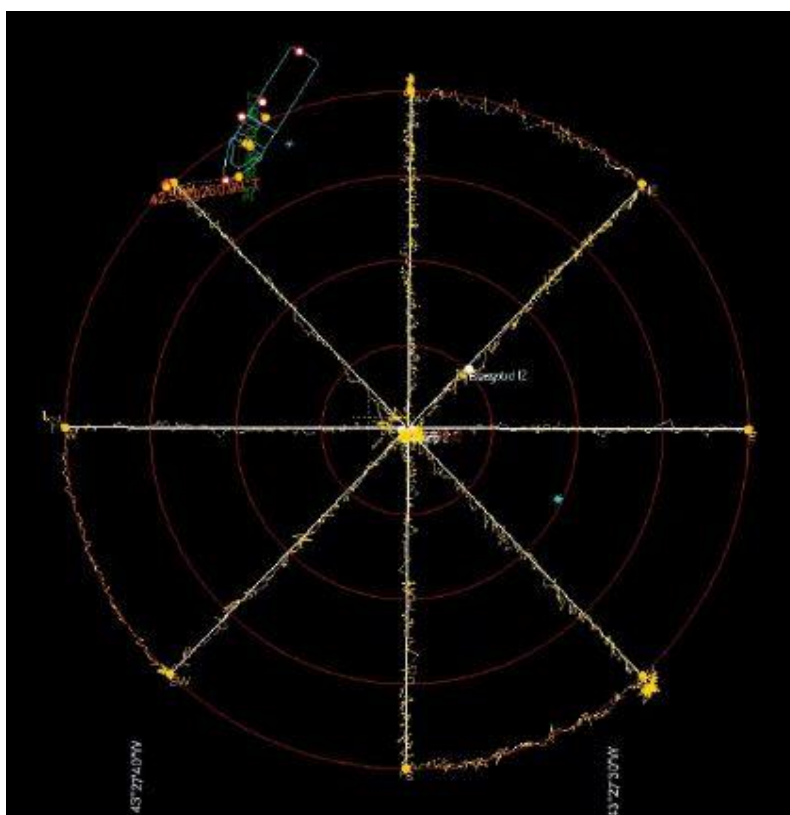




Figure 3 – Example of navigation path during the baseline survey

Instructions were received by client, and proposed coordinates for each survey were indicated on map (Figure 2). This report focuses on Station # 43 – New Position only.



Station #43_New Position					
Northing	Easting	Latitude	Longitude	Estimated Depth	Asfound Depth
7.375.238,83	399.398,71	23° 43' 50,54" S	039° 59' 13,24" W	2.970	2.980
Station #43_Project Position				549m to 248° from original position	
Northing	Easting	Latitude	Longitude		
7.375.436,89	399.910,43	23° 43' 44,22" S	045° 58' 55,12" W		

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All coordinates refer to DATUM SIRGAS 2000 UTM 24S.
Different location have different length of the radial lines.

Sampling Plan of BLOCK C-M-541				
IDENTIFIER	STATION NAME	Radius (m) Distance from center	SIRGAS 2000 UTM 24S	
			X	Y
1	Poço 1-BRSA-125-RJS	200	-39° 59' 18.805"	-23° 23' 16.687"
2	2	200	-39° 59' 15.471"	-23° 23' 18.954"
3	3	200	-39° 59' 16.778"	-23° 23' 22.582"
4	4	200	-39° 59' 20.919"	-23° 23' 22.555"
5	5	200	-39° 59' 22.172"	-23° 23' 18.912"
6	6	200	-39° 59' 18.769"	-23° 23' 11.810"
7	7	200	-39° 59' 10.435"	-23° 23' 17.479"
8	8	200	-39° 59' 13.702"	-23° 23' 26.547"
9	9	200	-39° 59' 24.054"	-23° 23' 26.481"
10	10	200	-39° 59' 27.185"	-23° 23' 17.373"
11	MAROLO 1	400	-39° 45' 19.006"	-23° 28' 27.188"
12	12	400	-39° 45' 18.987"	-23° 28' 23.937"
13	13	400	-39° 45' 15.647"	-23° 28' 26.200"
14	14	400	-39° 45' 16.949"	-23° 28' 29.829"
15	15	400	-39° 45' 21.092"	-23° 28' 29.809"
16	16	400	-39° 45' 22.352"	-23° 28' 26.167"
17	17	400	-39° 45' 18.959"	-23° 28' 19.059"
18	18	400	-39° 45' 10.610"	-23° 28' 24.717"
19	19	400	-39° 45' 13.863"	-23° 28' 33.790"
20	20	400	-39° 45' 24.223"	-23° 28' 33.739"
21	21	400	-39° 45' 27.372"	-23° 28' 24.636"
22	22	400	-39° 45' 18.913"	-23° 28' 10.930"
23	23	400	-39° 45' 2.215"	-23° 28' 22.245"
24	24	400	-39° 45' 8.721"	-23° 28' 40.391"
25	25	400	-39° 45' 29.440"	-23° 28' 40.291"
26	26	400	-39° 45' 35.739"	-23° 28' 22.083"
27	UBAIA 1	400	-39° 55' 26.269"	-23° 39' 24.301"
28	28	400	-39° 55' 26.246"	-23° 39' 21.050"
29	29	400	-39° 55' 22.905"	-23° 39' 23.317"
30	30	400	-39° 55' 24.212"	-23° 39' 26.944"
31	31	400	-39° 55' 28.362"	-23° 39' 26.919"
32	32	400	-39° 55' 29.618"	-23° 39' 23.277"
33	33	400	-39° 55' 26.211"	-23° 39' 16.173"
34	34	400	-39° 55' 17.859"	-23° 39' 21.839"
35	35	400	-39° 55' 21.128"	-23° 39' 30.908"
36	36	400	-39° 55' 31.502"	-23° 39' 30.846"
37	37	400	-39° 55' 34.643"	-23° 39' 21.739"
38	38	400	-39° 55' 26.154"	-23° 39' 8.045"
39	39	400	-39° 55' 9.449"	-23° 39' 19.377"
40	40	400	-39° 55' 15.987"	-23° 39' 37.515"
41	41	400	-39° 55' 36.735"	-23° 39' 37.391"
42	42	400	-39° 55' 43.018"	-23° 39' 19.177"
43	43	200	-39° 58' 55.125"	-23° 43' 44.216"
44	44	200	-39° 54' 44.307"	-23° 26' 53.137"
45	45	200	-39° 50' 0.419"	-23° 33' 31.040"
46	46	200	-39° 42' 46.781"	-23° 30' 49.028"
47	47	200	-39° 45' 6.200"	-23° 44' 7.566"
48	48	200	-39° 42' 12.596"	-23° 23' 24.641"

Figure 4 – Table of Station Locations



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3. PROJECT INFORMATION

The tables below details the project information regarding the personnel involved on operations, survey parameters, and the equipment to be inspected (**Table 1** to **Table 5**).

Table 1 – Operational Team		
Name	Function	Company
Leandro Pickhardt	Surveyor Supervisor	Oceaneering
Gabriel Azzolini	Online Surveyor	Oceaneering
Stefan Reuwsaat	Online Surveyor	Oceaneering
Vitor Elias	ROV Supervisor	Oceaneering
Carlos Henrique Silveira	ROV Supervisor	Oceaneering
Mike Gladson	Captain	Siem Offshore

Table 2 – Geodetic Parameters	
DATUM PARAMETERS	
DATUM	SIRGAS 2000 (ITRF2000 at epoch 2000.40) EPSG Code 6674
ELLIPSOID	GRS 1980 (GRS) EPSG Code 7019
SEMI MAJOR AXIS (a)	6 378 137.000 m
SEMI MINOR AXIS (b)	6 356 752.314 m
ECCENTRICITY SQUARE (e ²)	0.006 694 380 02
INVERSE FLATTENING (1/f)	298.257 222 101
COORDINATE SYSTEM PARAMETERS	
PROJECTION	Universal Transverse Mercator
ZONE	24 South
CENTRAL MERIDIAN	039° West Greenwich
LATITUDE OF ORIGIN	000° Equator
FALSE EASTING	500 000.0 m
FALSE NORTHING	10 000 000.0 m
SCALE FACTOR	0.9996
PROJECTED CRS:	SIRGAS 2000 / UTM Zone 24 S EPSG Code 31984
Table 3 – Survey Instruments	
Operation Mode	SSBL
Depth Gauge	
Model	DIGIQUARTZ 8CB4000

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Time	
Universal Time Coordinate	UTC - 3 Hours
Vertical Datum	
Datum	LMSL
Tide	TPXO Model / Atlantic Ocean

Table 4 – Environmental Conditions			
Date	Wind (kts)	Swell (m)	Surface DP Current (kts)
24-03-2020	14kts@140°	1,5m@180°	0,6kts@320°

3.1. Sound Velocity Profile

At the beginning of operations, the ROV MILL 048 dived till the seabed at constant speed in order to collect the sound velocity, and its results were updated on the HIPAP USBL system and survey navigation system. The figure below presents the profile during the downcast.

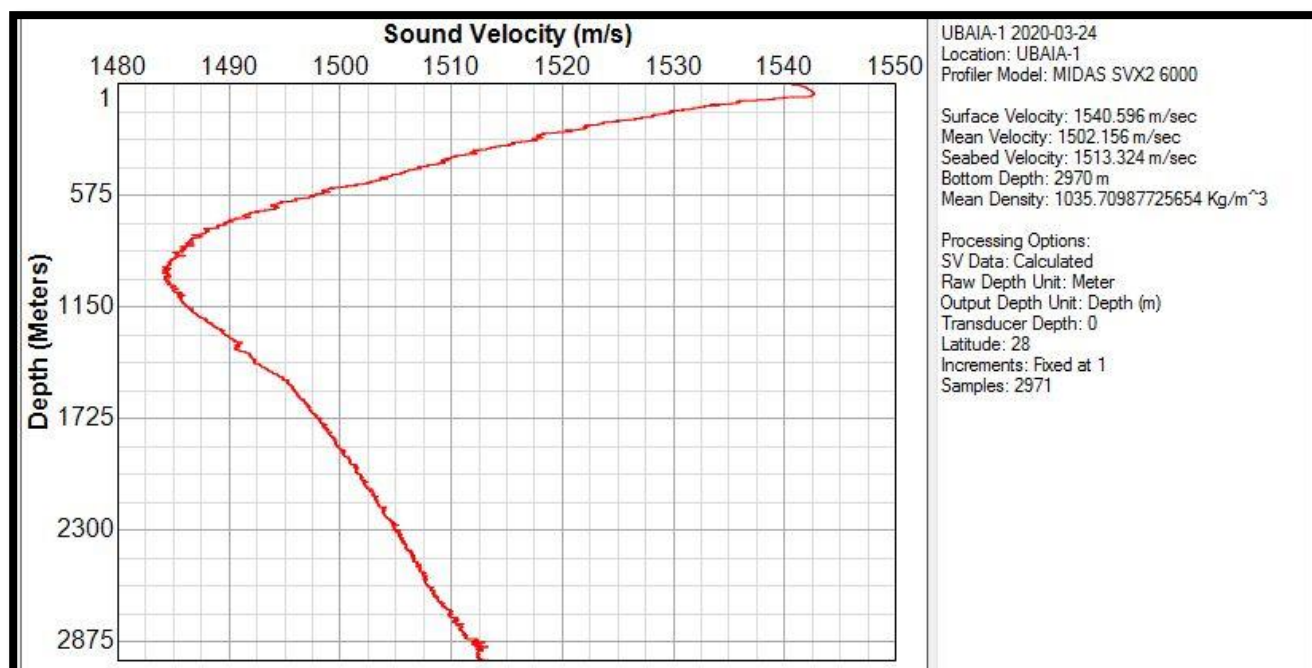




Figure 5 – SVP representation



Table 5 – Sound Velocity Profile			
Date	UTM Coordinates		Mean Sound Velocity (m/s)
	N (m)	E (m)	
24-03-2020	7.375.584,00	399.545,00	1502,1

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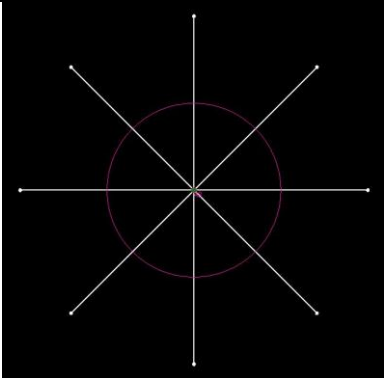
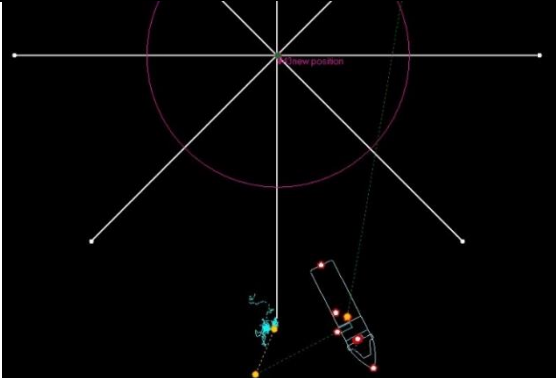




4. OPERATIONAL SEQUENCE

The ROV dived and commenced the inspection of the environmental baselines at Station #43, following sequence:

- EBS Station #43 – EBS Plan View (**Picture 1**);
- EBS at Station #43 – from S to N Baseline (**Picture 2 to Picture 14**);
- EBS at Station #43 – from NE to SW Baseline (**Picture 15 to Picture 20**);
- EBS at Station #43 – from W to E Baseline (Erro! Fonte de referência não encontrada.**Picture 21 to Picture 25**);
- EBS at Station #43 – from SE to NW Baseline (**Picture 26 to Picture 30**);
- EBS at Station #43 – on the circle of 100m radius in a counter clockwise direction and the center of location (**Picture 31 to Picture 40**).

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5. PICTURES

			
Picture 1 – Station #43 – EBS Plan View		Picture 2 – S to N Baseline – Start – Plan View	
			
Picture 3 – S to N Baseline – Start – Seabed View		Picture 4 – Marine Life on Seabed	
			
Picture 5 – Marine Life on Seabed		Picture 6 – Marine Life on Seabed	



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Picture 7 – Debris on Seabed



Picture 8 – Marine Life on Seabed



Picture 9 – Marine Life on Seabed



Picture 10 – Marine Life on Seabed



Picture 11 – Debris on Seabed



Picture 12 – Debris on Seabed



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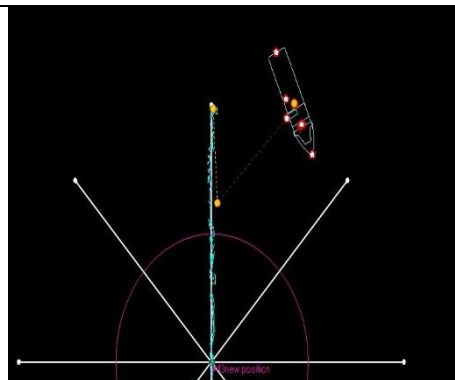
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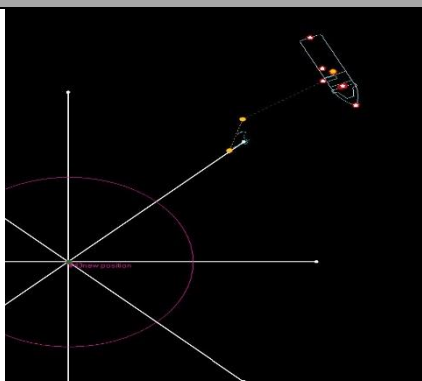
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Picture 13 – S to N Baseline – End – Seabed View



Picture 14 – S to N Baseline – End – Plan View



Picture 15 – NE to SW Baseline – Start – Plan View



Picture 16 – NE to SW Baseline – Start – Seabed



Picture 17 – Marine Life on Seabed



Picture 18 – Marine Life on Seabed



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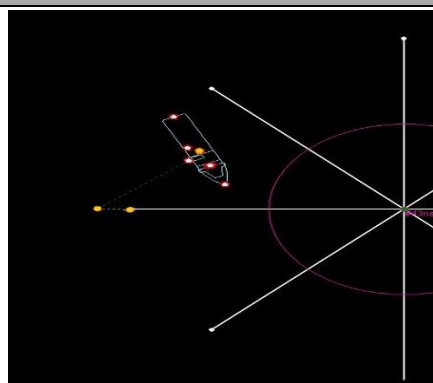
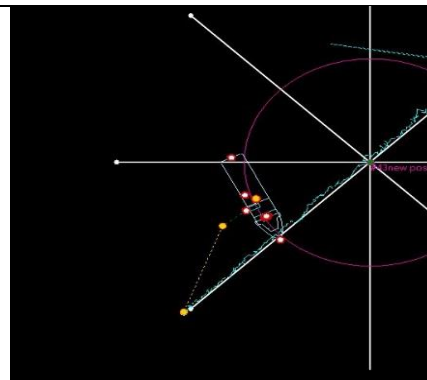
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Picture 23 – Marine Life on Seabed

Picture 24 – W to E Baseline – End – Seabed View

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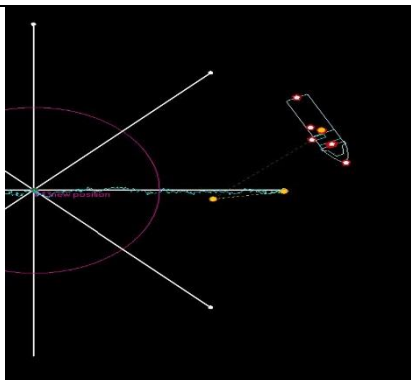
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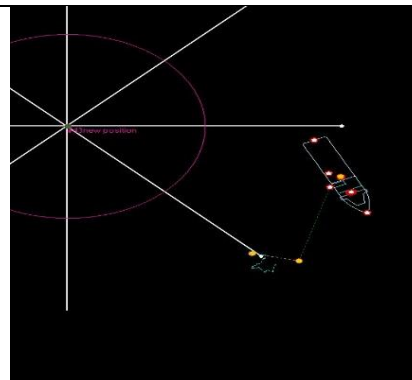
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Picture 25 – W to E Baseline – End – Plan View



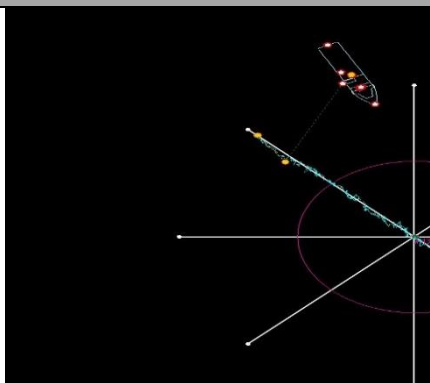
Picture 26 – SE to NW Baseline – Start – Plan View



Picture 27 – SE to NW Baseline – Start – Seabed View



Picture 28 – Marine Life on Seabed



Picture 29 – SE to NW Baseline – End – Plan View



Picture 30 – SE to NW Baseline – End – Seabed View



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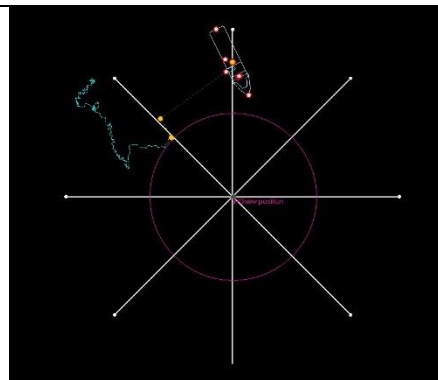
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Picture 31 – Start of inspection on the circle of 100m radius - direction counter clockwise - Seabed View

Picture 32 – Start of inspection on the circle of 100m radius - direction counter clockwise - Plan View



Picture 33 – Marine Life on Seabed

Picture 34 – Marine Life on Seabed



Picture 35 – Marine Life on Seabed

Picture 36 – Marine Life on Seabed

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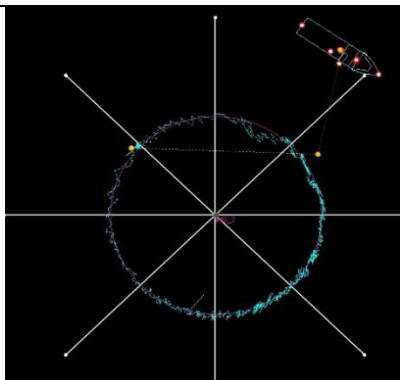
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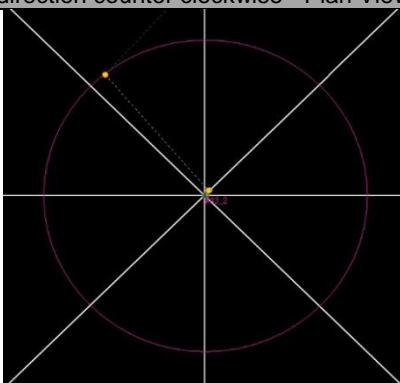
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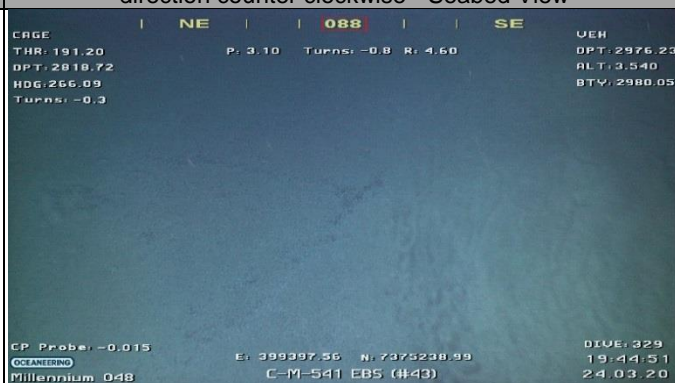
Picture 37 – End of inspection on the circle of 100m radius - direction counter clockwise - Plan View





Picture 38 – End of inspection on the circle of 100m radius - direction counter clockwise - Seabed View



Picture 39 – Center of the Location – Plan View





Picture 40 – Center of the Location – Seabed View

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6. CONCLUSION

- During the Station #43 survey, the sections South and South East reaches 3000m water depth what exceed the ROV operation limits. The position of the center of the Station #43 needed to changed, following the client instructions, the station was moved 549 meters to 248° to reach a shallow area, less than 3000 meters;
- The EBS operation at Station #43 – New Position in the C-M-541 Block was conducted with success and identified some marine life events at the location;

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7. ATTACHMENTS

- 01 HD with the images, videos, report and other files of the operation:
 - Images of Operation (*.jpeg);
 - Videos of Operation (*.mpg);
 - Report (*.pdf);
 - JSEA and RA (*.pdf);
 - SVP files (*.usr, *.000).

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8. ACCEPTANCE

Leandro Pickhardt		27-03-2020
Survey Supervisor - OSS	Signature	Date

No CSR on board		
Total Representative - CSR	Signature	Date



We Solve the Unsolvable.