

MISSION 3

M.V. NORDICA, SCHIEHALLION, UK

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Date: 25th – 28th July, 2003

Vessel: MSV *Nordica*

Collaborators: SOC DEEPSEAS group
BP
Subsea 7

Location: Schiehallion oil field, west of Shetland

1. NARRATIVE:

As part of the SERPENT project a trip to the Schiehallion field west of Shetland was undertaken on board the Subsea 7 vessel *Nordica*. This is a high specification ROV support vessel with two Centurion HD ROVs and a highly experienced crew, making it ideal for science industry collaboration. The official work scope involved the collection of several large chains on the seabed, but this task only required one ROV for the majority of the time, leaving the other one free to carry out biological tasks. The main aim of the science work was to survey an area of seabed within an active oil field to gain an impression of the species richness, standing stock and distribution of the benthic megafauna. Active oil field areas such as Schiehallion cover a wide area, the drilling operations only seem to impact a small region around the drilling site, leaving large areas of virtually unspoiled seabed. The seabed outside the protected oil field exclusion zones is heavily impacted by trawling and therefore not entirely representative of the “natural” seabed of the west of Shetland area.

The seabed in the Schiehallion zone ranges from around 360-400m in depth and tend to consist of a gravel, pebbles and occasional larger cobbles and boulders. It has large numbers of large invertebrates and fish with sponges, squat lobsters, urchins, ling and cod being particularly common.

While seabed survey operations were being carried out several traps were deployed designed to catch amphipods. These traps, containing a mackerel bait, attracted large numbers of these scavengers. These were preserved for future use by the BP biodiversity fellow at SOC, Tammy Horton.

In all, despite the short duration of the trip (16 hours on station), it was highly successful, with a number of ROV benthic surveys being carried out and a successful trapping experiment. This goes to highlight the value of industry science collaboration on projects such as this. Without the help of BP and Subsea7 and their ROV crews none of this work could have been achieved.

2. GEAR REPORT

2 x Centurion HD ROVs (Centurion 05 and 19)
Zoom video camera
Still digital camera – Kongsberg OE14-108
Amphipod trap with 2 catching tubes and mackerel bait

3. GOOD / BAD POINTS

Digital camera again proved difficult to operate, the software crashed repeatedly and images could not be uploaded while the camera was on the vehicle. There were also slight problems in interfacing but only due to the number of wires in the pods. Towards the end of the visit the camera software crashed on every photo and the pictures were not saved to the memory card.

Fresnel lens was not tested as it obscured all the imaging devices on the pan and tilt unit. The ROV crew also doubted whether the frame units would be strong enough. One lens was smashed by the airport baggage handlers.

Short time frame prevented more work from being done. Also other ROV operations were prioritised using many of the ships resources

4. SAMPLE / DATA CATALOGUE

SAMPLES COLLECTED:

Chains recovered in ROV operations contained specimens:

- 3 x *Cidaris cidaris* ?
- 1 x white urchin preserved in ethanol
- 5 x prawns preserved in ethanol
- 1 x *Munida sarsi* preserved in ethanol
- 2 x scallops
- 1 x scaphopod
- 1 x brachiopod
- 1 x Starfish (*Asterias rubens* ?)
- 1 x Ophiuroid
- 1 x amphipod associated with urchin preserved in ethanol

Traps provided around 100 amphipods which were preserved in ethanol

DATA OBTAINED:

- 3 x 50x50m grid surveys – two on station 1, one on station 2
- 6 x random 50m transects in 100x100m square on station 2
- 1 x altitude study, track run along pipeline at 1m and reciprocal at 3m alt on station 2

5. PRELIMINARY OBSERVATIONS

Station 1 and 2 both consisted of gravely substrate with occasional cobbles and boulders. Megafauna abundant (several per m²) and diverse with dominant species being sponges, squat lobsters, *Cidaris* sp. and *Echinus* sp. urchins, common fish included *Sebastes* sp. and ling. With many others represented in smaller numbers.

Both stations at similar depth and had similar fauna except station 2 appeared to have a larger number of large rocks and a higher diversity and number of species particularly sponges.

Amphipod traps worked well with short deployment time captured lots of amphipods, many of which were lost in the splash zone as water poured out of the traps. One tube had a cotton end to the funnel which significantly reduced the amount of amphipods captured but also reduced the losses in the splash zone. Traps had ling investigating them within a minute of deployment. Traps baited with mackerel in oil from a tin.

6. STATION LIST

Survey	Lat	Long	Northing	Easting
Grid 1 start			6691471.6	440951.13
Grid 1 end			6691425.71	440952.11
Grid 2 start	60.3491	4.0800	6690934	440395
Grid 2 end	60.3485	4.0809	6690874	440345.02
Grid 3 start	60.3540	4.0701	6691472.29	440952.49
Grid 3 end	60.3536	4.0710	6691427	440902.02
Altitude run start				
Altitude run end				
Transect 1 start			6690852	440360
Transect 1 end			6690881	440399
Transect 2 start			6690907	440405
Transect 2 end			6690859	440411
Transect 3 start			6690864	440401
Transect 3 end			6690892.73	440360
Transect 4 start			6690886.55	440358.27
Transect 4 end			6690850	440324
Transect 5 start			6690851	440332
Transect 5 end			6690895.22	440309.35
Transect 6 start			6690896	440314
Transect 6 end			6690915	440365

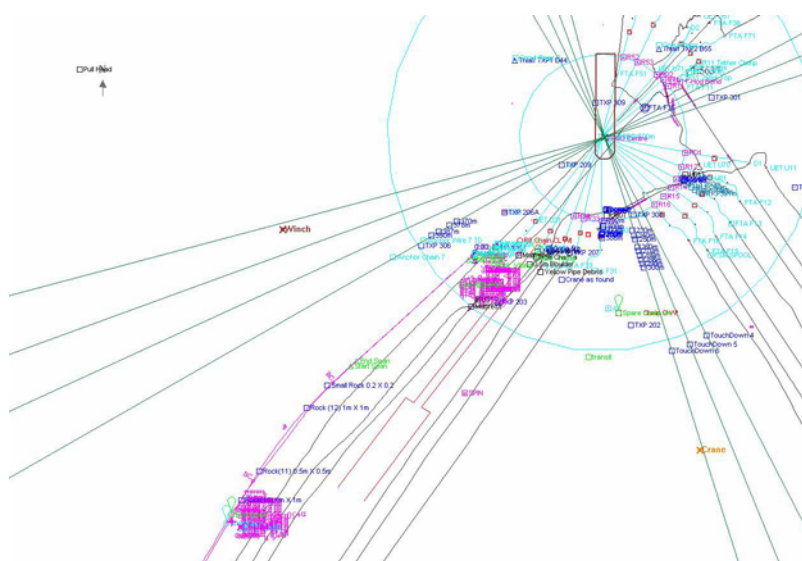


Figure 1: Schiehallion Subsea schematic

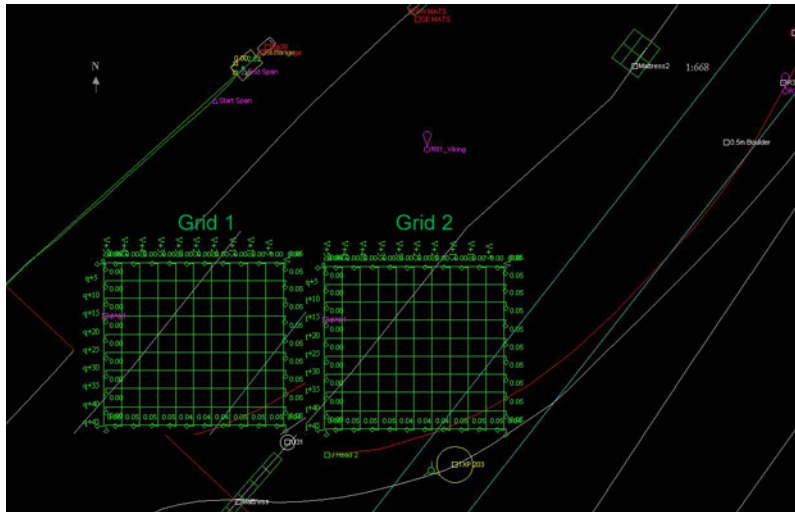


Figure 2: Plot of Station 1

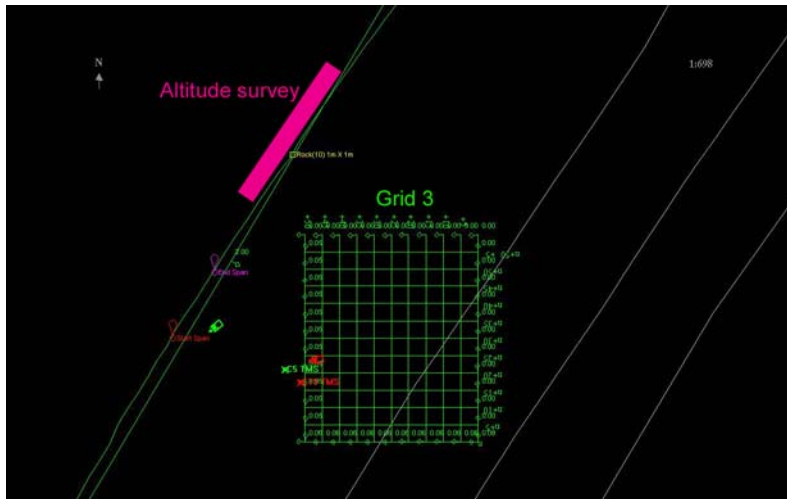


Figure 3: Plot of Station 2



Figure 4: Track of MSV Nordica from Invergordon to Schiehallion

APPENDIX

Events recorded on MSV Nordica cruise to Schiehallion oil field, west of Shetland

25TH JULY 2003

9:30 Boarded Nordica
10:15 Safety Briefing
13:00 Deck Briefing
18:00 Left Invergordon

26TH JULY 2003

Ship position: 60 deg 21.2039 N, 4 deg 04.3800 W
in 500m zone of Schiehallion FPSO

GRID 1

12:55 Launch centurion 19 with cutter fitted
13:05 Leave TMS
13:07 Start Grid 1, 50 x 50m grid surveyed at 5 m intervals, heading 270, the top line of the grid.
13:12 Turning S
13:13 Going E, doing line 2
13:18 Turning S
13:19 Going W, doing line 3
13:24 Turning S
13:25 Going E, doing line 4
13:30 trawl scar observed on seabed
13:31 Turning S
13:32 Going W, doing line 5
13:36 Turning S
13:37 Going E, doing line 6
13:42 Turning S
13:43 Going W, doing line 7
13:48 Turning S
13:49 Going E, doing line 8
13:54 Turning S
13:55 Going W, doing line 9
14:00 Turning S
14:01 Going E, doing line 10, the last line of the grid
14:05 End of Grid 1

GRID 2

14:33 Start grid 2
14:34 Going W, doing line 1
14:36 Flowline
14:40 Turning S
14:48 Going E, doing line 2
14:52 flowline
14:54 Tilt camera up as pan and tilt bulb blown
14:55 Turning S
14:56 Going W, doing line 3

15:03 Turning S
 15:04 Going E, doing line 5, one line missed
 15:12 Turning N
 15:14 Going W, doing line 4
 15:22 Turning S
 15:23 Going E, doing line 6
 15:28 Turning S
 15:31 Going W, doing line 7
 15:37 Turning S
 15:38 Going E, doing line 8
 15:44 Turning S
 15:45 Going W, doing line 9
 15:50 Turning S
 15:53 Going E, going line 10, the last line
 15:57 End of Grid 2

Centurion 19 used in cutting job, then on standby, then recovered. Video changed.

GRID 3 AND AMPHIPOD TRAPS

22:42 Centurion 19 launched with 2 tube amphipod trap in 5 function
 22:44 Reach seabed, approx. 390m deep
 22:48 deploy amphipod trap
 23:00 taking digital picture of trap, camera software crashed losing picture
 23:01 Start grid survey 3
 Camera just above bar (42.4 degrees from horizontal) and fully zoomed out
 23:09 Begin going E, doing line 1
 23:15 Turning S
 23:16 Going W, doing line 2
 23:21 Turning S
 23:22 Going E, doing line 3
 23:27 Turning S
 23:28 Going W, doing line 4
 23:34 Turning S
 23:35 Going E, stop, nav down
 23:38 Going E, doing line 5
 23:44 try again
 23:49 Reach end of line 5
 Turning S
 23:50 Going W, doing line 6
 23:57 Turning S
 23:59 Going E, doing line 7
 move camera up as light failed
 Pipeline WWI19 W38 12 inch diameter
 00:07 Turning S
 00:07 Going W, doing line 8
 00:16 Turning S (went too far on line 8 due to nav probs)
 00:19 Going E, doing line 9
 00:24 Grid abandoned due to job requirement

ALTITUDE COMPARISON

00:34:08 Flying N on pipe at low altitude
 00:37 turn around
 Flying at 3m

RANDOM SURVEY

Within 100m square fly 6 lines of 50m from a random start position on a random heading

Start and end of track recorded on audio channel

Start 00:44

Line	Start	End
1	00:44	
2		
3		
4		
5	1:12	1:17
6	1:18	1:22

AMPHIPOD TRAP RECOVERY

Recovered amphipod traps at 1:25

Recovered Centurion 19

1:45 Transit from Schiehallion to Invergordon