



# Seismic Studies on the Blake Ridge Gas Hydrates - Cruise Narrative

## Narrative/Log Summary

### Leg 1: 15 Nov. - 20 Nov. 1995

#### 15 Nov. 1995, JD 319

13:23: Depart Duke Marine Laboratory at Beaufort, N.C.

#### 16 Nov. 1995, JD 320

11:00: Transfer of media persons, Tori Hoehler, and equipment to Resolution.

14:00: Calibration tests with GI gun, using 105 in3 chambers for both the generator and the injector pulses. A 40 ms delay between both pulses was chosen in order to obtain an optimum source signature.

22:00: Picking up media persons from the Resolution. Tori Hoehler will be transferred later.

The Resolution reports problems with drill hole 994C, which therefore will be abandoned. A new hole will be drilled as Site 994D to perform logging and the VSP experiment.

Weather: Seas moderate with occasional white caps.

#### 17 Nov. 1995, JD 321

00:10: Begin SCS Line 1. Gun pressure was about 140 bar (2000 psi). This line connects all drill sites at Blake Outer Ridge.

01:19: GI gun was shut off due to problems with the supply cables.

01:39: GI gun resumed shooting

04:41: End of SCS Line 1.

04:57: Begin SCS Line 2.

05:45: The Resolution won't be ready for the VSP experiment before at least 12:30.

06:25: End SCS Line 2.

06:43: Begin SCS :Line 3.

08:13: End SCS :Line 3.

08:43: Begin SCS Line 4.

10:04: End SCS Line 4.

12:00: Transfer of Tori Hoehler together with some equipment from the Resolution.

15:31: Begin shooting the first walk-away VSP line V994D01. Due to problems with the

hole, only half of the originally planned line was shot (the southwestern branch, *fig. 9*).

The geophone depth was 493 mbsf.

16:36 End Line V994D01.

The bore hole must be reconditioned before further measurements can be performed. Therefore, the acquisition of SCS data was resumed.

19:43: Begin SCS Line 5.

22:55: End SCS Line 5.

Weather: Seas moderate, winds 10-20 knots.

#### 18 Nov. 1995, JD 322

00:30: Begin SCS line 6. Data lost because of bug in the data acquisition program a2d.

Further delays are anticipated for the second VSP line due to problems with the power supply on the Resolution.

01:43 End SCS Line 6.

06:31 Begin SCS Line 7.  
08:56 End SCS Line 7/Begin SCS Line 8. In order to obtain higher spatial resolution, profiling was done with 1.5-2.0 knts instead of 4-5 knts as for most other lines.  
10:19 End SCS Line 8.  
10:43 Begin SCS line 9.  
11:33 Profiling was interrupted, the guns turned of and streamer hauled in because the Resolution say that they will be ready in 20 minutes.  
12:40 Another damage at the drill ship, anticipating at least 6 hours delay.  
13:08 Begin SCS Line 10. This line was again acquired at 1.5-2 knts. After having repaired a valve at the compressor, gun pressure was raised from 140 to 210 bars (2000 to 3000 psi).  
14:27 End SCS Line 10, begin Line 11. Line 11 acquired at 4.5 knts.  
14:49 End SCS Line 11, begin SCS Line 12. This is the final part of Line 9, however, shot into the opposite direction (i.e., the position at 15:35 is about the same as that at 11:33).  
15:35 End SCS Line 12.  
17:18 Begin SCS Line 14.  
18:14 End SCS Line 14, begin SCS Line 15.  
18:30 End SCS Line 15  
Next walkaway VSP experiment should start in 20-30 mins. Thus, we are heading towards starting point for the walk-away VSP.  
19:30 Second VSP line V994D02 with receivers at 650 mbsf. This time, the whole spread over the bore hole was shot.  
21:24 End V994D02.  
Weather: Seas calm, winds 10-20 knts.

**19 Nov. 1995, JD 323**

00:00: The instruments in the hole obviously were damaged while trying to pull them up to the next position. Therefore, SCS profiling was resumed.  
01:00 Begin SCS Line 16.  
03:13 End SCS Line 16, begin SCS Line 17.  
06:54 End SCS Line 17, begin SCS Line 18.  
10:59 Begin SCS Line 19.  
11:20 Terminating SCS Line 19 because acquisition of the next VSP line should be started soon.  
15:00 Resolution reports that the tool was damaged in the hole again. Therefore, the they decided to terminate the VSP experiment at Site 944D and to try to fix the problems with the tool for a possible VSP experiment at Site BRH-6. The Cape Hatteras steamed further north to acquire seismic data from the Blake Diapir area.  
22:29 Begin SCS Line 20.  
00:00 Passing Blake Diapir.  
Weather: Seas calm, winds 10-20 knts.

**20 Nov. 1995, JD 324**

01:29 Begin SCS Line 21. Due to a leak in the GI gun air supply, the pressure was lowered from 210 to 150 bar (3000 to 2200 psi).  
03:29 End SCS Line 21, begin SCS Line 22.  
03:29 End SCS Line 22, begin SCS Line 23.  
05:00 Passing diapir again.  
09:46 SCS Line 24.  
12:20 End SCS Line 24. Hauling in gear, heading for Beaufort. 22:00 Arriving at dock.  
Weather: Seas calm, winds 10-20 knts.

**Leg 2: 26 Nov. - 1 Dec. 1995**

**26 Nov. 1995, JD 330**

16:00 Left dock under fair skies for immediate rendezvous with the Resolution to transfer the repaired VSP part, Dave Williams, and several ODP boxes to the drill ship and receive an update on drilling operations at Site 995.

**27 Nov. 1995, JD 331**

12:00 Rendezvous with the drill ship, make transfer. VSP operations scheduled to begin Wednesday at noon. Begin transit to first OBS site ~50 nm to the south.

18:10 Deploy OBS A2. Beautiful sunshine, calm wind and seas.

18:24 Deploy OBS A3

20:18 Begin shooting OBS Line 1 pattern.

**28 Nov. 1995, JD 332**

07:07 Shooting of OBS Line 1 pattern complete. Begin recovery operations.

08:24 OBS A2 released.

09:29 OBS A2 recovered.

09:59 OBS A3 released.

11:09 OBS A3 recovered.

Upon completion of the 1st OBS experiment, we made way for the drill sites with the intention of deploying the OBSs and potentially conducting the 2nd OBS experiment before beginning VSP operations. We were contacted by Quinton Lewis over single-side band and informed of ODP's (shore-based office) desire for us to remove an infirm marine technician, Greg Lovelace, from the Resolution and transport him to shore at our earliest convenience. After a second conversation with Quinton we devised a plan wherein we would rendezvous with the Resolution, retrieve Lovelace, deploy the OBSs over site 994D, shoot the east-west line, then transit to the offshore limit of the R/V Susan Hudson where we would rendezvous with her and transfer Lovelace and, apparently, a shipment of food stores which had arrived in Beaufort for the Resolution. VSP operations were scheduled to begin at 17:00Z the next day.

16:00 Rendezvous with the Resolution, Lovelace on board.

17:14 OBS A3 deployed.

17:30 OBS A2 deployed, begin transit to west end of dip line.

18:44 Begin shooting line OBS 2a.

22:36 End of line OBS 2a.

23:00 Equipment hauled in, begin transit to rendezvous with the Hudson.

23:30 Two hours into the Hudson's transit her crew decided to abort the plan due to rough seas. We begin transiting back to the OBS Line 2 site to complete the OBS experiment.

**29 Nov. 1995, JD 333**

01:24 Begin shooting OBS 2b, the strike line in relatively calm seas with 15-20 knt winds and moderate swells.

05:20 End of shooting Line OBS 2b.

06:49 OBS A3 released.

07:58 OBS A3 on board.

08:13 OBS A2 released.

09:15 OBS A2 on board. The SCS gear is immediately deployed.

09:38 Begin SCS Line 25.

11:57 End SCS Line 25, begin SCS Line 26.

12:20 End SCS Line 26.

12:21 Begin SCS Line 27.

13:32 End of SCS Line 27, begin SCS Line 28.

15:10 End of SCS Line 28.

Seas continued to roughing after the recovery of the OBSs. Following a conversation with the Resolution, we steamed to the end of VSP Line V995B01 and stood by.

18:48 Begin V995B01

21:24 End V995B01

21:56 Begin V995B02

**30 Nov. 1995, JD 334**

00:15 End V995B02.

00:46 Begin V995B03.

01:07 Shot logger not working. Failure not notice for 30 minutes.

01:45 PC rebooted, shot logger again operational.

03:00 End V995B03.

03:20 Begin V995B04.

05:31 End V995B04

06:03 Begin V995B05.

08:20 End V995B05.

08:45 Begin V995B06.

10:00 It is noticed that the shot\_log program is again not working. Shot time has not updated since ~09:10. Begin efforts to analyze the problem, discontinue shot randomizer.

11:23 End V995B06.

12:22 Begin V995B07.

12:42 Failure of the shot logger again noticed. Failure from 12:25-12:42

13:06 Failure of the shot logger from 13:01-13:06.

13:30 It is noticed that one of the flashing lights of the gun selenoids is remaining on. Only one chamber of the GI gun is firing. The firing lines had become wet on the fantail.

13:53 Gun problem fixed. Both chambers firing again.

14:32 End V995B07.

15:06 Begin V995B08.

17:08 End V995B08.

The Resolution radios to tell that they made a miscalculation in the number of pipe sections put down above the side-entry sub and that there will be no line 9. We plan a final rendezvous with Resolution to transfer a liquid nitrogen bottle to the Hatteras and diskettes with shot times to the Resolution. A brief consideration is given to another attempt to rendezvous with the Hudson to bring back out the food stores and a replacement tech for Lovelace. The weather is too severe for this operation, however, and we decide to simply pick up several remaining lines and end the cruise early.

19:19 Begin SCS Line 29.

20:42 End SCS Line 29, begin SCS Line 30. It is noticed at this time that spurious but ordered signals are being recorded by our system. Upon realizing that these were the airgun shots from the zero-offset VSP shooting of the Resolution, we contacted them to see if we were interfering with their experiment. It was decided to continue with our shooting, as our source was significantly weaker than theirs, we were in constant motion, and we were heading out of the area.

21:48 End SCS Line 30, begin SCS Line 31.

22:34 End SCS Line 31

23:04 Begin SCS Line 32.

**1 Dec. 1995, JD 335**

01:19 End SCS Line 32. Haul in gear, head for Beaufort.

14:00 Arriving at dock.