

A. GENERALDepth References

1. All depths given are with respect to the Datum Point on the Main Guide Base, which will be approximately 370 ft below derrick floor.
2. All depths given in brackets are approximate depths and are with respect to rotary table.
3. Expected water depths: \pm 280' below MSL.
4. Vessel ballasted to about 57' draught for drilling.
5. Distance from rotary table to MSL will be approximately 90 ft.

1) Location

A/S Norske Shell Block 17/10 (Licence no. 010)

Approx Surface coordinates N 58° 01' 38"
E 03° 10' 00"

2) Type of Well

Exploration, to be drilled as an expendable hole.

3) Rig

SEDNETH I Semi-submersible with underwater control equipment.

Contractor : Sea Drilling Netherlands.

4) Total Depth

About 10700' (11070'). About 400' below top Zechstein salt.

5) Objective

Investigation of Tertiary and Mesozoic sequences down to top Zechstein.

Main objective is possible sandstones and limestones in Lower Cretaceous and Jurassic. Secondary objectives are possible Lower Tertiary sands, Upper Cretaceous chalk, and Triassic sands.

6) Prognosis (below datum)

Seabed - 1000'	Quaternary Pleistocene	Sands and clays
1000' - 4600'	Tertiary	Clays, some marls, minor sands in Miocene and Eocene
4600 - 6400'	Danian U. Cretaceous	Chalk
6400 - 8700'	L. Cretaceous Jurassic	Shales, some marls, possibly sandstones and limestones in lower part.
8700 - 10300'	Triassic	Claystones, silt- stones, minor sand- stones and anhydrite. Characterized by red and brown colours.
10300 - 10700'	Permian (Zechstein)	Rocksalt, probably with anhydrite cap.

7) Pressures

In 17/11-1 a mud weight of 10.0 ppg was sufficient to hold all pressures down to top salt. ✓

8) Well Control

Pressure control will be maintained from 13-3/8" casing point to T.D. in accordance with Company's well control policy.

A stock of at least 200 sacks cement will be kept on board at all times for plugging back in case of emergency. ✓

9) Deviation Control

Deviation build up should be restricted if possible to one degree per thousand feet. Totcos should be taken every 500 feet or nearest bit change down to 5000 feet. Thereafter deviation will be checked by Schlumberger and no further Totcos will be taken unless specifically required. Dog-legs should be avoided as far as possible and in any case should not exceed $1\frac{1}{2}$ degrees per hundred feet. ✓

- 10) Summary of Operations (refer to detailed procedure)
 - 1) Run Temporary Guide Base (TGB) if necessary.
 - 2) Run $17\frac{1}{2}$ " bit with 36" hole opener and drill to $\pm 170'$ (540').
(Alternatively drill 26" hole and open out to 36").
 - 3) Make up 30" marine sub-conductor below Main Guide Base (MGB).
Run 30" on drill pipe landing MGB on TGB. Latch 30" suspension joint into MGB.
 - 4) Cement 30" marine sub-conductor up to seabed.
 - 5) Drill $17\frac{1}{2}$ " hole to 1000' (1370').
 - 6) Run 13-3/8" casing and cement up to seabed.
 - 7) Run 16-3/4" BOP stack on drill pipe and latch to 13-3/8" casing hanger.
 - 8) Drill 12-1/4" hole to 4700' (5070') ($\pm 100'$ below top chalk). Log.
 - 9) Run 9-5/8" casing and cement in two stages.
 - 10) Drill $8\frac{1}{2}$ " hole to TD $\pm 10700'$ (11070').
 - 11) Log, and DST if required.
 - 12) Run and cement 7" casing, if required.
 - 13) Make production test if required.
 - 14) Abandon hole, cut and recover well head assembly.

B. EVALUATION.

1. Logging

Refer to Appendix 3 for logging programme.

2. Mud and Formation Logging

Full surveillance of mud and formation logging will be carried out by Exploration Logging International Inc., starting at 1000' (1370'). All significant changes in formation and shows will be reported immediately to Shell well site P.E.

3. Mud Sampling

Mud samples are to be collected while circulating before every logging or testing job.

4. Ditch cuttings

Samples are required every 20' down to 4700' (5070') thereafter every 10' to T.D.

Four full plastic bags are required over each interval. Of these two sets should be unwashed (but lightly rinsed and dried) for Norske Shell and BIPM, and two sets should be washed and dried for the Geological Survey of Norway and for exchange purposes.

5. Coring

Full provision is to be made for coring at any time below 4700' (5070')

Sidewall samples (shales) for palaeo. control are required every 100' from 2000' (upper Tertiary) to top salt, with the exception of upper Cretaceous chalk where samples are only needed every 250'. Samples also in Permian if non evaporite intercalations are present in salt.

Rigsite P E will select sidewall samples in reservoir rocks and possible hydrocarbon bearing intervals.

6. Testing

- a) Open hole straddle DST's may be considered in 12-1/4" or 8 1/2" hole, if hole condition is satisfactory. DST's may also be made in 9-5/8" or 7" casing. Byron-Jackson DST tools available from Stavanger.
- b) Production tests may be required in 9-5/8" or 7" casing using Otis Removable Sub Sea Test Tree and 3 1/2" Hydril CS tubing.

C. RESPONSIBILITY ON THE RIG

1. Toolpusher

The Norske Shell Toolpusher will ensure that Shell Drilling Superintendent's orders are carried out and that drilling standards conform to accepted Group practices.

2. Petroleum Engineer

The Norske Shell Petroleum Engineer will be responsible for supervising the Exploration Logging International technicians, and for the collection and reporting of all well technical evaluation data. He will advise the Toolpusher on mud treatment and keep records of mud properties and chemical and cement stocks. It will be the responsibility of the Petroleum Engineer to order and maintain adequate stocks on board of mud materials and cement for the rig.

3. Secrecy

This is a tight hole and vital information such as depths, formations, shows, test results etc must not be passed in the clear by Radio Telephone.

John G. Margrave
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Chief Petroleum Engineer

Not available
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Drilling Superintendent

A. Jackson
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Exploration Manager

B. Mansor
.....

Operations Manager

Casing Programme

a) 30" Marine Sub-Conductor at about 150' (520')

30" - 1" wall ; 250 lbs/ft ; Vetco At sunch joints. Duplex shoe on bottom.

b) 13-3/8" Casing at 1000' (1370')

13-3/8" 72 lbs/ft. N-80 Buttress thread. Float shoe on bottom and float collar one joint above shoe. One spring centralizer to be positioned at shoe of 30" marine sub conductor.

c) 9-5/8" Casing at about 4700' (5070')

9-5/8" 47 lbs/ft. N-80 Range 3 Buttress thread. Float shoe on bottom and float collat two joints above shoe. DV collar at 1100' (1470'). Metal Petal Basket just below DV collar.

6 Spring centralizers over bottom 12 joints + 1 inside 13-3/8" shoe.
2 Spring centralizers, one either side of DV collar.

d) 7" Casing at about 10700' (11070') if required.

Seabed - 500'	32 lbs/ft	N-80	Range 3	Extremeline
500' - 4600'	29 "	N-80	"	Buttress
4600' - 10700'	32 "	N-80	"	Extremeline

Float shoe on bottom and float collar two joints above shoe. DV collar may be required. Metal Petal Basket just below DV collar.

25 Spring centralizers to be available, one inside 9-5/8" shoe and one either side of DV collar.

For 13-3/8", 9-5/8" and 7" casings an extra 400' will be required for handling strings.

e) Casing pressure tests will be restricted to the following pressures:

30"	200 psi
13-3/8"	2000 psi
9-5/8"	3000 psi
7"	3000 psi

The pressure tests on the 13-3/8", 9-5/8" and 7" casings are to be carried out immediately after bumping the plug.

If differential equipment is used this should be converted to float equipment before running below the previous casing shoe.

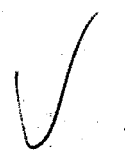
Hole size and casing depths may be revised during drilling.

A formation breakdown pressure test will be carried out immediately after drilling out the 13-3/8" and 9-5/8" casing shoes.

f) Abandonment

Plug back with cement as necessary. Top of last plug to be up to sea bed.

CEMENTING PROGRAMME



Casing Size Inch	Casing Depth Feet	Annular		Feet Cement Inside	Excess % in open hole	Slurry Volume incl. excess cu. ft.	Mixing Water	Slurry Density lb/gal	Additives	Thickening Time hrs.	Sacks Cement
		Fill From	Feet To								
30	150	150	0	30	200	1171	Sea	15.7	2% Ca Cl ₂	3	1000
13-3/8	1000	1000	0	40	50	1430	Sea	15.7	-	6	1200
9-5/8	4700	4700	1100	80	20	1395	Fresh	15.7	-	4	1200
		1100	0	-	20	363	"	15.7	-	6	350
7	10700	10700	8700	80	20	325	Fresh	15.7	0.5% B5 + 16.1 lbs salt per sack	3	300
		?	?	-	20	?	"	15.7	0.5% B5 + 16.1 lbs salt per sack	3	?

- NOTES:
- 1) All depths below datum (MGB)
 - 2) Use construction cement for 30" and 13-3/8" jobs and Class B for all other jobs
 - 3) Slurry volume for density 15.7 is 1.17 cu. ft/sack
 - 4) " " " " 12.4 (20% Dylite) is 2.43 cu. ft/sack
 - 5) Volumes calculated with 10 ft pocket below shoe.
 - 6) Use 10 bbl BJ Mudsweep ahead of all jobs on 9-5/8" and 7".

Logging Programme

a) At 9-5/8" casing depth

(In 12-1/4" hole)

IES	1 : 200	1 : 500
LL7	1 : 200	1 : 500
MLL	1 : 200	1 : 500
BSGRC	1 : 200	1 : 500 (GR up to seabed)
FDC	1 : 200	1 : 500
TS	in 9-5/8" casing	
SWS		

Figure 3



b) At Total Depth

(In 8 1/2" hole)

Same as at 9-5/8" casing depth plus SNP and CDM

TS in 7" casing if run.

A velocity survey will be carried out at or near T.D.

Mud Programme

a) Sea Bed to 13-3/8" casing depth.

To be drilled with sea water with returns at sea bed.
Periodically, while drilling and before logging or running casing viscous mud will be spotted.

Properties of viscous mud : weight 8.6 - 9.0 lbs/gal
viscosity 70 - 80 secs MF

Chemicals required : Magcogel, salt, line.

b) to 9-5/8" casing depth

Spersene seawater mud.

Increase weight and decrease fluid loss gradually with depth.
Keep solids content to minimum by using desander and desilter.
At 4000' increase viscosity to 60 secs.

Properties : weight 8.8 - 10.0, viscosity 40 - 60,
fluid loss 20 - 10 cc API.

Chemicals required : magcogel, salt gel, caustic soda,
soda ash, spersene, drilling detergent.

Note: Barytes must be available before drilling out the 13-3/8" casing shoe.

c) to T.D.

Careful attention should be paid to the mud properties and again solids build-up should be watched.

Properties : weight 9.5 - 11.0 viscosity 45 - 55,
fluid loss 3-6.

Chemicals required : as under b) plus XP-20, magcobar, CMC,
magconol, bit lube (4lbs/bbl).

At 8500' there should be a stock of 75 tons of salt on the rig.
When rock salt is encountered the bit should be pulled back to the 9,5/8" casing shoe, and the mud should be converted to a salt saturated system.

Chemicals required : salt, My-lo-gel, line.

A Magcobar service engineer will be on call in Stavanger in case of difficulties.

DESCRIPTION OF BLOWOUT PREVENTERS TO BE USED
WITH SEDNETH I.

(refer Safety Regulations Section 34 (g))

B.O.P. Stacks

Two B.O.P. stacks will be available for use as follows:

1. 20" Stack

- 1 - 20" x 2000 psi "MSP" type HYDRIL
- 1 - adaptor spool, with two 3" flanged outlets
- 2 - Cameron 3" x 2000 psi WP type F block angle hydraulically operated valves.

2. 16 3/4" Stack

- 1 - 16 3/4" x 5000 psi HYDRIL, type GK
- 1 - 16 3/4" 5000 psi Cameron type U tripple ram BOP with wedge-locks on all rams.
- 2 x 2 Cameron 3 1/8" 5000 psi WP type F underwater valves with type A fail-safe hydraulic operators.

Choke and Kill lines

Both lines are Hydril 3 1/2" x 158 lbs/ft J 55 tbg. type with PH 6 type joints.

PAYNE blowout preventer control equipment

WELL CONTROL POLICY

"On-the-rig" blowout drills and "pit drills" will be carried out until all crews are competent and familiar with all aspects of handling a blowout.

B.O.P. and Casing Pressure Tests

B.O.P.

All the well head components and the connections to it will be pressure-tested with water through kill line by means of a

Cameron plug-type B.O.P. tester. The test pressure applied will be the rated working pressure of the ram preventers and will be maintained for 15 minutes.

Casing

The test pressure applied will be determined in agreement between the company and contractor's representatives, but will not exceed the standard mill test pressure.

Pressure tests will be done:

- a. once a week
- b. prior to drilling into a known high-pressure zone
- c. any time requested by company.