

NORSK HYDRO a.s
FINAL REPORT
WELL 16/3-1
LICENCE 007 NORWAY

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P R E F A C E

Licence 007 was awarded the Petronord group in 1965
The group now consists of the following companies:

Elf Norge A/S	21.584	per cent
Total Marine Norsk A/S	16.188	" "
Aquitaine Norge A/S	10.792	" "
Norsk Hydro Produksjon a.s	26.800	" "
Eurafrep Norge A/S	1.824	" "
Coparex Norge A/S	1.596	" "
Cofranord A/S	1.216	" "
Phillips Petroleum Co. Norway	14.78	" "
Norsk Agip A/S	5.22	" "

The well 16/3-1 was drilled by Norsk Hydro Produksjon a.s
on behalf of the Operator, Elf Norge A/S.

S U M M A R Y

The objectives of well 16/3-1 were to investigate the Paleocene sand pinch out, the weathered top of the Cretaceous chalk and the Jurassic sandstone.

The well was spudded in on January 31, 1976 and was abandoned 10 days later due to progressive tilting of the BOP stack.

A summary of well data is presented in table 1, page iv. A location map is found in fig. 1, page iii.

Figure 1

Location of well 16/3-1

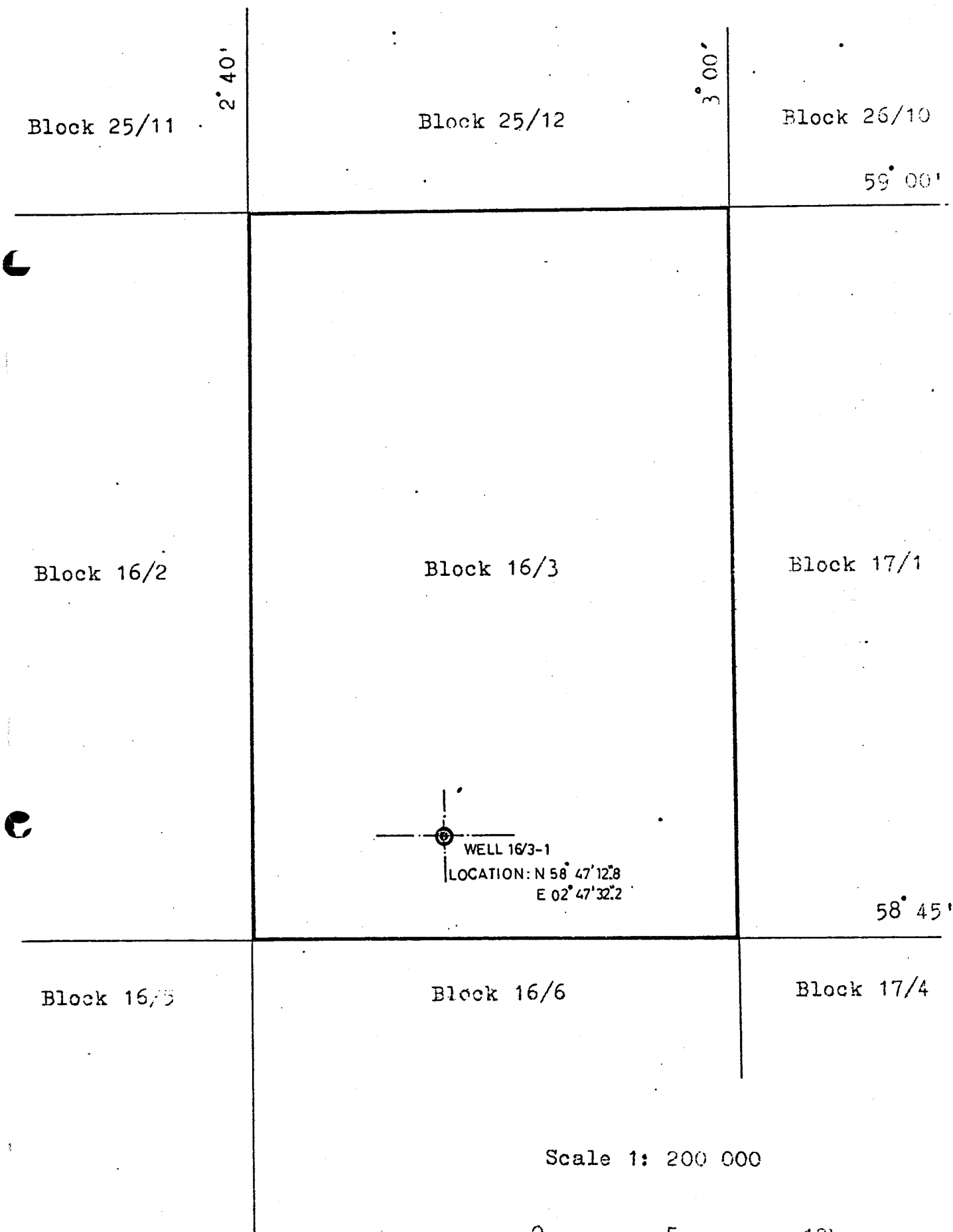


TABLE 1

Summary of well data:

Location	58°47'12,8" N 02°47'32,2" E
Operator	Elf Norge A/S
Drilling supervision	Norsk Hydro Produksjon a.s
Rig	Polyglomar Driller
Contractor	Rasmussen Global Marine Ltd.
RKB elevation (to MSL)	24 m.
Water depth	118 m
Spudded	January 31, 1976
Abandoned	February 10, 1976
Well program:	
Hole diameter:	36" to 179.5 m 26" to 198 m 17½" to 445 m
Casing record:	30" set at 179 m 20" set at 192 m 13-3/8" set at 440 m

S E C T I O N A

O P E R A T I O N S

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1. Location survey

A/S GEOTEAM performed a site survey with echo-sounder and side scan sonar during the period from the 19th to the 22nd of December 1975.

The area surveyed was a 2 x 2 kilometers square with its base aligned E - W and centered at:

58°47'11" N

02°47'36" E

The sea floor was found to be gently undulating, nearly flat, throughout the whole area. The water depths varied between 118.0 meters and 119.5 meters.

The sea bed was interpreted to consist mainly of loose or soft sediments with localized areas of coarser or denser material.

No obstructions or other special features were recorded in the area.

2. Navigation and positioning of the rig

The rig left CCB, Bergen for its new location in block 16/3 at 0820 hrs, January 26.

A course of 200° was held to a point 10 miles S.E. of the location. The heading was then changed to 290° for the final 10 mile approach.

The speed averaged 9.0 knots.

UDI Operations Ltd. carried out the navigation by use of the satellite system.

A total of 41 x 2-D and 27 x 3-D passes were recorded and evaluated.

The final position of the derrick center was:

$58^{\circ}47'12.88''$ North

$02^{\circ}47'32.25''$ East

This put the rig at a distance of 70 m on a bearing of 288° from the intended location.

The UDI navigation report is found in appendix 1.

3. Mooring procedure and anchoring of the rig

On the 27th January, the move had proceeded according to the plan and Polyglomar Driller was approaching the location of well 16/3-1. No. 4 anchor was dropped 2500 feet from location, and by 1710 hrs the same day, all the remaining anchors had been run out. The rig was ballasted down to 70 feet draught and at 0110 hrs on 28th January, tension was applied to all the anchors, but the anchors no. 1, 8, 3 and 4 were found to be slipping. Further unsuccessful attempts to tension the 4 anchors were made later in the morning. A representative for Noble Denton was on board the rig from Bergen to witness the anchoring procedure. Permission to spud was not granted until all anchors would hold 20 0000 lbs plus 25%. However, by this time the weather had deteriorated and it was not possible to start to re-lay the anchors until 0800 hrs on the 30th January. This day 4 anchors were reset but only 3 of them were holding. 2 piggybacks were placed on no. 8 anchor and one on no. 4 anchor. After several contacts with Noble Denton, London, permission to spud was given when no. 8 anchor was tested to 150 000 lbs + 25%.

Fig. A.1 shows the mooring pattern plotted on true north map.

The rig was given 310° true north heading. The final anchor pattern, the chain pay out and the anchor tension is tabulated in table A.1.

TABLE: A.1

ANCHOR PATTERN AND TENSIONING 16/3-1

ANCHOR NO	DIRECTION DEGREE	CHAIN LENGTH FEET	ANCHOR TENSION TEST lbs
1	335	2450	300 000
2	020	2280	275 000
3	070	2480	300 000
4	100	2370	300 000
5	150	2190	275 000
6	195	2460	275 000
7	237	2350	325 000
8	275	2300	200 000

Rig heading: 310 deg. True North

4. Resume of operations

4.1 Summary

The well was spudded in on January 31, after four days spent on anchoring of the rig.

The 36" hole was drilled to 179.5 m. High viscosity mud was spotted before the 30" casing was run and set at 179 m.

The cement was drilled out and the 26" hole was extended to 198 m.

Four joints of 20" casing were set with the shoe at 192 m. The riser and BOP stack were run and tested.

The 18-3/4" wear bushing was landed after several unsuccessful attempts of passing through the BOP stack.

The 17½" hole was drilled to 445 m. Problems were encountered in passing the bottom hole assembly through the BOP stack. Sonic and gamma ray logs were run before setting the 13-3/8" casing. This casing string was landed at 440 m.

Several attempts to set and test the 13-3/8" seal assembly were made without success.

Directional surveys revealed that the BOP stack was tilted about six degrees from the vertical position, and that the tilt angle had increased since the 20" csg was set and tested.

Due to further expected problems in passing through the BOP with this tilt angle and a potential danger of laying down the BOP if the riser had to be released, it was decided to abandon the well.

The abandonment was completed on February 10.

The deviation surveys are presented in table A.2

TABLE: A.2

HOLE DEVIATION

Depth (m)	SPERRY SUN deviation (deg)
150	4° 49'
180	4° 40'
210	4° 09'
240	3° 23'
270	2° 46'
300	2° 14'
330	1° 37'
360	1° 35'
390	1° 28'
410	0° 58'
415	0° 49'

Horizontal displacement: 12,67 meters.

4.2 Activity report

The time distribution for the operation is shown in table A.3 and fig. A.3.

A total of 15.3 days was spent on this well of which 1.8 days account for moving and anchoring of the rig.

The low fraction of total time spent on drilling is mainly due to the early abandonment of the well as well as special problems which were encountered.

A majority of time was spent installing and testing the subsea equipment. Several attempts were made in setting the 18-3/4" wear bushing, and the decision to plug the well was made after having spent about two days trying to set and test the 13-3/8" seal assembly.

Waiting on weather accounted for 15.6% of the total time. Most of this time was spent waiting to reset the anchors.

About 1.8 days or 11.8% were spent on abandonment.

FIGURE A.2

DRILLING PROGRESS, WELL

Operator: Norsk Hydro a.s
 Coordinates: 58°47'12.88"N
 02°47'32.25"E

Spud in: Jan.31.1976
 Well compl: Febr 10 1976
 Rig: Polyglomar Driller

Water depth: 118m
 RKB to MSL: 24m
 RKB to Sea Bed: 142m

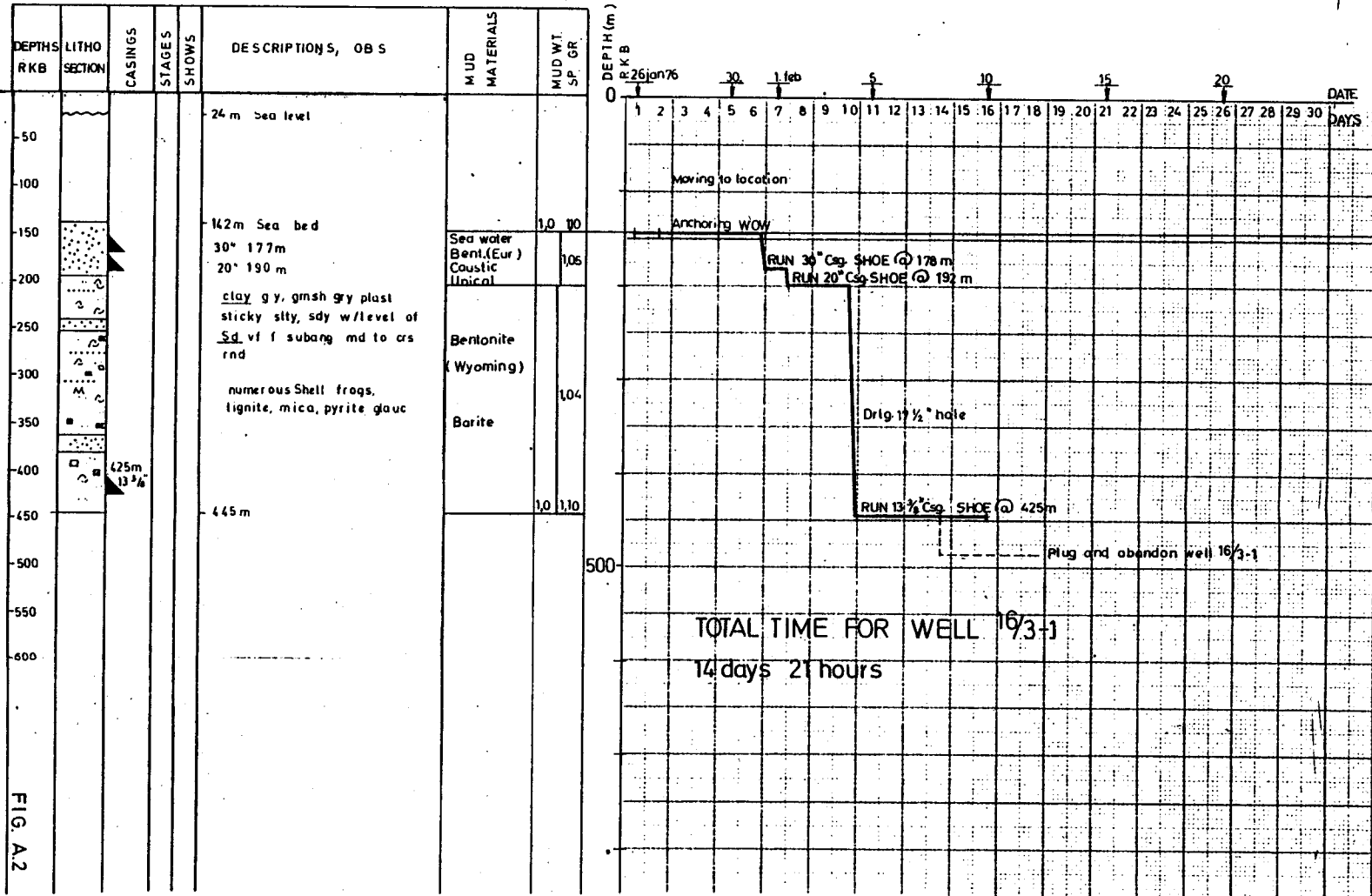


FIG. A.2

Table A.3

TIME DISTRIBUTION

Operation Days Percentage of total time on location

1	Under way	1,055	7,01
2	Mooring	0,791	5,26
3	Drilling	0,520	3,46
4	Tripping - Survey	0,479	3,18
5	Circulating	0,062	0,42
6	Run - cement casing	1,541	10,24
7	Formation evaluation	0,604	4,01
8	Subsea equipment	1,354	8,99
9	Lost time - DRLG equip.	0,020	0,14
10	" " Subsea equip.	2,00	13,28
11	" " Fishing		
12	" " Hole problems		
13	" " Mooring system	1,416	9,41
14	" " W O weather	2,354	15,64
15	" " W O equip.	0,083	0,55
16	" " W O orders		
17	" " Completion equip.		
18	" " Other	1,000	6,64
19	Plug and Abandon	1,770	11,77
20	Sub total	15,333 days	100%

4.3 Diary report

January 26, 1976

Polyglomar Driller departed from C.C.B. Ågotnes, Sotra at 9.20 and SEA BRUTE was towing.

January 27, 1976

The rig arrived at location at 11.10hrs and anchors number 4,8,5,1,6,7,2, and 3 was set. The rig was ballasted down to its drilling draught. The depth from RKB to sea bed was 142 m.

January 28, 1976

Tested anchors number 2,5,6 and 7. Waited on weather to reset anchors number 1,3,4, and 8. Tested choke and kill manifold plus BOP stack and choke and kill lines on BOP stack.

January 29, 1976

Waited on weather to reset anchors number 1,3,4 and 8.

January 30, 1976

Five anchors were tested satisfactory, three were connected to piggybacks; of which two were tested satisfactory. The last, anchor number 8 held 180 000 lbs. Tried to get permission from Nobel Denton in London to spud.

January 31, 1976

Permitted to spud if anchor number 8 held 150 000 lb + 25%. Reset this anchor with 2 piggybacks and tested to 150 000 lb + 25%.
Went down with 26" bit and 36" holeopner and hit the bottom at 142. meter. Spudded and drilled from 142 m to 179.5 m. Circulated and spotted 300 bbls mud.

Survey was run. POOH. Picked up 30" casing and guide frame. Depth: 178 m.

February 1, 1976

Filled 30" casing with saltwater and stabbed into the 36" hole. The casing stuck at 149 m; picked up the kelly and washed the casing down. Jumped divers to observe the setting of the guide frame on the sea bed. Cemented 30" casing and displaced with sea water. Casing shoe set at 179 m. Ran in hole with 26" bit, tagged cement at 174.5 m and drilled to 198 m. Spotted 150 bbls mud. POOH. Depth: 198 m.

February 2, 1976

Landed and cemented 20" casing at 192. m. Displaced cement with saltwater. POOH. Ran riser and BOP. Pressure tested choke and kill lines every third joint to 7500 psi. Tested all anchors. Depth: 198 m.

February 3, 1976

Landed BOP stack on wellhead. Tested choke and kill hoses to 5000 psi. Filled riser with saltwater and tested the diverter to 100 psi. When running the wear bushing it stopped, possibly in the balljoint. The rig was moved to reduce the angle on the balljoint. On the next attempt the wear bushing hung up in the Hydril. The wear bushing was run again and was finally landed in the wellhead. Depth: 198 m.

February 4, 1976

Ran in hole with 17½" bit and drilled with sea water from 198 m to 445 m. POOH. Ran GR-BHC, but were unable to pass 316 m. POOH. Went into the hole with bottom hole assembly, but could not pass the stack. Depth: 445 m.

February 5, 1976

Worked string and passed BOP stack. Took weight from 278 m to 316 m, washed down to 445 m. POOH. Ran G.R. and BHC from 445 m to 122 m. Ran 26 joints 13-3/8" casing, landed at 440 m. Cemented and displaced with 150 bbls sea water. Depth: 445 m.

February 6, 1976

Tried to test assembly, no success. Tried to recover seal assembly but backed off first joint under rotary, made up the same. Moved the rig to get through the BOP stack with the running tool. Attempt was made to test seal assembly, - no success. Ran Sperry- Sun gyro survey. Depth: 445 m.

February 7, 1976

Ran directional surveys inside BOP. Found the stack to be tilted about 6 degrees from vertical. Tested collet connector to 5000 psi. Tried to get seal assembly out, but had to leave it in the hole. Running tool was badly damaged. Made up 18-3/4" wear bushing and ran in hole to find position of seal assembly.

February 8, 1976

After several negative attempts to retrieve seal assembly, the decision was made to plug the well. Plugged the well and pulled the BOP stack. Depth: 445 m.

February 9, 1976

After having set back the BOP stack, the wellhead was blown off. Made up 20" casing running tool and ran to wellhead. Stabbed in, but unable to make up because of angle of wellhead. Waited on weather to pull wellhead.

February 10, 1976

Retrieved guide frame, 13-3/8", 20" and 30" casing.
Final abandonment of well 16/3-1 at 11.00 hrs,
February 10, 1976.

5. Abandonment of the well

The 13-3/8" casing shoe was cemented at 440 m. The float collar was at 425 m.

The casings were perforated from 186 m to 188 m.

Cement plug No. 1 was spotted from 215 m with 90 sacks class G neat cement.

Cement plug No. 2 was set from 187 m with 70 sacks class G neat cement.

All casing strings were cut 5 m below ocean floor. Retrieved the wellhead and upper part of casings.

The well abandonment is shown in fig. A.4

Left location at 11.00 hours February 10, 1976.

The seafloor could not be inspected by divers due to bad weather. The seafloor was inspected by use of T.V. and no remaining obstructions were observed.

The inspection report is found in fig. A.5.

6.1 Materials report

Casing and wellhead

A CIW wellhead system was employed. The 36" hole was drilled without any guidance system. The 30" casing was run together with the 4- post guide base. The 26" hole was drilled without riser. A 18-3/4" wellhead housing was installed with the 20" casing and the 10,000 psi WP BOP stack was latched to this housing.

The following casings were run:

Size	Grade	Weight lbs/ft	Setting depth m
30"	1"	310	177
20"	x-52	94	191
13-3/8"	K-55	68	440

6.2 Drill bit record

The drill bits used in this well are specified in the bit record, table A.4.

6.3 Mud report

- 36" hole 30" csg. Drilled with sea water, return to sea bed. Displaced hole with high visc. mud before running 30" csg. MW = 1.05, visc. = 130 sec./qt. Drilled out cement with sea water. Drilled with Gel-sea water mud system.
- 26" hole 20" csg. Spotted 150 bbls high viscosity mud before running 20" csg. MW - 1.05, visc. = 125 sec/qt
- 17½" hole 13-3/8" csg. Drilled with Gel-sea water mud system. Bled in 600 bbls high viscosity mud when reaching 445 m prior to logging. Circulated and conditioned the hole once more because logging tool was stopped by sloughing in of hole. MW = 1,04 visc. = 56.

A summary of mud properties is shown in table A.5.

MUD SYSTEM - SEAWATER GEL

Sh	W:T. Sp.Gr	Funn Visc.	P.V. cp	Y.P. lb/100ft ²	Gels lb/100ft ²	Ph	Water loss	Cake 32nd in	Pm	Pf/Mf	Cloride ppm	Calcium ppm	Sand %	Solids %	Oil %	Water %	Meth blue
	1.04	130	48	44			NC										
	1.04	125	46	42		9.5	NC										
	1.04	125	46	42		9.5	NC										
	1.04	120	45	41	12/22	9.5											
	1.04	56	4	33	10/25	9.0	2.0	2		3.0	10.000	1000	TR	7	0	93	
	1.04	56	4	41	11/21	9.0	2.2	2		.3	10.000	1000	TR	7	0	93	
	1.04	50	5	38	10/22	9.0	2.5	2		.3	10.000	1000	TR	7	0	93	
	1.04	50	5	38	10/22	9.0	2.5	2		.3	10.000	1000	TR	7	0	93	
	1.04	50	5	38	10/22	9.0											

6.4 Cement report

The 30" casing was cemented with 250 sacks class G cement with 8% bentonite and 2% CaCl_2 and 10 sacks of mica followed with 200 sacks of class G cement with 3% CaCl_2 . Good returns to sea floor.

The 20" casing was cemented with 200 sacks of class G cement with 8% bentonite and 2% CaCl_2 plus 2 sacks of mica. Slurry was followed with 100 sacks of class G neat cement with 3% CaCl_2 . Operation was carried out with returns to sea floor.

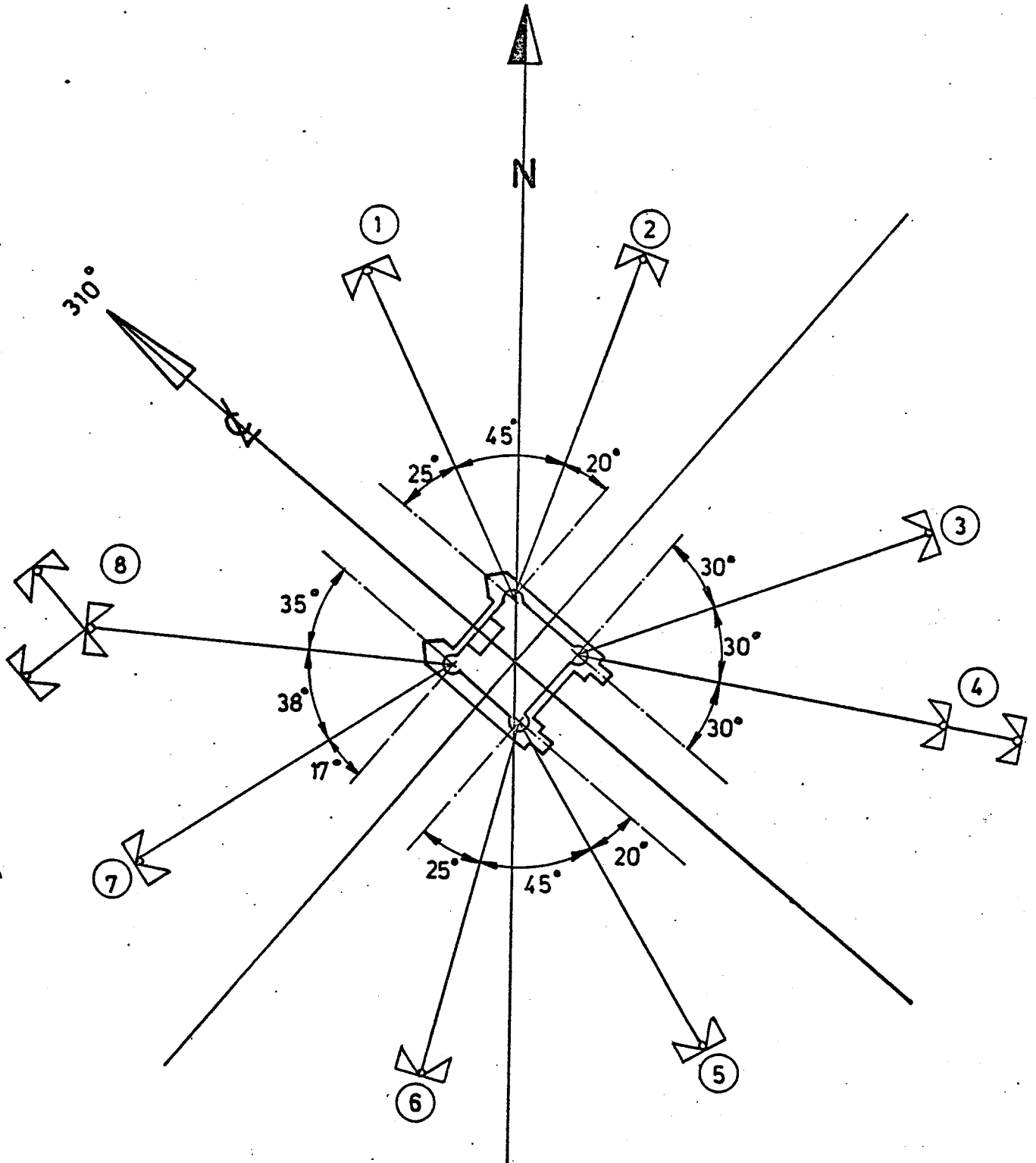
The 13-3/8" casing was cemented with 450 sacks class G cement with 8% bentonite followed with 200 sacks class G cement with 2% CaCl_2 .

MOORING LINE PATTERN

POLYGLOMAR DRILLER

WELL 16/3-1

(FWD PILOT HOUSE END)



HEADING: 310°

Well coordinates: N 58° 47' 12" 8
E 02° 47' 32" 2

Water depth (MSL) : 118 m

FIGURE A.3

TOTAL TIME DISTRIBUTION - WELL 16/3 -1

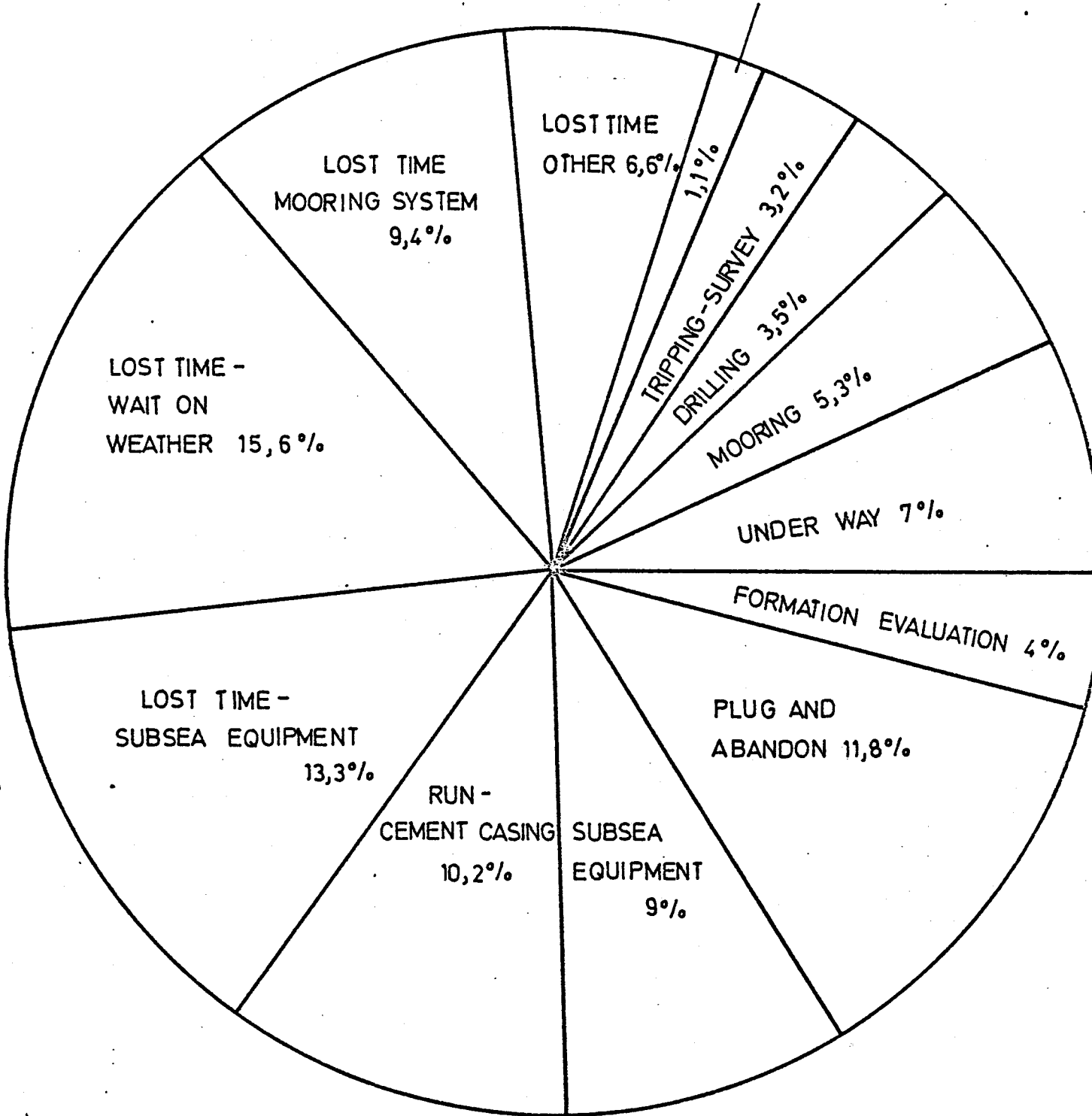
TOTAL TIME: 361,33 HOURS

15,055 DAYS

LOST TIME WAIT ON EQUIPMENT 0,6%

LOST TIME DRLG. EQUIPMENT 0,1%

CIRCULATING 0,4%



ABANDONMENT OF WELL 16/3-1

Sea bed at 142m
Casings cut at 147m

30" 310ppf. , shoe at 177m
Perforations from 186m to 188m
20" X-52 , 94ppf , shoe at 192m

187 m

215m

Float collar
at 425m

13 ³/₈" K-55, 68ppf., shoe at 440m

TD-445m

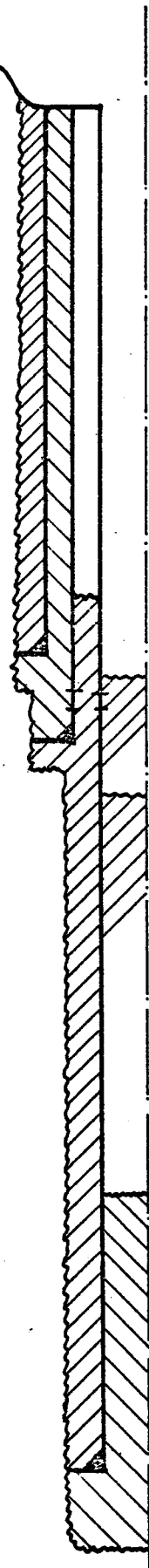




Figure A.5

POLYGLOMAR DRILLER

Polyglomar Driller, Feb. 12th 1976.

INSPECTION REPORT

INSPECTION OF SEABED PRIOR TO MOVE RIG FROM LOCATION 16/3-1

58 47' 12,8796"N

02 47' 32,2499"E

HEAVY WEATHER CONDITIONS DID NOT PERMIT SEABED INSPECTED BY DIVERS.

SEABED INSPECTED WITH TV PRIOR TO FULL CUTTED CASINGS AND WELLHEAD.

NO OBSTRUCTIONS OF ANY KIND REMAINED ON SEABED.

RECOVERED CASINGS AND WELLHEADS SHOWED 15 3/8" + 20" + 30" CASINGS CUT 5M BELOW SEABED.

REPORTED BY:

[Signature]
Norsk Hydro Repr.

[Signature]
POLYGLOMAR DRILLER
PLATFORMSIF

[Signature]
RGM Repr.

Appendix 1

UDI Operations Ltd: Report on dynamic move of Polyglomar
Driller from Bergen to block 16/3.



Operations Ltd.

Colony Road
Broom of Cow Industrial Estate
Aberdeen AB2 3RE
Telephone 0124 700151
Telex 72501

Please note our new
London address:-
The World Trade Centre,
London E1 9AA.
Telephone: 01-790 7979
Telex : 884671

Please Reply To: ABERDEEN

Elf Norge,
P.O. Box 168,
4001 Stavanger,
Norway.

Ref IS/VGR

3rd February 1976

For the attention of Mr. R. J. McBride

REPORT ON DYNAMIC MOVE OF POLYGLOMAR DRILLER

FROM BERGEN TO BLOCK 16/3

UDI personnel and equipment arrived on "Polyglomar Driller" at 2030 on the 23rd January 1976. The following morning the equipment was set up in the Pilot House in preparation for the move.

By 0150 on the 26th January, the supply boats were instructed to commence lifting anchors, and by 0820 all anchors were racked, the tow line connected and the rig was underway to the new location in Block 16/3.

It was proposed to steer a course of 200° to a point 10 miles S.E. of the location, then change to a heading of 290° for a final 10 mile approach to the location. Excellent progress was made on the move with speeds averaging 9.0 knots for most of the time. By 0955 on the 27th January, the move had gone according to plan and No 4 anchor was dropped 2500 feet from location, and by 1710 the same day, all the remaining anchors had been run out. The rig was estimated to be approximately 75 metres West of location at this time. The rig was then ballasted down to 70 foot draught and at 0110 on the 28th January, tension was applied to all the anchors, but Nos 1, 8, 3 and 4 were found to be slipping. Further unsuccessful attempts to tension the 4 anchors were made later in the

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Directors: M P L Adams (Chairman & Joint Managing), J Hay (Joint Managing), J F H D
B H Greenaway, I Murray, P V See

morning. However, by this time the weather had deteriorated and it was not possible to start to re-lay the anchors until 0800 on the 30th January. At this stage, it was agreed that as so much time had been lost already, no attempts would be made later to move the rig closer to the location.

At 1030 on the 31st January, we decided to load a 3-D programme in anticipation that as 7 anchors were tensioned and tested, the rig would not move by any noticeable amount, and after discussions with A. Dahle and C. Griffin, it was agreed that under the circumstances, we should continue with the 3-D checkout. Permission was eventually given to spud in at 1800 hours G.M.T. on the 31st January.

The 3-D checkout comprised a total of 41 x 2-D and 27 x 3-D passes, and the final position of the derrick centre on the "Polyglomar Driller" in European Datum, was computed as $58^{\circ} 47' 12.880$ North $02^{\circ} 47' 32.250$ East.

This puts the rig at a distance of 69.94 metres on a bearing of 288.1° from the intended location.

The equipment and personnel were then transported back to Aberdeen via Stavanger.

HYDROGRAPHIC SURVEYOR:

I. Simpson

ELECTRONIC ENGINEER:

N. Duncan

"POLYGLOMAR DRILLER"

SEQUENCE OF EVENTS

<u>DATE</u>	<u>TIME</u>	<u>EVENT</u>
23.1.76	1430	Check in Dyce for charter to Bergen.
	1610	Depart Dyce for Bergen.
	1810	Arrive Bergen.
	2030	Arrive "Polyglomar Driller".
24.1.76	0900	Commenced setting up equipment in Pilot House.
	1400	All equipment set up and checked. Standing by waiting to move.
25.1.76		Standing by waiting to move.
26.1.76	0150	Supply boats called to commence anchor handling.
	0700	Sat Nav system operational.
	0815	All anchors racked, tow line established and rig underway.
	1100	Left fjord and heading 200° to location. Average speed from 1100 to 2400 hours = 9 knots.
27.1.76	0600	Rig approximately 10 miles from location. Changing course to 290° for a 10 mile approach to location.
	0955	No 4 anchor dropped 2500 feet from location.
	1010	Rig over location.
	1030	Running No 8 anchor.
	1145	Running No 5 anchor.
	1250	Running No 1 anchor.
	1430	Rig approximately 100 metres West of location.
	1435	Moved about 25 metres closer to location.
	1600	Running No 6 anchor.

Cont...

"POLYGLOMAR DRILLER"

SEQUENCE OF EVENTS

<u>DATE</u>	<u>TIME</u>	<u>EVENT</u>
27.1.76	1610	Running No 7 anchor.
	1650	Running No 2 anchor.
	1710	Running No 3 anchor.
	1715	All anchors run out. De-ballasting rig to 70 foot draught before applying tension.
28.1.76	0100	Rig ballasted down to 70 foot draught.
	0110	Commenced tensioning anchors.
	0800	4 anchors slipping.
	1000	4 anchors still slipping but weather deteriorated and unable to reset them until weather improves.
29.1.76		Waiting on weather all day but checking position.
30.1.76	0800	Weather improved, commenced re-setting the 4 anchors.
31.1.76	1000	7 anchors holding but still working on No 8.
	1030	Commenced 3-D programme.
	1430	Discussed the position with A. Dahle and C. Griffin and it was agreed that under the circumstances, we should continue with the 3-D checkout rather than wait until No 8 anchor had been tested.
	1800	Permission given to spud in.
1.2.76	1300	27 x 3-D passes evaluated, converted to E.D. and final position handed to rig personnel.
		Depart "Polyglomar Driller".
	1630	Arrive Dyce, Aberdeen.
		Off hire.

"POLYGLOMAR DRILLER" BLOCK 16/3

FINAL POSITION BY SATELLITE NAVIGATION

LAT 58^o 47' 12".880 NORTH

LON 02^o 47' 32".250 EAST

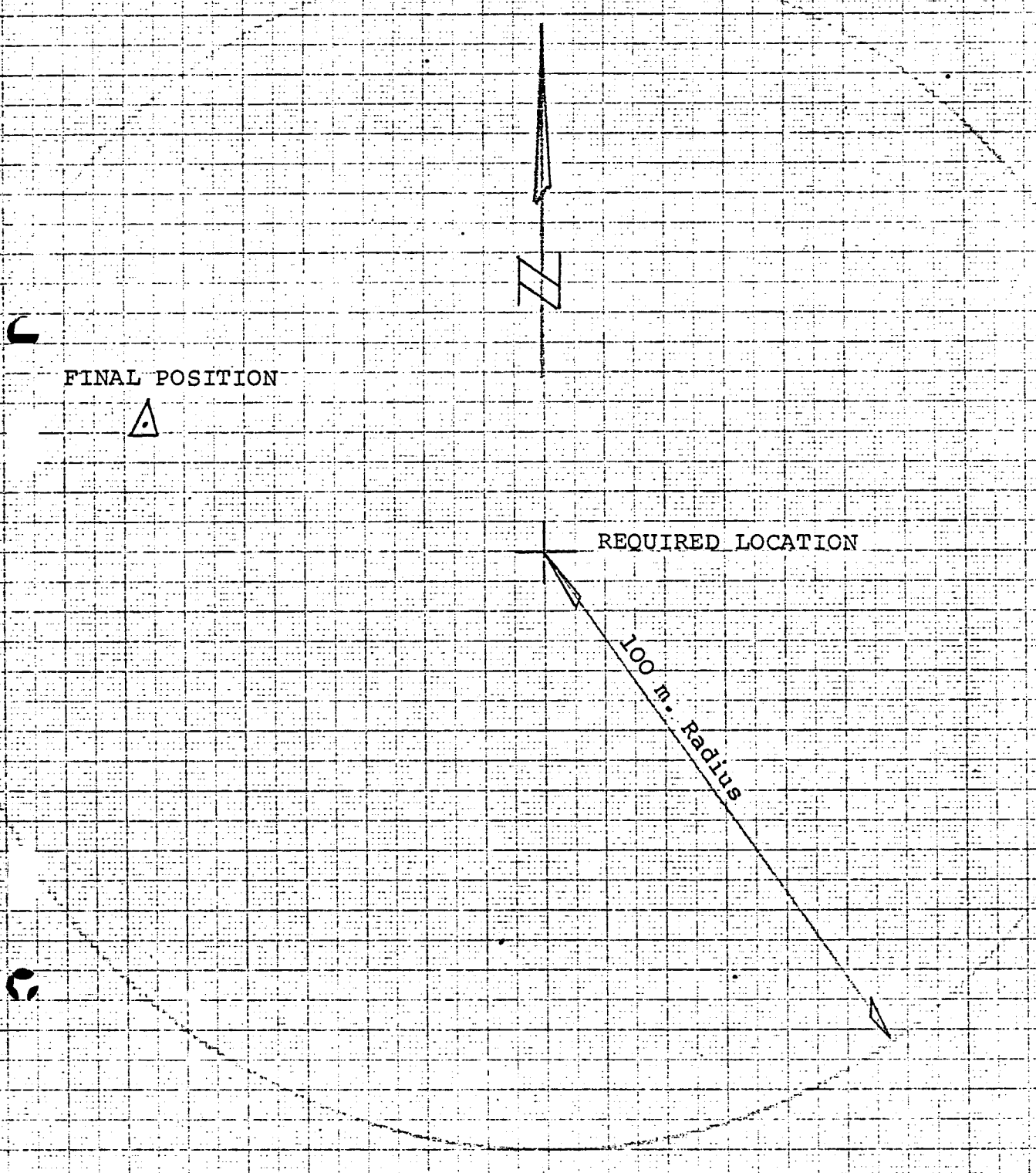
THIS IS EUROPEAN DATUM AND IS THE CENTRE OF THE DERRICK. THIS POSITION IS DERIVED FROM SATELLITE DATUM WGS 72.

THE REQUIRED LOCATION WAS:

LAT 58^o 47' 12".18 NORTH

LON 02^o 47' 36".39 EAST

THE RIG IS THEREFORE 69.94 METRES ON A BEARING OF 288.1^o FROM THE REQUIRED LOCATION.



FINAL POSITION



REQUIRED LOCATION

100 m. Radius

SCALE 1:1000

0 m.



100

DECCA MAIN CHAIN READINGS. BERGEN OE. "POLYGLOMAR DRILLER" BLOCK 16/3

LAT 58° 47' 12.8796" NORTH

LON 02° 47' 32.2499" EAST

<u>TIME GMT.</u>	<u>GREEN E.</u>	<u>PURPLE B.</u>
0800	30.58	61.87
0830	30.55	61.79
0900	30.57	61.90
0930	30.58	61.85
1000	30.57	61.83
1030	30.57	61.84
1100	30.57	61.84
1130	30.58	61.87
1200	30.55	61.82
1230	30.56	61.83

UDI OPERATIONS LTD.

SATELLITE NAVIGATION DEPARTMENT

POLYGLOMAR

RIG DRILLER BLOCK 16/3

COMPANY Norske Hydro

DATE 23rd Jan-1st February 1976

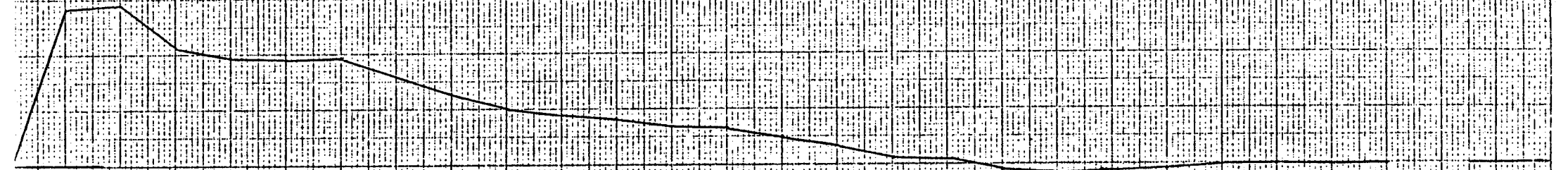
SHEET 1 LATITUDE

SHEET 2 LONGITUDE

SHEET 3 ANTENNA

SHEET 4 COMBINED

SHEET No. 1 OF 4



THIS DIAGRAM ILLUSTRATES THE VARIATION IN METRES BETWEEN SUCCESSIVE PASSES

PASS NUMBER

UDI OPERATIONS LTD.

SATELLITE NAVIGATION DEPARTMENT

POLYGIOMAR
RIG DRILLER BLOCK 16/3

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DATE 23rd Jan-1st February 1976

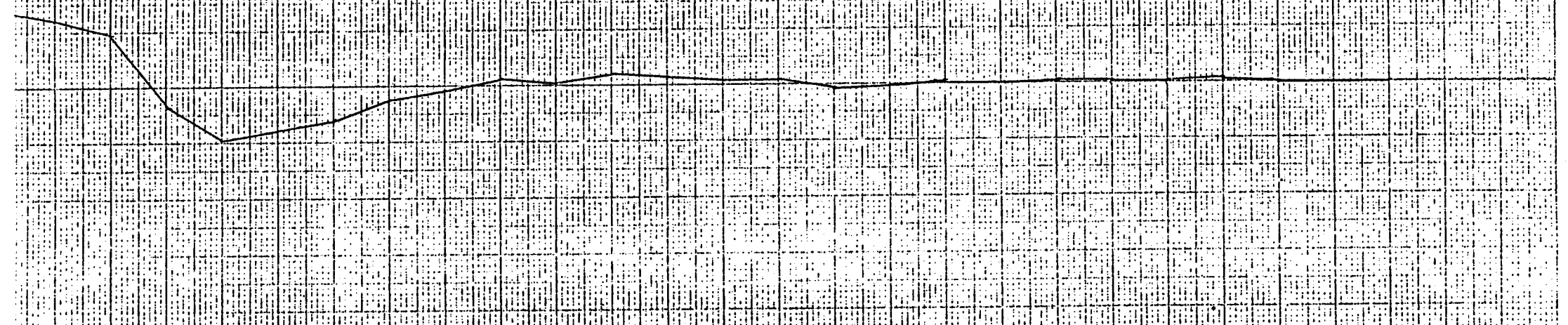
SHEET 1 LATITUDE

SHEET 2 LONGITUDE

SHEET 3 ANTENNA

SHEET 4 COMBINED

SHEET No. 2 OF 4



THIS DIAGRAM ILLUSTRATES THE VARIATION IN METRES BETWEEN SUCCESSIVE PASSES

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

PASS NUMBER

UDI OPERATIONS LTD.

SATELLITE NAVIGATION DEPARTMENT

POLYGLOMAR

RIG DRILLER BLOCK 16/3

COMPANY NORSKE HYDRO

DATE 23rd Jan-1st February 1976

SHEET 1 LATITUDE

SHEET 2 LONGITUDE

SHEET 3 ANTENNA

SHEET 4 COMBINED

SHEET No. 3 OF 4

THIS DIAGRAM ILLUSTRATES THE VARIATION IN METRES BETWEEN SUCCESSIVE PASSES

3 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

PASS NUMBER

UDI OPERATIONS LTD.

SATELLITE NAVIGATION DEPARTMENT

POLYGIOMAR
RIG DRILLER BLOCK 16/3

COMPANY NORSKE HYDRO

DATE 23rd Jan - 1st February 1976

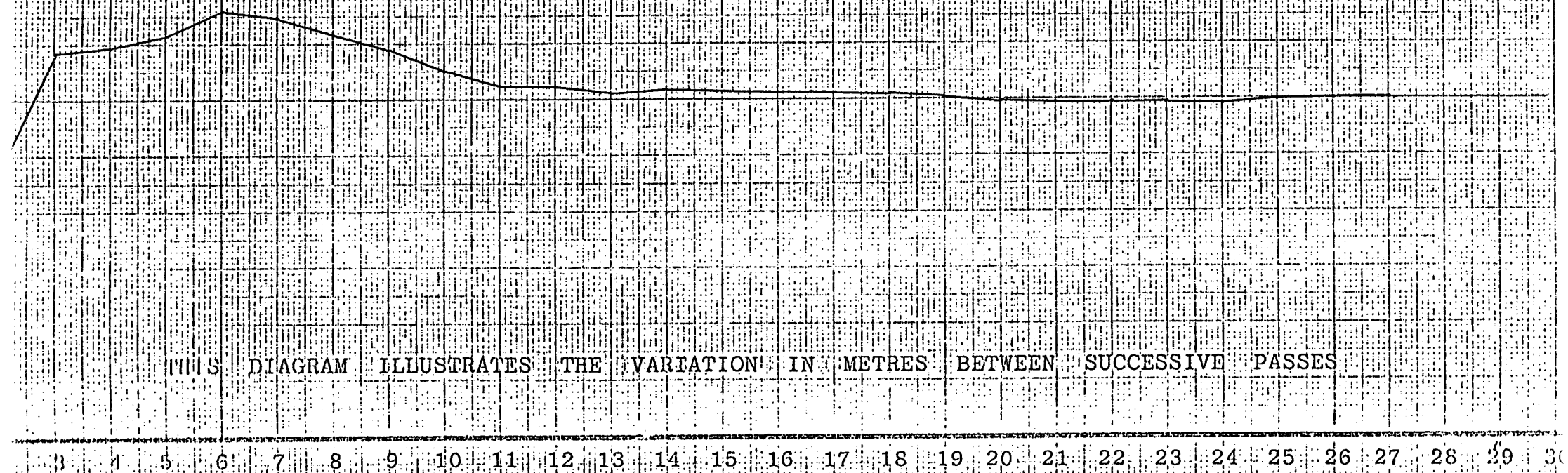
SHEET 1 LATITUDE

SHEET 2 LONGITUDE

SHEET 3 ANTENNA

SHEET 4 COMBINED

SHEET No. 4 OF 4



THIS DIAGRAM ILLUSTRATES THE VARIATION IN METRES BETWEEN SUCCESSIVE PASSES

PASS NUMBER

RIG AND PLATFORM POSITIONAL DATA FOR COMPARISON OF
POSITIONAL VARIATION BETWEEN SATELLITE AND LAND BASED

RADIO SYSTEM FIXES

POLYGLOMAR

RIG/~~PLATFORM~~: Driller

SITED IN BLOCK: Nor. 16/3

OPERATOR: Norske Hydro
(for Elf Norge)

SATELLITE DERIVED POSITION

FINAL FIX:

LATITUDE: $58^{\circ} 47' 12.8796''$ North LONGITUDE: $02^{\circ} 47' 32.2499''$ EAST

HEIGHT OF AERIAL ABOVE MEAN SEA LEVEL: 24.3

HEIGHT OF AERIAL ABOVE SPHEROID: 54.3 ~~FROM FIX~~ BY 3D FIX

POINT ON STRUCTURE FIXED: Centre of Derrick

0 SET TO POINT FIXED BY RADIO SYSTEM: _____ M AT _____^o TRUE/MAGNETIC

DATES AND TIMES OF OBSERVATIONS: 0800 1st Feb to 1230 1st February 1976

FIXING METHOD: ~~2D~~/3D GEOID MAP USED: UDI

NO. OF 2D PASSES RECORDED: 41

NO. OF 3D FIXES EVALUATED: 27

PASS ALTITUDE RESTRICTION ON OTHER MANUAL DATA EDITING APPLIED: Satellite 180 rejected

DATUM SHIFTS APPLIED FROM Satellite DATUM TO European DATUM

X: + 84 Y: + 103 Z: + 127

SPHEROIDAL PARAMETERS USED FOR SATELLITE DATUM: $a = 6378145$ $\frac{1}{f} 298.25$

SPHEROIDAL PARAMETERS USED FOR FINAL FIX DATUM: $a = 6378388$ $\frac{1}{f} 297.00$

SPREAD OF 3D FIXES: LAT. ± 3.0 m. APPROX. LONG ± 2.0 m. APPROX.

SURVEY CONTRACTOR: UDI EQUIPMENT USED: Magnavox

LAND BASED RADIO SYSTEM POSITION

FINAL FIX:

LATITUDE _____ LONGITUDE _____

POINT ON STRUCTURE FIXED: _____

PRINCIPAL CHAIN USED FOR FIX: _____

BACK UP CHAINS: _____

DATE AND TIME OF FIX: _____

METEOROLOGICAL CONDITIONS IF KNOWN: _____