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A / S N O R S K E S H E L L

CONTINGENCY PLAN FOR UNCONTROLLED

BLOWOUT OF WELL 17/11-2

May 1976

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1. INTRODUCTION

An uncontrolled blow-out is a very rare phenomenon and during the drilling of any well every effort is made to ensure safety at all times. Well control begins with the planning of the well prognosis and includes an alert drilling crew having knowledge of all possible hazards, mud control techniques and the facilities to detect at the earliest possible moment indications of problems in the well and the equipment to control the possible development of such problems. It requires that both company and contractor personnel are properly trained and that all concerned maintain constant surveillance during the drilling operations.

Well control can be divided into two categories:

1. Primary Control.
2. Secondary Control.

Primary control is the use of the hydrostatic head of the drilling fluid to overbalance the formation pressure and to prevent foreign fluids from entering the well bore.

Secondary control is the use of blow-out prevention equipment to control the well in the event primary control is lost.

Conditions which contribute to most blow-outs are:

1. Loss of Primary Control

1. Failure to keep the hole full.
2. Drilling with insufficient mud weight.
3. Loss of circulation.
4. Swabbing and/or piston action from pulling and running tools.

2. Loss of Secondary Control

6. Failure to install, check or operate BOP equipment properly.
7. Failure to detect a kick and to initiate kick control operations quickly.
8. Mechanical failure of BOP equipment.
9. Failure of casing.
10. Failure of well-head equipment.
11. Failure of the drilled formation or the cement bond around a casing string.

In exploration wells, where formation pressures are generally not known, primary well control may be lost as a result of drilling into an abnormally pressured zone with too low a mud gradient in the hole. In such an event a "kick" occurs and secondary control techniques are applied in order to restore the well to a stable condition.

Experience has shown that the majority of blow-outs have been caused by errors made by rig personnel and it cannot be over-emphasized that training and monitoring are the best preventive measures.

In the event of an uncontrolled blowout on a semi-submersible drilling unit the first action must be to safeguard the personnel on the rig. While it may be possible to evacuate the majority of non-essential personnel prior to the total loss of control of the well, in the final event it is assumed that the rig will be moved off location to save both life and equipment.

Having moved the rig off location the possibility of gaining control from the surface is considered unlikely unless the well kills itself and therefore the only method remaining is to drill relief wells from a safe distance.

This contingency plan pre-supposes the blowing well will not kill itself and is therefore based on the "relief-well" concept.

II DRILLING THE INITIAL WELL

1. DRILLING PROGRAMMES

Prior to the commencement of drilling, a comprehensive drilling programme is prepared and approved by the Chief Petroleum Engineer, Drilling Superintendent and Geologist.

The programme takes into account all geological and geophysical data of the area and all other information which can be gathered from other wells in the area. This programme is issued to all personnel, both on-shore and on the rig, who require to know and comprehend the purpose and details contained therein. In addition supervisory personnel ~~are~~ are equipped with the necessary operational manuals required to monitor and interpret the progress of the well.

2. LOCATION FIXING AND WELL SURVEY

The position of the well-head will be surveyed by the most accurate method available. Modern satellite navigation positioning equipment is considered to have an accuracy of 5 metres. During the drilling of the well single-shot surveys are taken at closely spaced intervals and continuous directional surveys are run at each casing point below the 20" casing shoe, if significant deviation is apparent from the single shot surveys

3. DATA ACQUISITION AND PRESERVATION

All records of the above surveys are passed ashore each day and stored in fire-proof filing cabinets as an additional safety measure. Also, as each strip of the mud log is completed, it will be sent to shore for safe storage. The availability of this data is of the utmost importance in locating the bottom hole position during relief well drilling and killing operations.

4. EXPECTATIONS FROM 17/11-2

Well 17/11-2 is a new field wildcat and therefore little concrete evidence is available as to what the well might encounter. However, in order to assist in evaluation of a "blow-out" well prior to the event the following points may be of help.

- a) The only target for this well is the M. Jurassic to Triassic sandstones and shales. The rest of the section to be drilled is predominantly shales and is unlikely to represent an "blow-out" hazard to the rig.
- b) From source rock studies of the area there is a higher probability of encountering oil than gas. The discoveries of Bream and Brisling encountered fairly heavy oil with low GOR's.
- c) The expected reservoir will be sandstone but little can be predicted as to the quality of the rock, if indeed sands are present.
- d) From the sparse pressure evidence available it would appear likely that a "close-to" hydrostatic pressure regime will be penetrated. This statement should however, be treated with caution.
- e) Nothing is known about the length of the oil (or gas) columns which might be encountered.

III ORGANIZATION

1. GENERAL

Prior to the event the exact requirements of a relief well and well killing operation cannot be accurately defined. Much of the technical, logistical and planning work can only be initiated when a "blow-out" has occurred and the available data acquired, assembled and interpreted.

However, the basic organisational set-up is summarised in Attachment 1.

In all instances of major catastrophe the organisation and the communication and coordination between supervisors is very important to the quick and efficient execution of remedial action. Each staff supervisor should clearly define his responsibilities and ensure that his staff maintain close communication between each other.

2. RESPONSIBILITIES

The various responsibilities for the planning and execution of the blow-out killing operation are as follows:

Operations Manager

Overall coordination of the planning for relief well drilling and subsequent killing operations.

Drilling Manager

Responsible for all technical matters associated with the drilling and killing operations.

Chief Petroleum Engineer

Responsible for location selection and design of the relief well programmes. Responsible for interpretation of all data relating to the geology and petroleum engineering aspects, e.g. petrophysical evaluation, reservoir technology.

Drilling Superintendent

Responsibility for drilling the relief wells.

Materials/Transport Supervisor

Responsibility for logistics associated with material acquisition, supply vessel coordination, helicopter control etc.

Safety Officer

Responsible for all matters relating to safety, pollution and fire-control.

Killing Supervisor

Responsible for the completion of the relief well, and in conjunction with the drilling superintendent will supervise the installation of all equipment required for killing the well and will be in charge of the actual killing operations.

Administrator

Will be responsible for the complex telecommunications network which will be required. In addition he will be responsible for all ancillary office services and accommodation etc. for incoming staff and contractors.

Special Assistant - Government Liaison

Will be responsible for liaison with the various Norwegian Governmental authorities for all technical matters.

Public Relations Officer

Will be responsible for all matters relating to information of non-technical nature, to keep interested parties (i.e. Local Government, fishing community, media) informed of the progress of the control operations.

3. COMMUNICATIONS

A fully-equipped control centre will be established in the Norske Shell offices in Tananger. This will comprise office space for operational staff together with an operations centre which will be the nerve centre of the work. The control centre will be manned 24 hours a day and will maintain an up-to-the-minute status of all activities. A detailed record of all events will be kept in this room.

In addition the telephone and telex system will be manned 24 hours per day.

It is envisaged that one staff member from each of the technical functions will always be on call and all staff will be contactable immediately.

Provision for the supply of food and for temporary sleeping accommodation will be made in the area, probably using mobile caravans.

Several cars will be acquired and one driver will be on duty at all times.

4. INFORMATION CENTRE

An office, probably temporary, will be established outside the immediate vicinity of the operational base to provide information on the "blow-out" situation.

It will be staffed by Shell public relations staff who will liaise with the Operations Manager and keep all interested parties fully briefed of the work being undertaken and the progress being made.

IV EQUIPMENT AVAILABILITY, LOGISTICS AND TIMING

Attachment 2 illustrates the estimated times required to acquire, transport and mobilize the items of major equipment and to drill the relief wells. The following comments are applicable to the items listed:

1. DRILLING RIGS

It is estimated that in the average blow-out situation two relief wells would be required in order to ensure an effective killing operation. With very severe blow-outs additional relief wells may be required in order that a sufficiently high injection rate of killing fluid may be achieved. The actual number of relief wells required is largely dependent upon the magnitude of the flow from the producing formation.

Norske Shell would expect / to obtain the drilling rigs required from within the Shell Group. At present Shell UK Exploration and Production operate three mobile drilling units in the North Sea, the Stadriil, Sedco 700 and the Ocean Voyager, and it is anticipated that one or more would be available on request.

In addition there are at present several unoccupied units available in the North Sea area.* Furthermore it is understood that in a blow-out situation where drilling equipment is not readily available other operators would interrupt operations already in progress to make equipment available, even to their own detriment.

It is anticipated that suitable drilling units for the relief wells would be available on location in one to three weeks from the time of the blow-out. Actual timing will be dependent upon the stages of wells in progress in which operations may have to be interrupted and the wells temporarily suspended, mobilization of unoccupied rigs, weather conditions, etc.

As an example in the case of unoccupied rigs we have been advised verbally by Smedvig ("West Venture") that their unit could be mobilised within one week in an emergency situation.

If in the event the "Chris Chenery" is not damaged severely during the "blow-out" and is able to recover its anchors it may well be possible that this rig could begin drilling operations on one relief well almost immediately. It is assumed that the 13-5/8 inch BOP stack will have been lost but since the rig utilises a two-stack system it could proceed with drilling operations to the 13-3/8 inch casing setting depth using the 21-1/4 inch BOP stack. Subsequent to the setting of this casing string, either a suitable "spare" BOP stack would be mobilized or alternatively the "Chris Chenery" would be moved off location and replaced with a second rig suitably equipped to complete the drilling of the relief well.

* Refer Attachment 11

2. DRILLING PROGRAMMES

It is anticipated that it could take up to 3 weeks to produce detailed relief well drilling programmes including review, discussion and approval.

However, this should not delay drilling operations as the wells can be spudded in without formal approval of the entire programmes. It is further envisaged that modifications to the programmes would be required during the drilling operations e.g. revision of targets.

In broad outline the relief well programmes will provide for cementing about 250 feet of 30" conductor and about 1000 feet of 20" casing in vertical hole. The holes will be "kicked off" in the 17½" sections and hole angles will be built-up to about 40 degrees. 13-3/8" casing will be set at about 5000 feet TVD. 9-5/8" casing will be set at 7000 to 8000 feet TVD depending upon conditions in the blow-out well, and the final approach to the blow-out will be made in 8½" hole. A possible outline drilling and killing procedure is shown in Attachment 3, but it must be emphasized that the actual procedures employed will be dependent upon the nature and condition of the blow-out.

3. SITING OF RELIEF WELLS

Attachment 4 shows schematically how the relief wells might be located. They would be sited some 1½ to 2 kilometres up-wind from the blow-out. This would be sufficient to ensure safety from the blow-out plume in the event of change of wind direction and would not require an excessive deviation programme in order to reach the expected sub-surface target. The position will also be dependent on sea-floor condition and the geology of the area.

No problems are foreseen in acquiring location positioning expertise in placing the rigs on location.

4. WELLHEADS

During normal drilling operations Norske Shell always retain one set of back-up wellhead equipment in Tananger. This could then be used for the first of the relief wells.

Additional equipment could be obtained from other Shell Group companies operating in the North Sea area. For example Shell Expro normally carry an extensive stock of this equipment and this would be available to Norske Shell within the same time frame as it would take to acquire the drilling rig.

In the event that additional conventional wellhead equipment would have to be purchased from suppliers in the United States, it is considered that such equipment could be available on site in about 2 to 3 weeks. If special wellhead equipment were required the acquisition time might be more lengthy, possibly as long as six weeks.

5. CASING

In the case of well 17/11-2 it is not envisaged that any special grades of casing would be required for the relief wells. The stock list of casing carried by Norske Shell and Shell Expro is included as Attachment 5 and as can be seen this is more than adequate. Should further casing be necessary other operating companies would be requested to provide such casing from their stocks and, as indicated previously, their cooperation in an emergency situation should be forthcoming.

6. MUD

No problems are envisaged in this area. We enclose as Attachment 6 a copy of a letter from Dresser Magcobar, the mud company currently contacted for well 17/11-2, which indicates that requirements could easily be met in the time frame required.

7. CEMENT AND ADDITIVES

Again no problems are envisaged. Cement class "G" is readily available on demand in Norway, and special cements such as Pozmix can be obtained on demand at the dockside in Germany from Dyckerhoff, a round trip of some 3 days for a supply boat from our present location.

Cement additives, although not normally available in large quantities, are not considered to be a problem item. Air freight would be able to make sufficient available for requirements in 1-2 weeks.

8. DIRECTIONAL DRILLING EQUIPMENT

A list of directional drilling equipment available from Eastman Whipstock is given in Attachment 7 and the inventory of non-magnetic drill collars and gyro survey equipment held by Dowell Schlumberger is shown as Attachment 8. This equipment is adequate to cope with directional drilling operations in two relief wells simultaneously.

9. PUMPING EQUIPMENT

Until the nature of the blow-out, flow-rate, formation pressures and hole and casing sizes are established, the kill pump pressure requirements and pumping rates cannot be defined. However, many suitable unitized, high pressure pumping units are available on rental from service companies as shown in Attachment 9. The majority of these units is already located in the North Sea area; further units are located in Continental Europe and in the Mediterranean area. Were it necessary further units could be air-freighted to Europe from the United States.

Since the killing equipment will not be required on site until approximately 3 weeks after commencement of drilling (i.e. up to 6 weeks after the blow-out occurs) there will be ample time available for acquisition, transport and mobilization of the pumping units.

10. MANIFOLD

No problems are foreseen in respect of this aspect. Material not readily available can be manufactured within the necessary time frame at local supply bases at Aker Norsco and Norsesea.

11. MUD TANKS

Additional mud storage tanks are likely to be required at each of the relief wells for killing operations. The actual additional capacity will not be known until the blow-out has been assessed but requirements could be as high as 1000 to 1500 bbls per relief well. Halliburton has available suitable tanks of 500 bbls capacity each, 7 already located in the North Sea area and further 6 in Continental Europe. This should be sufficient for our requirements. Other tanks may also be available.

Again sufficient time would be available for mobilization of the tannage required.

12. AUXILIARY VESSELS

Additional supply ships would have to ^{be}acquired on short-term charter in the event of a blow-out. These would be needed for normal drilling supply, transportation of killing equipment, and for pollution surveillance and control.

It is assumed that the normal two supply vessels accompanying the "Chris Chenery" will be available.

In addition it is assumed that two anchor handling/supply vessels will accompany the relief well drilling rigs, making a total of 6 vessels immediately available.

Although actual requirements can only be guesstimated it is envisaged that 3-4 additional vessels would be required either on charter for the duration of the operations or on a spot-charter basis as required. This would include vessels required for pollution surveillance and control.

The current state of the market indicates that acquisition of adequate vessels will present no problem.

13. AIR TRANSPORT

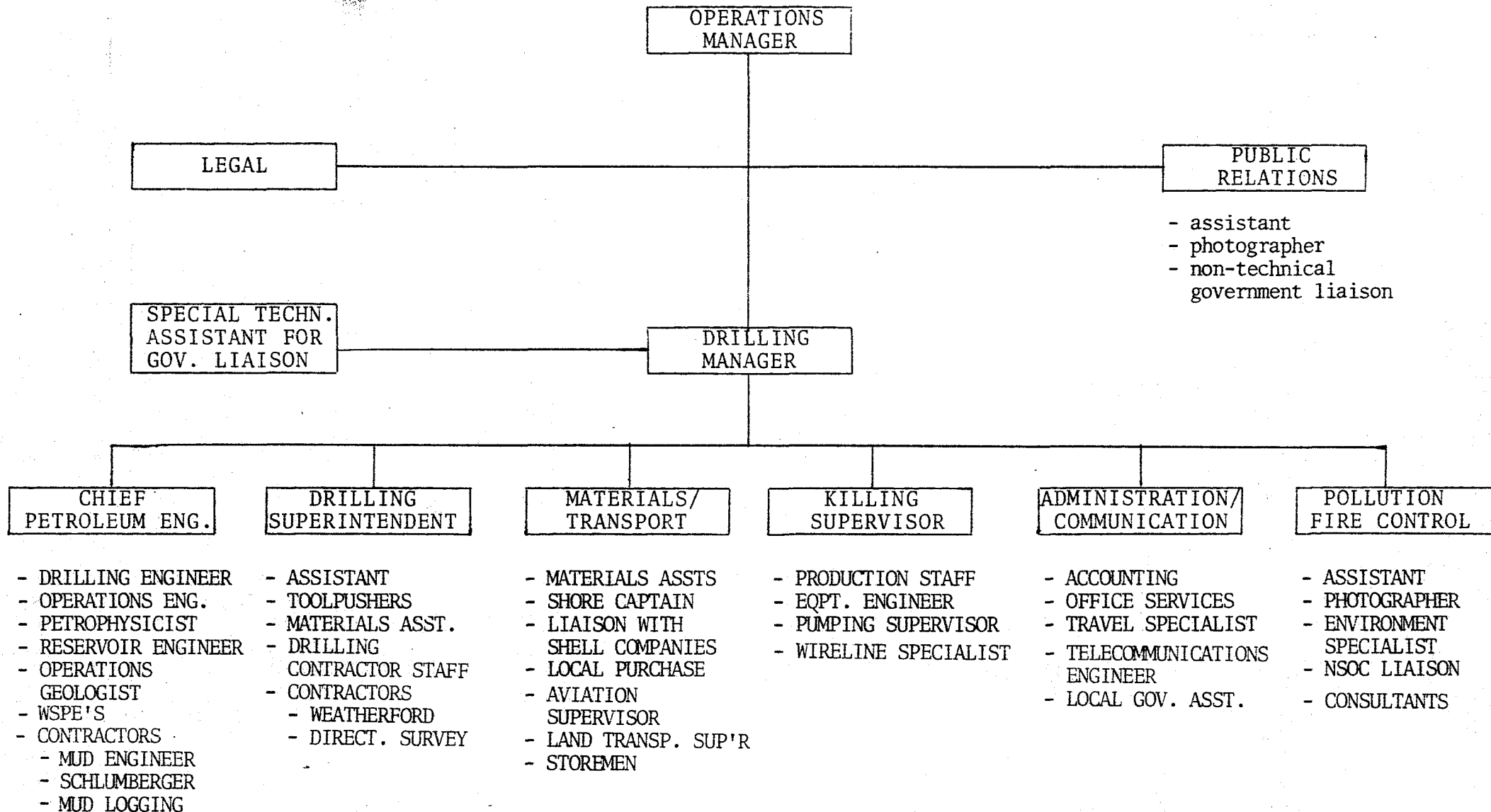
During the blow-out operations one S61N helicopter (flying time to location ca. 45 mins.) would be on term charter to Norske Shell for transport of personnel and essential material. Normal crew-change helicopters would be used as required.

It is also envisaged that a chartered fixed-wing aircraft, probably with seating capacity for 10-15 personnel would also be required during the operations for ferrying in/out essential personnel as required.

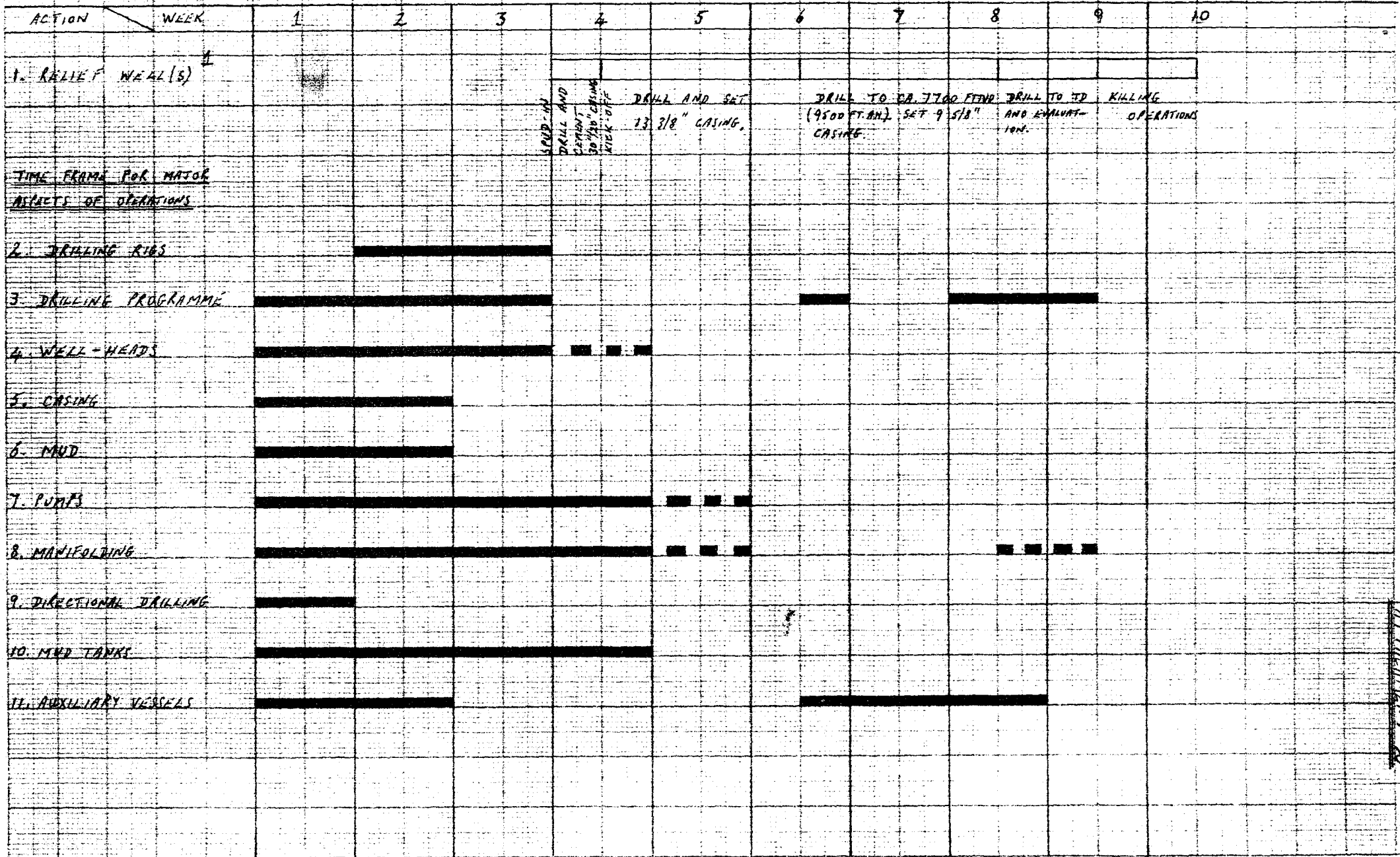
14. CONCLUSION

All in all, although the dimension of the problem should not be underestimated and although considerable effort and control will be required to get the right material in the right place at the right time, the acquisition of the majority of the equipment required can be obtained quickly from sources in the immediate North Sea area. Other equipment which may have to be acquired from further afield can be on-site within the time frame defined by relief well drilling operations.

BLOW-OUT TASK FORCE



RELIEF WELL DRILLING SCHEDULE AND LOGISTICS OF OBTAINING MAJOR EQUIPMENT ITEMS



ATTACHMENT 2

1: NO ALLOWANCE HAS BEEN INCLUDED IN THE DRILLING TIME FOR WOW OR OTHER UNUSUAL PROBLEMS ASSOCIATED WITH THE DRILLING E.G. SIDETRACKING.

TENTATIVE DRILLING PROGRAMME FOR
RELIEF WELL AND KILLING PROCEDURE

The sketch included with this attachment gives a rough indication of the relative positions of the blow-out and the relief wells.

1. Drill and cement both 30" and 20" casings.
2. Kick off and drill in 17½" hole for 13-3/8" casing setting depth. The casing setting depth will be dependent on several factors among which are:
 - a) Formation gradient at original 13-3/8 inch shoe in initial well.
 - b) Geological section penetrated by the blow-out well.
 - c) Status of blow-out well
 - d) Estimates of flow-rates and pressures etc. of the producing formation.
3. Drill ahead in 12-1/4" hole on a deviation plan to intersect or arrive at close proximity to the blowing well at the producing reservoir.
Extreme diligence is required in determining the positions of relief wells as they are drilled in relationship to the blow-out well. Intermediate logs will be run if there are indications of loss of geological control or evidence of invasion of blow-out fluids into formerly water-bearing reservoirs.

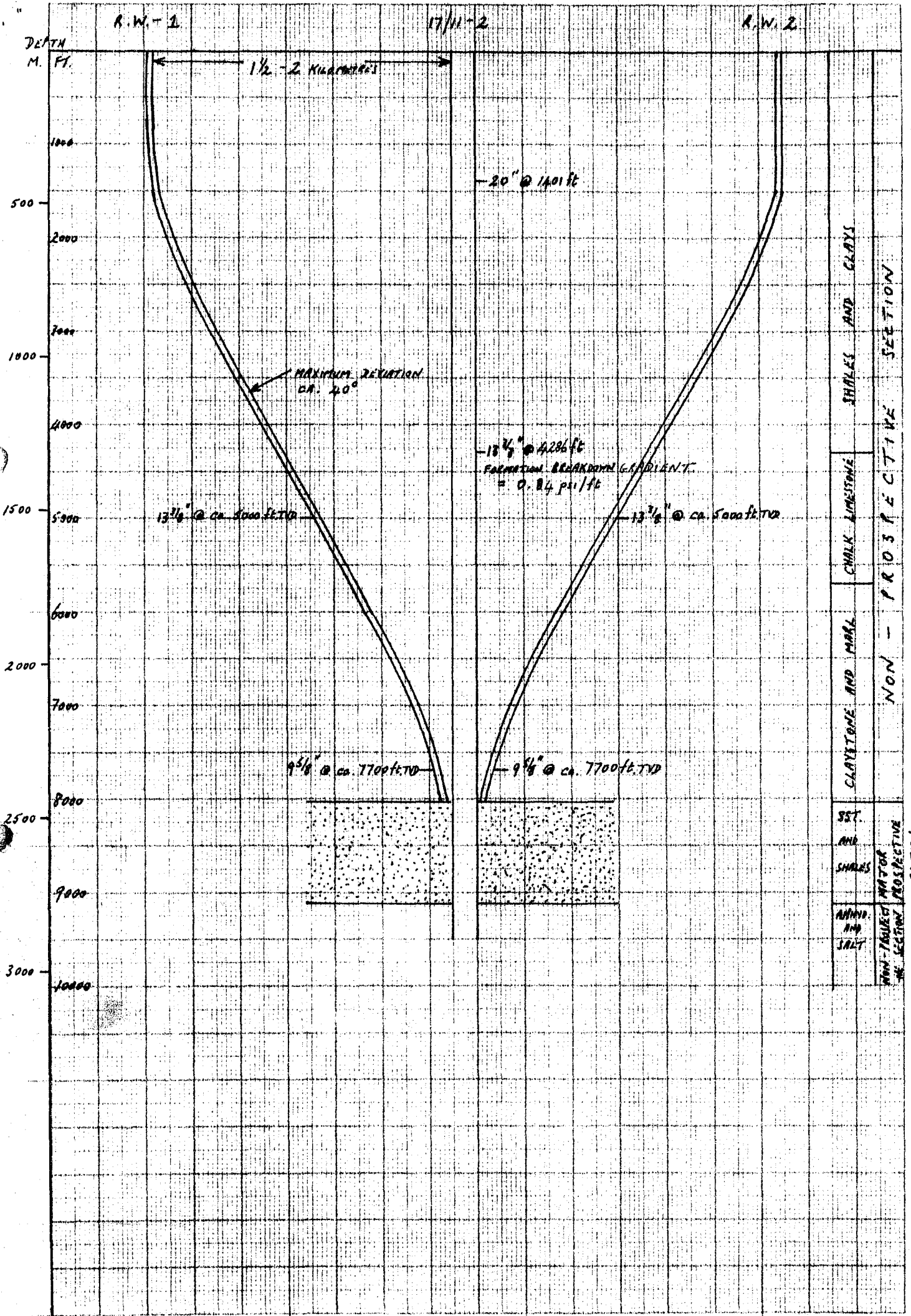
The exact setting depth of the 9-5/8" casing will only be determinable after the blow-out has occurred and upon evaluation of the data from the relief well. In principle it should be set as close to the top of the producing reservoir as safety permits.

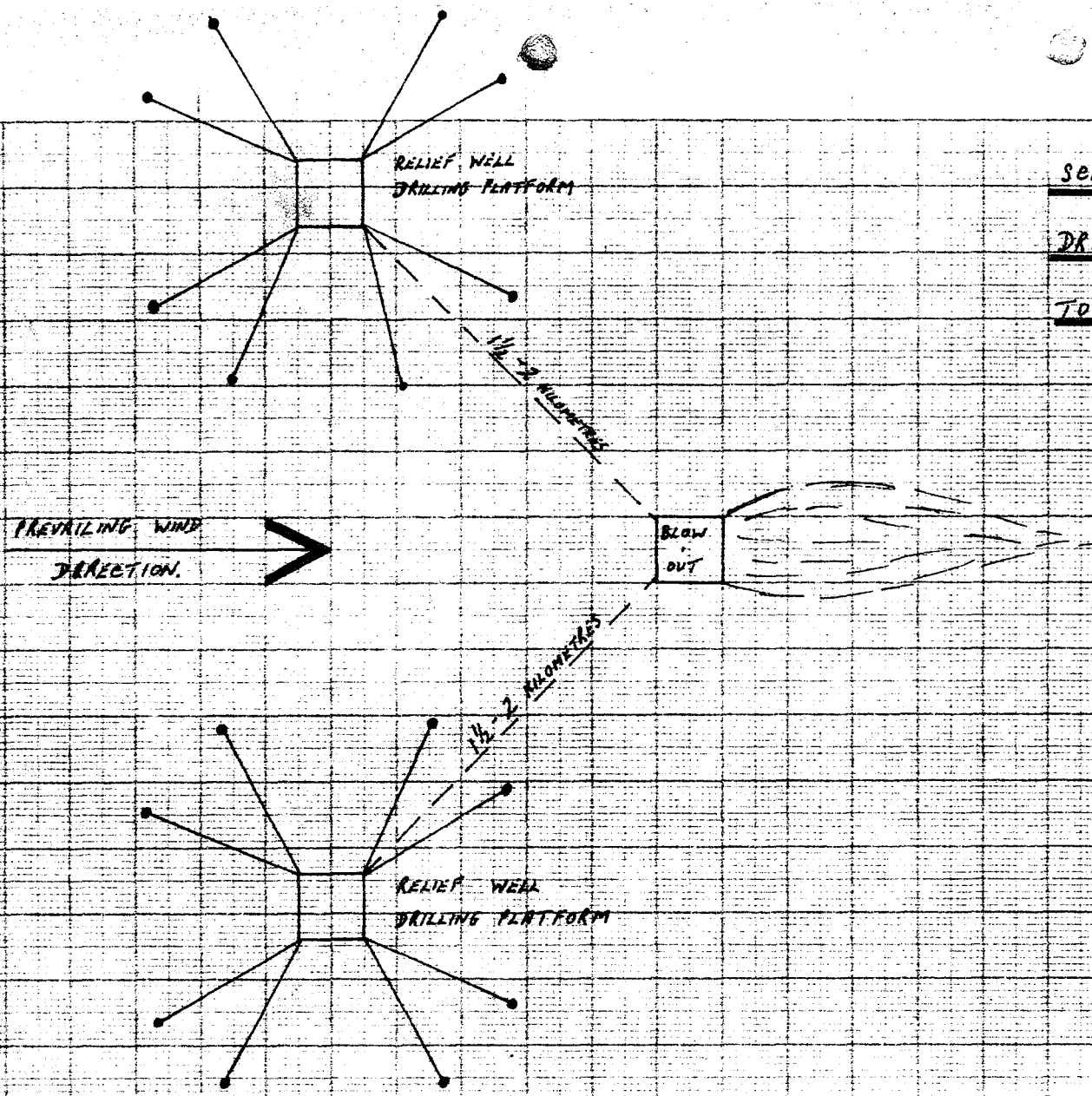
In the event that casing or part of the drill string remains in the blow-out well it may be possible to utilize the ULSEL logging device of Schlumberger to assist in guiding the relief wells to the blow-out well. Where no steel present in the blow-out well the ULSEL device could not be used and in this event it may be necessary to set 9-5/8" casing say 1000 feet above the top of the producing formation in order to leave adequate space between the casing shoe and the top of the producing interval to allow a number of 8½" side track holes to be drilled, since several attempts may be necessary to bring the relief well in close proximity to the blowing well.

4. Prior to drilling out of the 9-5/8" casing, all high pressure pumping equipment, manifolds and tanks will be mobilized and test-run. Mud, cement and chemicals required will be available on site and the required mud for the killing operation will be prepared and stored at the relief well sites.
5. The final stages of the relief wells will be drilling in 8½" hole. As stated in 3 above it may be necessary to make several side track and redrill attempts before the relief well can be brought in close proximity to the blow-out well. When close proximity has been established 7" casing or liner strings may be set prior to carrying out tests to establish communication between each relief well and the blow-out. It is anticipated that prior to undertaking the actual killing operation the relief wells would be equipped with either 7" casing or liner.
6. Dependent upon pressure requirements it may be necessary to install packers and injection strings in the relief wells.
7. Communication between the relief wells and the blow-out well will be established with sea water.
8. Killing operations will commence by pumping sea water into the relief wells simultaneously. This will be followed by pumping mud until the blow-out is completely dead. The

blow-out will then be secured by pumping cement from the relief wells. Volumes, pump rates and pressures can only be assessed when all parameters of the blow-out and relief wells are known.

9. When the blow-out has been secured by cementing at the bottom, attempts will be made to enter the top of the blow-out well to fulfill a normal abandonment requirements.





SCHEMATIC LAY-OUT OF RELIEF WELL
DRILLING PLATFORMS WITH RESPECT
TO THE BLOW-OUT

| CASING SIZE | GRADE | NORSKE SHELL | SHELL UK EXPL. AND PROD. |
|-------------|----------------------|--------------|--------------------------|
| 36" | WT 1" | 1280' | - |
| | WT 1½" | 480' | - |
| 30" | WT 1" | 920' | |
| | Vetco | | ca. 1000' |
| 20" | Vetco 94 lbs/ft | 720' | ca. 5000' |
| | K55 BTS 106.5 lbs/ft | 5760' | |
| | K55 BTS 133 lbs/ft | 1440' | |
| 13-3/8" | N80 BTS 72 lbs/ft | 10680' | 50 - 70,000' |
| 9-5/8" | N80 BTS 47 lbs/ft | 2000' | ca. 200,000' |
| | N80 VAM 47 lbs/ft | 6280' | |
| | N80 LTC 40 lbs/ft | 920' | |
| | P110 VAM 47 lbs/ft | 6760' | |
| 7" | Unspec. | | ca. 150,000' |
| | N80 BTS 29 lbs/ft | 10160' | |
| | P110 BTS 29 lbs/ft | 42960' | |
| | P110 VAM 32 lbs/ft | 5360' | |
| | P110 VAM 35 lbs/ft | 2920' | |

DATE : 3,5,76

Dresser Norway A/S

MAGCOBAR SECURITY SWACO

P.O. BOX 23 4056 TANANGER · PHONE: (045) ~~49 324~~ 96 033 96 324
TELEX NO 33168 STAVANGER "DRENO" N

Tananger, April 13, 1976

Norske Shell Exploration & Production
P. O. Box 40
4056 Tananger

Attn: Mr. M. J. Pink
Chief Petroleum Engineer

Dear Sir,

This is in reference to our conversation last week concerning mud materials for possible blow out controls for the North Sea Area.

Below please find the following information.

Dresser Norway's capacity for handling bulk materials such as Magcobar Barite . In Tananger we have a capacity of 1250 metric tons and in Dusevik a capacity of 930 metric tons.

Dresser Norway's 90 day inventory concerning Magcobar Barite will average 1200 metric tons per month. In case of an emergency such as a blow out in the Norwegian area Dresser Norway can and will supply any needs or requirements up to 4,000 metric tons of Barite with a delivery within 2 weeks from our Foynes Plant in Ireland.

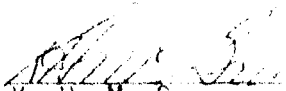
Other materials such as Spersene, Bentonite, XP-20, CMC and etc. are kept in ample supply by Dresser Norway for drilling activity in the Norwegian area and also in case of emergency. The main chemicals such Spersene and Bentonite can be delivered here in Norway within 1 to 2 weeks.

I hope this answers all your questions concerning Dresser Norway's facilities, in case of such emergency for the Norwegian Directorate.

Please do not hesitate to call upon me in the future concerning the above.

Regards.

Yours very truly,


K. H. Mc Grew
Manager Sales & Eng.

To: See Below
 Date: April 6, 1976
 From: A. Asbjørnsen - Warehouse Manager
 Subject: TANANGER WAREHOUSE INVENTORY

Dreco - Norway A/S

MAGCOBAR SECURITY SWACO

P.O. BOX 23 - 4056 TANANGER - PHONE: (045) 43 324
 TELEX NO.: 33 1 68 - STAVANGER -DRENO- N

Copy to: B. Denton M. Openshaw T. Black B. Berry
 E. Haynes L. Peel J. Vidal B. Heard
 D. Doran J. Glazener P. Riederer R. Berkel
 H. Behrens J. Puryear A. Smith B. Basjes

Peel - Berger

| PRODUCT | UNIT | QUANTITY ON STOCK | | | |
|----------------------|----------|-------------------|--|--|--|
| Aluminium Stearate | 25 lb | | | | |
| Aluminium Stearate | 50 lb | | | | |
| Aluminium Stearate | 25 kg | 25 | | | |
| Magcobar Barite | 100 lb | 34544 | | | |
| Magcobar Bentonite | 25 kg | 685 | | | |
| Magcogel Bentonite | 100 lb | | | | |
| Magcogel Bentonite | 50 kg | 632 | | | |
| Bentonite Wyoming | 100 lb | 576 | | | |
| Bit Lube | 55 gal | | | | |
| Calcium Chloride | 50 kg | | | | |
| Caustic Soda | 25 kg | 3208 | | | |
| Caustic Soda | 50 kg | | | | |
| Cell-O-Seal | 28 lb | | | | |
| Magco C.M.C.-H.V. | 25 kg | | | | |
| Magco C.M.C.-L.V. | 25 kg | 342 | | | |
| Desco | 25 lb | 422 | | | |
| Desco | 50 lb | | | | |
| Diaseal M | 50 lb | 300 | | | |
| D.M.S. Surfak | 55 gal | 36.1/2 | | | |
| Drilling Detergent | 55 gal | | | | |
| Drispac | 50 lb | 352 | | | |
| Drispac Superlo | 50 lb | 340 | | | |
| Kwik Seal | 40 lb | | | | |
| Lime | 20 kg | | | | |
| Lime | 25 kg | | | | |
| Lime | 33.1/3kg | | | | |
| Magco Inhibitor A202 | 55 gal | 10 | | | |
| S1- 1000 | 55 gal | 10 | | | |

To: See Below
 Date: April 6, 1976
 From: A. Asbjørnsen - Warehouse Manager
 Subject: TANANGER WAREHOUSE INVENTORY

Dresser Norway A/S

MAGCOR SECURITY SWACO

P.O. BOX 23 - 4056 TANANGER - PHONE: (045) 43 324
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Copy to: B. Denton M. Openshaw T. Black B. Berry
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 D. Doran J. Glazener P. Riederer R. Berkel
 H. Behrens J. Puryear A. Smith B. Basjes

| PRODUCT | UNIT | QUANTITY ON STOCK | QUANTITY ON ORDER | E.T.A. | P/O | REMARKS |
|------------------------|--------|----------------------|----------------------|--------|-----|---------|
| Lime | 40 kg | 3 | | | | |
| Magconol | 55 gal | 13 | | | | |
| Magcophos | 25 kg | | | | | |
| Mica Coarse & Medium | | 59 | | | | |
| Mica Fine | 25 kg | 467 | | | | |
| Mud Fiber | 20 kg | 56 | | | | |
| My-Lo-Jel | 25 kg | | | | | |
| My-Lo-Jel Pres. | 25 kg | | | | | |
| Nut Plug Coarse | 25 kg | 148 | | | | |
| Nut Plug Fine | 25 kg | 254 | | | | |
| Oil Seal | 50 lb | | | | | |
| Pipe Lax | 55 gal | 20 | | | | |
| Resinex | 50 lb | 246 | | | | |
| Salinex | 55 gal | 15 | | | | |
| Salt Gel | 50 lb | 673 | | | | |
| Salt Gel | 100 kg | 30 | | | | |
| Soda Ash | 50 kg | | | | | |
| Sodium Bicarbonate | 50 kg | | | | | |
| Sodium Nitrate | 50 kg | | | | | |
| Sodium Sulphate | 50 kg | 90 | | | | |
| Soltex | 50 lb | | | | | |
| Spersene | 50 lb | 453 | | | | |
| Sodium Chromate | 25 kg | 11 | | | | |
| XP-20 | 50 lb | 1017 | | | | |
| Visquick | 50 lb | 336 | | | | |
| Pallets | | 339 | | | | |
| Pallet Covers | | 692 | | | | |
| IS-IL Oxygen Scavenger | 55 gal | 15 | | | | |

To: See Below
 Date: April 9th, 1976
 From: S.Fjereide - Warehouse Manager
 Subject: BERGEN WAREHOUSE INVENTORY

Dresser Norway A/S
MAGCOBAR SECURITY SWACO
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 E. Haynes L. Peel J. Vidal B. Heard
 D. Doran J. Glazener P. Riederer R. Berkel
 H. Behrens J. Puryear A. Smith B. Basjes

| PRODUCT | UNIT | QUANTITY ON STOCK | QUANTITY ON ORDER | E.T.A. | P/O | REMARKS |
|--------------------|----------|-------------------|-------------------|---------|--------|---------|
| Aluminium Stearate | 25 lb | | | | | |
| Aluminium Stearate | 50 lb | | | | | |
| Aluminium Stearate | 25 kg | | | | | |
| Magcobar Barite | 100 lb | 11.400 | 800 m.tons | 4.20.76 | M-1053 | |
| Magcobar Bentonite | 25 kg | | | | | |
| Magcogel Bentonite | 100 lb | | 1000 sx | 4.25.76 | M-1054 | |
| Magcogel Bentonite | 50 kg | | | | | |
| Bentonite Wyoming | 100 lb | 1.680 | | | | |
| Bit Lube | 55 gal | | | | | |
| Calcium Chloride | 50 kg | | | | | |
| Caustic Soda | 25 kg | 1.600 | | | | |
| Caustic Soda | 50 kg | | | | | |
| Cell-O-Seal | 28 lb | 505 | | | | |
| Magco C.M.C.-H.V. | 25 kg | 97 | | | | |
| Magco C.M.C.-L.V. | 25 kg | 391 | | | | |
| Desco | 25 lb | | | | | |
| Desco | 50 lb | | 440 sx | 4.25.76 | M-1049 | |
| Diaseal M | 50 lb | | | | | |
| D.M.S. Surfak | 55 gal | | | | | |
| Drilling Detergent | 55 gal | 25 | 20 dr. | 4.15.76 | M-1053 | |
| Drispac | 50 lb | | 660 sx | 4.25.76 | M-1042 | |
| Drispac Superlo | 50 lb | | 660 sx | 4.25.76 | M-1042 | |
| Kwik Seal | 40 lb | | | | | |
| Lime | 20 kg | | | | | |
| Lime | 25 kg | | | | | |
| Lime | 33.1/3kg | | | | | |

To: See Below
 Date: April 9th, 1976
 From: S. Fjereide - Warehouse Manager
 Subject: BERGEN WAREHOUSE INVENTORY

Dresser Norway A/S

MAGCOBAR SECURITY SWACO

P.O. BOX 23 - 4056 TANANGER - PHONE: (045) 43 324
 TELEX NO.: 33 1 68 - STAVANGER -DRENO- N

Copy to: B. Denton M. Openshaw T. Black B. Berry
 E. Haynes L. Peel J. Vidal B. Heard
 D. Doran J. Glazener P. Riederer R. Berkel
 H. Behrens J. Puryear A. Smith B. Basjes

| PRODUCT | UNIT | QUANTITY ON STOCK | QUANTITY ON ORDER | E.T.A. | P/O | REMARKS |
|----------------------|--------|----------------------|----------------------|---------|--------|---------|
| Lime | 40 kg | | | | | |
| Magconol | 55 gal | 5 | | | | |
| Magcophos | 25 kg | | | | | |
| Mica Coarse & Medium | | 300 | | | | |
| Mica Fine | 25 kg | 300 | | | | |
| Mud Fiber | 20 kg | | | | | |
| My-Lo-Jel | 25 kg | | | | | |
| My-Lo-Jel Pres. | 25 kg | | | | | |
| Nut Plug Coarse | 25 kg | 200 | | | | |
| Nut Plug Fine | 25 kg | 199 | | | | |
| Oil Seal | 50 lb | | | | | |
| Pipe Lax | 55 gal | 10 | | | | |
| Resinex | 50 lb | 320 | | | | |
| Salinex | 55 gal | | | | | |
| Salt Gel | 50 lb | | | | | |
| Salt Gel | 100 kg | | | | | |
| Soda Ash | 50 kg | 192 | | | | |
| Sodium Bicarbonate | 50 kg | | | | | |
| Sodium Nitrate | 50 kg | | | | | |
| Sodium Sulphate | 50 kg | | | | | |
| Siltext | 50 lb | 877 | 880 sx | 5.1.76 | M-1049 | |
| Silarsene | 50 lb | 1.760 | 880 sx | 4.25.76 | M-1056 | |
| Sodium Chromate | 25 kg | | | | | |
| Sil 20 | 50 lb | 878 | | | | |
| Silquick | 50 lb | | 440 sx | 5.1.76 | M-1055 | |
| Sillets | | 725 | | | | |
| Silnet Covers | | 1.000 | | | | |
| Sil Coarse | 50 lb | 300 | | | | |
| Sil Fine | 50 lb | 300 | | | | |

DIRECTIONAL DRILLING
EASTMAN WHIPSTOCK EQUIPMENT AVAILABILITY

| 17-1/2" Hole | 12-1/4" Hole | 8-1/2" Hole |
|---------------------------------------|---|--|
| 10" x 93 Stage Turbine | 7-5/8" x 93 Stage Turbine | 6-3/4" x 64 Stage Turbine |
| 9-1/2" OD - 2° Bent Sub | 8" OD - 1-1/2° Bent Sub. | 6-1/4" OD - 1-1/2° Bent Sub |
| 9-1/2" OD - Nonmag. Dr. collar (2) | 8" OD - 2° Bent Sub. | 6-1/4" OD - 2° Bent Sub |
| 17-1/2" Near Bit Stabilizer (2) | 12-1/4" Near Bit Stabilizer (2) | 8-1/2" Near Bit Stabilizer (3) |
| 2 x 17-1/2" String Stabilizer(4) | 2 x 12-1/4" String Stabilizer (6) | 2 x 8-1/2" String Stabilizer (6) |
| Magnetic Single Shot Instrument | Magnetic Single Shot Instrument | Magnetic Single Shot Instrument |
| U.B.H.O. Orienting Equipment | U.B.H.O. Orienting Equipment | U.B.H.O. Orienting Equipment |
| 17-1/2" Bit, Non-Sealed Bearing | 12-1/4" Bit, Non-Sealed Bearing | 8-1/2" Bit, Non-Sealed Bearing |
| | 12-1/4" Turbine Diamond Sidetracking Bit | 8-1/2" Turbine Diamond Sidetracking Bit |
| | 8" OD - NonMag. Dr. Collar (2) | 6-1/4" OD - NonMag. Dr. Collar (2) |

NOTE: 1) All tools except bits are available in Tananger, Norway
2) Three directional Drilling Supervisors are on-call in Norway.

ATTACHMENT 7

I N V E N T O R Y - L I S T

| <u>QUANT.</u> | <u>DESCRIPTION</u> | <u>LENGTH</u> |
|---------------|---|---------------|
| 2 | 4 3/4" X 3 1/2" IF Monel Drillcollars | 30' |
| 1 | 4 3/4" X 3 1/2" IF Monel Drillcollar | 20' |
| 3 | 6 1/4" X 4 1/2" IF Monel Drillcollars | 30' |
| 3 | 9 1/2" X 7 5/8" Reg. Monel Drillcollars | 30' |

Will have 8" X 6 5/8" Reg. Monel collars in stock shortly.

Complete Sperry Sun single shot plus accessories

Complete Sperry Sun multishot plus accessories

AVAILABILITY OF PUMPING UNITS

| CONTRACTOR \ AREA | N O R T H S E A A R E A | | | C O N T I N E N T A L E U R O P E | | | M E D I T E R R A N E A N A N D A E G E A N | | |
|---------------------|-------------------------|--------------|-----------|-----------------------------------|--------------|-----------|---|--------------|-----------|
| | NO. OF UNITS | HHP PER UNIT | TOTAL HHP | NO. OF UNITS | HHP PER UNIT | TOTAL HHP | NO. OF UNITS | HHP PER UNIT | TOTAL HHP |
| BJ | 2 | 600 | 1200 | | | | | | |
| DOWELL-SCHLUMBERGER | 5 | 825 | 4125 | 2 | 825 | 1650 | | | |
| | 3 | 500 | 1500 | | | | | | |
| HALLIBURTON | 11 | 250 | 2750 | 2 | 250 | 500 | | | |
| | 4 | 500 | 2000 | 6 | 500 | 3000 | | | |
| | 12 | 550 | 6600 | 6 | 550 | 3300 | 3 | 550 | 1650 |
| TOTAL | 37 | | 18175 | 16 | | 8450 | 3 | | 1650 |

NOTE : THESE FIGURES ARE SUBJECT TO UPWARD REVISION AS THE CONTRACTORS ARE CHECKING THEIR INVENTORIES THROUGHOUT EUROPE.

IMPORTANT TELEPHONE NUMBERSA. A/S NORSKE SHELLTEL. NO.

| | | |
|--------------------------|---------------------|-------------|
| Tananger Base | | (045) 96488 |
| Oslo Office | | (02) 200250 |
| Sola Refinery | | (045) 50000 |
| Manager E&P | : J. Spinks | 66415 |
| Chief Petroleum Engineer | : M. Pink | 57175 |
| Drilling Superintendent | : W. Dekker | 28814 |
| Operations Engineer | : R. Glencross | 85657 |
| Drilling Engineer | : J. Perez-Martinez | 96645 |
| Materials Superintendent | : A. Harestad | 96495 |
| Personnel Superintendent | : T.B. Endresen | 85694 |
| Geologist | : D. Provan | 24003 |

B. INTERNATIONAL DRILLING COMPANY

| | | |
|----------------------------|-------------------|--------------|
| Tananger Office | | (045) 96380 |
| Aberdeen Office | | (224) 28383 |
| Drilling Superintendent | : J.R. Nichols | (045) 90296 |
| Drilling Manager(Aberdeen) | : L.C. Steinocher | (224) 733592 |

C. EMERGENCY SERVICES

| | | | |
|---------------------|---------------------------|---------------------------|----------------------------|
| Rogaland Hospital | | (045) 31000 | |
| Stavanger Hospital | | (045) 21500 | |
| Dr. Nome | Office No. (045) 31000 | Mobile No. (045) 50138 | Private No. (045) 47305 |
| Sola Rescue Centre | | (045) 50039 | |
| Stavanger Police | | (045) 31520 | |
| Helikopter Services | | (045) 75535 | |

D. GOVERNMENT AGENCIES

| | |
|---------------------------------|-------------|
| Norwegian Petroleum Directorate | (045) 33160 |
| Norwegian Maritime Directorate | (02) 379280 |
| Ministry of Industry | (02) 419010 |
| Labour Directorate | (02) 469820 |
| Pollution Control Inspectorate | (02) 418860 |

E. SHELL COMPANIES

| | |
|--|---------------------|
| S.I.P.M., The Hague, Holland | - 31 - 70 - 77 6655 |
| Shell UK Exploration & Production Ltd, | |
| London | - 44 - 1 - 934 1234 |
| Aberdeen | - 44 - 224 - 29966 |
| Lowestoft | - 44 - 502 - 62133 |
| | |
| N.A.M. Assen, Holland | 31 - 5920 - 27111 |
| Deutsche Shell AG | 49 - 40 - 6341 |
| Shell Francaise | 33 - 1 - 2568282 |

F. NORTH SEA OPERATORS

NORWAY

| | | |
|-------------|-------|--------|
| Amoco | (045) | 96811 |
| BP | (045) | 75711 |
| Conoco | (045) | 41955 |
| Elf | (045) | 88055 |
| Esso | (045) | 28540 |
| Mobil | (045) | 27292 |
| Norsk Hydro | (02) | 564180 |
| Phillips | (045) | 96711 |
| Saga | (045) | 41900 |
| Statoil | (045) | 33180 |

SCOTLAND

| | | |
|-------------------|-----------|--------|
| Amoco | Aberdeen | 871041 |
| Arco | Aberdeen | 873143 |
| BP | Dyce | 3131 |
| Burman Oil | Aberdeen | 574278 |
| Conoco | Dundee | 452911 |
| Elf | Peterhead | 21867 |
| Esso | Aberdeen | 513180 |
| Hamilton Brothers | Aberdeen | 874461 |
| Mobil | Aberdeen | 574456 |
| North Sea Sun Oil | Aberdeen | 874766 |
| Occidental | Peterhead | 4686 |
| Phillips | Peterhead | 4885 |
| Siebens | Aberdeen | 56854 |
| Texaco | Aberdeen | 574477 |
| Total | Aberdeen | 574361 |

| | | |
|-------------|----------|--------|
| Trans Ocean | Aberdeen | 871693 |
| Trans World | Aberdeen | 22369 |
| Union | Aberdeen | 871511 |

HOLLAND

| | | |
|---------|---------|--------|
| Amoco | (030) | 940341 |
| BP | (010) | 220216 |
| Chevron | (070) | 614471 |
| Conoco | (070) | 865471 |
| Gulf | (01888) | 2255 |
| Mobil | (010) | 147011 |
| Placid | (070) | 814581 |
| Tenneco | (070) | 834703 |
| Union | (1020) | 139933 |

G. DRILLING CONTRACTORS

NORWAY

| | | |
|-------------------|-------|--------|
| Aker | (045) | 96722 |
| K/S Dyvi Drilling | (045) | 96722 |
| Global Marine | (045) | 32827 |
| Gotaas Larsen | (02) | 419040 |
| Neptune | (045) | 41935 |
| A/S Norsedrill | (045) | 41911 |
| Odeco | (045) | 20924 |
| Ross Drilling | (045) | 41966 |
| Rowan | (02) | 419040 |
| Santa Fe | (045) | 96820 |
| Smedvik | (045) | 20040 |
| Waage Drilling | (045) | 96888 |
| Zapata | (045) | 96044 |

ABERDEEN

| | | |
|-----------------|----------|--------|
| Bawden Drilling | Aberdeen | 703671 |
| Forex | " | 21066 |
| Global Marine | " | 55272 |
| KCM Drilling | " | 872030 |
| Odeco | " | 874252 |
| Santa Fe | " | 871747 |
| Sedco | " | 874949 |

| | | |
|-----------------|----------|--------|
| Stormdrill | Aberdeen | 874252 |
| Waage | " | 871747 |
| Western Oceanic | " | 573088 |
| Zapata | " | 575776 |

HOLLAND

| | | |
|----------|-------|---------|
| Neddrill | (070) | 949350 |
| Penrod | (022) | 3017541 |

H. OILFIELD SUPPLIERS - STAVANGER

| | |
|----------------------------|-------|
| A-1 Bit and Tool | 41319 |
| Aker Norsco | 96611 |
| Baker | 96520 |
| Baroid | 96524 |
| B.J. | 96533 |
| Cameron | 96588 |
| Ceca | 96055 |
| Christiansen | 41033 |
| Dowell-Schlumberger | 41944 |
| Dresser | 96033 |
| Eastman Whipstock | 96501 |
| Flopetrol | 96615 |
| FMC | 96467 |
| Gray Tool | 41033 |
| Halliburton | 96733 |
| Imco | 96755 |
| Mannesmann | 96788 |
| Maritime Drilling Services | 96633 |
| Milchem | 96677 |
| Norsea | 41033 |
| Otis | 42144 |
| Schlumberger | 51035 |
| Sperry Sun | 41985 |
| Vetco | 24870 |
| Weatherford | 41077 |

PRIVATE
 HIERKUM HANSEN 11 00 07
 GRAFF WANG 11 00 03
 LAMMINGA 11 00 01
 NORFOLK 11 00 04
 NORGREN 11 00 10
 SMAAVIK 11 00 18
 WOXEN 11 00 17

R. S. PLATOU A/S

DRONNING MAUDS GT. 3 - OSLO

TELEGRAMS:
 RESPLATO
 TELEX 19990
 P. O. BOX 1357 - VIFA -
 OSLO 1

OFFSHORE

NORTH SEA RIG ACTIVITY.

As of April 16th, 1976 55 drilling rigs were located in the North Sea area of which 40 were semisubmersibles and 15 jack-ups. 9 units were idle, 10 units were used as service platforms and 44 were on location or on their way to location.

The following units are idle:

| | | |
|---------------|----|---------------------|
| Kingsnorth 11 | SS | River Thames |
| Onsworld 51 | SS | Firth of Forth |
| Waage I | SS | Stavanger |
| Waage II | SS | Stavanger |
| West Venture | SS | Stavanger |
| Atlantic I | SS | Bergen |
| Norskald | SS | Bergen |
| Nortroll | SS | Sandefjord |
| Zephyr I | SS | Rotterdam (docking) |

| | | |
|-------|---|--|
| EPD | | |
| EPB | | |
| EPP | ✓ | |
| EPD | | |
| EPPD | | |
| EPPB | | |
| EPD | | |
| EPB | | |
| EPK | | |
| EPD | | |
| EPM | | |
| EPD | | |
| EPD | | |
| EPFF | | |
| EPD | | |
| EPD-A | | |
| EPL | | |
| EPA | | |
| | | |
| | | |
| | | |
| FILE | | |

Rigs under construction due to work in the North Sea or adjacent areas after delivery:

| Del.: | Owner | Rigname | Type | Operator | Period |
|----------|-----------------|-----------|------|----------|---------|
| Apr. 76 | Offshore Europe | Petrel | DPDS | Elf | 5 years |
| May 76 | Reardon Smith | Celtic I | SS | BP | 3 years |
| June 76 | Sedco | Sedco 471 | DPDS | BP | 3 years |
| July 76 | Penrod Drilling | Penrod 67 | JU | Placid | Term |
| Sept. 76 | Staubo/Pedersen | Pelerin | DPDS | Total | 5 years |

As of April 16th, 1976 the total committed drilling rigs in the North Sea operating and under construction, will terminate their contracts as follows:

| Available | 1/76 | 2/76 | 1/77 | 2/77 | 1/78 | 2/78 |
|------------|------|------|------|------|------|------|
| 9 | 8 | 8 | 13 | 4 | 1 | 2 |
| cumulated: | 9 | 17 | 25 | 38 | 43 | 45 |

In addition there are 17 uncommitted drilling rigs under construction at European yards to be delivered as follows:

| | 1/76 | 2/76 | 1/77 | 2/77 | 1/78 | 2/78 |
|------------|------|------|------|------|------|------|
| 2 | 9 | 4 | 0 | 1 | 1 | |
| cumulated: | 2 | 11 | 15 | 15 | 16 | 17 |