



ENTREPRISE DE RECHERCHES ET D'ACTIVITES PETROLIERES

FFG-G. 101.9. FRF 000009

**elf NORGE**

**FRIGG FIELD  
PRODUCTION FACILITIES**

# MONTHLY REPORT

SEPTEMBER 1976

SNEA (P) - DISSEMINATIONS	
Arrivée les	15 OCT 1976
M. REGION	<input checked="" type="checkbox"/>
M. PAYS	<input checked="" type="checkbox"/>
M. EXPORT	<input checked="" type="checkbox"/>
M. GRISE	<input checked="" type="checkbox"/>
Traité par	<input checked="" type="checkbox"/>
Préparé par	<input checked="" type="checkbox"/>
Approuvé par	<input checked="" type="checkbox"/>
Signature	<input checked="" type="checkbox"/>

D.E.P.  
4061 N° 6/1372

September 1, 1976

FRIGG FIELD

PRODUCTION FACILITIES

MONTHLY REPORT

SEPTEMBER 1976

Distribution

Ministry of Industry (Oslo)  
Oil Direktorat (Stavanger)  
Department of Energy (London)  
Dpt. Energy - Petroleum Production Division  
Branch Petroleum Production Inspectorate

C.F.P. (Paris - 5 ex)  
Norsk Hydro (Oslo)  
Statoil  
S.N.P.A.

D.E.P. (Mr. Didier)  
Direction Production  
D.C.O.  
Dpt. Forages  
Dpt. Gisements  
D.G.N.  
Direction Financière  
S.G. Risques Assurances  
Direction Frigg (5 ex)  
Division E.C.D. Frigg (Mr. Gainette)  
- Dpt. Infrastructure (Mr. Laffont)  
- Dpt. Etudes-Production (Mr. Tartera)  
- Dpt. Installation (Mr. Dussert)  
- Dpt. Cost Control (Mr. Assouly)  
- Dpt. Administration (Mr. Mauguy)  
Division Travaux Mer (Mr. Le Rest)  
- Dpt. Sea Construction (2 ex)  
Service budget financement (Mr. Teneul)  
Mission Londres (Mr. Dufond)

+++++





## I. OFFSHORE OPERATIONS

(For the period ending September 20, 1976)

### 1.1. OP installation

Follower B 2-1 was installed on the platform on August 20.

Hook-up of modules was completed on the 24 and the first well pump was installed on the 22nd.

The bottom hole assembly was made up on the 24th and drilling commenced on the 25. Two sets of insert piles were loaded into the racks on the 24 and follower extension A 2-1 and A 2-2 were stabbed on the 26.

By August 27, the drilling depth reached was 637 ft, however, it was discovered that the rockwell connectors were leaking. Some new mud was mixed and an attempt made to start drilling. This time, a loss of circulation was discovered. A cement plug was made up and inserted into the hole where it was then dispersed into the soil on the 29. Drilling and reaming were performed. Drilling continued to a depth of 640 ft, where a bed of boulders and gravel was encountered causing problems with the drill bit. These problems lasted until September 9, when they were finally overcome using cement and resin plugs. Drilling continued into clay and the hole was completed to depth by September 15.

Inserting of pile has commenced as well as drilling of the second hole is now underway, so far with no problems.

### 1.2. DP2 Jacket installation

Two Hughes rigs were placed on the drilling modules on August 20. On August 21, four deep well drill pumps were installed in DM2. Follower extensions were stabbed and welded up to drill floor on sleeves A 4-2 and B 1-2.





Two sets of insert piles were loaded onto the platform on August 25. Followers were installed on B 4-4 and A 1-4 on September 3.

Hook-up of the drilling modules progressed until the beginning of September when weather deteriorated badly and held up progress for two weeks during which time 2 followers only were set on B 1-2 and A 2-4.

Weather improved sufficiently on September 17, to allow completion of the hook-up of one drilling module and the commencement of drilling of the insert piles.

### 1.3. Line installation

The 32" line was successfully pulled in and laid from TP1 on August 20. Pull-in and laying of the 24" line from TP1 was started on the 22nd and completed on August 24.

The cathodic protection on R5 and R6 was checked and found to be adequate on TP1. Emergency seals were installed on R5 and R6. A leak was located on the 2" valve of R6.

In the week ending September 3, the two middle spools of R5 and R6 were laid in position on the sea bottom. The flange was removed from J3 in preparation for the 2" pull-in, however, the weather deteriorated at the beginning of September and no further work was possible until September 17.

The middle spool for R6 was cut and weld prepped at both ends on September 18 and 19. R6 was cut and flooded on both CDPI and TP1 spools on the same date.

### 1.4. CDPI installation

On August 27, all east-west treillis beams had been loaded-out on the 25th. Four lifting winches were taken off on the 24th. Dismantling of the west beams started on the 25 and was completed on the 28th.





The south-west leg beam was offloaded on August 30. Dismantling of the north-west column was completed on September 8. The south section of the running beam and a northern brace were offloaded on the 16th and at the present time the Buzichelli gantry crane has been completely dismantled.

Total dismantling time : 33 days (37 days with ringer crane installation)

The installation of the 8" riser supports was completed on the 25th and the caps on the 36" sleeves were removed. Life raft stations were fabricated and installed and the wellhead modules reinforced for skidding. The west burner boom was installed and welded on August 31.

Module BR2 was skidded into final position (September 15).

#### Hook-up operations

Installation of the 8" cooling line, 4" fuel line and exhaust pipes continued until August 27 at which date the 4" fire loop was completed. The east and west burner booms were installed on September 3.

Fabrication and installation of the water supply and exhaust systems for the SAIPM modules was completed on September 10.

The fire system was connected to the quarters on September 3.

Work is progressing well on the installation of the gas detection system, sanitary waste system, shale shaker discharge, fire ring main, halon system and multi-tubes.

#### Drilling

The hook-up of the module and erection of the derrick was completed on September 10. The setting of the packers, shock absorbers and conductor in the first hole was started. Some difficulties were encountered and this operation was not completed until September 15.





1.5. Treatment platform nr. 1 (TP1)

On August 20, the pull-in of the 32" was completed and the platform prepared to receive module 04, which was set on August 21 and skidded on August 22. Module 05 was then lifted and set on August 24.

Work progressed on tie-in with the preparation of the bends at the bottom of column C1. The pull-in of the 24" line was completed on August 24 and the TV camera removed from outside the tunnel.

Dewatering of column C2 was completed on August 25. During the week ending September 3, several welds had been completed on risers R5, R6, R7 and R8, these are ready to be X-rayed. All welds on riser R6 were completed on September 7 and radiography was carried out the next day. A problem of ovality was encountered on R7, but this has been corrected.

Alignment of R5 was completed on the 9th and preheating started.

On September 17, R8 has been tied in at -100 level.

The hoist in column C1 broke down on September 10, but this was repaired on September 12.

Work continued throughout the month on the welding of the modules to the skid beams and the installation of deck plating. The flare boom was installed on August 29.

The Manitowoc and the RB 150 were removed on September 15.

+++++





QP PLATFORM

## II. PRODUCTION FACILITIES

### 2.1. Treatment platform nr. 1 - TP1

The construction of the TP1-QP bridge has been completed with a new length of 89 m on September 28 in ANTWERP. Prior to this, on September 23, the bridge had been loaded on the barge MORLAND 3. The barge should leave ANTWERP on October 1st.

### 2.2. Living quarters platform - QP

Work in BORDEAUX is complete at CHANTIERS DE LA GARONNE. The barge MORLAND 5, carrying module B finally left BORDEAUX on September 20. The barge BRHM2, carrying module A left BORDEAUX September 8.

### 2.3. Lines and connections

After the last qualification, five welders have been accepted and will be available for offshore operations.

All welding and radiographic procedures have been accepted.

The engineering studies for the stabilisation and line protection are in progress.

.../...



III. PRODUCTION FACILITIES - PHASE II3.1. Drilling platform nr. 2 - DP23.11 Production modules. Engineering

The total engineering progress is 99%. The detailed engineering progress is as follows :

. General arrangement	: 100%
. Model construction	: 98%
. Piping arrangement	: 100% (except for firewater auxiliary pipework)
. Isoing	: 100%

The job file books are in progress and we plan to distribute this document on November 1st, 1976.

. Procurement

Procurement progress is 99%. The material delivered on site is reaching 95%, including steels. We are still encountering some difficulties with the delivery of the MAPEGAZ valves and EUROFILCO equipment (24 x 26" T)

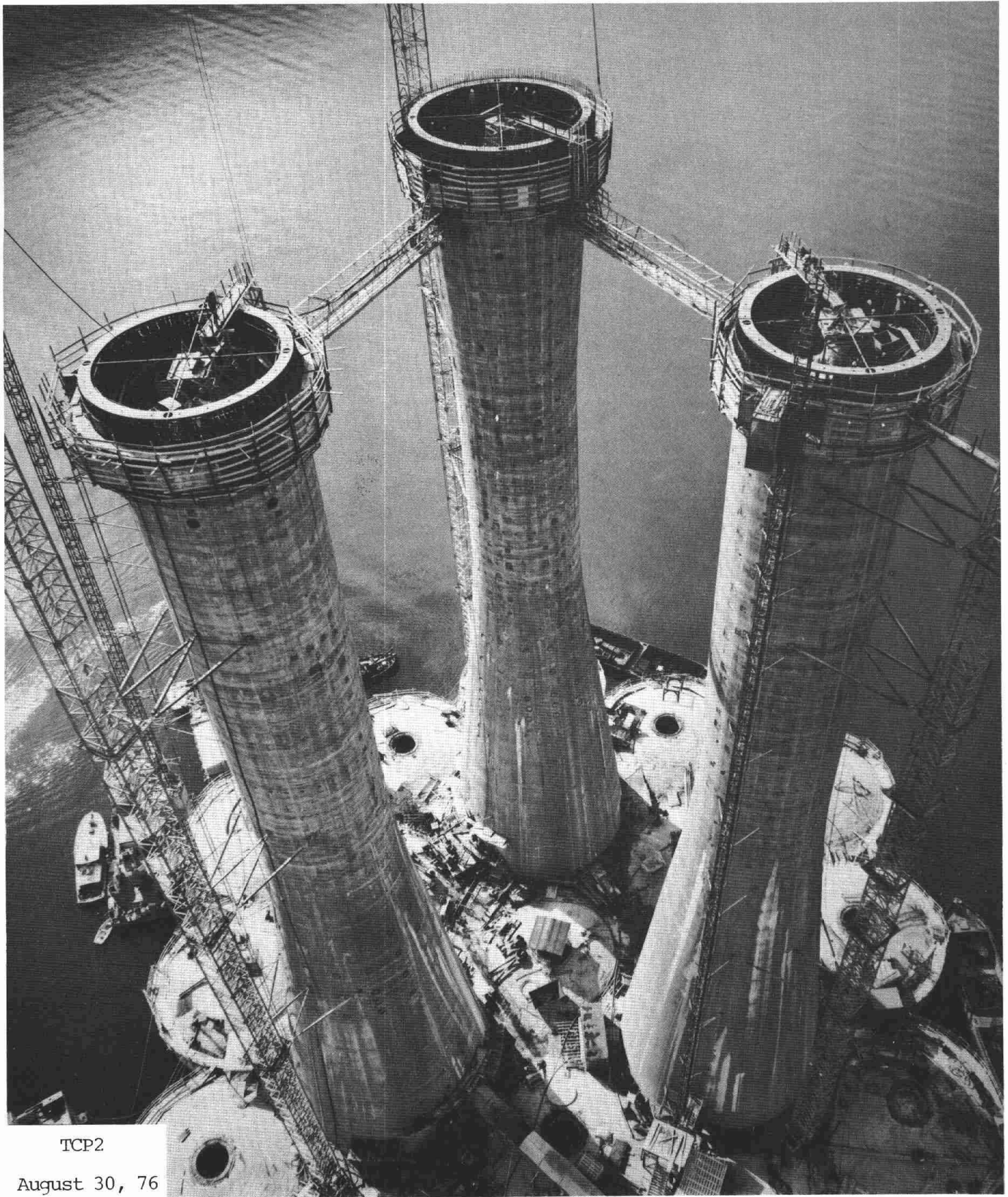
. Fabrication

Total progress is 90,6%.

a) Construction of modules

All efforts are centered in order to have the modules sea-fastened on barge on November 1st, 1976.

Module 01 : 93%	Module 03 : 90,5%
Module 02 : 97,5%	Module 04 : 89%



TCP2

August 30, 76



### 3.2. TCP2 platform

#### 3.21 Structure

##### 3.211 Management

The main management activities have been the examination of the claims presented by NORCON concerning some change orders which are still in dispute and the application of the bonus clause of the contract E. 10.

A discussion was held with NORCON relative to the financial aspect of services to be provided by NORCON to CHRISTIANI NIELSEN after October 1, scheduled date for the completion of the structure.

##### 3.212 Engineering

The main activities have been :

- . Drawing up of onshore operations manual for inclination test, immersion test and deck mating operation.
- . Final design of deck connection
- . Preliminary study of towing out and installation.
- . Preliminary study of grouting module.

##### 3.213 Construction

- a) The upper rings for the connection between shafts and deck are complete.
- b) The installation of equipment in ballast cylinder is nearing completion, 97% of the work is complete.
- c) Acceptance of the following equipment has performed : monitoring of the low voltage circuit, ventilation, SYMINEX and NGI sensors.

d) On the structure, the only work which remains to be performed is as follows :

- , Loading of additional olivin ballast.
- , Closing of access holes at bottom of shafts and ballast cylinder.
- , Closing of upper domes of cells 2, 4 and 6 (these had remained open until feasibility of additional condensate facility in cells was definitely known).
- , Concreting of bend for outfall of cooling water pumps.

### 3,214 Steel support frame

#### Fabrication at CMP's and sub-contractors's

The fabrication and assembly at CMP in Mardyck, ACB and SOCOMET is progressing satisfactorily, respecting the present schedule.

The fabrication at the FRANCE ENTREPRISE GROUP (JULIN CMM, MUNCH, RANVILLE YARD) has been delayed if compared to the schedule presented on August 30, 1976.

These contractors must take all dispositions necessary (work in three shifts, work on week-ends and prefabrication of chord elements in shop..) in order to maintain a delivery at the end of December 1976. A new schedule will be presented on October 4, 1976.

#### Fabrication in STORD

Fabrication in STORD is progressing normally and the first element has been delivered as anticipated to CMP in DUNKIRK.



### Final assembly

ELF had a study made relative to the final assembly of the support frame on a french site in order to compell the Joint Venture AMV /CMP to submit a realistic schedule as well as a lump sum for this operation.

A comparative study of the two solutions is in progress and the final choice will be made at the beginning of October.

The schedules submitted until now, show a support frame transferred in ANDALSNES on two barges and ready for mating operation on April 25, 1977.

The contract NORCO - Joint venture AMV/CMP will be finalized In October 1976.

### Engineering

The design and the calculations made by KVAERNER ENGINEERING as well as the controls by DNV and TNO are nearing completion for the main structure. KVAERNER is designing the secondary elements (attachments, platforms, temporary equipments) which will be fastened onto the support frame. All these elements should be completely defined and designed during October 1976.

#### 3.215 TCP2 riser installation

##### a) Coating of risers

The expert agreed to the use of the coal tar epoxy, however, DNV's agreement is pending awaiting for results of tests being carried out and will be subject to the condition that the number of anodes for protection against corrosion be doubled.

b) Fabrication work

The completion of coating work is as follows :

R1 : 10%	R4 : 100%
R2 : 20%	R5 : 90%
R3 : 0%	R6 : 80%

c) Installation workColumn 3

- . Support legs & clamps at el. + 80m are installed and welded out for J-tubes J-1, J-2 and J-3.
- . Installation of J-tube section is in progress, seven sections have been installed.
- . Support legs at el. +54 m for risers R-1, R-2 and R-3 are installed and welded out.
- . Support legs & clamps at el. +80 m for risers R-1, R-2 and R-3 : fitting complete.

Column 5

- . Supports & clamps at el. + 82m for J-tubes J-4 and J-6 installed and welded out.
- . Installation of support legs and clamps for risers R-4 and R-5 are in progress.

External riser

Riser R1 is installed

Condensate piping

Installation of 12" condensate piping in progress.

d) Schedule

Due to delays caused by NORCON in erecting the potain crane, it is very unlikely that CHRISTIANI & NIELSEN will be able to finish work before week 10 in 1977.

3.216 TCP2 temporary equipmenta) Management

Amendment nr. 3 to contract E. 58 with HDW relative to cancellation of construction of module 66 has been finalized and signed.

Amendment nr. 4 to contract E. 58 with HDW for the construction of module 41 has been sent out to be signed.

b) Procurement

The following equipment has been included in inquiry of been ordered during this month :

Equipment	Position
Diesel generator	Ordered
Main sea-water pumps	"
Fire pump, potable water pumps and sea water transfer pump.	"
Life-boat and life rafts and Davitts	"
Desalination plant	"
Heating ventilation and air conditioning system	Bid tabulation in preparation
Structure for modules 42 & 43	Bid tabulation in preparation

c) Engineering

. Design : Support frame walkways, pipe rack and life-boat support are in progress.

. Structural : Drawings for stairways of modules 68 and 72 are complete.



- . Mechanical : Preliminary piping drawings have been issued.
- . Accommodation units : Most drawings have been issued approved for construction.

d) Construction

- . 90% of structural steel on the HDW yard in HAMBOURG has been sandblasted and received the prime coating.
- . All steels for modules 64, 67 and 69 have been cut.
- . Welding work is in progress on modules 64, 67 and 69.
- . The contractor is two weeks behind schedule but has decided to work two shifts instead of one and expects to be back on schedule in the middle of October.

3.22 TCP2 treatment modules

3,221 Structural design (job 2177)

- . Design and drafting of the sales gas metering frame is completed and drawings were issued approved for construction.
- . Power generation package pancakes 08 and 09 : Work has been centered on the design of erector installed items. The stress analysis of the finished structure is in progress.
- . The design of the pipe support frames in cellar deck area is also in progress (frames suspended from the support frame).
- . Underdeck stiffening for pipe supports in modules 01, 02, 03 and 04 is in progress.
- . Design studies were undertaken relative to :
  - Skidding of modules
  - Jacking of modules to level
  - Provision of temporary access inside modules during hook-up.
  - Interaction of modules with support frame.
  - Provision of sling platforms.
  - Requirements to modify padeyes to achieve level lifts.
  - Design slings and shackles.

- . Bridge : Most structural drawings have been issued AFC.
- . HP vent stack : Conclusion of the feasibility study made by McDERMOTT was sent to ELF NORGE for comments.
- . A meeting held on September 2, attended by McDERMOTT, BROWN & ROOT and ELF to discuss the design calculations of the module framing and their installation. Some clarifications were requested from McDERMOTT. Weighing, lifting skidding and sequence of installation were discussed and further meetings are to be held relative to these matters.

### 3.222 Process design (job 2169)

#### a) Process, mechanical and piping

- . NPD's approval has been received for firewater monitors and sprinkler heads as used on TP1.
- . Last issue of the P & I diagrams is being drafted.
- . Gas analysis and sampling were discussed with D.O.T.
- . Plant operation was checked with reference to a 1° tilt. Critical items were the glycol contactors and the glycol regeneration units.
- . Work has proceeded on the preparation of a scope of work for the onshore/offshore erection of the heating, ventilation and air conditioning systems.
- . Work has commenced on the review of vendor drawings for the vent stack.
- . Some problems are still outstanding with regards to BROWN & ROOT supplied material.
- . Drainage tie-ins are being discussed with BROWN & ROOT AND KE/TP.

#### b) Electrical

- . A scope of work including onshore and offshore electrical hook-up is being written and due for issue at the end of September.
- . Electrical distribution document QP, TP1, TCP2 : Work commenced on September 13, 1976 and is anticipated to be completed at the end of October.

- . Review of PARSONS PEEBLES and KONGSBERG drawings is being continued.

A problem has arisen regarding the possibility of PARSON PEEBLES to issue to site all the construction drawings which are urgently required. A meeting is to be held at McDERMOTT House on September 29, to discuss this problem and find the necessary answers.

c) Instrument

COMSIP work in progress is as follows :

- . loop diagrams, shutdown logic diagrams, shutdown schematics shutdown cabinet lay-out and wiring diagram, telemetry interface cabinet, computer and telemetry data list, local metering panels.

McDERMOTT HUDSON work in progress is as follows :

- . Discussions with DOE on the condensate metering.
- . Gas sampling system
- . Coordination with COMSIP
- . Drafting of instrument drawings
- . Fire detection logic diagrams are 80% complete.

Estimated percentages of completion on September 15 :	
. Structural design and engineering	: 65%
. Process design and engineering	: 70%
. Project management	: 41%



These packages are based on the manhours estimates to complete the job, presented to ELF NORGE in August 76. These manhours have not been accepted by ELF NORGE who asked McDERMOTT to review their estimates based on the change orders known to date. Manhours will be available from McDERMOTT at the beginning of October.



3,223 Construction of TCP2 treatment modules1. Fabrication at Orkanger

Percentages of completion for the week ending September 12, 1976 are as follows :

	Work completed	Work anticipated on S.B.V. schedule
Structure	57%	76%
Piping	74%	79%
Equipment	68%	80%
Instrument	2%	29%
Electrical	23%	54%
TOTAL	57%	70%

Manpower	321 productive
	35 staff
	<u>8 subcontractors</u>
TOTAL	364

The model arrived on site at the beginning of September, work is planned to re-start on the model on September 20.

2. Fabrication at EBERSUND

Load out of generator package 08 from EBERSUND was completed on Sunday August 22.

KARMOY STALINDUSTRI are progressing in the construction of the cellar deck units above shafts 1, 3 and 5.

Final inspection by DNV has been carried out on fire pump house in pancake 07, which has been shipped on September 10, 1976 in attendance of NOBLE DENTON to ORKANGER. The second shipment, fire pump house for steel deck area is scheduled to occur on September 24, 1976.

### 3.23 TCP2 compression

#### 1. Management

Amendment nr. 1 to contract S. 139 has been signed. It concerns the modification of the basic diagram as well as the modification of contractual time schedule,

Discussions are being held relative to amendment nr. 2 relative to electrical interconnections.

#### 2. Engineering

The technical evaluation of the proposals received for turbines and compressors is progressing normally. It is difficult to obtain some information from the suppliers, mainly concerning the weight of the equipment.

An alternative at 4000 Rpm has been requested from the compressor constructors in order to try to develop an alternative at such speed offered by one of the turbine constructors.

Specifications for the turbo-generators are in progress at KVAERNER TECHNIP.

### 3.24 Lines and connections

The choice relative to a company for the coating of the 26" pipe has not yet been made.

+++++





OPERATIONS	1974												1975												1976												
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
Delivery of Plates in ANTWERP (3 shipments)					•	•	•																														
Jacket & Support Frame Rolling																																					
Jacket & Support Frame Préfabrication																																					
Jacket Assembly & Load-Out																																					
Support Frame Assembly & Load-Out																																					
Flotation Tanks Fabrication																																					
Piles & Pile Followers Fabrication																																					
Living Quarters Framing																																					
Living Quarters Outfitting																																					
Control Room, Telemetry, Radio Installation																																					
Norwegian Satellite Communication Link Fabrication of Equipment																																					



LIVING QUARTERS PLATE<sup>m</sup>

elf  
NORGE

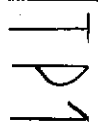
FRIGG FIELD  
PRODUCTION FACILITIES

ISSUED: 30 Sept 76

QP

OPERATIONS	1975												1976												1977													
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D		
CONCRETE STRUCTURE DRY DOCK																																						
CONCRETE STRUCTURE BUILT (DRY DOCK)																																						
CONCRETE STRUCTURE BUILT (DEEP WATER)																																						
DECK FABRICATION DECK TRANSPORTATION																																						
DECK INSTALLATION																																						
MATERIALS PROCUREMENT																																						
PREFABRICATION OF DECKS MODULES & PANCAKES FRAMING I/S - KSV																																						
FABRICATION OF MODULES & PANCAKES WITH THEIR EQUIPMENTS																																						
TRANSPORTATION OF (M) & (P) TO THE IN-SHORE POSITION																																						
M & P LIFTING AND INSTALLATION																																						
HOOK-UP CONNECTIONS AND PRE-COMMISSIONING OF (M) AND (P) IN THE IN-SHORE POSITION																																						
TOWING OF THE STRUCTURE WITH THE EQUIPMENT																																						
GROUTING																																						
HOOK-UP OFFSHORE LIFTING AND INSTALLATION OF BRIDGE																																						
TEMPORARY FACILITIES (CONSTRUCTION)																																						

OPERATIONS	1974												1975												1976													
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D		
Concrete Structure Graving Dock																																						
Concrete Structure 1 <sup>st</sup> Stage Construction																																						
Concrete Structure 2 <sup>nd</sup> Stage Construction																																						
Temporary Modules Fabrication																																						
Support Frame Rollins & Prefab																																						
Support Frame Assembly																																						
Loch Fyne Operation																																						
Deck Units Framing																																						
Deck Units Out Fitting																																						
Modules Framing																																						
Modules Outfitting																																						
Bridge TP1 - R F																																						



TREATMENT PLATFORM N°1

elf  
NORGE

FRIGG FIELD  
PRODUCTION FACILITIES

ISSUED: 30 Sept 76

TP1



