

ELF NORGE

F.I.T. BOTTOM HOLE PRESSURE

FIELD: FRIGG

WELL: 25/1-4

13/05/1974

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N.B. – Only the chapters marked with a cross appear in this report.

FLOPETROL

Base : STAVANGER
 Month - Year : 05/74

Customer : ELF NORGE

Service order N° : _____

Field : FRIGG

Well : 25/1-4

Zone tested : 2759,6m

Perforations from : and

to : 2760,5m

**SEQUENCE OF
EVENTS**

Date	Time	Operations
13/05/74		F.I.T. N° 1
	04.00	Ran in hole F.I.T. plus 2 X 5000 PSI bombs
	05.13	Opened flow line valve and set The tool at 2759,6m/RF
	05.14	Shout shaped charge
	05.27	Closed seal valve
	05.28	Pulled F.I.T. tool
		F.I.T. N° 2
	08.45	Ran in hole F.I.T. plus 2 X 5000 PSI bombs
	09.37	Opened flow line valve and set The tool at 2760,5m/RF
	09.40	Shout shaped charge
	10.05	Closed seal valve
	10.08	Pulled F.I.T. tool
		Read charts

REMARKS

Chief Operator
H. CABANIS

COMMENTS

- Only one AMERADA was available for the two F.I.T. run, the 3h clock stopped on the second AMERADA.

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BOTTOM HOLE PRESSURE ELEMENT CALIBRATION FORM

FLOPETROL

Calibration no 1

Date: 5/05/74

Miscellaneous Information

Pressure Element n°: 25207 Range: 5000 Gauge (Inner Housing) n°: 10581
 Clock n°: _____ Hours: _____ Constructor: _____ { Constructor: COLEMAN Range: 10000
 Dead Weight Testers { Constructor: _____ Range: _____

Calibration Operation

Base line drawn at atmospheric pressure Reading $D_0 = \underline{0.0000}''$ Temp. = ambient
 Reference line reading $D_R = \underline{D0}$ Reference pressure $P_R = \underline{\text{atmospheric}}$ Temp. = ambient
 Max. Temperature expected = 110° C Calibration Temp. = 110° C Drawing of all calibration steps { With a crank
 { With a clock
 Equivalent Pressure p of level difference between DWT and the bellows during calibration
 Level difference $h = \underline{\hspace{2cm}}$ } $p = \underline{\hspace{2cm}}$ { plus in case of DWT above bellows
 Specific gravity of oil $d = \underline{\hspace{2cm}}$ } { minus in case of DWT beneath bellows

Results of Calibration reading

P (Dwt)	D (1)	Y (4)	ΔY (5)	Y^2	YP	$P_c = KY + a$	Non linearity Correction $C = P - P_c$
PST		INCHES	INCHES	Units on this line		PST	PST
3000		1.1349	0.1854			3002.02	-2.02
3500		1.3203	0.1876			3497.70	+2.30
4000		1.5079	0.1874			3999.25	+0.75
4500		1.6953	0.1872			4500.27	-0.27
5000		1.8825				5000.76	-0.76
20000		7.54090	Σ	11.72280	31098.700	$\Sigma^+ = 3.05$ $\Sigma^- = -3.05$	

Calculations by least square Method

$A = \frac{\Sigma P}{n} = \underline{4000}$ $B = \frac{\Sigma Y}{n} = \underline{1.508180}$
 $D = \frac{\Sigma (YP)}{\Sigma Y} = \underline{4124.003766}$ $C = \frac{\Sigma (Y^2)}{\Sigma Y} = \underline{1.554562}$
 $K = \frac{D - A}{C - B} = \underline{2673.532 \text{ PSI/''}}$
 $a = A - BK = \underline{-32.167 \text{ PSI}}$ $a = D - CK = \underline{-32.167 \text{ PSI}}$

- (1) D = Reading on the chart reader for the pressure P
- (2) D_0 = Reading for the base line
- (3) D_R = Reading for the reference line
- (4) Y = Deflection { $D - D_0$ if no reference line
 $D - D_R$ if reference line drawn
- (5) ΔY = For checking
- (6) n = Number of calibration steps

REMARKS

Read the uppers steps of the calibration to calcul the hydrostatic pressure

Chief Operator

H. CABANIS

Final results of Calibration

K = 2673.532 PSI/''
 $a + p = \underline{-32.167 \text{ PSI}}$

$D_R - D_0 = Y_R = \underline{\hspace{2cm}}$ $P_R = \underline{\hspace{2cm}}$ $P_{RCE} = \underline{\hspace{2cm}}$

- Pressure recorded with single bombs
- Pressure recorded with tandem bombs
 - 71 - Upper bombs
 - 72 - Lower bombs

$$P = KY + a + p + C$$

K = Element modulus
 Y = Deflection for pressure P
 a = Zero or reference pressure correction
 C = Element curvature

READING USING BASE LINE

$Y = D - D_0$
 D = Reading for pressure P
 D₀ = Base line reading
 K, a, p and C are obtained from calibration

READING USING REFERENCE LINE

$Y = D - D_R$
 D = Reading for pressure P
 D_R = Reference line reading for pressure P_R
 $a = P_{RCE} =$ Calculated pressure for reference line
 K, P_{RCE}, p and C are obtained from calibration

FLOPETROL

Base : STAVANGER
Date : 13/05/74

Customer : ELF NORGE Well : 25/1-4
Service Order No : _____ Zone tested : _____
Field : FRIGG

BOTTOM HOLE PRESSURE ELEMENT Chart Reading Form

Ref. Time	True Cumulated Time	Choke Size	Depth	Well head Pressure DWT or Gauge	D	Y	non linearity Correction C *	P = KY+a+p+C	REMARKS	
hours			meters			inches		PSI	Units on this line	
				F.T.T.	N° 1					
04.00			Ran in hole							
05.13			Opened flow line valve and set the tool							
05.14			Short shaped charge							
			Vibrations of the stylus (read one mini and one maxi before stabilisation of the pressure)							
05.15			MINIMUM			1.8178		4828		
05.17			MAXIMUM			1.9241		5112		
05.18						1.8419		4892		
05.19						1.9450		5168		
05.20						1.9466		5172		
05.25						1.9453		5169		
05.27						1.9453		5169		
"			Closed seal valve							
05.28						1.9503		5182		
			<u>Remark: Seal failure from the beginning to the end of the chart, recorded the hydrostatic pressure of the mud.</u>							

Pressure Element No : 25207 Range : 5000 Constructor : AMERADA
Clock No : 21481 Hour : 3 Type : _____ Gauge (Inner housing) : 10581
Other Devices run at the same time : another 5000 PSI bomb

Run number : 1
Depth origin : RF
Depth of pressure Element : 2753,6m
Perforations : _____
Tubing size : 95/8
Tubing shoe : 1907m

Chart Reading { Calibration no : 1 Date : 5/05/74 { Before running in
 Computed from former Calibration no : _____ Date : _____ { After pulling out
P_R = _____ P_{RCE} = _____
K = 2673,532 PSI
a_{xxx} = -32,167 PSI

Base Line reading D₀ = 0.0000" Reference Line reading D_R = DO
Maximum Temperature recorded = _____ D_R - D₀ = 0.0000"

Chief Operator
H. CABANIS

* On request of Customer and when the calibration range is significant for non linearity correction.

Symbole : 1107 GD.02

FIT nbr I

FRIGG 25/1-4

PE 5000 nbr 25207

3rd clock nbr 21481

5000

4000

3000

2000

1000

5.13 5.15 5.17 5.18 5.19 5.20 5.25 5.27 5.28

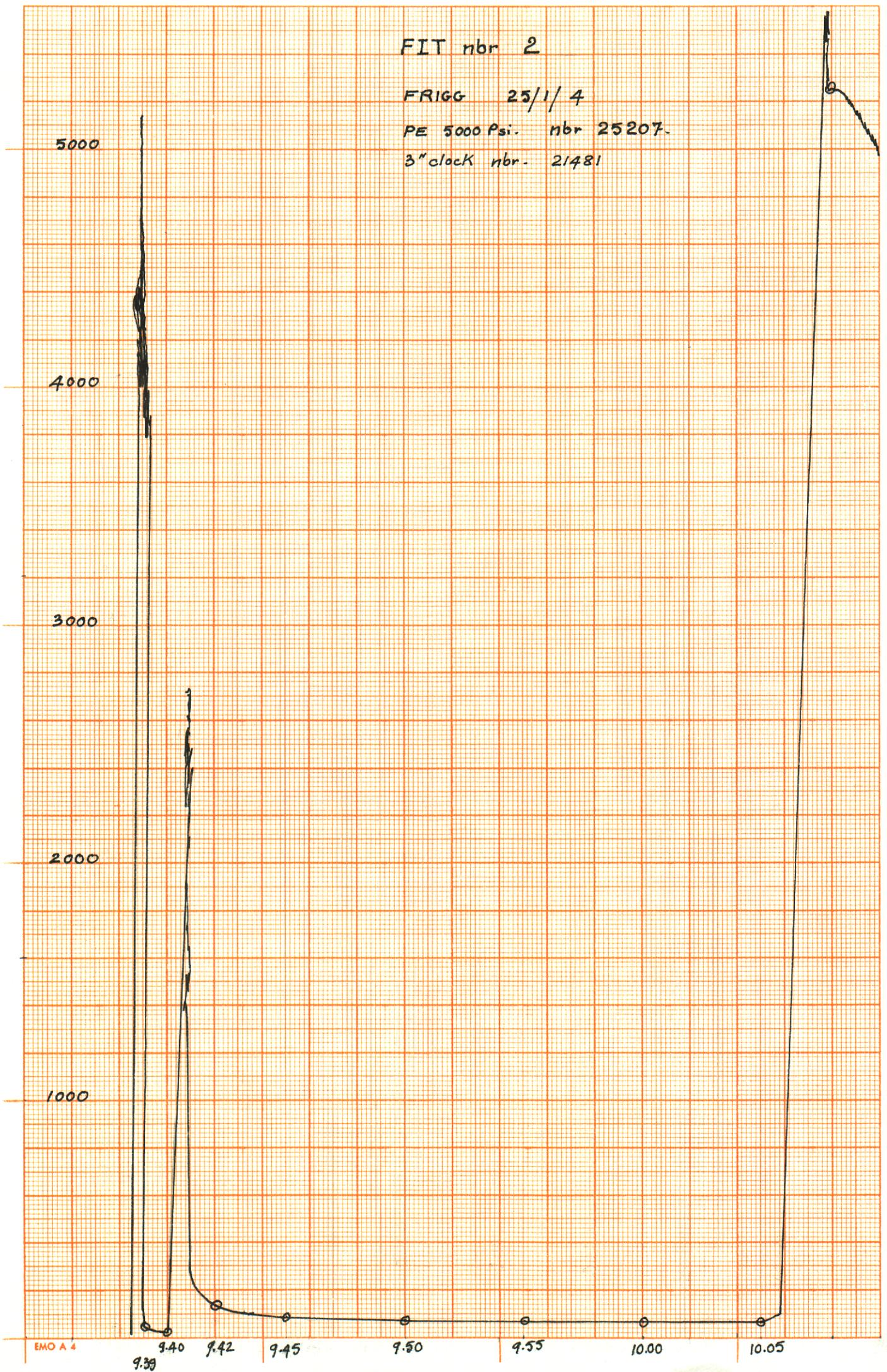


FIT nbr 2

FRIGG 25/1/4

PE 5000 Psi. nbr 25207.

3" clock nbr. 21481



Division : DEN



Center : STAVANGER

Service order :

AMERADA CHART

Customer : ELF NORGE

Field : FRIGG

Well : 25/1-4

Date : 13/05/74

Remarks: Calibration plus B.H.P.

Run N° 1

Pressure element 5000 psi n° 25207

Clock 3.00 hours n° 21481

Division : DEN



Center : STAVANGER

Service order :

AMERADA CHART

Customer : ELF NORGE

Field : FRIGG

Well : 25/1-4

Date : 13/05/74

Remarks: Run N° 2

Pressure element 5000 psi n° 10581

Clock 3.00 hours n° 21481

Division : DEN



Center : STAVANGER

Service order :

AMERADA CHART

Customer : ELF NORGE

Field : FRIGG

Well : 25/1-4

Date : 13/05/74

Remarks: Calibration plus B.H.P.
Run N° 1

Stopped of the clock

Pressure element 5000 psi n° 28701

Clock 3.00 hours n° 10560

Division : DEN



Center : STAVANGER

Service order :

AMERADA CHART

Customer : ELF NORGE

Field : FRIGG

Well : 25/1-4

Date : 13/05/74

Remarks: Run N° 2

Pressure element 5000 psi n° 28701

Clock 3.00 hours n° 10560