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ENVIRONMENTAL DATA GULLFAKS C. ANNUAL SYNTHESIS/ANALYSIS 1995

Knut A. Iden and Helle Tønnessen

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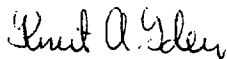
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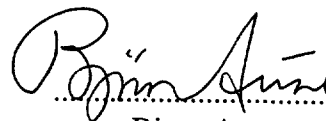
SUMMARY

The history of the environmental data system at Gullfaks C is presented very shortly. The system of to day is described with regard to the main environmental parameters. The performance in 1995 is described. The measurements of the main environmental parameters in 1995 are summarised. Frequency tables for wind speed /wind direction and significant wave height (Hm0)/peak period (Tp) are computed. Probability values for different return periods are computed for wind speed and significant wave height.

SIGNATURE



.....
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.....
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GULLFAKS C

ANNUAL SYNTHESIS/ANALYSIS 1995

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1 Introduction

This report is a summary of the environmental conditions recorded at the Gullfaks C platform during 1995. The data has been recorded by Statoil a/s, the operator of the Gullfaks field.

Oceanographic and meteorological data has been measured since November 1989 at Gullfaks C giving information of the environmental conditions the platform are influenced by. The regularity of the recording system was variable in the beginning. The data reported from the platform were in periods actually measured at platform Stafjord A. The storing system for the instrumental data was operational in November 1990 but December 1990 is the first one with data coverage near 100 %. Until December 1992 the EMS system archived hourly values and data was transferred to DNMI in the data format DF005. In December 1992 the format was changed to DF015 and later to DF022. From December values are recorded each 20 minute.

The collection of environmental data related to the oil activity is specified in the "Acts, regulations and provisions for the petroleum activities" issued by the Norwegian Petroleum Directorate.

The environmental data are collected in order to :

- Judge the safety of the installations
- Determine the long-term effects of the environment on the structures
- Improve construction requirements
- Help to plan field operations.

Three hourly weather reports are produced routinely and submitted to DNMI in the form of a coded message (SYNOP/SHIP message). The SHIP messages are important for the weather forecasting system. The three hourly weather reports are also stored at DNMI in the general archive serving climatological purposes.

At Gullfaks C the complete set of parameters available in the EMS are stored each 20 minute. Each month these data are retrieved from the system and copied to a streamer tape.

The streamer tape is sent to MIROS a/s where the data are checked. Quality controlled data are on a monthly basis sent to DNMI together with a report. The parameters available in the complete DF022 format is given in Appendix A.

The data controlled by MIROS a/s are the basis for this annual synthesis report. It is an established practice that the first permanent platform in a new area is instrumented to record the environmental conditions. In the Statfjord/Gullfaks region this responsibility was first given to the platform Statfjord A. From this site measurements started in 1978. The reporting of environmental data from the area was transferred to the platform Gullfaks C in November 1989. Gullfaks C was from this time established as an operational centre for the helicopter traffic of the area.

2 The data collecting system (GFC-EMS)

2.1 Instrumentation

The EMS is delivered by MIROS A/S and all parameters regarding waves are measured by a MIROS wave radar. The meteorological parameters are measured by instruments from other firms. The different instruments are interfaced to the EMS with an exception for the sea temperature. This parameter is measured by personnel on board the stand by vessel each 3 hour and reported to the platform.

The main environmental parameters are measured with the following sensors :

WIND SENSORS

Manufacturer	Vaisala
Type	Wind speed and wind direction sensors
Model	WAA 15 and WAW 15
Range	0-75 m/s 0-360 °
Location B	Top of derrick 142.5 m above mean sea l. (SHIP message)
Location A	Top of antenna tower 99 m above mean sea l. (METAR)

AIR TEMPERATURE SENSOR

Manufacturer Vaisala
 Type Platinum Resistance Element
 Model DTS 12
 Range -100 - +100 °C
 Location Top of the module LQ-L13 73 m above mean sea l.

AIR HUMIDITY SENSOR

Manufacturer Vaisala
 Type Humicap
 Model HMP 30U
 Range 0 - 100 % RH
 Location Top of the module LQ-L13 73 m above mean sea l.

AIR PRESSURE SENSOR

Manufacturer Vaisala
 Type Vaisala aneroid
 Model PA 21
 Range
 Location 77.5 m above mean sea l.

WAVE SENSOR

Manufacturer MIROS a/s
 Type MIROS Wave Radar
 Model SH-001/03, CP-6506
 Location SW corner of the platform 69 m above mean sea l.
 Range

Max. wave height	0-40 m
Signif. wave height	0-20 m
Period, mean and peak	3-30 s
Direction, mean	0-360 °
Direction, spread	15-90 °

2.2 Performance and data coverage

The data coverage in 1995 for the main parameters are given in table 2.1. As mentioned above, the sea temperature (Tw) is measured by the personnel of the stand by vessel and reported from Gullfaks C to DNMI on a 3 hourly basis in the SHIP message. The data coverage is near 100 % throughout the year for this parameter. All the other parameters are logged in the GFC-EMS system each 20 minute. The data coverage for these parameters vary through the year. This is especially so for the wave parameters.

In March the wave radar was out of order from the 19 until the 31 explaining the low data coverage for the wave data for this month. In some periods of May , August and September, the wave data is missing due to very low wind speed resulting in the absence of capillary waves which is a necessity for the wave radar measurements.

The logged data are copied from the EMS computer to a streamer tape each month. Unfortunately, an error has existed in the copying routine resulting in loss of data. In June most of the data was lost and the data coverage is also especially low in July and November due to the same reason.

On January 1 one of the situations with most severe weather conditions of the year occurred. The situation is described below. Unfortunately the logged data was lost due to the error in the copying routine mentioned above. The three hourly SHIP data are thus used when describing this situation.

Table 2.1 Data coverage in percent for the main parameters at Gullfaks C in 1995.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
T	95	100	96,5	97,3	90	14,4	66,1	97,6	99,6	99,1	41,4	99,4	83,2
Tw	94	99,6	98,4	98,3	96,4	96,3	100	99,2	98,8	99,6	100	99,6	98,3
Hm0	94,8	99,8	58,5	96,7	84,9	14,2	64,2	91,3	89,2	95,6	41	99	77,5
Hmax	94,8	99,8	58,5	96,7	84,7	14,2	64,2	91,2	89,2	95,6	41	99	77,5
FF	95	100	99,2	97,3	90,3	14,4	66,1	97,6	99,6	92	41,4	100	82,8
FG	95	100	99,2	97,3	90,3	14,4	66,1	97,6	99,6	92	41,4	99,9	82,8

3. Special weather events in 1995

In the period 1980-1994 there are about 12 events recorded in the Staffjord/Gullfaks area where the significant wave height was 10 m or higher. The criterion "significant wave height ≥ 10 m" has been applied to determine weather events of some interest. In 1995 there are 6 different situations where the criterion is fulfilled. This is the highest number of events of this kind for a single year in the record.

January 1995 started with the passing of a strong depression. At 12 UTC the depression centre was situated over Southern Sweden. Between the depression and a ridge west of Ireland -Iceland a very strong northerly wind field was created. The wind resulted in significant wave heights above 10 m. The weather map valid for 12 UTC January 1 is presented in figure 3.1. Unfortunately the detailed data are missing on this occasion. Our source of information is therefore the 3 hourly data transmitted to DNMI as SHIP messages in real time. Wind speed and significant wave height are plotted in figure 3.2. Conditions were favourable for wave heights to increase southward in the North Sea in this situation. At Ekofisk significant wave height of 11.8 m was measured by a Datawell wave rider buoy.

On the fifth of January another atmospheric situation created very high sea at Gullfaks C. In this situation, as can be seen in figure 3.3 a high pressure centre was located over Estonia and a deep depression was approaching from West creating very strong southerly wind in the Gullfaks area. Significant wave height reached 11.9 m in this situation.

Details about wind speed and significant wave height are plotted in figure 3.4 for the whole month of January. As can be seen from the plot the significant wave height are above 10 m at both 18 and 20. The weather map for the 18 is given in figure 3.5 showing weather conditions very similar to those of January 5.

The highest wind speed was measured on January 31 when the wind speed increased from 1.3 m/s to 30.1 m/s in 18 hour. Again a depression is approaching from west creating a very strong south westerly wind field as can be seen in figure 3.6. About 13 UTC on the 31 significant wave height was 12.6 m at Gullfaks C.

The last situation in 1995 fulfilling the criterion is from March 11 when significant wave height arose to 10.1 m about 12 UTC. The weather conditions on this occasion are very similar to those of January 5.

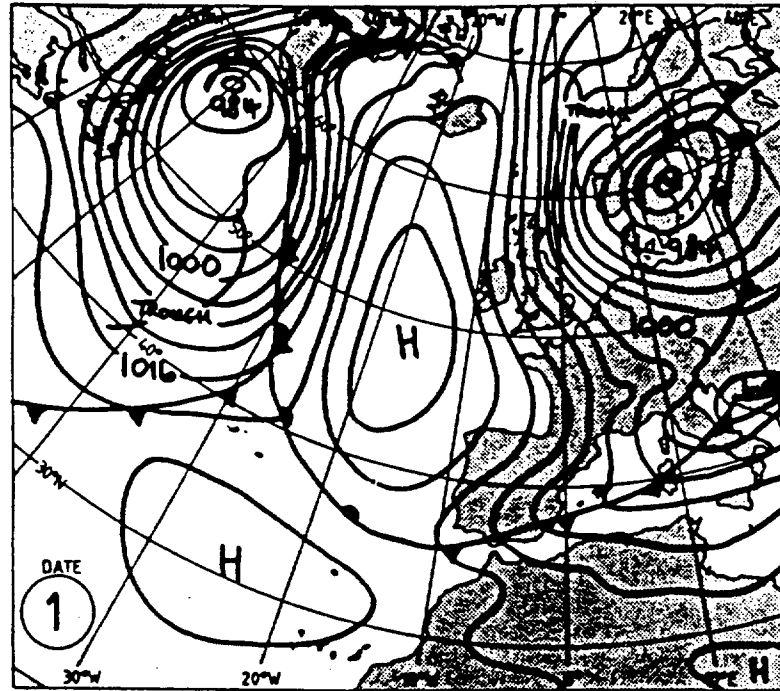


Figure 3.1 Weather map valid for 12 UTC January 1, 1995.

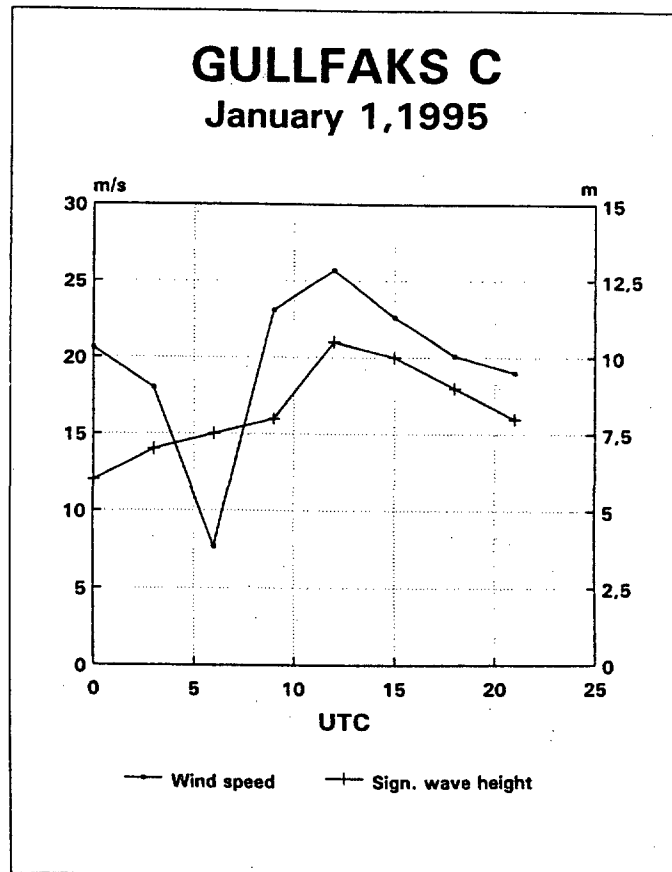


Figure 3.2 Wind speed and significant wave height January 1, 1995.

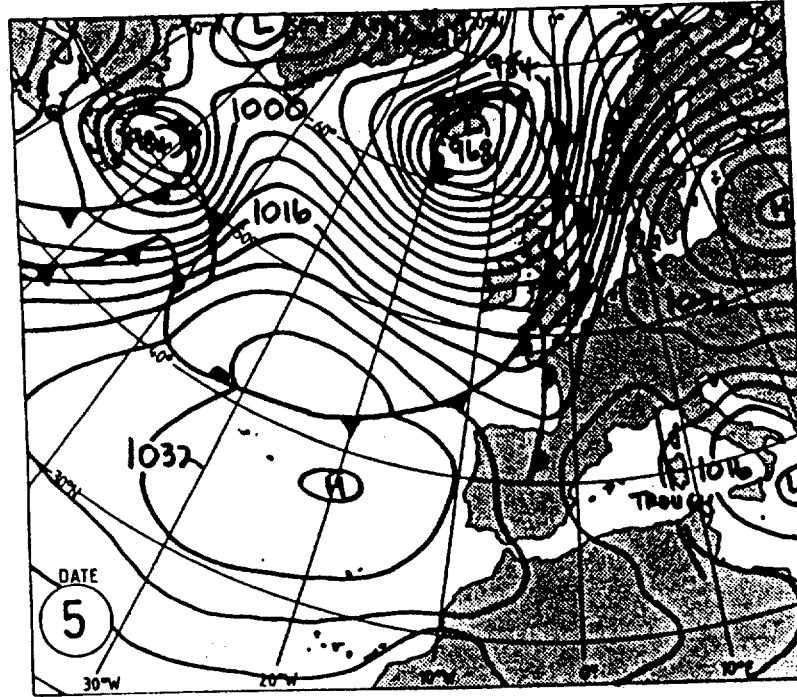
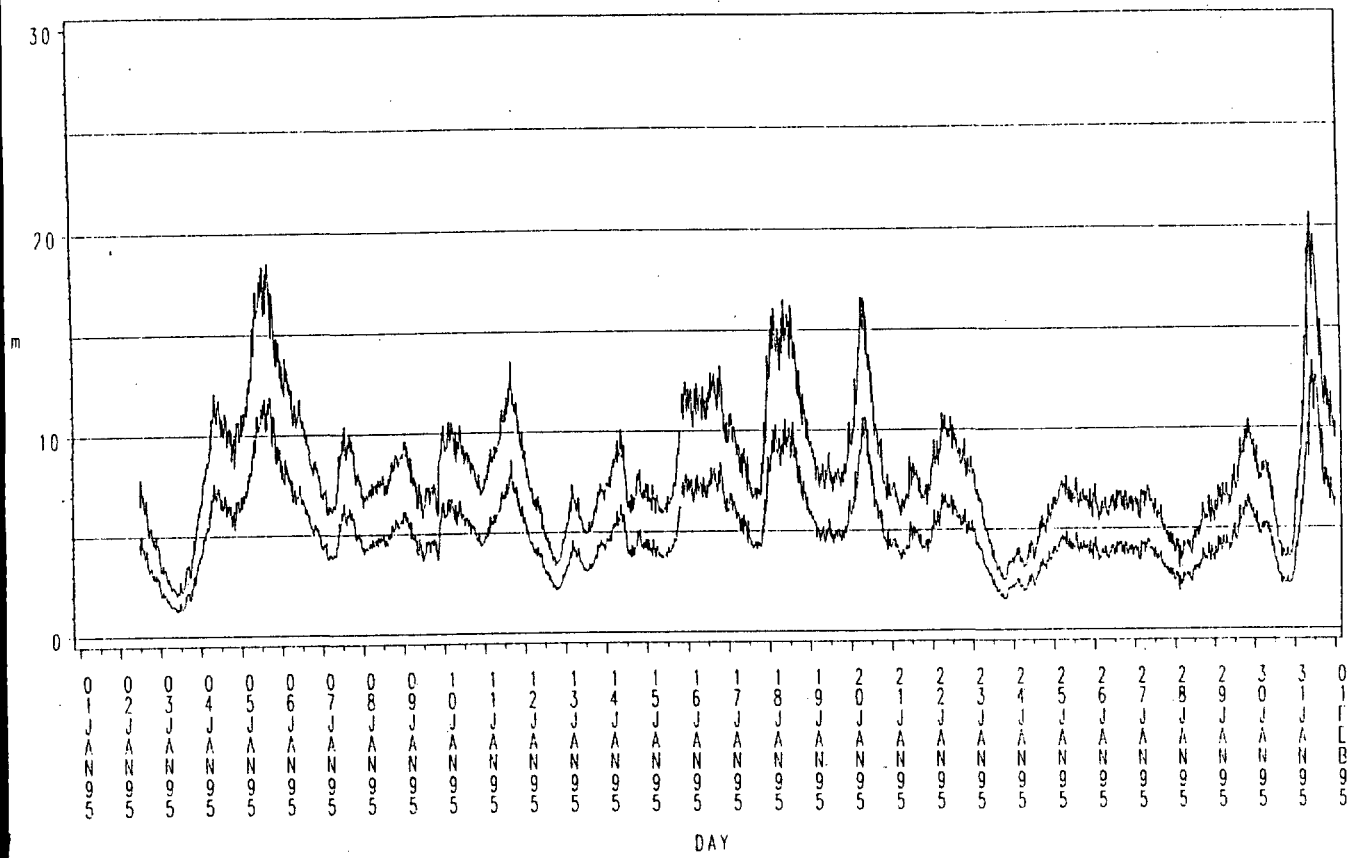


Figure 3.3 Weather map valid for 12 UTC January 5, 1995.

Hmo and Hmax measured by MIROS wave radar.



GULLFAKS C 1995

Wind speed (m/s) measured in top of derrick reduced to 10 m a.m.s.l. (10 min mean)

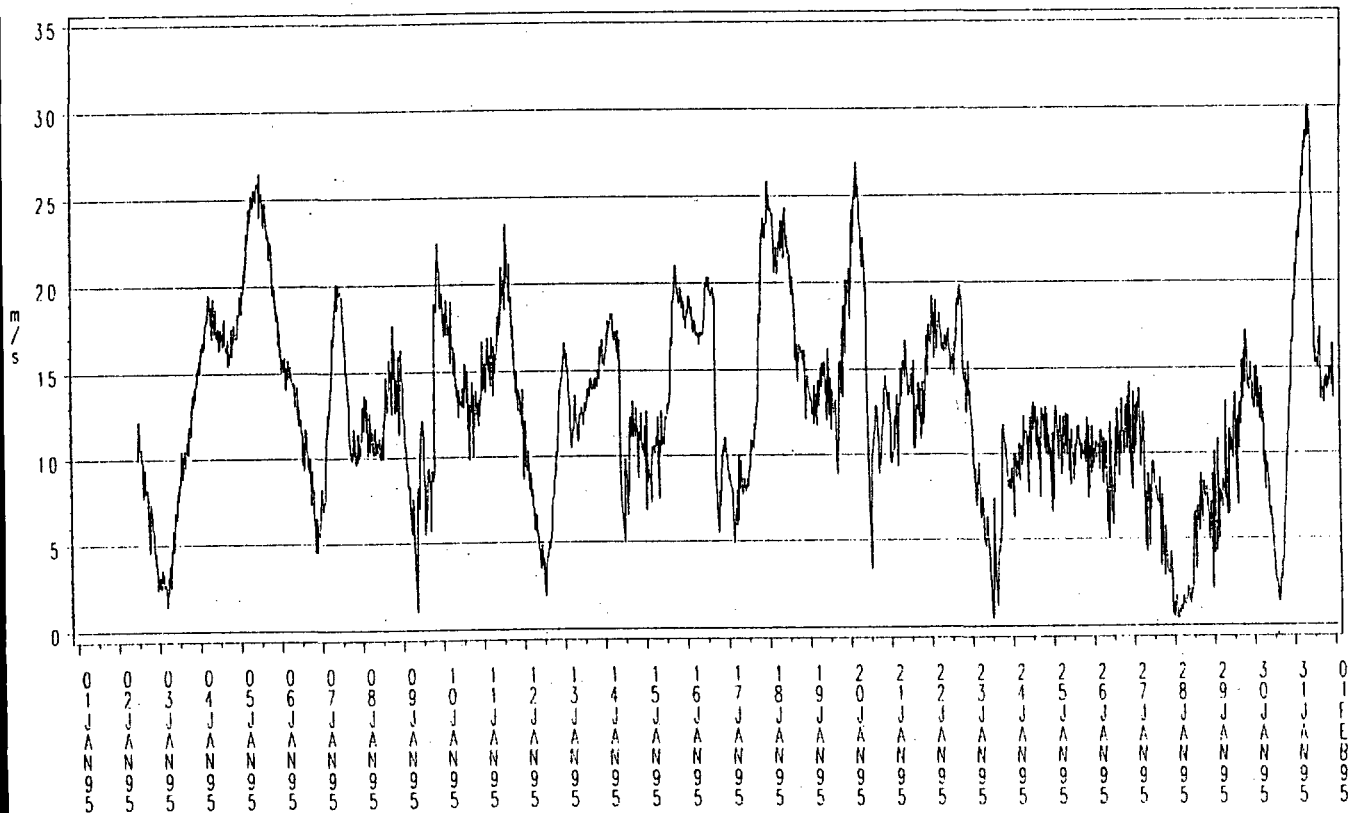


Figure 3.4 Wind speed and significant wave height each 20 minute in January 1995.

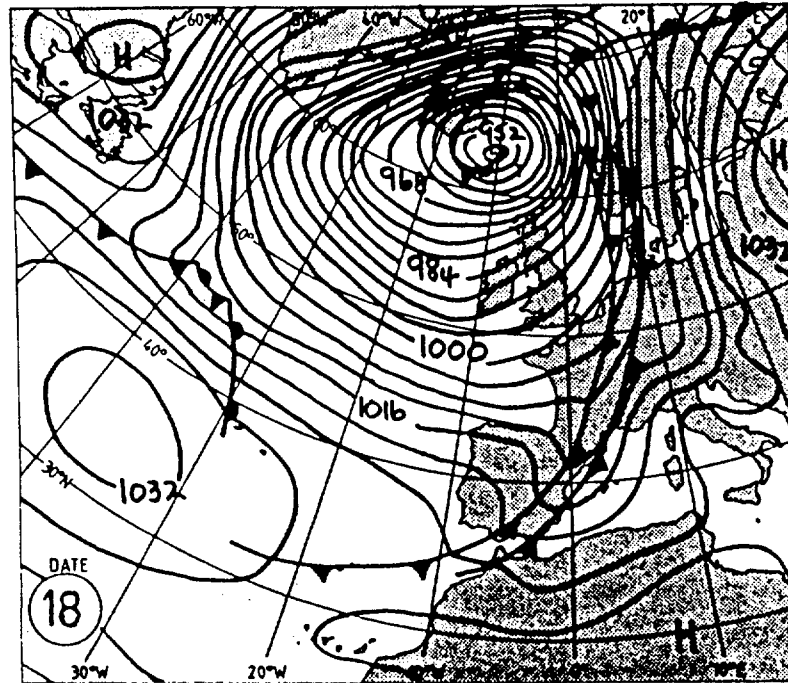


Figure 3.5 Weather map valid for 12 UTC January 18, 1995.

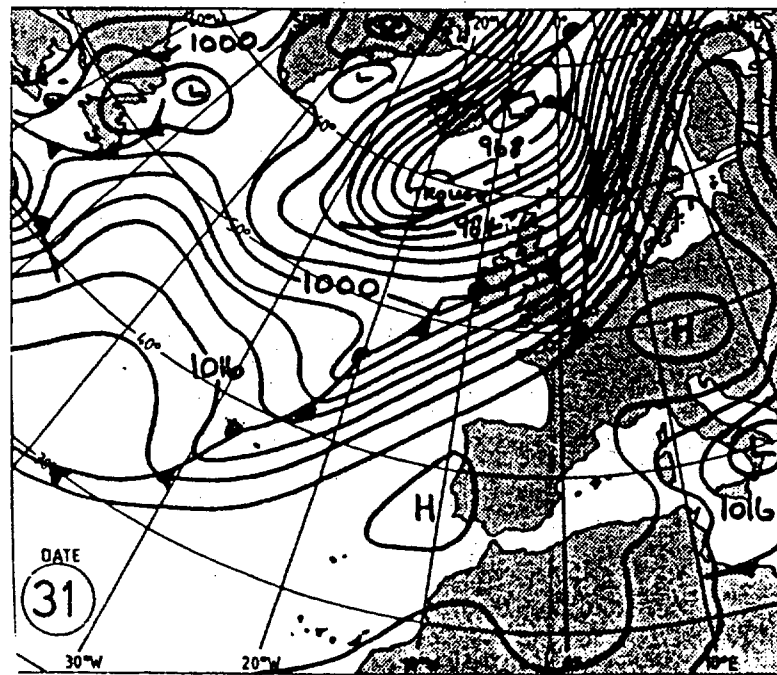


Figure 3.6 Weather map valid for 12 UTC January 31, 1995.

4. Results

4.1 Climatological summary Gullfaks C 1995

A short summary of the main parameters measured at Gullfaks C is presented in table 4.1.

The parameters presented are listed below.

T = Air temperature measured 73 m a.m.s.level

Tw = Sea temperature measured by the stand by vessel

U = Air humidity in %

QFF = Air pressure measured 77,5 m above m.s.l. reduced to m.s.l.

Hm0 = Estimate of significant wave height

Hmax = Estimate of maximum wave height

FF = Wind speed (10 min mean) measured in top of derrick (142 m) and reduced to reference level 10 m a.m.s.level

FX = Maximum wind speed (10 min mean) ...

FG = Gust wind speed (3 sec mean) measured in top of derrick (142 m) and reduced to reference level 10 m a.m.s.level

The reduction coefficient applied both for FF, FX and FG in the GFC-EMS is : $x=(10/142)**0.13=.708$

The reduction coefficient for the gust wind speed (FG) taken equal to the reduction to the 10 min mean wind speed (FF) is not correct. In most cases this will give a too high reduction. The reason that this is not changed is not to introduce inhomogeneities in the archive. It is easy to reconstruct the measured value in the derrick 142 m a.m.s.l. and give it a more correct treatment when needed.

The parameters are stored each 20 minute in the existing system at Gullfax C. The 10 min mean wind speed (FF) represents the last 10 min of the 20 min period. The maximum of the 10 min mean may have occurred in the period not presented. The maximum 10 min mean of the wind speed (FX) is recorded independently and updated each 3 hour. As can be seen of the table the maximum of FX is thus \geq the maximum of FF.

Table 4.1 Summary of the main parameters measured at Gullfaks C in 1995.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Y.
T													
Max	8.8	8	8	8.7	12.8	13.1	15.8	17.4	19.3	13.4	10.1	9.8	19.3
Mean	4.7	3.7	3.6	4.7	6.6	10.1	12.8	12.6	12.5	9.8	7.6	4.3	7.4
Min	-1	-3.5	-3.8	-2.1	0.7	8.5	8.9	8.8	4.3	3.8	2.1	-3.9	-3.9
Cover.	95	100	96.5	97.3	90	14.4	66.1	97.6	99.6	99.1	41.4	99.4	83.2
Tw													
Max	9	8.2	8	7.8	8.7	12.8	14.1	14.2	14.6	11.2	9.9	9.6	14.6
Mean	8.5	7.8	7.7	7.2	7.7	10.1	12.3	13.3	13.2	10.5	9.4	8.8	9.7
Min	7.7	6.8	6.9	6.1	6.2	8	11	12.3	10.8	9.6	7.5	6.5	6.1
Cover.	94	99.6	98.4	98.3	96.4	96.3	100	99.2	98.8	99.6	100	99.6	98.3
U													
Max	100	100	100	100	100	100	100	100	100	98	97	99	100
Mean	79	81	82	78	83	83	92	94	82	86	87	74	83
Min	47	42	45	41	26	52	56	61	25	58	48	44	25
Cover.	95	100	96.5	97.3	76.3	14.4	59.2	92.9	98.8	99.1	41.4	99.4	80.9
QFF													
Max	1028.6	1018.9	1029.8	1033.2	1024.7	1034.2	1023.8	1026.7	1027	1024.9	1029.2	1044.9	1044.9
Mean	998	990.6	997.9	1013	1013.6	1022.8	1012.3	1017.8	1009	1006.4	1011.1	1020.9	1008.3
Min	968.6	960.2	964.2	988.7	1001.5	1016.3	998.1	991.5	979.9	984.9	986.9	996.1	960.2
Cover.	94.4	98.8	95.5	96.4	89.9	14.4	66.1	97.2	99	98.4	41.3	98.2	82.5
Hm0													
Max	13.3	7.3	10.1	6.1	4.6	1.7	3.4	3.2	7.8	7.9	6	7.4	13.3
Mean	5.1	3.8	3.5	2.8	1.8	1.1	1.4	1.4	2.2	3.4	2.9	2.9	2.8
Min	1.2	1	0.1	0.6	0.5	0.6	0.4	0.4	0.6	1	0.9	1.05	0.1
Cover.	94.8	99.8	58.5	96.7	84.9	14.2	64.2	91.3	89.2	95.6	41	99	77.5
Hmax													
Max	20.7	11.6	15.7	9.6	7.3	2.8	5.5	5.2	12.3	12.6	9.6	11.7	20.7
Mean	8	6.1	5.5	4.4	2.9	1.7	2.4	2.3	3.6	5.4	4.6	4.6	4.5
Min	2	1.6	0.2	1	0.9	0.9	0.7	0.7	0.9	1.6	1.5	1.7	0.2
Cover.	94.8	99.8	58.5	96.7	84.7	14.2	64.2	91.2	89.2	95.6	41	99	77.5
FF													
Max	30.1	22.7	24.4	20.1	16.9	9.7	14	13.6	23.1	21.9	18.2	19.6	30.1
Mean	12.7	10.2	10.9	8.3	7.4	5.2	6.7	6	6.7	10.6	8.5	7.4	8.7
Min	0.4	0.6	0.4	0.4	0.1	2	0	0	0	0	0.2	0	0
Cover.	95	100	99.2	97.3	90.3	14.4	66.1	97.6	99.6	92	41.4	100	82.8
FX													
Max	30.8	22.7	24.7	21.1	17.2	10.1	14.3	14	23.2	22.4	18.5	19.7	30.8
Cover.	95	100	99.2	97.3	90.3	14.4	66.1	97.6	99.6	92	41.4	100	82.8
FG													
Max	34	26.6	27.5	23	18.4	11	15.1	15.4	26.1	25.6	21.1	21.8	34
Mean	14.5	11.8	12.5	9.5	8.4	6.1	7.3	6.8	7.5	11.8	9.5	8.8	9.9
Min	0.9	1.3	1.1	0.9	0.6	2.3	0.1	0	0.6	0.1	0.6	0	0
Cover.	95	100	99.2	97.3	90.3	14.4	66.1	97.6	99.6	92	41.4	99.9	82.8

4.2 Frequency tables wind speed/wind direction

The computations are based on data for the period 1993-1995. The reason for this is the change in storing frequency from December 1992. Until November 1992 only hourly values are available. From December 1992 measurements exist each 20 minute. To analyse the complete series from December 1990 - December 1995 we had to reduce the data set to hourly values for the period after December 1992.

In this report we have considered it more appropriate to use the complete data set stored after December 1992.

Norwegian Meteorological Institute
Climate department

Maritim station: GULLFAKS C
Observation period: 1990.12 --
Height of station: --
Position: 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

January 1993- 1995

FF	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.
		15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	345.0			
		Number of calms														
0.0-	1.9	7	9	9	20	18	8	3	2	10	10	5	4	105	1.64	1.66
2.0-	3.9	15	22	9	12	16	16	17	45	27	14	34	38	265	4.14	5.80
4.0-	5.9	29	40	34	63	44	28	22	26	31	35	80	79	511	7.99	13.78
6.0-	7.9	36	39	64	89	21	61	39	49	36	45	67	134	680	10.63	24.41
8.0-	9.9	60	42	15	4	8	45	74	76	87	60	71	134	676	10.56	34.97
10.0-	11.9	54	73	3	.	18	81	101	123	153	106	72	139	923	14.42	49.40
12.0-	13.9	37	38	.	.	.	77	162	137	220	92	24	107	894	13.97	63.37
14.0-	15.9	19	4	.	.	11	99	160	120	133	82	35	58	721	11.27	74.64
16.0-	17.9	9	.	.	.	33	96	159	162	89	72	23	63	706	11.03	85.67
18.0-	19.9	12	3	.	.	21	29	141	81	79	38	16	50	470	7.34	93.01
20.0-	21.9	8	.	.	.	3	32	70	6	25	19	12	28	203	3.17	96.19
22.0-	23.9	1	.	.	.	5	33	60	2	3	14	4	9	131	2.05	98.23
24.0-	25.9	.	.	.	.	1	18	55	1	3	3	.	1	82	1.28	99.52
26.0-	27.9	.	.	.	.	.	2	12	.	1	.	.	.	18	0.28	99.80
28.0-	29.9	.	.	.	.	.	.	10	.	.	.	.	.	10	0.16	99.95
30.0-	31.9	.	.	.	.	.	.	1	.	.	.	.	.	2	0.03	99.98
32.0-	33.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	99.98
34.0-	35.9	.	.	.	.	.	.	.	.	.	.	.	.	1	0.02	100.00
>=36.0		.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
Sum		287	270	134	188	199	625	1086	830	897	593	443	846	6399		
Rel. fr.		4.5	4.2	2.1	2.9	3.1	9.8	17.0	13.0	14.0	9.3	6.9	13.2			
Cum. fr.		4.5	8.7	10.8	13.7	16.8	26.6	43.6	56.6	70.6	79.8	86.8	100.0			
Max. FF		22.4	18.9	11.2	8.9	24.2	26.9	30.0	24.1	26.1	26.7	22.6	34.5			
Mean FF		10.2	8.7	6.0	5.3	10.1	13.6	15.5	12.9	12.8	12.6	9.6	11.0			
St.dev. FF		4.5	3.5	2.1	1.9	6.5	5.5	5.3	4.5	4.2	4.9	4.8	4.9			

Statistics:

Minimum FF 0.1
DD 71.0
Date 29.01.1994 08 UTC Date 23.01.1994 06 UTC
Maximum FF 34.5
DD 319.2
Mean FF 12.1
St.dev. FF 5.3

DATA COVERAGE: 95.6%

Norwegian Meteorological Institute
Climate department

Maritim station: GULLFAKS C
 Observation period: 1990.12 --
 Height of station: --
 Position: 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

February 1993- 1995

FF	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.
		15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	345.0	1	0.02	
		Number of calms														
0.0-	1.9	7	27	50	58	49	18	4	16	19	3	9	14	274	4.53	4.55
2.0-	3.9	12	19	61	25	25	37	46	68	57	66	41	37	494	8.18	12.73
4.0-	5.9	28	57	58	44	19	51	89	69	61	83	107	76	742	12.28	25.01
6.0-	7.9	37	72	73	31	14	53	107	136	96	88	96	101	904	14.96	39.97
8.0-	9.9	18	58	29	3	1	35	253	82	88	71	52	119	809	13.39	53.36
10.0-	11.9	11	29	12	15	8	45	175	115	129	86	52	139	816	13.51	66.87
12.0-	13.9	18	9	1	3	7	120	213	82	110	68	34	121	786	13.01	79.87
14.0-	15.9	14	1	1	1	4	113	199	72	67	57	48	83	659	10.91	90.78
16.0-	17.9	3	2	1	1	2	38	87	38	35	61	31	32	330	5.46	96.24
18.0-	19.9	1	1	1	1	1	28	29	9	26	22	21	21	156	2.58	98.82
20.0-	21.9	1	1	1	1	1	19	4	3	19	1	2	5	54	0.89	99.72
22.0-	23.9	1	1	1	1	1	16	1	1	1	1	1	1	17	0.28	100.00
24.0-	25.9	1	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00
26.0-	27.9	1	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00
28.0-	29.9	1	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00
30.0-	31.9	1	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00
32.0-	33.9	1	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00
34.0-	35.9	1	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00
	>=36.0													0	0.00	100.00
Sum		149	274	285	180	129	573	1206	690	707	607	493	748	6042		
Rel. fr.		2.5	4.5	4.7	3.0	2.1	9.5	20.0	11.4	11.7	10.0	8.2	12.4			
Cum. fr.		2.5	7.0	11.7	14.7	16.8	26.3	46.3	57.7	69.4	79.4	87.6	100.0			
Max. FF		20.4	17.1	16.3	14.1	16.4	23.2	21.6	20.9	21.5	22.7	21.6	21.4			
Mean FF		8.2	6.7	5.0	4.2	4.4	11.8	11.1	9.5	10.3	9.9	9.1	10.2			
St.dev. FF		4.0	3.3	2.9	3.6	4.4	5.3	3.9	4.3	4.7	4.7	4.7	4.2			

Statistics:

Minimum FF 0.0
 DD 116.5
 Date 28.02.1994 23 UTC Date 01.02.1994 15 UTC
 Maximum FF 23.2
 DD 158.1
 Mean FF 9.6
 St.dev.FF 4.6

DATA COVERAGE: 99.9%

Norwegian Meteorological Institute
Climate department

Maritim station: 1990.12 -- Observation period: 1990.12 -- Height of station: 61.2 N, 2.3 E
GULLFAKS C

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

March 1993- 1995

FF	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.
0.0-	1.9	4	2	2	7	12	5	6	6	7	7	8	5	73	1.18	1.19
2.0-	3.9	21	10	44	21	11	7	53	100	41	41	44	26	423	6.81	8.01
4.0-	5.9	16	37	49	51	7	1	54	107	99	105	102	59	687	11.07	19.08
6.0-	7.9	45	41	35	30	29	19	58	137	141	124	88	54	801	12.90	31.98
8.0-	9.9	39	13	13	20	21	41	133	137	189	175	87	61	929	14.97	46.95
10.0-	11.9	54	7	2	5	9	40	151	128	176	170	80	75	897	14.45	61.40
12.0-	13.9	61	8	3	1	4	55	143	183	175	129	66	95	923	14.87	76.27
14.0-	15.9	58	14	1	.	3	67	154	76	107	69	47	55	651	10.49	86.76
16.0-	17.9	36	8	.	.	3	85	103	64	41	28	34	21	423	6.81	93.57
18.0-	19.9	16	5	.	.	.	79	73	16	4	12	8	5	218	3.51	97.08
20.0-	21.9	1	.	.	.	.	64	43	.	.	2	6	6	122	1.97	99.05
22.0-	23.9	.	.	.	.	.	35	11	.	.	2	5	1	54	0.87	99.92
24.0-	25.9	.	.	.	.	.	2	1	.	.	.	1	.	4	0.06	99.98
26.0-	27.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	99.98
28.0-	29.9	.	.	.	.	.	.	.	.	.	.	1	.	1	0.02	100.00
30.0-	31.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
32.0-	33.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
34.0-	35.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
	>=36.0													0	0.00	100.00
Sum		351	145	149	135	99	500	983	954	980	869	555	486	6207		
Rel.fr.		5.7	2.3	2.4	2.2	1.6	8.1	15.8	15.4	15.8	14.0	8.9	7.8			
Cum.fr.		5.7	8.0	10.4	12.6	14.2	22.2	38.1	53.4	69.2	83.2	92.2	100.0			
Max. FF		20.9	18.9	14.3	12.9	17.8	24.3	24.4	19.5	18.9	28.0	24.9	22.3			
Mean FF		11.3	8.5	5.4	5.9	7.3	15.6	12.4	9.8	10.0	9.8	9.7	9.9			
St.dev. FF		4.4	4.4	2.4	2.2	3.8	4.8	4.8	4.3	3.6	3.8	4.5	4.4			

Statistics:

Minimum FF 0.0 Maximum FF 28.0 Mean FF 10.5
DD 110.1 DD 283.0 St.dev. FF 4.6
Date 01.03.1994 00 UTC Date 18.03.1993 16 UTC

DATA COVERAGE: 92.7%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 1990.12 -- 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

April 1993- 1995

FF	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.
0.0-	1.9	22	21	15	15	22	33	22	17	24	23	14	9	237	3.69	3.78
2.0-	3.9	91	72	61	59	95	76	53	99	43	45	49	55	798	12.43	16.21
4.0-	5.9	147	132	85	109	67	68	84	85	105	68	82	61	1093	17.02	33.23
6.0-	7.9	89	146	49	109	60	123	72	111	81	114	98	56	1108	17.26	50.49
8.0-	9.9	59	77	42	48	34	136	146	198	162	81	58	57	1098	17.10	67.59
10.0-	11.9	48	121	18	38	10	106	205	142	110	31	56	51	936	14.58	82.17
12.0-	13.9	47	88	2	12	23	75	100	62	38	31	50	71	599	9.33	91.50
14.0-	15.9	15	93	.	.	.	7	74	17	19	8	32	45	310	4.83	96.32
16.0-	17.9	7	77	.	.	.	10	27	2	.	3	13	17	156	2.43	98.75
18.0-	19.9	.	48	.	.	.	9	17	.	.	.	1	.	75	1.17	99.92
20.0-	21.9	.	3	.	.	.	.	2	.	.	.	.	.	5	0.08100.00	
22.0-	23.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
24.0-	25.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
26.0-	27.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
28.0-	29.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
30.0-	31.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
32.0-	33.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
34.0-	35.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
>=36.0														0	0.00100.00	
Sum		525	878	272	390	311	643	802	733	582	404	453	422	6421		
Rel.fr.		8.2	13.7	4.2	6.1	4.8	10.0	12.5	11.4	9.1	6.3	7.1	6.6			
Cum.fr.		8.2	21.9	26.1	32.2	37.0	47.0	59.5	70.9	80.0	86.3	93.3	99.9			
Max. FF		17.1	20.1	12.9	12.7	13.9	19.0	20.4	16.9	15.7	17.6	18.2	17.8			
Mean FF		6.9	9.9	5.7	6.4	5.6	8.2	9.8	8.1	8.0	7.3	8.3	9.0			
St.dev. FF		3.6	4.9	2.7	2.7	3.2	3.8	4.0	3.4	3.2	3.3	4.0	4.3			

Statistics:

Minimum FF 0.0 Maximum FF 20.4 Mean FF 8.1
 DD 124.0 DD 177.3 St.dev. FF 3.9
 Date 29.04.1993 20 UTC Date 03.04.1994 21 UTC

DATA COVERAGE: 99.1%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 1990.12 -- 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

May 1993- 1995

FF	DD		Number of calms										Sum	Rel. fr.	Cum. fr.
	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0			
0.0-	1.9	56	24	41	48	60	39	42	70	17	23	28	504	7.79	7.81
2.0-	3.9	62	24	32	55	58	82	100	43	72	121	132	818	12.64	20.45
4.0-	5.9	169	52	63	41	47	112	96	33	54	110	150	1015	15.69	36.14
6.0-	7.9	252	149	41	43	70	122	45	61	30	46	112	1012	15.64	51.78
8.0-	9.9	167	396	54	17	24	131	162	73	53	31	37	1169	18.07	69.85
10.0-	11.9	53	529	31	5	17	135	181	20	42	28	4	1053	16.28	86.12
12.0-	13.9	13	329	3	25	152	112	2	15	23	1	157	672	10.39	96.51
14.0-	15.9	7	77	7	30	28	2	2	19	1	62	157	157	2.43	98.93
16.0-	17.9	7	7	38	10	2	10	2	5	7	0	62	62	0.96	99.89
18.0-	19.9	7	7	6	1	1	1	1	1	1	1	7	7	0.11	100.00
20.0-	21.9	7	7	6	1	1	1	1	1	1	1	7	7	0.11	100.00
22.0-	23.9	7	7	6	1	1	1	1	1	1	1	7	7	0.11	100.00
24.0-	25.9	7	7	6	1	1	1	1	1	1	1	7	7	0.11	100.00
26.0-	27.9	7	7	6	1	1	1	1	1	1	1	7	7	0.11	100.00
28.0-	29.9	7	7	6	1	1	1	1	1	1	1	7	7	0.11	100.00
30.0-	31.9	7	7	6	1	1	1	1	1	1	1	7	7	0.11	100.00
32.0-	33.9	7	7	6	1	1	1	1	1	1	1	7	7	0.11	100.00
34.0-	35.9	7	7	6	1	1	1	1	1	1	1	7	7	0.11	100.00
>=36.0													0	0	0.00
Sum	772	1668	229	199	253	727	849	331	361	278	335	467	6470		
Rel.fr.	11.9	25.8	3.5	3.1	3.9	11.2	13.1	5.1	5.6	4.3	5.2	7.2			
Cum.fr.	11.9	37.7	41.3	44.3	48.2	59.5	72.6	77.7	83.3	87.6	92.8	100.0			
Max. FF	13.3	16.9	12.0	10.6	13.3	18.5	18.0	16.5	16.2	14.9	10.7	11.5			
Mean FF	6.5	9.9	6.4	4.7	5.7	9.3	8.5	4.9	6.8	6.5	4.7	5.1			
St.dev. FF	2.7	3.1	3.1	2.7	3.7	4.4	3.7	2.9	4.1	3.5	2.1	2.2			

Statistics:

Minimum FF 0.0 Maximum FF 18.5 Mean FF 7.6
 DD 68.8 DD 146.3 St.dev. FF 3.7
 Date 13.05.1994 05 UTC Date 18.05.1993 05 UTC

DATA COVERAGE: 96.6%

Norwegian Meteorological Institute
Climate department

Maritim station: GULLFAKS C
 Observation period: 1990.12 --
 Height of station: --
 Position: 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

FF	1993- 1995																Sum	Rel. fr.	Cum. fr.
	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	345.0	Number of calms				
0.0-	1.9	32	15	16	24	27	26	35	42	19	22	8	28	294	6.35	6.37			
2.0-	3.9	108	77	57	9	34	47	59	65	57	93	101	104	811	17.51	23.88			
4.0-	5.9	152	92	17	.	.	56	63	72	77	93	178	138	938	20.25	44.14			
6.0-	7.9	158	30	.	3	3	53	50	94	159	130	133	236	1046	22.59	66.72			
8.0-	9.9	104	14	.	.	.	26	62	109	171	146	55	115	802	17.32	84.04			
10.0-	11.9	18	22	.	.	3	18	126	51	57	53	18	48	411	8.87	92.92			
12.0-	13.9	3	41	.	.	.	16	51	21	19	24	15	2	195	4.21	97.13			
14.0-	15.9	.	78	.	.	.	.	4	.	.	1	1	.	84	1.81	98.94
16.0-	17.9	.	48	.	.	.	.	.	.	.	.	.	.	48	1.04	99.98
18.0-	19.9	.	1	.	.	.	.	.	.	.	.	.	.	1	0.02	100.00
20.0-	21.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
22.0-	23.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
24.0-	25.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
26.0-	27.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
28.0-	29.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
30.0-	31.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
32.0-	33.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
34.0-	35.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
>=36.0		575	418	90	33	67	242	450	454	559	562	509	671	4631					
Sum		12.4	9.0	1.9	0.7	1.4	5.2	9.7	9.8	12.1	12.1	11.0	14.5						
Rel.fr.		12.4	21.4	23.4	24.1	25.5	30.8	40.5	50.3	62.4	74.5	85.5	100.0						
Cum.fr.		13.1	18.0	5.5	2.4	12.5	13.3	14.5	13.6	13.9	15.1	14.0	13.5						
Max. FF		5.9	9.0	3.0	1.4	2.6	6.0	7.8	6.7	7.3	6.9	5.9	6.3						
Mean FF		2.4	5.4	1.2	0.8	2.5	3.2	3.8	3.3	2.7	2.9	2.4	2.5						
St.dev. FF																			

Statistics:

Minimum FF 0.1
 DD 24.2
 Date 05.06.1994 05 UTC Date 12.06.1993 01 UTC
 Maximum FF 18.0
 DD 30.7
 Mean FF 6.7
 St.dev.FF 3.2

DATA COVERAGE: 71.5%

Norwegian Meteorological Institute
Climate department

Maritim station: GULLFAKS C
Observation period: 1990.12 --
Height of station: --
Position: 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

July 1993- 1995

FF	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.
0.0-	1.9	117	63	24	28	35	44	22	13	23	23	44	31	510	8.59	8.59
2.0-	3.9	182	85	56	50	43	88	144	227	119	119	100	140	1470	24.75	33.33
4.0-	5.9	21	81	125	32	50	76	169	225	236	236	103	83	1322	22.26	55.59
6.0-	7.9	.	77	93	31	31	142	293	226	225	225	85	35	1321	22.24	77.83
8.0-	9.9	.	28	29	8	26	109	270	114	74	74	65	63	792	13.33	91.16
10.0-	11.9	.	4	5	2	17	34	187	70	42	42	4	50	421	7.09	98.25
12.0-	13.9	.	.	.	.	.	11	73	6	.	.	.	5	100	1.68	99.93
14.0-	15.9	.	.	.	.	.	.	4	.	.	.	.	.	4	0.07	100.00
16.0-	17.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
18.0-	19.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
20.0-	21.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
22.0-	23.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
24.0-	25.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
26.0-	27.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
28.0-	29.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
30.0-	31.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
32.0-	33.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
34.0-	35.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
	>=36.0	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
Sum		320	338	332	151	202	504	1162	881	719	719	401	407	5940		
Rel.fr.		5.4	5.7	5.6	2.5	3.4	8.5	19.6	14.8	12.1	12.1	6.8	6.9			
Cum.fr.		5.4	11.1	16.7	19.2	22.6	31.1	50.7	65.5	77.6	84.3	91.2	100.0			
Max. FF		5.8	10.2	11.2	10.0	11.4	13.3	15.0	12.7	11.3	11.1	13.2	12.9			
Mean FF		2.3	4.6	5.3	4.2	5.2	6.3	7.5	5.9	5.8	5.2	5.6	4.0			
St.dev. FF		1.1	2.5	2.2	2.4	3.0	2.9	2.9	2.6	2.2	2.5	3.2	2.2			

Statistics:

Minimum FF 0.0
 DD 338.0
 Date 31.07.1995 14 UTC Date 26.07.1994 06 UTC
 Maximum FF 15.0
 DD 175.3
 Mean FF 5.6
 St.dev. FF 2.7

DATA COVERAGE: 88.7%

Norwegian Meteorological Institute
Climate department

Maritim station: GULLFAKS C
Observation period: 1990.12 --
Height of station: --
Position: 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

August 1993- 1995

FF	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.
0.0-	1.9	48	34	45	31	35	13	27	8	21	43	13	48	366	5.93	6.02
2.0-	3.9	62	45	76	9	12	28	62	156	136	179	192	90	1047	16.95	22.97
4.0-	5.9	93	55	47	20	15	98	184	278	283	154	152	138	1517	24.56	47.53
6.0-	7.9	240	13	30	8	47	156	102	242	278	99	117	194	1526	24.70	72.24
8.0-	9.9	119	14	1	10	80	121	126	128	154	32	72	226	1082	17.52	89.75
10.0-	11.9	126	18	1	1	11	37	140	41	30	14	14	95	514	8.32	98.07
12.0-	13.9	20	2	3	2	2	10	33	15	2	2	24	111	1.80	99.87	
14.0-	15.9	1	1	1	1	1	1	1	4	1	1	3	8	0.13	100.00	
16.0-	17.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
18.0-	19.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
20.0-	21.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
22.0-	23.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
24.0-	25.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
26.0-	27.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
28.0-	29.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
30.0-	31.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
32.0-	33.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
34.0-	35.9	1	1	1	1	1	1	1	1	1	1	1	0	0.00	100.00	
	>=36.0	709	181	202	79	202	463	674	872	904	507	560	818	6177	0	0.00
Sum																
Rel. fr.		11.5	2.9	3.3	1.3	3.3	7.5	10.9	14.1	14.6	8.2	9.1	13.2			
Cum. fr.		11.5	14.4	17.7	19.0	22.2	29.7	40.6	54.8	69.4	77.6	86.7	99.9			
Max. FF		14.1	12.3	13.6	10.0	12.6	12.6	13.6	14.6	12.2	9.5	11.1	14.7			
Mean FF		7.1	4.8	3.7	3.9	6.6	7.0	7.3	6.2	6.1	4.6	5.2	7.0			
St.dev. FF		2.9	3.0	2.3	2.9	3.1	2.4	3.0	2.4	2.2	2.0	2.3	2.9			

Statistics:

Minimum FF 0.0
DD 148.7
Date 02.08.1995 01 UTC Date 23.08.1993 20 UTC
Maximum FF 14.7
DD 343.9
Mean FF 6.2
St.dev. FF 2.6

DATA COVERAGE: 92.2%

Norwegian Meteorological Institute
Climate department

Maritim station: GULLFAKS C
Observation period: 1990.12 --
Height of station: --
Position: 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

September 1993- 1995

FF	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.
0.0-	1.9	73	53	34	77	63	55	14	11	33	24	16	88	541	8.36	8.39
2.0-	3.9	143	109	80	136	110	154	90	116	59	69	76	86	1228	18.97	27.35
4.0-	5.9	157	114	90	129	144	157	120	65	66	118	109	151	1420	21.93	49.28
6.0-	7.9	109	97	112	103	100	154	144	62	59	70	144	122	1276	19.71	68.99
8.0-	9.9	128	47	67	24	29	72	96	116	49	43	53	68	792	12.23	81.22
10.0-	11.9	91	34	7	29	5	44	46	57	66	55	10	22	466	7.20	88.42
12.0-	13.9	49	79	.	4	1	63	52	21	26	19	18	30	362	5.59	94.01
14.0-	15.9	11	41	.	.	.	29	16	6	9	20	25	12	169	2.61	96.62
16.0-	17.9	25	12	.	.	.	13	3	4	2	15	18	2	94	1.45	98.07
18.0-	19.9	24	8	.	.	.	.	1	2	6	9	22	2	74	1.14	99.21
20.0-	21.9	29	13	.	.	.	.	2	2	.	.	.	2	50	0.77	99.98
22.0-	23.9	.	.	.	.	.	.	.	.	.	.	.	.	1	0.02	100.00
24.0-	25.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
26.0-	27.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
28.0-	29.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
30.0-	31.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
32.0-	33.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
34.0-	35.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
>=36.0		839	607	390	502	452	741	584	462	375	444	491	586	6475		
Sum		13.0	9.4	6.0	7.8	7.0	11.4	9.0	7.1	5.8	6.9	7.6	9.1			
Rel.fr.		13.0	22.3	28.4	36.1	43.1	54.5	63.6	70.7	76.5	83.3	90.9	100.0			
Cum.fr.		21.4	21.8	10.5	12.2	12.2	17.3	20.7	21.4	18.9	21.4	19.7	23.1			
Max. FF		7.7	7.7	5.5	4.8	4.6	6.7	7.3	7.1	7.3	7.4	7.5	6.0			
Mean FF		5.0	4.9	2.5	2.7	2.3	3.9	3.6	3.6	4.0	4.4	4.4	3.7			
St.dev. FF																

Statistics:

Minimum FF 0.0
Maximum FF 23.1
Mean FF 6.7
DD 263.3
DD 325.1
St.dev.FF 3.9
Date 02.09.1995 00 UTC
Date 24.09.1995 04 UTC

DATA COVERAGE: 99.9%

Norwegian Meteorological Institute
Climate department

Maritim station: GULLFAKS C
Observation period: 1990.12 --
Height of station: --
Position: 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

October 1993- 1995

FF	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.
		15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	345.0	1	0.02	
		Number of calms														
0.0-	1.9	10	10	6	11	19	7	1	5	9	6	9	16	109	2.56	2.59
2.0-	3.9	17	38	49	54	19	17	32	30	37	35	42	16	386	9.08	11.67
4.0-	5.9	38	81	75	48	55	10	45	74	37	39	52	58	612	14.40	26.07
6.0-	7.9	37	93	69	31	32	17	41	105	75	99	101	41	741	17.44	43.51
8.0-	9.9	49	59	55	1	12	26	60	75	83	87	118	28	653	15.36	58.87
10.0-	11.9	72	65	35	1	1	37	106	58	60	35	32	18	520	12.24	71.11
12.0-	13.9	15	47	19	6	.	34	131	81	79	28	14	16	470	11.06	82.16
14.0-	15.9	8	57	31	.	.	52	74	98	34	34	36	18	442	10.40	92.56
16.0-	17.9	.	25	3	.	.	53	53	19	15	9	12	3	192	4.52	97.08
18.0-	19.9	.	31	.	.	.	41	11	1	5	6	.	.	95	2.24	99.32
20.0-	21.9	.	2	.	.	.	25	.	.	.	.	.	.	29	0.68	100.00
22.0-	23.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
24.0-	25.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
26.0-	27.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
28.0-	29.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
30.0-	31.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
32.0-	33.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
34.0-	35.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
>=36.0		.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
Sum		246	508	342	152	138	319	556	546	434	378	416	214	4250		
Rel.fr.		5.8	12.0	8.0	3.6	3.2	7.5	13.1	12.8	10.2	8.9	9.8	5.0			
Cum.fr.		5.8	17.7	25.8	29.4	32.6	40.1	53.2	66.0	76.3	85.2	94.9	100.0			
Max. FF		15.9	20.2	16.3	13.8	11.4	21.9	20.4	18.4	19.5	18.8	17.4	16.7			
Mean FF		8.4	9.6	7.8	4.7	5.0	13.4	11.2	9.8	9.5	8.7	8.3	7.5			
St.dev. FF		3.3	4.7	3.8	2.4	2.2	5.2	4.0	4.0	3.9	3.9	3.6	4.0			

Statistics:

Minimum FF 0.0
DD 122.2
Date 30.10.1995 14 UTC Date 25.10.1995 03 UTC
Maximum FF 21.9
DD 154.4
Mean FF 9.3
St.dev.FF 4.3

DATA COVERAGE: 63.5%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 257.9 61.2 N, 2.3 E

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

December 1993- 1995

FF	DD	345.0	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.
		15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	345.0			
		Number of calms														
0.0-	1.9	23	17	6	16	17	19	3	8	8	2	15	27	161	3.61	3.66
2.0-	3.9	93	45	41	71	24	8	44	40	35	50	54	83	588	13.20	16.86
4.0-	5.9	191	51	103	77	69	16	35	34	50	55	119	122	922	20.70	37.56
6.0-	7.9	102	58	65	14	8	49	33	46	36	54	96	56	617	13.85	51.41
8.0-	9.9	122	67	18	14	.	26	64	83	63	52	85	48	642	14.41	65.83
10.0-	11.9	60	25	11	.	.	31	105	65	66	50	86	59	558	12.53	78.36
12.0-	13.9	4	4	10	.	.	39	89	41	20	59	82	36	384	8.62	86.98
14.0-	15.9	6	.	.	.	1	53	62	48	8	17	35	32	262	5.88	92.86
16.0-	17.9	.	.	.	.	.	35	77	26	7	2	10	15	172	3.86	96.72
18.0-	19.9	.	.	.	.	.	25	50	4	1	.	3	6	89	2.00	98.72
20.0-	21.9	.	.	.	.	.	48	4	.	.	.	.	1	53	1.19	99.91
22.0-	23.9	.	.	.	.	.	4	.	.	.	.	.	.	4	0.09	100.00
24.0-	25.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
26.0-	27.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
28.0-	29.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
30.0-	31.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
32.0-	33.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
34.0-	35.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
>=36.0		.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
Sum		601	267	254	192	119	353	566	395	294	341	585	485	4454		
Rel.fr.		13.5	6.0	5.7	4.3	2.7	7.9	12.7	8.9	6.6	7.7	13.1	10.9			
Cum.fr.		13.5	19.5	25.2	29.5	32.2	40.1	52.8	61.7	68.3	75.9	89.1	100.0			
Max. FF		15.5	12.7	12.3	9.6	15.2	22.2	21.2	19.2	19.3	16.5	19.2	20.2			
Mean FF		6.4	6.5	5.9	4.2	4.3	12.7	11.8	9.7	8.1	8.4	8.5	7.6			
St.dev. FF		2.8	2.9	2.5	1.9	1.9	5.8	4.7	4.2	3.6	3.7	3.9	4.4			

Statistics:

Minimum FF 0.0
DD 257.9
Date 16.12.1995 10 UTC Date 01.12.1993 17 UTC
Maximum FF 22.2
DD 161.7
Mean FF 8.4
St.dev.FF 4.4

DATA COVERAGE: 66.5%

Norwegian Meteorological Institute
Climate department

Maritim station: 1990.12 -- Observation period: 1990.12 -- Position: 61.2 N, 2.3 E
GULLFAKS C

Frequency table of wind direction (DD) degrees and wind speed (FF) m/s

Jan.-Dec. 1993- 1995

FF	DD	15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Sum	Rel. fr.	Cum. fr.	
		15.0	45.0	75.0	105.0	135.0	165.0	195.0	225.0	255.0	285.0	315.0	Number of calms			
0.0-	1.9	405	314	232	345	359	291	179	183	257	203	158	348	3274	4.92	4.95
2.0-	3.9	814	568	571	494	488	560	750	1130	737	805	882	939	8738	13.14	18.09
4.0-	5.9	1059	835	757	652	547	680	1083	1233	1121	925	1180	1169	11241	16.90	34.99
6.0-	7.9	1115	817	642	502	395	949	1232	1361	1281	972	1036	1215	11517	17.31	52.30
8.0-	9.9	874	815	345	149	235	821	1692	1233	1202	893	753	917	9929	14.93	67.23
10.0-	11.9	600	927	153	96	96	649	1718	916	954	636	475	660	7880	11.85	79.08
12.0-	13.9	271	645	68	26	65	658	1328	673	711	475	314	507	5741	8.63	87.71
14.0-	15.9	132	365	32	1	19	450	910	460	396	290	262	306	3623	5.45	93.15
16.0-	17.9	80	179	4	.	38	369	661	326	194	190	141	153	2335	3.51	96.66
18.0-	19.9	52	96	.	.	21	235	422	115	122	87	71	84	1305	1.96	98.62
20.0-	21.9	39	18	.	.	3	207	157	11	44	24	20	42	565	0.85	99.47
22.0-	23.9	1	.	.	.	5	94	90	2	3	17	9	11	232	0.35	99.82
24.0-	25.9	.	.	.	.	1	20	56	1	3	3	1	1	86	0.13	99.95
26.0-	27.9	.	.	.	.	.	2	12	.	1	3	.	.	18	0.03	99.98
28.0-	29.9	.	.	.	.	.	10	.	.	.	1	.	.	11	0.02	100.00
30.0-	31.9	.	.	.	.	.	1	.	.	.	.	.	1	2	0.00	100.00
32.0-	33.9	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
34.0-	35.9	.	.	.	.	.	.	.	.	.	.	.	1	1	0.00	100.00
	>=36.0												0	0	0.00	100.00
Sum		5442	5579	2804	2265	2272	5985	10301	7644	7026	5524	5302	6354	66520		
Rel.fr.		8.2	8.4	4.2	3.4	3.4	9.0	15.5	11.5	10.6	8.3	8.0	9.6			
Cum.fr.		8.2	16.6	20.8	24.2	27.6	36.6	52.1	63.6	74.1	82.4	90.4	100.0			
Max. FF		22.4	21.8	16.3	14.1	24.2	26.9	30.0	24.1	26.1	28.0	24.9	34.5			
Mean FF		7.1	8.6	5.8	4.9	5.6	9.9	10.4	8.3	8.5	8.2	7.6	7.7			
St.dev. FF		3.9	4.4	3.0	2.7	3.8	5.4	4.9	4.3	4.2	4.4	4.1	4.3			

Statistics:

Minimum FF 0.0 Maximum FF 34.5 Mean FF 8.3
DD 257.9 DD 319.2 St.dev. FF 4.5
Date 16.12.1995 10 UTC Date 23.01.1994 06 UTC

DATA COVERAGE: 84.4%

4.3 Frequency tables wave height/wave period (H_{m0}/T_p)

The computations are based on data for the period 1993-1995. The reason for this is the change in storing frequency from December 1992. Until November 1992 only hourly values are available. From December 1992 measurements exist each 20 minute. To analyse the complete series from December 1990 - December 1995 we had to reduce the data set to hourly values for the period after December 1992.

In this report we have considered it more appropriate to use the complete data set stored after December 1992.

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 1990.12 1990.12 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

January 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
		4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.0			
0.0- 0.4															0	0.00	0.00
0.5- 0.9															0	0.00	0.00
1.0- 1.4															65	1.04	1.04
1.5- 1.9															309	4.94	5.98
2.0- 2.4															473	7.57	13.55
2.5- 2.9															394	6.30	19.85
3.0- 3.4															398	6.37	26.22
3.5- 3.9															9	0.14	26.36
4.0- 4.4															695	11.12	45.10
4.5- 4.9															27	0.41	45.51
5.0- 5.4															608	9.73	54.82
5.5- 5.9															559	8.94	63.77
6.0- 6.4															548	8.77	72.53
6.5- 6.9															418	6.69	79.22
7.0- 7.4															12	0.18	79.40
7.5- 7.9															292	4.67	90.67
8.0- 8.4															7	0.11	90.78
8.5- 8.9															203	3.25	93.92
9.0- 9.4															124	1.98	95.90
9.5- 9.9															79	1.26	97.17
10.0- 10.4															54	0.86	98.03
10.5- 10.9															34	0.54	98.58
11.0- 11.4															21	0.34	98.91
11.5- 11.9															19	0.30	99.22
12.0- 12.4															22	0.35	99.57
12.5- 12.9															13	0.21	99.78
13.0- 13.4															7	0.11	99.89
13.5- 13.9															5	0.08	99.97
>=14.0															2	0.03	100.00
Sum		1	30	91	185	524	950	1111	1123	1021	356	535	113	211	6251		
Rel.fr.		0.0	0.5	1.5	3.0	8.4	15.2	17.8	18.0	16.3	5.7	8.6	1.8	3.4			
Cum.fr.		0.0	0.5	2.0	4.9	13.3	28.5	46.3	64.2	80.6	86.3	94.8	96.6	100.0			
Max. Hm0		1.6	2.9	4.3	5.7	6.3	7.5	8.3	9.4	12.1	12.5	13.3	7.7	9.6			
Mean Hm0		1.6	2.4	2.9	3.3	3.7	4.0	4.6	5.2	5.5	6.2	5.6	5.1	5.3			
St.dev. Hm0		0.0	0.4	0.6	0.8	1.1	1.5	1.8	1.9	2.0	2.4	2.4	1.2	1.4			

Statistics:

Minimum Hm0	1.2	Maximum Hm0	13.3	Mean Hm0	4.8
TP	8.7	TP	14.2	St.dev. Hm0	1.7
Date	03.01.1995 09 UTC	Date	31.01.1995 11 UTC	Mean TP	11.3
Minimum TP	4.9	Maximum TP	18.5	St.dev. TP	2.0
Hm0	1.6	Hm0	4.3		
Date	03.01.1995 14 UTC	Date	27.01.1994 22 UTC		

DATA COVERAGE: 93.4%

Norwegian Meteorological Institute
Climate department

Maritim station: 1990.12 --
GULLFAKS C

Observation period: 1990.12 --

Height of station: 61.2 N, 2.3 E

Position: 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

February 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
		4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.0			
0.0-	0.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	0.00
0.5-	0.9	.	.	.	6	12	13	17	33	33	11	.	.	.	0	0.00	0.00
1.0-	1.4	.	.	7	16	14	26	45	53	58	25	40	9	.	125	2.96	2.96
1.5-	1.9	.	.	7	16	14	26	45	53	58	25	40	9	.	293	6.95	9.91
2.0-	2.4	1	19	47	38	34	13	31	106	48	11	79	18	5	450	10.67	20.58
2.5-	2.9	.	13	31	24	23	40	31	73	83	36	36	20	33	443	10.51	31.09
3.0-	3.4	.	3	42	45	69	50	41	57	91	25	57	14	62	556	13.18	44.27
3.5-	3.9	.	19	54	87	101	43	75	55	55	5	55	10	21	525	12.45	56.72
4.0-	4.4	.	1	25	81	106	64	28	37	1	21	21	10	8	382	9.06	65.78
4.5-	4.9	.	.	3	17	107	69	84	47	4	18	20	4	10	459	10.88	76.67
5.0-	5.4	.	.	3	17	74	88	62	90	18	21	4	4	3	387	9.18	85.84
5.5-	5.9	.	.	5	40	67	65	46	17	34	2	3	2	3	279	6.62	92.46
6.0-	6.4	.	.	1	17	47	49	21	7	16	7	16	6	6	170	4.03	96.49
6.5-	6.9	.	.	2	10	16	22	10	4	4	4	8	4	1	77	1.83	98.32
7.0-	7.4	.	.	1	11	6	15	4	4	7	7	7	3	.	47	1.11	99.43
7.5-	7.9	.	.	2	3	8	4	1	1	1	1	1	1	.	19	0.45	99.88
8.0-	8.4	.	.	1	1	3	.	.	.	.	.	.	.	.	5	0.12	100.00
8.5-	8.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
9.0-	9.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
9.5-	9.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
10.0-	10.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
10.5-	10.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
11.0-	11.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
11.5-	11.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
12.0-	12.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
12.5-	12.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
13.0-	13.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
13.5-	13.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
>=14.0		1	35	147	213	423	611	569	733	627	165	392	121	180	4217		
Sum																	
Rel.fr.		0.0	0.8	3.5	5.1	10.0	14.5	13.5	17.4	14.9	3.9	9.3	2.9	4.3			
Cum.fr.		0.0	0.9	4.3	9.4	19.4	33.9	47.4	64.8	79.7	83.6	92.9	95.7	100.0			
Max. Hm0		2.0	3.3	4.1	5.0	7.0	8.1	7.9	8.1	7.8	7.7	7.4	7.9	6.6			
Mean Hm0		2.0	2.5	2.8	3.1	3.7	4.2	4.3	3.9	3.7	3.5	3.6	3.7	3.7			
St.dev. Hm0		0.0	0.3	0.6	0.8	1.0	1.2	1.5	1.7	1.5	1.6	1.5	1.5	1.0			

Statistics:

Minimum Hm0	1.0	Maximum Hm0	8.1	Mean Hm0	3.8
TP	11.1	TP	11.3	St.dev.Hm0	1.0
Date	25.02.1995 09 UTC	Date	01.02.1994 16 UTC		
Minimum TP	4.7	Maximum TP	18.5	Mean TP	11.2
Hm0	2.0	Hm0	2.4	St.dev.TP	2.4
Date	18.02.1995 21 UTC	Date	12.02.1993 22 UTC		

DATA COVERAGE: 69.7%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 1990.12 -- 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

March 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
		4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.0			
0.0- 0.4									4					1	4	0.08	0.08
0.5- 0.9				2	10	7	7	18	15	6					66	1.28	1.36
1.0- 1.4			1	7	20	22	7	22	45	28	9	13			175	3.39	4.75
1.5- 1.9				6	46	16	21	32	35	66	45	83	2	1	419	8.12	12.87
2.0- 2.4				16	47	33	17	70	74	121	66	5	8		457	8.86	21.72
2.5- 2.9				12	124	49	37	57	38	97	144	9	11		578	11.20	32.93
3.0- 3.4				2	62	45	64	65	36	76	170	44	41	4	617	11.96	44.88
3.5- 3.9					20	41	99	66	23	44	57	110	18	6	512	9.92	54.81
4.0- 4.4				7	49	166	71	32	45	56	39	99	24	7	595	11.53	66.34
4.5- 4.9					38	138	71	47	19	31	9	47	6	10	416	8.06	74.40
5.0- 5.4					7	92	132	65	33	19	15	32	10	13	418	8.10	82.50
5.5- 5.9						30	123	71	18	18	18	47	8	9	332	6.43	88.93
6.0- 6.4						6	60	34	25	15	13	18	3	9	183	3.55	92.48
6.5- 6.9							24	47	29	7	7	13	2	6	156	3.02	95.50
7.0- 7.4							8	17	35	13	2	8	2	6	91	1.76	97.27
7.5- 7.9							1	7	25	12	1	4			50	0.97	98.24
8.0- 8.4								1	7	17					25	0.48	98.72
8.5- 8.9									7	29					36	0.70	99.42
9.0- 9.4									2	13	1				16	0.31	99.73
9.5- 9.9										10					10	0.19	99.92
10.0- 10.4											1				1	0.02	99.94
10.5- 10.9											2				2	0.04	99.98
11.0- 11.4												1			1	0.02	100.00
11.5- 11.9															0	0.00	100.00
12.0- 12.4															0	0.00	100.00
12.5- 12.9															0	0.00	100.00
13.0- 13.4															0	0.00	100.00
13.5- 13.9															0	0.00	100.00
>=14.0															0	0.00	100.00
Sum		0	37	315	308	699	794	548	715	790	264	534	83	73	5160		
Rel.fr.		0.0	0.7	6.1	6.0	13.5	15.4	10.6	13.9	15.3	5.1	10.3	1.6	1.4			
Cum.fr.		0.0	0.7	6.8	12.8	26.3	41.7	52.3	66.2	81.5	86.6	97.0	98.6	100.0			
Max. Hm0			3.0	4.2	5.3	6.3	7.5	8.0	9.0	11.2	9.3	7.5	7.1	7.4			
Mean Hm0			2.3	2.6	3.2	4.0	4.3	4.1	3.7	3.9	3.6	3.9	4.4	5.1			
St.dev. Hm0			0.4	0.6	1.1	1.1	1.5	1.8	2.1	2.2	1.5	1.4	1.0	1.4			

Statistics:

Minimum Hm0	0.1	Maximum Hm0	11.2	Mean Hm0	3.9
TP	11.1	TP	12.9	St.dev.Hm0	1.4
Date	04.03.1995	Date	30.03.1993		
	18 UTC		21 UTC		
Minimum TP	5.0	Maximum TP	29.4	Mean TP	10.7
Hm0	1.4	Hm0	1.4	St.dev.TP	2.3
Date	05.03.1995	Date	05.03.1995		
	07 UTC		07 UTC		

DATA COVERAGE: 77.1%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp)

April 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
0.0-	0.4	.	1	1	.	1	.	.	.	.	.	.	.	1	3	0.05	0.05
0.5-	0.9	1	2	4	.	4	.	.	4	.	.	.	.	19	134	2.35	2.40
1.0-	1.4	4	7	120	127	109	29	32	32	3	3	7	5	10	531	9.30	11.70
1.5-	1.9	5	37	98	137	196	290	122	75	90	34	59	1	2	1146	20.08	31.79
2.0-	2.4	2	75	137	123	144	228	119	37	88	17	27	11	3	1011	17.72	49.50
2.5-	2.9	1	12	89	118	122	102	130	117	78	25	39	.	12	845	14.81	64.31
3.0-	3.4	.	.	46	111	104	113	79	77	53	35	96	6	3	723	12.67	76.98
3.5-	3.9	.	.	9	62	112	103	73	47	43	29	46	25	21	570	9.99	86.96
4.0-	4.4	.	.	4	23	68	69	41	16	6	9	13	8	14	271	4.75	91.71
4.5-	4.9	.	.	.	10	41	45	33	22	12	7	12	4	5	191	3.35	95.06
5.0-	5.4	.	.	.	3	12	16	43	41	18	4	6	.	7	150	2.63	97.69
5.5-	5.9	.	.	.	5	.	8	28	24	8	1	3	.	1	78	1.37	99.05
6.0-	6.4	.	.	.	.	.	6	6	9	1	.	.	.	.	22	0.39	99.44
6.5-	6.9	.	.	.	.	.	2	5	3	1	.	.	.	.	11	0.19	99.63
7.0-	7.4	.	.	.	.	.	4	4	11	.	.	.	.	.	15	0.26	99.89
7.5-	7.9	.	.	.	.	.	.	2	4	.	.	.	.	.	6	0.11	100.00
8.0-	8.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
8.5-	8.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
9.0-	9.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
9.5-	9.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
10.0-	10.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
10.5-	10.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
11.0-	11.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
11.5-	11.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
12.0-	12.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
12.5-	12.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
13.0-	13.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
13.5-	13.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
>=14.0		13	132	432	711	980	1113	714	519	431	164	313	87	98	5707		
Sum		0.2	2.3	7.6	12.5	17.2	19.5	12.5	9.1	7.6	2.9	5.5	1.5	1.7			
Rel.fr.		0.2	2.5	10.1	22.6	39.7	59.2	71.8	80.8	88.4	91.3	96.8	98.3	100.0			
Cum.fr.		2.5	2.8	4.1	5.3	5.8	6.5	7.6	7.7	6.8	5.8	5.9	4.8	5.5			
Max. Hm0		1.6	2.0	2.2	2.4	2.5	2.5	3.1	3.2	2.7	2.9	2.9	2.5	2.8			
Mean Hm0		0.4	0.3	0.7	0.9	1.1	1.1	1.3	1.5	1.1	1.0	1.0	1.4	1.5			
St.dev. Hm0																	

Statistics:

Minimum Hm0	0.4	Maximum Hm0	7.7	Mean Hm0	2.7
TP	8.3	TP	11.3	St.dev.Hm0	0.6
Date	27.04.1993 02 UTC	Date	20.04.1993 20 UTC		
Minimum TP	3.8	Maximum TP	31.3	Mean TP	9.9
Hm0	0.9	Hm0	1.0	St.dev.TP	2.4
Date	14.04.1993 17 UTC	Date	14.04.1993 16 UTC		

DATA COVERAGE: 88.1%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

May 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
0.0-	0.4	1	6	42	119	152	2	1	58	22	6	9	1	17	741	16.99	17.22
0.5-	0.9	42	110	55	42	157	108	52	72	51	12	8	1	19	1064	24.39	41.61
1.0-	1.4	48	158	245	133	157	108	52	72	51	12	8	1	19	1064	24.39	41.61
1.5-	1.9	6	54	453	233	150	94	48	36	22	15	12	4	10	1137	26.07	67.68
2.0-	2.4	13	130	178	101	36	27	11	35	35	8	5	2	2	546	12.52	80.19
2.5-	2.9	3	68	150	163	23	10	9	15	15	11	10	2	2	464	10.64	90.83
3.0-	3.4	12	31	45	46	2	11	7	4	7	6	3	1	2	166	3.81	98.37
3.5-	3.9	3	21	52	63	19	4	1	4	4	1	1	1	2	66	1.51	99.89
4.0-	4.4	4	4	17	32	13	2	1	2	2	1	1	1	2	2	0.05	99.93
4.5-	4.9	2	2	2	2	2	2	2	2	2	2	2	2	2	3	0.07100	100.00
5.0-	5.4	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
5.5-	5.9	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
6.0-	6.4	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
6.5-	6.9	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
7.0-	7.4	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
7.5-	7.9	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
8.0-	8.4	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
8.5-	8.9	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
9.0-	9.4	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
9.5-	9.9	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
10.0-	10.4	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
10.5-	10.9	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
11.0-	11.4	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
11.5-	11.9	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
12.0-	12.4	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
12.5-	12.9	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
13.0-	13.4	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
13.5-	13.9	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00100	100.00
>=14.0		96	339	972	792	804	560	281	201	152	59	47	7	52	4362	0	0.00100
Sum		96	339	972	792	804	560	281	201	152	59	47	7	52	4362	0	0.00100
Rel.fr.		2.2	7.8	22.3	18.2	18.4	12.8	6.4	4.6	3.5	1.4	1.1	0.2	1.2			
Cum.fr.		2.2	10.0	32.3	50.4	68.8	81.7	88.1	92.7	96.2	97.6	98.6	98.8	100.0			
Max. Hm0		1.9	2.9	3.7	4.3	4.4	5.4	5.0	3.6	3.2	3.5	3.2	3.9	3.6			
Mean Hm0		1.0	1.2	1.7	2.0	2.0	1.9	1.6	1.4	1.7	1.9	1.8	1.8	1.4			
St.dev. Hm0		0.2	0.4	0.5	0.7	0.9	1.2	1.0	0.7	0.7	0.8	0.8	1.0	0.7			

Statistics:

Minimum Hm0	0.2	Maximum Hm0	5.4	Mean Hm0	1.7
TP	6.9	TP	9.9	St.dev.Hm0	.9
Date	08.05.1993 08 UTC	Date	06.05.1994 06 UTC		
Minimum TP	3.3	Maximum TP	31.9	Mean TP	8.3
Hm0	1.4	Hm0	0.7	St.dev.TP	2.4
Date	31.05.1995 10 UTC	Date	25.05.1995 09 UTC		

DATA COVERAGE: 65.1%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

June 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
		4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.0			
0.0-	0.4		1												1	0.04	0.04
0.5-	0.9	23	20	63	76	33	34	30	31	10		1			322	13.20	13.24
1.0-	1.4	34	116	105	130	161	82	71	26	30	3	21	1	5	785	32.17	45.41
1.5-	1.9	5	18	116	147	135	103	95	35	6	5	1		1	667	27.34	72.75
2.0-	2.4	2	12	90	45	31	44	36	40	9	1				310	12.70	85.45
2.5-	2.9		7	34	21	37	13	3	28	14					157	6.43	91.89
3.0-	3.4			1	2	36	61	21	8	7					136	5.57	97.46
3.5-	3.9					3	48	2							53	2.17	99.63
4.0-	4.4						9								9	0.37	100.00
4.5-	4.9														0	0.00	100.00
5.0-	5.4														0	0.00	100.00
5.5-	5.9														0	0.00	100.00
6.0-	6.4														0	0.00	100.00
6.5-	6.9														0	0.00	100.00
7.0-	7.4														0	0.00	100.00
7.5-	7.9														0	0.00	100.00
8.0-	8.4														0	0.00	100.00
8.5-	8.9														0	0.00	100.00
9.0-	9.4														0	0.00	100.00
9.5-	9.9														0	0.00	100.00
10.0-	10.4														0	0.00	100.00
10.5-	10.9														0	0.00	100.00
11.0-	11.4														0	0.00	100.00
11.5-	11.9														0	0.00	100.00
12.0-	12.4														0	0.00	100.00
12.5-	12.9														0	0.00	100.00
13.0-	13.4														0	0.00	100.00
13.5-	13.9														0	0.00	100.00
>=14.0		64	174	409	421	436	394	258	168	76	9	23	1	7	2440		
Sum																	
Rel.fr.		2.6	7.1	16.8	17.3	17.9	16.1	10.6	6.9	3.1	0.4	0.9	0.0	0.3			
Cum.fr.		2.6	9.8	26.5	43.8	61.6	77.8	88.4	95.2	98.4	98.7	99.7	99.7	100.0			
Max. Hm0		2.0	2.6	3.3	3.3	3.6	4.2	3.5	3.2	3.1	2.0	1.6	1.1	1.6			
Mean Hm0		1.1	1.3	1.6	1.5	1.7	2.1	1.7	1.8	1.8	1.5	1.1	1.1	1.2			
St.dev. Hm0		0.3	0.4	0.6	0.5	0.7	1.0	0.6	0.7	0.8	0.3	0.1	0.0	0.2			

Statistics:

Minimum Hm0	0.4	Maximum Hm0	4.2	Mean Hm0	1.7
TP	5.6	TP	9.5	St.dev.Hm0	0.5
Date	04.06.1993	Date	11.06.1993		
Minimum TP	2.7	Maximum TP	30.3	Mean TP	8.4
Hm0	0.9	Hm0	0.9	St.dev.TP	1.9
Date	04.06.1993	Date	28.06.1995		

DATA COVERAGE: 37.7%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

July 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
		4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.0			
0.0-	0.4	1	.	.	1	.	1	.	.	.	.	2	.	22	5	0.37	0.37
0.5-	0.9	46	66	56	37	15	2	1	.	3	7	5	7	22	267	19.57	19.94
1.0-	1.4	40	146	150	62	33	6	8	10	12	1	.	.	42	510	37.39	57.33
1.5-	1.9	7	46	85	38	58	19	9	7	12	.	.	.	15	296	21.70	79.03
2.0-	2.4	2	9	40	38	39	43	5	1	1	.	.	.	2	180	13.20	92.23
2.5-	2.9	.	4	24	25	18	7	4	.	1	.	.	.	.	83	6.09	98.31
3.0-	3.4	1	.	4	1	4	6	7	.	.	.	.	.	.	23	1.69100.00	
3.5-	3.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
4.0-	4.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
4.5-	4.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
5.0-	5.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
5.5-	5.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
6.0-	6.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
6.5-	6.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
7.0-	7.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
7.5-	7.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
8.0-	8.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
8.5-	8.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
9.0-	9.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
9.5-	9.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
10.0-	10.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
10.5-	10.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
11.0-	11.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
11.5-	11.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
12.0-	12.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
12.5-	12.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
13.0-	13.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
13.5-	13.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
>=14.0		97	271	359	202	167	84	34	18	29	8	7	81	1364	0	0.00100.00	
Sum		7.1	19.9	26.3	14.8	12.2	6.2	2.5	1.3	2.1	0.6	0.5	0.5	5.9			
Rel.fr.		7.1	27.0	53.3	68.1	80.4	86.5	89.0	90.3	92.4	93.0	93.5	94.1	100.0			
Cum.fr.		3.3	2.7	3.1	3.1	3.3	3.4	2.0	2.9	2.9	1.1	0.7	0.9	2.4			
Max. Hm0		1.1	1.2	1.5	1.6	1.8	2.0	2.0	1.4	1.4	0.8	0.6	0.7	1.1			
Mean Hm0		0.4	0.4	0.5	0.6	0.6	0.5	0.8	0.3	0.4	0.1	0.2	0.2	0.3			
St.dev. Hm0																	

Statistics:

Minimum Hm0	0.4	Maximum Hm0	3.4	Mean Hm0	1.5
TP	14.9	TP	10.7	St.dev.Hm0	0.7
Date	31.07.1995 10 UTC	Date	22.07.1995 23 UTC		
Minimum TP	2.4	Maximum TP	32.7	Mean TP	8.1
Hm0	0.8	Hm0	0.9	St.dev.TP	4.2
Date	31.07.1995 15 UTC	Date	30.07.1995 07 UTC		

DATA COVERAGE: 20.4%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 1990.12 -- 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

August 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
		4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.0			
0.0- 0.4	1	3	3	3	3	3	3	3	3	3	3	3	3	3	10	0.31	0.31
0.5- 0.9	34	56	78	93	138	151	151	32	4	18	11	12	7	20	643	20.25	20.56
1.0- 1.4	62	213	104	61	153	179	130	58	47	47	11	2	4	24	1048	33.00	53.56
1.5- 1.9	7	63	88	43	56	113	106	57	2	23	2	3	5	13	548	17.25	70.81
2.0- 2.4	21	107	61	75	99	28	20	23	20	23	3	1	5	11	454	14.29	85.11
2.5- 2.9	1	33	46	57	69	34	17	22	20	22	20	19	7	7	325	10.23	95.34
3.0- 3.4	15	15	45	39	24	4	2	12	2	12	2	1	2	4	144	4.53	99.87
3.5- 3.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	0.13	100.00
4.0- 4.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
4.5- 4.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
5.0- 5.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
5.5- 5.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
6.0- 6.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
6.5- 6.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
7.0- 7.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
7.5- 7.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
8.0- 8.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
8.5- 8.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
9.0- 9.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
9.5- 9.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
10.0- 10.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
10.5- 10.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
11.0- 11.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
11.5- 11.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
12.0- 12.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
12.5- 12.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
13.0- 13.4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
13.5- 13.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
>=14.0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0.00	100.00
Sum	104	357	428	354	520	635	334	158	124	124	34	35	25	68	3176		
Rel.fr.	3.3	11.2	13.5	11.1	16.4	20.0	10.5	5.0	3.9	3.9	1.1	1.1	0.8	2.1			
Cum.fr.	3.3	14.5	28.0	39.1	55.5	75.5	86.0	91.0	94.9	96.0	97.1	97.1	97.9	100.0			
Max. Hm0	1.8	2.7	3.3	3.6	3.6	3.3	3.0	3.2	3.3	3.2	2.9	3.0	3.0	2.4			
Mean Hm0	1.1	1.3	1.6	1.8	1.6	1.6	1.6	1.7	1.7	1.7	2.1	2.0	1.9	1.3			
St.dev. Hm0	0.3	0.4	0.7	0.9	0.8	0.7	0.6	0.5	0.8	0.8	0.8	1.0	0.9	0.5			

Statistics:

Minimum Hm0	0.4	Maximum Hm0	3.6	Mean Hm0	1.6
TP	6.1	TP	8.4	St.dev.Hm0	0.4
Date	10.08.1995 20 UTC	Date	23.08.1993 22 UTC		
Minimum TP	3.3	Maximum TP	31.2	Mean TP	8.7
Hm	0.6	Hm	0.8	St.dev.TP	2.7
Date	03.08.1995 01 UTC	Date	21.08.1995 09 UTC		

DATA COVERAGE: 47.4%

Norwegian Meteorological Institute
Climate department

Maritim station: 1990.12 -- Observation period: 1990.12 -- Height of station: 61.2 N, 2.3 E
GULLFAKS C

Frequency table of wave height (Hm0) m and wave period (Tp) s

September 1993- 1995

Hm	4.9	5.0	5.9	6.0	6.9	7.0	7.9	8.0	8.9	9.0	9.9	10.0	10.9	11.0	11.9	12.0	12.9	13.0	13.9	14.0	14.9	15.0	15.9	16.0	>=	Sum	Rel. fr.	Cum. fr.	
0.0-0.4		5		1		1		3																	1	11	0.24	0.24	
0.5-0.9	12	49		156		136		129		127		22		13		14									1	26	685	14.92	15.16
1.0-1.4	11	61		216		187		284		190		109		76		27									1	1184	25.78	40.94	
1.5-1.9	2	80		122		160		183		173		72		47		18									24	918	19.99	60.93	
2.0-2.4	4	59		168		108		109		114		81		21		7									5	707	15.40	76.33	
2.5-2.9		2		32		71		83		79		48		29		4										349	7.60	83.93	
3.0-3.4		5		7		21		47		58		39		14		28										224	4.88	88.81	
3.5-3.9				2		15		35		36		11		5		14										133	2.90	91.70	
4.0-4.4				3		3		14		8		12		14		17										93	2.03	93.73	
4.5-4.9						1		7		20		9		12		18										79	1.72	95.45	
5.0-5.4								6		17		14		10		7										62	1.35	96.80	
5.5-5.9										19		12		4		8										46	1.00	97.80	
6.0-6.4										8		8		10		3										36	0.78	98.58	
6.5-6.9												3		8		12										40	0.87	99.46	
7.0-7.4												2		6		6										22	0.48	99.93	
7.5-7.9																2										3	0.07	100.00	
8.0-8.4																										0	0.00	100.00	
8.5-8.9																										0	0.00	100.00	
9.0-9.4																										0	0.00	100.00	
9.5-9.9																										0	0.00	100.00	
10.0-10.4																										0	0.00	100.00	
10.5-10.9																										0	0.00	100.00	
11.0-11.4																										0	0.00	100.00	
11.5-11.9																										0	0.00	100.00	
12.0-12.4																										0	0.00	100.00	
12.5-12.9																										0	0.00	100.00	
13.0-13.4																										0	0.00	100.00	
13.5-13.9																										0	0.00	100.00	
>=14.0																										0	0.00	100.00	
Sum	29	261		707		703		900		849		442		269		185										4592			
Rel.fr.	0.6	5.7		15.4		15.3		19.6		18.5		9.6		5.9		4.0										100.0			
Cum.fr.	0.6	6.3		21.7		37.0		56.6		75.1		84.7		90.6		94.6										98.3			
Max. Hm0	2.0	3.1		4.1		5.0		5.1		6.3		7.1		7.4		7.8										7.5			
Mean Hm0	1.2	1.5		1.5		1.7		1.8		2.1		2.4		2.7		3.4										4.1			
St.dev. Hm0	0.4	0.6		0.7		0.8		0.9		1.2		1.4		1.7		1.9										2.0			
																										0.5			

Statistics:
Minimum Hm0 0.4 Maximum Hm0 7.8 Mean Hm0 2.0
Tp 7.5 St.dev.Hm0 0.8
Date 18.09.1993 23 UTC Date 26.09.1995 04 UTC
Minimum Tp 2.4 Maximum Tp 31.1 Mean Tp 8.9
Hm0 0.7 Hm0 0.6 St.dev.Tp 2.4
Date 16.09.1993 06 UTC Date 10.09.1995 23 UTC
DATA COVERAGE: 70.9%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 25.10.1995 06 UTC 61.2 N.2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

October 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
		4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.0			
0.0-	0.4	.	.	4	.	4	.	.	.	.	.	.	.	.	8	0.19	0.19
0.5-	0.9	.	.	10	30	20	4	1	5	.	.	.	.	.	70	1.66	1.85
1.0-	1.4	8	6	16	35	157	41	40	38	4	.	.	13	7	365	8.68	10.54
1.5-	1.9	9	2	5	27	100	184	145	114	23	.	.	.	2	612	14.55	25.09
2.0-	2.4	1	34	35	110	144	78	82	83	34	3	1	.	.	605	14.39	39.48
2.5-	2.9	.	10	49	84	110	81	135	98	55	7	17	5	1	652	15.51	54.98
3.0-	3.4	.	.	1	61	87	64	78	94	90	54	11	34	2	576	13.70	68.68
3.5-	3.9	.	.	6	88	142	70	81	41	19	9	18	.	.	474	11.27	79.95
4.0-	4.4	.	.	.	22	70	76	40	35	28	2	8	.	.	272	6.47	86.42
4.5-	4.9	.	.	.	3	41	76	35	26	30	2	8	.	.	221	5.26	91.68
5.0-	5.4	.	.	.	.	16	49	36	27	18	1	6	.	.	153	3.64	95.32
5.5-	5.9	.	.	.	.	.	24	19	28	16	.	.	.	.	88	2.09	97.41
6.0-	6.4	.	.	.	.	.	4	15	32	5	.	.	.	.	56	1.33	98.74
6.5-	6.9	.	.	.	.	.	3	11	18	8	.	.	.	.	40	0.95	99.69
7.0-	7.4	.	.	.	.	.	.	5	4	1	.	.	.	.	11	0.26	99.95
7.5-	7.9	.	.	.	.	.	.	2	.	.	.	.	.	.	2	0.05100.00	
8.0-	8.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
8.5-	8.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
9.0-	9.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
9.5-	9.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
10.0-	10.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
10.5-	10.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
11.0-	11.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
11.5-	11.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
12.0-	12.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
12.5-	12.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
13.0-	13.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
13.5-	13.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00100.00	
>=14.0		18	53	186	486	868	769	741	639	295	33	87	20	10	4205		
Sum																	
Rel.fr.		0.4	1.3	4.4	11.6	20.6	18.3	17.6	15.2	7.0	0.8	2.1	0.5	0.2			
Cum.fr.		0.4	1.7	6.1	17.7	38.3	56.6	74.2	89.4	96.4	97.2	99.3	99.8	100.0			
Max. Hm0		2.0	3.2	3.8	4.7	5.4	7.0	7.9	7.4	7.0	5.0	5.5	3.0	2.8			
Mean Hm0		1.5	2.1	2.5	2.6	2.6	3.1	3.1	3.2	3.5	3.3	3.5	1.9	1.4			
St.dev. Hm0		0.3	0.5	0.8	0.9	1.2	1.3	1.4	1.5	1.3	0.7	0.8	0.8	0.5			

Statistics:

Minimum Hm0 0.2 Maximum Hm0 7.9 Mean Hm0 2.9
 Tp 6.4 Tp 10.2 St.dev.Hm0 0.8
 Date 03.10.1993 21 UTC Date 25.10.1995 06 UTC
 Minimum Tp 4.1 Maximum Tp 22.9 Mean Tp 9.6
 Hm0 1.2 Hm0 1.5 St.dev.Tp 1.6
 Date 22.10.1993 15 UTC Date 14.10.1995 23 UTC

DATA COVERAGE: 62.8%

Norwegian Meteorological Institute
Climate department

Maritim station: GULLFAKS C
Observation period: 1990.12 --
Height of station: --
Position: 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

November 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
		4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.0			
0.0-	0.4	.	.	.	.	1	2	14	24	19	2	.	.	.	4	0.13	0.13
0.5-	0.9	.	.	.	37	9	31	28	13	59	8	7	6	3	77	2.59	2.72
1.0-	1.4	6	32	39	50	20	13	9	10	59	46	64	.	1	278	9.35	12.07
1.5-	1.9	.	26	50	59	70	34	10	29	72	53	44	5	2	333	11.20	23.27
2.0-	2.4	3	34	59	70	84	85	64	12	26	27	42	7	1	466	15.67	38.94
2.5-	2.9	.	14	43	84	85	64	12	2	26	27	42	7	1	407	13.69	52.62
3.0-	3.4	.	.	24	37	95	48	30	23	14	11	38	6	.	326	10.96	63.58
3.5-	3.9	.	.	4	25	95	76	30	27	21	1	23	18	12	332	11.16	74.75
4.0-	4.4	.	.	.	36	45	45	18	4	8	.	2	.	12	220	7.40	82.15
4.5-	4.9	.	.	.	3	44	53	17	6	1	.	.	.	18	142	4.77	86.92
5.0-	5.4	.	.	.	.	13	36	30	9	1	.	.	.	2	91	3.06	89.98
5.5-	5.9	.	.	.	.	1	17	32	12	.	.	.	.	.	62	2.08	92.06
6.0-	6.4	.	.	.	.	.	11	33	29	.	.	.	.	.	73	2.45	94.52
6.5-	6.9	.	.	.	.	.	.	13	24	.	.	.	.	.	37	1.24	95.76
7.0-	7.4	.	.	.	.	.	.	3	15	4	.	.	.	.	22	0.74	96.50
7.5-	7.9	.	.	.	.	.	.	.	11	14	.	.	.	.	25	0.84	97.34
8.0-	8.4	.	.	.	.	.	.	.	12	19	.	.	.	.	31	1.04	98.39
8.5-	8.9	.	.	.	.	.	.	.	3	24	.	.	.	.	27	0.91	99.29
9.0-	9.4	.	.	.	.	.	.	.	2	15	.	.	.	.	17	0.57	99.87
9.5-	9.9	.	.	.	.	.	.	.	.	3	.	.	.	.	3	0.10	99.97
10.0-	10.4	.	.	.	.	.	.	.	.	1	.	.	.	.	1	0.03	100.00
10.5-	10.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
11.0-	11.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
11.5-	11.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
12.0-	12.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
12.5-	12.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
13.0-	13.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
13.5-	13.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
>=14.0		9	106	219	328	510	442	289	250	360	148	220	42	51	2974		
Sum																	
Rel.fr.		0.3	3.6	7.4	11.0	17.1	14.9	9.7	8.4	12.1	5.0	7.4	1.4	1.7			
Cum.fr.		0.3	3.9	11.2	22.3	39.4	54.3	64.0	72.4	84.5	89.5	96.9	98.3	100.0			
Max. Hm0		2.2	2.9	3.8	4.7	5.5	6.3	7.1	9.3	10.1	3.8	4.1	3.9	5.2			
Mean Hm0		1.5	1.8	2.1	2.6	3.4	3.5	3.9	4.5	3.5	2.1	2.5	3.0	3.9			
St.dev. Hm0		0.4	0.5	0.6	0.9	0.9	1.3	1.9	2.4	2.8	0.5	0.7	0.9	1.0			

Statistics:

Minimum Hm0	0.2	Maximum Hm0	10.1	Mean Hm0	3.2
TP	11.2	TP	12.7	St.dev.Hm0	1.4
Date	02.11.1993 15 UTC	Date	30.11.1993 03 UTC	Mean TP	10.1
Minimum TP	4.1	Maximum TP	29.9	St.dev.TP	2.5
Hm0	1.2	Hm0	2.5		
Date	01.11.1995 01 UTC	Date	30.11.1995 18 UTC		

DATA COVERAGE: 45.9%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 1990.12 -- 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

December 1993- 1995

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
		4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.0			
0.0-0.4	0.4	.	.	.	.	2	3	5	.	.	.	.	.	4	5	0.11	0.11
0.5-0.9	0.9	.	.	.	2	11	48	37	28	38	9	.	2	6	68	1.56	1.68
1.0-1.4	1.4	.	.	4	2	50	32	43	77	114	33	31	4	7	212	4.87	6.55
1.5-1.9	1.9	.	.	5	21	57	22	43	77	114	42	80	7	18	410	9.42	15.96
2.0-2.4	2.4	1	12	12	21	30	52	119	134	121	42	80	13	23	649	14.91	30.87
2.5-2.9	2.9	.	5	22	35	24	78	137	287	149	38	73	13	23	884	20.30	51.17
3.0-3.4	3.4	.	3	12	21	62	46	72	85	77	23	41	16	11	469	10.77	61.94
3.5-3.9	3.9	.	.	11	20	89	70	60	69	58	15	34	17	8	451	10.36	72.30
4.0-4.4	4.4	.	.	6	23	70	83	43	39	81	17	41	10	2	415	9.53	81.83
4.5-4.9	4.9	.	.	.	3	34	50	30	15	43	25	22	.	.	222	5.10	86.93
5.0-5.4	5.4	.	.	.	.	7	52	29	38	21	10	6	.	.	163	3.74	90.68
5.5-5.9	5.9	.	.	.	.	.	21	27	19	31	9	20	.	.	127	2.92	93.59
6.0-6.4	6.4	.	.	.	.	.	8	38	36	21	6	14	.	.	123	2.82	96.42
6.5-6.9	6.9	.	.	.	.	.	.	18	58	2	7	14	.	.	99	2.27	98.69
7.0-7.4	7.4	.	.	.	.	.	.	5	34	3	.	8	.	.	50	1.15	99.84
7.5-7.9	7.9	.	.	.	.	.	.	.	5	.	.	1	.	.	6	0.14	99.98
8.0-8.4	8.4	.	.	.	.	.	.	.	1	.	.	.	.	.	1	0.02	100.00
8.5-8.9	8.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
9.0-9.4	9.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
9.5-9.9	9.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
10.0-10.4	10.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
10.5-10.9	10.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
11.0-11.4	11.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
11.5-11.9	11.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
12.0-12.4	12.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
12.5-12.9	12.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
13.0-13.4	13.4	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
13.5-13.9	13.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00
>=14.0		1	20	72	146	436	565	663	925	759	234	389	65	79	4354		
Sum																	
Rel.fr.		0.0	0.5	1.7	3.4	10.0	13.0	15.2	21.2	17.4	5.4	8.9	1.5	1.8			
Cum.fr.		0.0	0.5	2.1	5.5	15.5	28.5	43.7	65.0	82.4	87.8	96.7	98.2	100.0			
Max. Hm0		2.1	3.2	4.4	4.6	5.4	6.4	7.3	8.0	7.4	6.7	7.5	4.4	4.1			
Mean Hm0		2.1	2.5	2.8	2.9	3.0	3.3	3.3	3.4	3.1	3.3	3.5	3.2	2.5			
St.dev. Hm0		0.0	0.4	0.8	0.9	1.2	1.4	1.5	1.6	1.3	1.4	1.5	0.7	0.8			

Statistics:

Minimum Hm0	0.3	Maximum Hm0	8.0	Mean Hm0	3.2
TP	9.4	TP	11.3	St.dev.Hm0	1.0
Date	27.12.1993 01 UTC	Date	01.12.1993 19 UTC		
Minimum Tp	4.7	Maximum Tp	28.1	Mean Tp	11.2
Hm0	2.1	Hm0	3.2	St.dev.Tp	2.0
Date	30.12.1995 00 UTC	Date	22.12.1995 08 UTC		

DATA COVERAGE: 65.0%

Norwegian Meteorological Institute
Climate department

Maritim station: Observation period: Height of station: Position:
GULLFAKS C 1990.12 -- 1990.12 -- 61.2 N, 2.3 E

Frequency table of wave height (Hm0) m and wave period (Tp) s

Hm0	TP	<=	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	>=	Sum	Rel. fr.	Cum. fr.
0.0-0.4	2	10	15	5	10	6	6	1	8	93	15	32	43	2	61	0.12	0.12
0.5-0.9	158	302	422	429	522	561	561	241	145	93	93	15	32	110	3073	6.30	6.42
1.0-1.4	213	740	932	793	1172	828	828	562	435	382	69	65	34	137	6342	13.00	19.42
1.5-1.9	42	338	1076	876	1015	1171	810	613	473	220	220	351	27	76	7088	14.52	33.94
2.0-2.4	16	312	898	856	844	911	720	669	543	150	150	283	57	49	6308	12.93	46.87
2.5-2.9	1	99	572	736	795	655	655	850	648	187	187	249	55	79	5581	11.44	58.30
3.0-3.4	1	14	307	485	698	718	394	353	349	138	138	321	95	89	4355	8.92	67.23
3.5-3.9	.	.	90	372	796	618	332	275	372	111	111	235	75	79	3705	7.59	74.82
4.0-4.4	.	.	25	213	683	618	332	250	266	75	186	38	91	2340	4.79	85.80	
4.5-4.9	.	.	.	68	461	572	333	250	266	75	186	38	91	2340	4.79	85.80	
5.0-5.4	.	.	.	15	204	474	442	311	231	80	130	33	66	1986	4.07	89.87	
5.5-5.9	.	.	.	1	54	341	380	283	191	67	156	41	46	1560	3.20	93.06	
6.0-6.4	.	.	.	.	10	167	289	267	149	65	85	19	30	1081	2.22	95.28	
6.5-6.9	.	.	.	.	2	58	177	321	145	50	101	11	19	884	1.81	97.09	
7.0-7.4	.	.	.	.	1	28	106	202	96	38	54	10	15	550	1.13	98.22	
7.5-7.9	.	.	.	.	4	48	123	96	16	19	2	6	6	314	0.64	98.86	
8.0-8.4	.	.	.	.	1	11	66	85	12	4	7	186	7	186	0.38	99.24	
8.5-8.9	.	.	.	.	.	36	86	11	6	6	142	0.29	99.53	3	142	0.29	99.53
9.0-9.4	.	.	.	.	.	14	53	12	6	6	87	0.18	99.71	2	87	0.18	99.71
9.5-9.9	.	.	.	.	.	1	26	15	4	4	47	0.10	99.81	1	47	0.10	99.81
10.0-10.4	.	.	.	.	.	.	.	.	.	9	7	7	23	23	0.05	99.85	
10.5-10.9	.	.	.	.	.	.	.	.	.	6	8	7	21	21	0.04	99.90	
11.0-11.4	.	.	.	.	.	.	.	.	.	2	10	11	23	23	0.05	99.94	
11.5-11.9	.	.	.	.	.	.	.	.	.	2	10	11	13	13	0.03	99.97	
12.0-12.4	.	.	.	.	.	.	.	.	.	2	1	4	7	7	0.01	99.99	
12.5-12.9	.	.	.	.	.	.	.	.	.	.	2	3	5	5	0.01	100.00	
13.0-13.4	.	.	.	.	.	.	.	.	.	.	.	2	2	2	0.00	100.00	
13.5-13.9	.	.	.	.	.	.	.	.	.	.	.	.	.	0	0.00	100.00	
>=14.0	433	1815	4337	4849	7267	7766	5984	5718	4849	1534	2670	594	986	48802	0	0.00	100.00
Sum	0.9	3.7	8.9	9.9	14.9	15.9	12.3	11.7	9.9	3.1	5.5	1.2	2.0				
Rel.fr.	0.9	4.6	13.5	23.4	38.3	54.2	66.5	78.2	88.1	91.3	96.8	98.0	100.0				
Cum.fr.	3.3	3.3	4.4	5.7	7.0	8.1	8.3	9.4	12.1	12.5	13.3	7.9	9.6				
Max. Hm0	1.1	1.5	1.9	2.2	2.6	3.0	3.4	3.7	3.7	3.8	3.8	3.5	3.2				
Mean Hm0	0.3	0.6	0.8	1.0	1.3	1.6	1.8	2.0	2.1	2.2	2.2	1.9	1.9				
St.dev. Hm0																	

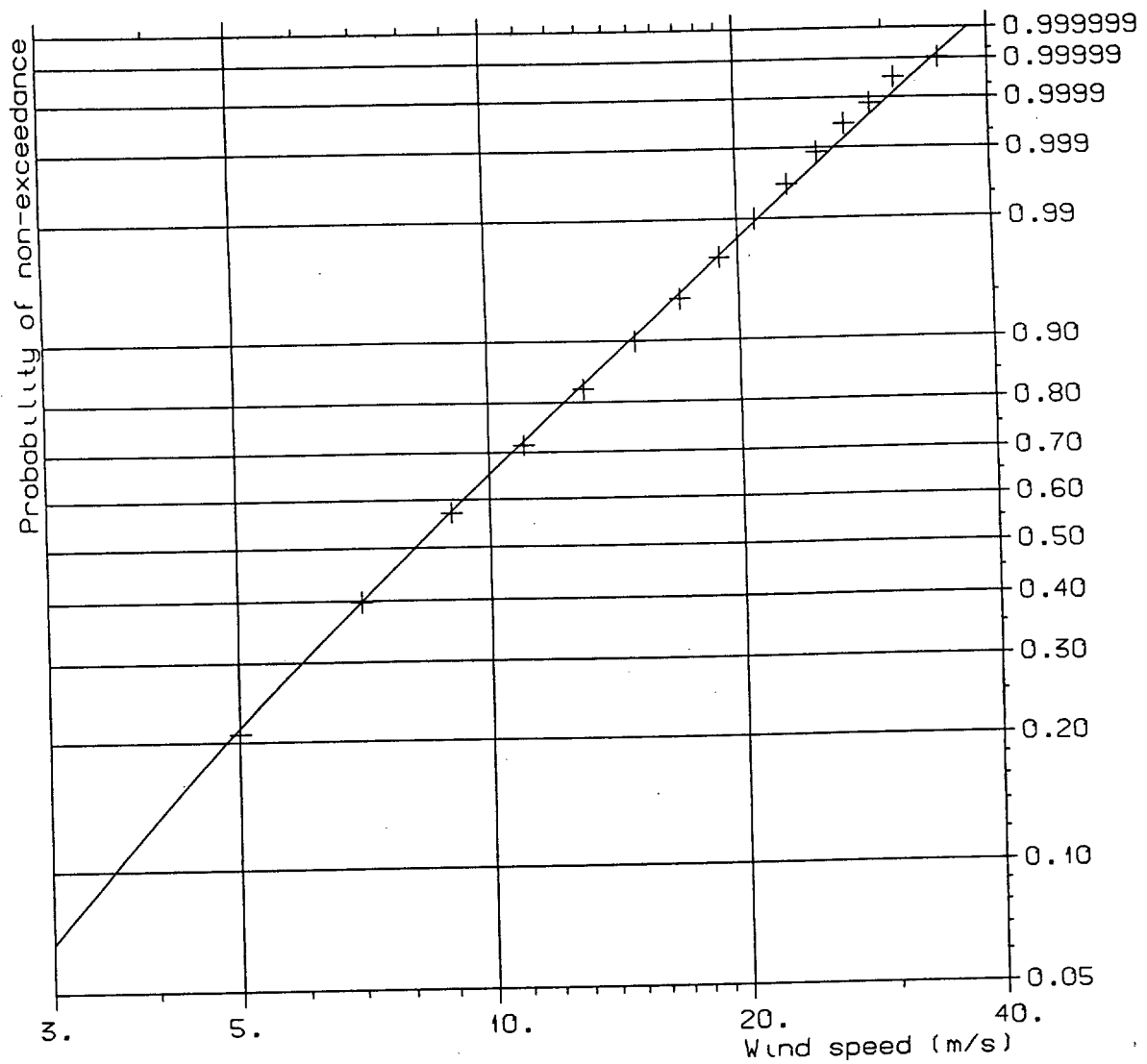
Statistics:

Minimum Hm0	0.1	Maximum Hm0	13.3	Mean Hm0	3.0
TP	11.1	TP	14.2	St.dev.Hm0	1.4
Date	04.03.1995 18 UTC	Date	31.01.1995 11 UTC		
Minimum TP	2.4	Maximum TP	32.7	Mean TP	9.9
Hm0	0.8	Hm0	0.9	St.dev.TP	2.6
Date	31.07.1995 15 UTC	Date	30.07.1995 07 UTC		

DATA COVERAGE: 61.9%

5. Computation of 10-100 year estimates

5.1 10-100 year estimates of the wind speed based on the 10 m level



<u>MODEL DISTRIBUTION:</u>	
WEIBULL parameters:	
Shape	1.816
Scale	8.703
Location	1.008
Estimated using: Method of Moments	

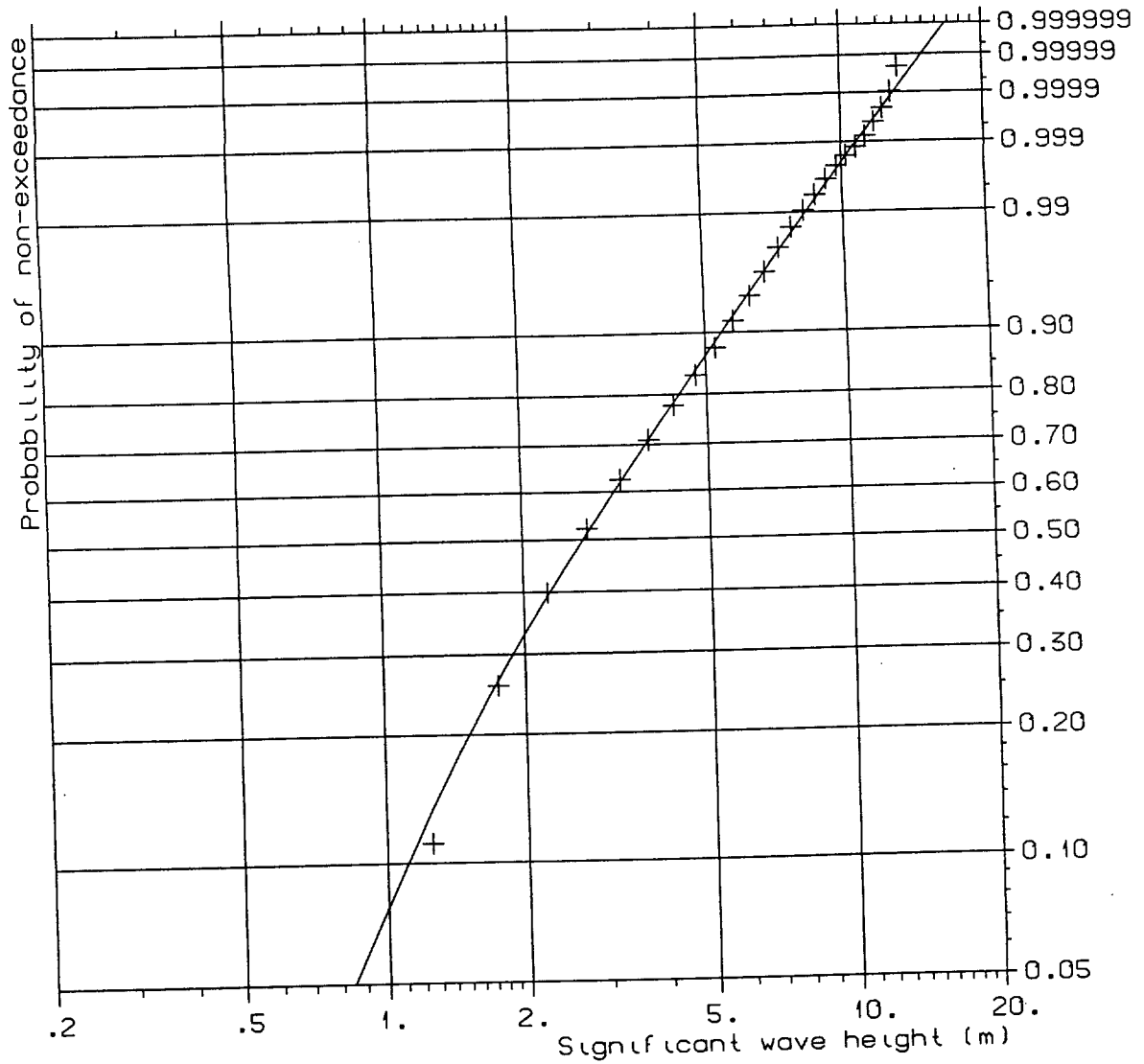
<u>ESTIMATED EXTREMES:</u>	
"RETURN" PERIOD	VALUE
- years -	- m/s -
1.0	28.3
5.0	31.2
25.	33.9
100.	36.1
Duration of exceedance: 3.0 hours	

<u>OBSERVED DISTRIBUTION:</u>	
Mean value	8.74
Std. deviation	4.41
Skewness	0.77

<u>GENERAL INFORMATION:</u>	
No. of data	: 63224
No. of indep. data:	580

	GULLFAKS C 1993-1995 Wind speed measured in top of derrick reduced to 10 m a.m.s.l.	FIGURE 5.1
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5.2 10-100 year estimates of the wave height based on data from MIROS wave radar



MODEL DISTRIBUTION:

WEIBULL parameters:

Shape	1.507
Scale	2.864
Location	0.445

Estimated using:
Method of Moments

ESTIMATED EXTREMES:

"RETURN" PERIOD	VALUE
- years -	- m -
1.0	11.8
5.0	13.3
25.	14.7
100.	15.8

Duration of exceedance:
3.0 hours

OBSERVED DISTRIBUTION:

Mean value	3.03
Std. deviation	1.75
Skewness	1.06

GENERAL INFORMATION:

No. of data	: 48802
No. of indep. data:	447

GULLFAKS C 1993-1995 Data from MIROS wave radar DNMI	FIGURE 5.2
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6. References

- Kvalitetskontroll rapport naturdata, januar 1995, Miros a/s
Kvalitetskontroll rapport naturdata, februar 1995, Miros a/s
Kvalitetskontroll rapport naturdata, mars 1995, Miros a/s
Kvalitetskontroll rapport naturdata, april 1995, Miros a/s
Kvalitetskontroll rapport naturdata, mai 1995, Miros a/s
Kvalitetskontroll rapport naturdata, juni 1995, Miros a/s
Kvalitetskontroll rapport naturdata, juli 1995, Miros a/s
Kvalitetskontroll rapport naturdata, august 1995, Miros a/s
Kvalitetskontroll rapport naturdata, september 1995, Miros a/s
Kvalitetskontroll rapport naturdata, oktober 1995, Miros a/s
Kvalitetskontroll rapport naturdata, november 1995, Miros a/s
Kvalitetskontroll rapport naturdata, desember 1995, Miros a/s

Appendix A

Complete set of parameters available in the format DF022.

Block Parameter				Observasjons	Middl	Enh	Merknad
-Navn	-Par	-nr	-kode Navn	sted	tid	tid	
WR1-031	01	07	VARn Variance of surface elevation			m*m	Ref. to Point Spectrum
WR1-031	02	08	Hm0 Significant Wave Height			m	
WR1-031	03	09	Tp1 Peak Period			s	of Point Spectrum
WR1-031	04	10	SDp1 Peak Spectral Density			m*m/Hz	of Point Spectrum
WR1-031	05	11	Dp1 Peak Direction corresponding to SDp1			deg	
WR1-031	06	12	Dm1 Mean Direction corresponding to SDp1			deg	Around the Mean
WR1-031	07	13	SPR1 Spread corresponding to SDp1			m	
WR1-031	08	14	H2 Wave Height corresp. to Secondary peak			s	
WR1-031	09	15	Tp2 Period of Secondary Peak			m*m/Hz	
WR1-031	10	16	SDp2 Secondary Peak Spectral Density			deg	
WR1-031	11	17	Dp2 Peak Direction of Secondary Peak			deg	
WR1-031	12	18	Dm2 Mean Direction of Secondary Peak			deg	Around the Mean
WR1-031	13	19	SPR2 Spread corresponding to SDp2			deg	
WR1-031	14	20	Dpt Total energy Peak Direction			deg	
WR1-031	15	21	Dmt Total energy Mean Direction			deg	Around the Mean
WR1-031	16	22	SPRT Total energy Directional Spread			deg	
WR1-031	17	23	Tz Mean Zero Upcrossing Period			s	
WR1-031	18	24	Tav Mean Period			m/s	Str|m
WR1-031	19	25	CM Current Magnitude			deg	Str|m
WR1-031	20	26	CD Current Direction			m/s	Str|m
WR1-031	21	27	CE East component of Current velocity			m/s	Str|m
WR1-031	22	28	CN North component of Current velocity			m/s	Str|m
WR1-031	23	29	SPRC Current Spread			m	
WR1-031	24	30	Hmax Maximum Wave height			s	
WR1-031	25	31	Ts Significant Wave Period			s	
WR1-031	26	32	Tmax Maximum Wave Period			m	
WR1-031	27	33	HTmax Wave height of Maximum Wave Period			s	
WR1-031	28	34	THmax Wave Period of Maximum Wave height				
WR1-031	29	35	not used				
WR1-031	30	36	not used				
ST1-002	01	38	Tew1 Seawater Temperature			deg	
ST2-002	01	40	Tew2 Seawater Temperature			m	
WL1-002	01	42	Hw1 Water level ten min. average			m	
WL2-002	01	44	Hw2 Water level ten min. average			m/s	
WIA-015	01	46	DifWsaSpeed Difference			deg	
WIA-015	02	47	DifWsaDirection Difference			m/s	
WIA-015	03	48	Mwmla Min. Gust Last 2 min			m/s	
WIA-015	04	49	Mwala Aver. Speed Last 2 min			deg	
WIA-015	05	50	Mwpla Max. Gust Last 2 min			deg	
WIA-015	06	51	Dwmla Min. Direction Last 2 min			deg	
WIA-015	07	52	Dwala Aver. Direction Last 2 min			deg	
WIA-015	08	53	Dwpla Max. Direction Last 2 min			m/s	
WIA-015	09	54	Mwm2a Min. Gust Last 10 min reduced	10 m		m/s	
WIA-015	10	55	Mwa2a Aver. Speed Last 10 min reduced	10 m		m/s	
WIA-015	11	56	Mwp2a Max. Gust Last 10 min reduced	10 m		deg	
WIA-015	12	57	Dwm2a Min. Direction Last 10 min			deg	
WIA-015	13	58	Dwa2a Aver. Direction Last 10 min			deg	
WIA-015	14	59	Dwp2a Max. Direction Last 10 min			m/s	
WIB-015	01	61	DifWsaSpeed Difference			deg	
WIB-015	02	62	DifWsaDirection Difference			m/s	
WIB-015	03	63	Mwmlb Min. Gust Last 2 min			m/s	
WIB-015	04	64	Mwalb Aver. Speed Last 2 min			deg	
WIB-015	05	65	Mwplb Max. Gust Last 2 min			deg	
WIB-015	06	66	Dwmlb Min. Direction Last 2 min			deg	
WIB-015	07	67	Dwalb Aver. Direction Last 2 min			deg	
WIB-015	08	68	Dwplb Max. Direction Last 2 min			m/s	
WIB-015	09	69	Mwm2b Min. Gust Last 10 min reduced	10 m		m/s	
WIB-015	10	70	Mwa2b Aver. Speed Last 10 min reduced	10 m		m/s	
WIB-015	11	71	Mwp2b Max. Gust Last 10 min reduced	10 m		deg	
WIB-015	12	72	Dwm2b Min. Direction Last 10 min			deg	
WIB-015	13	73	Dwa2b Aver. Direction Last 10 min			deg	
WIB-015	14	74	Dwp2b Max. Direction Last 10 min			deg	
TH1-009	01	76	Tea1 Air Temperature 1 min. mean	70 m		1 min	deg
TH1-009	02	77	Ted1 Dewpoint Temp. 1 min. mean	70 m		1 min	deg
TH1-009	03	78	Hua1 Air Humidity 1 min. mean	70 m		1 min	%RH
TH1-009	04	79	Pa11 Air Pressure at sensor 1 min. mean	70 m		1 min	hPa
TH1-009	05	80	Pa21 Air Pressure QFE 1 min. mean	80 m		1 min	hPa QNH
TH1-009	06	81	Pa31 Air Pressure QFF 1 min. mean	00 m		1 min	hPa QFE
TH1-009	07	82	Pa41 Air Pressure QNH 1 min. mean	00 m		1 min	hPa QFF
TH1-009	08	83	Pa51 Air Pressure 3 Hour Trend	00 m		1 min	hPa
TH2-009	01	85	Tea2 Air Temperature 1 min. mean	70 m		1 min	deg
TH2-009	02	86	Ted2 Dewpoint Temp. 1 min. mean	70 m		1 min	deg
TH2-009	03	87	Hua2 Air Humidity 1 min. mean	70 m		1 min	%RH
TH2-009	04	88	Pa12 Air Pressure at sensor 1 min. mean	70 m		1 min	hPa
TH2-009	05	89	Pa22 Air Pressure QFE 1 min. mean	80 m		1 min	hPa QNH
TH2-009	06	90	Pa32 Air Pressure QNH 1 min. mean	00 m		1 min	hPa QFE
TH2-009	07	91	Pa42 Air Pressure QFF 1 min. mean	00 m		1 min	hPa QFF
TH2-009	08	92	Pa52 Air Pressure 3 Hour Trend	00 m		1 min	hPa
CL1-005	01	94	Hc11 Cloud Level 1 (lowest cloud)			m	
CL1-005	02	95	Hc21 Cloud Level 2			m	
CL1-005	03	96	Hc31 Cloud Level 3			m	
CL1-005	04	97	Hv11 Vertical Visibility			m	
V11-002	01	99	Lv11 Horizontal Visibility			m	
PT1-002	01	101	Hr11 Precipitation last fixed 3 hours			mm	
MR1-005	01	103	Mwpp31Max Gust last fixed 3 hours			m/s	
MR1-005	02	104	Uwpp31UTC time for parameter 103			h:m	
MR1-005	03	105	Mwap31Max Average speed last fixed 3 hours			m/s	
MR1-005	04	106	Uwap31UTC time for parameter 105			h:m	
MR2-005	01	108	Mwpp61Max Gust last fixed 6 hours			m/s	
MR2-005	02	109	Uwpp61UTC time for parameter 108			h:m	
MR2-005	03	110	Mwap61Max Average speed last fixed 6 hours			m/s	
MR2-005	04	111	Uwap61UTC time for parameter 110			h:m	
WS1-248	01	154	Observation direction spectrum 1			deg	
WS1-248	02	155	Configuration parameter			m*m/Hz	
WS1-248	03	156	Spectral Density (point 1,direct.1)			m*m/Hz	
WS1-248	04	157	Spectral Density (point 2,direct.1)			m*m/Hz	
WS1-248	248	401	Spectral Density (point 41,direct.6)			m/s	
CV1-007	01	403	ffdd1 Current Speed, Direction 1			m/s	
CV1-007	02	404	ffdd2 Current Speed, Direction 2			m/s	
CV1-007	03	405	ffdd3 Current Speed, Direction 3			m/s	
CV1-007	04	406	ffdd4 Current Speed, Direction 4			m/s	
CV1-007	05	407	ffdd5 Current Speed, Direction 5			m/s	
CV1-007	06	408	ffdd6 Current Speed, Direction 6			m/s	