INDEX OF REVISIONS

REV.	DESCRIPTION AND / OR AFFECTED SHEETS
0	ORIGINAL
A	UPDATED SEA WATER CHARACTERISTICS (ITEM 7). INCLUDED WAVE SPREADING FORMULATION (ITEM 5.4). THE PROJECT NAME WAS CHANGED FROM FRANCO TO BUZIOS FIELD.
B	UPDATED CURRENT DATA (ITEM 6)
C	UPDATED HEADER TO INCLUDE NORTHERN SANTOS BASIN PRE-SALT FIELDS. UPDATED TABLES 3.5.1, 5.1.1 to 5.1.17 TO INCLUDE SIMULTANEOUS WAVE, WIND AND NEAR SURFACE CURRENTS EXTREME CONDITIONS.
D	INCLUDED NOTICE ABOUT DOCUMENT PROPERTY
E	UPDATED TABLE 3.5.2
F	INCLUDED TABLE 7.4
G	UPDATE AIR TEMPERATURE (TABLES 3.3.1-3); INCLUDED HVAC (TABLE 3.3.4); INCLUDED RAINFALL (TABLES 3.4.1-6)

	ORIGINAL	REV. A	REV. B	REV. C	REV. D	REV. E	REV. F	REV. G	REV. H
DATE	15/07/2013	10/11/2014	14/06/2017	20/04/2018	12/07/2018	25/09/2020	21/07/2021	26/03/2025	
EXECUTION	GUISELA	JAMLIMA	JAMLIMA/GFM	JAMLIMA	WCB	BX23	RTQL	BXU2/BZM7	
VERIFICATION	JAMLIMA	GUISELA	WCB	ERIC	JAMLIMA	BX22	CTXJ	CTXJ/FFV8	
APPROVAL	MAURO	VINICIUS	ARTHUR	ARTHUR	ARTHUR	CXVE	A7OQ	U3LG	

INDEX

1 OBJECTIVE

To present metocean data (meteorological and oceanographic parameters) to be used in the design of offshore units and production systems at northern Santos Basin Pre-Salt fields, offshore Brazil.

Figure 1 – Map of Northern Santos Basin Pre-Salt fields, offshore Brazil.

STATEMENT

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2 SYSTEM OF UNITS AND DIRECTION CONVENTION

The International System of Units (S.I.), UNESCO-IOC (Intergovernmental Oceanographic Commission) and WMO (World Meteorological Organization) recommendations were adopted.

WIND and WAVES: direction indicates where the wind and waves comes from (origin at True North, clockwise sense).

CURRENT: direction indicates where the current goes to (origin at True North origin, clockwise sense).

Regarding the numeric values for cardinal directions: zero (0º) is associated with North direction, twenty two point five (22.5º) is associated with North-Northeast direction, forty five (45º) is associated with Northeast direction, sixty seven point five (67.5º) is associated with East-Northeast direction, ninety (90º) is associated with East direction, and so on, as used in a nautical chart compass rose (Figure 2 below).

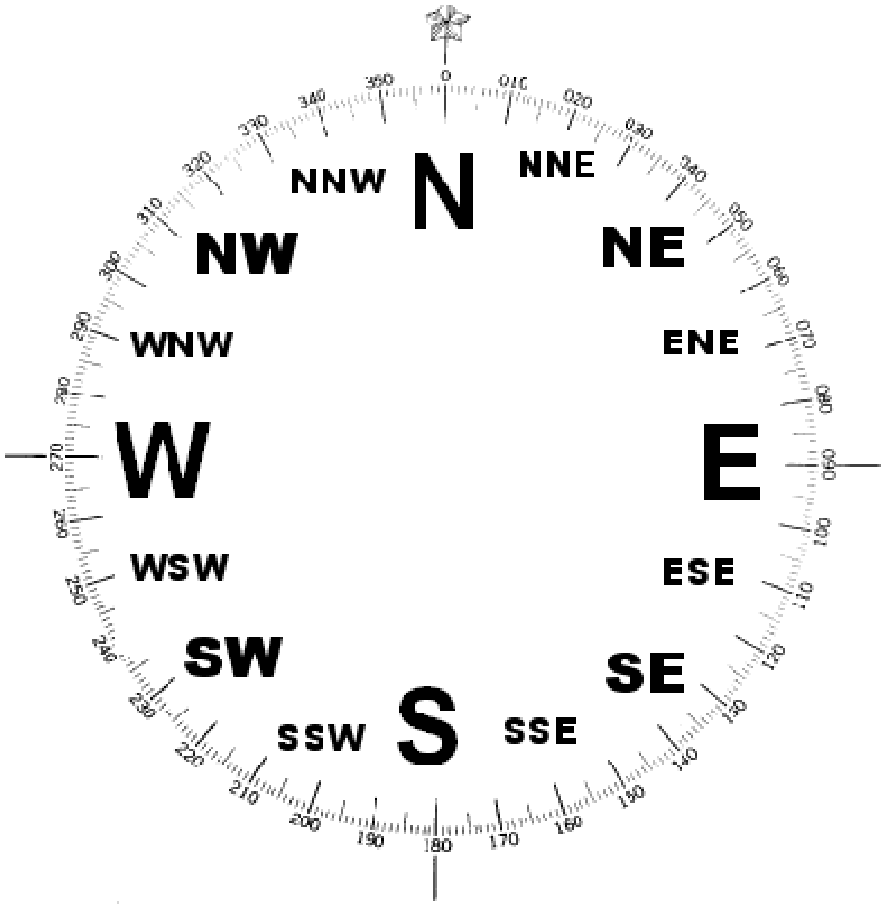

Figure 2 – Compass rose (numeric values associated with each direction)

3 METEOROLOGICAL DATA

3.1 Atmospheric Pressure

Absolute minimum : 999.3 hPa
Mean : 1016.0 hPa
Absolute maximum : 1034.0 hPa

Mean monthly values

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1012.4	1012.8	1014.0	1015.8	1017.5	1019.1	1020.5	1020.1	1018.0	1015.4	1013.8	1012.1

Source: UCDs measurements in Santos Basin in the period from Jul/2010 to Jun/2024. Ref. [1].

3.2 Relative Humidity

Absolute minimum : 33.3 %
Mean : 79.7 %
Absolute maximum : 100.0 %

Mean Monthly Values

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
85.0	83.6	80.8	75.7	73.5	78.5	77.2	77.9	80.4	81.5	79.7	83.2

Source: UCDs measurements in Santos Basin in the period from Jul/2010 to Jun/2024. Ref. [1].

3.3 Air Temperature (Dry Bulb)

Absolute minimum : 13.5°C
Mean : 23.4°C
Absolute maximum : 33.6°C

3.3.1 Characteristics Monthly Values of Air Temperature (°C)

MONTH	MINIMUM ABSOLUTE	MINIMUM	MEAN	MAXIMUM	MAXIMUM ABSOLUTE
JAN	19.1	24.5	25.5	26.7	31.0
FEB	20.7	24.7	25.9	27.4	33.6
MAR	20.9	24.8	26.0	27.4	33.4
APR	18.6	23.8	24.9	26.3	31.3
MAY	17.1	22.1	23.2	24.6	30.1
JUN	15.0	21.0	22.1	23.4	30.1
JUL	13.5	20.3	21.3	22.6	28.2
AUG	15.1	20.0	21.0	22.3	29.6
SEP	15.8	20.6	21.5	22.7	28.2
OCT	16.3	21.0	22.0	23.1	28.8
NOV	16.6	21.8	22.8	24.1	31.3
DEC	19.9	23.6	24.6	25.8	30.8
ANNUAL	13.5	22.3	23.4	24.7	33.6

Observation: MINIMUM is equal to the mean of minimum daily values
MAXIMUM is equal to the mean of maximum daily values

Source: UCDs measurements in Santos Basin in the period from Jul/2010 to Jun/2024. Ref. [1].

3.3.2 Air Temperature (Dry Bulb) Exceedance - Monthly Values (°C)

Month → % Exc↓	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
100.00	19.1	20.7	20.9	18.6	17.1	15.0	13.5	15.1	15.8	16.3	16.6	19.9	13.5
99.99	19.1	20.8	21.0	18.6	17.1	15.2	13.8	15.1	16.0	16.3	16.8	19.9	14.8
99.90	19.9	21.9	21.7	19.6	17.8	16.2	14.5	15.4	16.6	17.2	17.8	20.5	16.1
99.80	20.5	22.2	22.0	19.9	18.1	16.5	15.2	15.8	16.9	17.6	18.5	20.7	16.6
99.70	20.9	22.3	22.1	20.3	18.4	16.8	15.5	15.9	17.2	17.8	18.8	20.8	17.0
99.60	21.2	22.4	22.3	20.6	18.6	17.2	15.8	16.1	17.4	18.1	19.0	20.9	17.2
99.50	21.4	22.4	22.4	20.9	18.8	17.5	16.0	16.2	17.5	18.2	19.1	21.0	17.5
91.00	21.9	22.7	22.7	21.5	19.3	18.0	16.4	16.7	17.9	18.7	19.4	21.4	18.2
92.00	22.5	23.0	23.1	21.9	19.9	18.4	17.2	17.4	18.7	19.1	19.7	21.7	18.9
93.00	22.8	23.2	23.3	22.2	20.3	18.8	17.7	17.9	18.8	19.3	20.0	21.9	19.2
94.00	23.0	23.4	23.5	22.4	20.5	19.1	18.1	18.2	19.0	19.5	20.2	22.1	19.5
95.00	23.2	23.5	23.7	22.5	20.7	19.4	18.4	18.4	19.2	19.7	20.4	22.3	19.7
90.00	23.8	24.0	24.2	23.1	21.3	20.1	19.2	19.1	19.6	20.2	21.0	22.8	20.5
80.00	24.4	24.7	24.8	23.8	21.9	20.9	20.1	19.9	20.3	20.9	21.7	23.4	21.4
75.00	24.6	24.9	25.0	24.1	22.1	21.1	20.4	20.2	20.5	21.1	22.0	23.6	21.7
70.00	24.8	25.1	25.2	24.3	22.4	21.4	20.7	20.4	20.7	21.3	22.2	23.8	22.0
60.00	25.1	25.5	25.6	24.6	22.8	21.8	21.2	20.9	21.1	21.7	22.6	24.2	22.6
50.00	25.5	25.9	26.0	24.9	23.2	22.1	21.6	21.2	21.5	22.0	22.9	24.5	23.3
40.00	25.8	26.3	26.3	25.2	23.6	22.5	21.9	21.5	22.0	22.3	23.2	24.9	24.0
30.00	26.2	26.7	26.7	25.6	24.0	22.9	22.2	21.7	22.3	22.6	23.6	25.3	24.7
25.00	26.4	26.9	26.9	25.8	24.2	23.1	22.4	21.9	22.5	22.8	23.8	25.5	25.1
20.00	26.5	27.1	27.1	26.1	24.5	23.3	22.6	22.1	22.8	23.0	24.0	25.7	25.5
15.00	26.8	27.4	27.4	26.4	24.8	23.5	22.8	22.3	23.0	23.2	24.2	26.0	26.0
10.00	27.2	27.8	27.7	26.8	25.2	23.9	23.2	22.6	23.2	23.5	24.6	26.4	26.5
5.00	27.8	28.3	28.2	27.4	26.0	24.4	23.7	23.1	23.6	24.1	25.1	27.0	27.2
4.00	28.0	28.6	28.4	27.6	26.2	24.6	23.8	23.2	23.7	24.3	25.3	27.2	27.4
3.00	28.3	28.9	28.7	27.8	26.4	24.8	24.0	23.5	23.9	24.5	25.6	27.4	27.6
2.00	28.6	29.3	29.1	28.1	26.6	25.1	24.4	23.8	24.2	24.8	25.9	27.8	27.9
1.00	29.2	30.0	29.7	28.7	27.0	25.8	24.9	24.4	24.9	25.4	26.6	28.4	28.6
0.50	29.6	30.6	30.1	29.2	27.6	26.3	25.4	24.9	25.8	25.9	27.1	28.9	29.2
0.40	29.7	30.7	30.3	29.3	27.7	26.5	25.6	25.2	26.0	26.1	27.3	29.1	29.3
0.30	29.8	30.8	30.6	29.5	28.0	26.8	25.8	25.5	26.1	26.4	27.5	29.3	29.6
0.20	30.0	31.0	30.8	29.7	28.3	27.3	26.0	26.0	26.4	26.7	27.9	29.5	29.8
0.10	30.4	31.5	31.2	30.1	28.5	27.7	27.1	27.0	26.7	27.3	28.7	29.9	30.3
0.01	31.0	33.0	33.2	31.2	29.8	29.5	28.0	29.4	28.1	28.6	30.6	30.6	31.5
0.00	31.0	33.6	33.4	31.3	30.1	30.1	28.2	29.6	28.2	28.8	31.3	30.8	33.6

Source: UCDs measurements in Santos Basin in the period from Jul/2010 to Jun/2024. Ref. [1].

3.3.3 Percentage of Air Temperature Occurrence in Monthly Basis

Range of Temperature (°C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
13 - 14							0.01						0.001
14 - 15							0.14						0.011
15 - 16						0.09	0.41	0.36	0.01				0.073
16 - 17						0.27	1.13	0.98	0.22	0.02	0.02		0.222
17 - 18					0.18	0.65	2.13	2.10	0.85	0.35	0.10		0.534
18 - 19				0.06	0.46	2.59	4.57	5.92	2.81	1.47	0.30		1.523
19 - 20	0.12			0.17	1.53	5.27	10.5	12.2	11.8	5.67	2.56	0.02	4.180
20 - 21	0.19	0.02	0.01	0.34	4.79	13.7	17.6	22.6	21.2	14.5	7.20	0.48	8.601
21 - 22	0.82	0.09	0.23	1.77	15.1	23.8	27.2	34.6	24.2	28.1	15.8	3.11	14.675
22 - 23	3.11	1.93	1.62	6.33	23.3	27.2	24.8	15.8	25.0	30.7	27.4	9.44	16.474
23 - 24	8.22	8.40	6.09	15.1	24.9	18.1	8.66	4.02	11.0	13.3	27.5	22.1	13.977
24 - 25	23.0	17.0	17.8	30.5	17.3	5.94	2.24	1.10	1.78	4.09	13.1	28.2	13.518
25 - 26	29.7	25.8	25.2	23.8	7.64	1.52	0.72	0.27	0.52	1.12	4.22	22.0	11.844
26 - 27	22.6	24.1	26.7	13.8	3.64	0.54	0.10	0.10	0.33	0.29	1.14	9.86	8.550
27 - 28	8.14	15.2	15.7	5.73	0.71	0.21	0.10	0.08	0.04	0.10	0.39	3.20	4.085
28 - 29	2.71	4.64	4.31	1.56	0.23	0.03	0.01		0.01	0.05	0.09	1.10	1.213
29 - 30	1.01	1.67	1.61	0.57	0.06			0.02			0.07	0.40	0.445
30 - 31	0.23	0.73	0.48	0.09	0.01	0.01						0.05	0.130
31 - 32		0.18	0.11	0.02							0.01		0.025
32 - 33		0.02	0.01										0.002
33 - 34		0.01	0.02										0.002

Source: UCDs measurements in Santos Basin in the period from Jul/2010 to Jun/2024. Ref. [1].

3.3.4 HVAC - Dry Bulb / Wet Bulb Temperatures

Basin: Santos	Data Source: UCDs measurements					Height (m):		PR.atm:		Period:			
						42.5		101.60		Jul/10 to jun/24			
Month> Hot	Annual Freq	annual cooling / dehumidification				summer cooling / dehumidification				winter cooling / dehumidification				Month> Cold
February		**TBS**	TBUc	**TBU**	TBSc	**TBS**	TBUc	**TBU**	TBSc	**TBS**	TBUc	**TBU**	TBSc	August
	0.4%	29.3	25.2	26.5	28.0	30.2	25.6	27.0	28.6	16.2	13.3	12.1	17.3	
ΔAdT	1%	28.5	25.0	26.0	27.6	29.6	25.9	26.7	28.3	17.0	13.7	12.9	18.0	ΔAdT
2.7	2%	27.9	24.6	25.7	27.2	29.0	25.3	26.4	28.0	17.7	14.2	13.4	18.4	2.3

Source: ABNT NBR 16401-1/2008 – Central and unitary air conditioning systems. Part 1: Design of installations. Ref. [2].

PR atm – average local ATM pressure [kPa]
Period – meteorological measurements period
Month > Hot – month with the highest average of the max temperatures
Month > Cold – month with the smallest average of the min temperatures
Δ AdT – average diary air temperature range [ºC]
TBS, TBU – project temperatures (max / min) of dry/wet bulb [ºC]
TBSc, TBUc – coincidental temperatures of dry/wet bulb [ºC]

Source: UCDs measurements in Santos Basin in the period from Jul/2010 to Jun/2024. Ref. [1].

Note: Among the various scenarios studied in its 6th report of 2023, the IPCC concluded that there is more than a 50% chance of the global average air temperature reaching or exceeding the 1.5°C limit between 2021-2040 when compared to values between 1850-1900.
Source: https://www.ipcc.ch/report/sixth-assessment-report-cycle/. Ref. [3].

3.4 Rainfall

3.4.1 Disaggregation Factor

Duration (minutes)	Disaggregation Factor	
	Acumulated	Intensity
1	0.057	3.420
5	0.274	3.290
10	0.438	2.628
30	0.766	1.532

3.4.2 Extreme IDF Curves

Duration	1h	2h	3h	4h	6h	9h	12h	18h	24h
1 year	30.0	48.2	61.0	70.8	85.2	100.2	111.1	126.8	138.2
5 years	47.4	76.1	96.2	111.6	134.4	158.0	175.1	199.9	217.9
10 years	54.8	88.1	111.4	129.2	155.6	182.9	202.7	231.4	252.3
15 years	59.2	95.1	120.3	139.5	168.0	197.4	218.9	249.8	272.4
20 years	62.3	100.0	126.6	146.8	176.8	207.8	230.3	262.8	286.6
30 years	66.6	107.1	135.4	157.1	189.1	222.3	246.5	281.3	306.7
50 years	72.1	115.9	146.6	170.1	204.7	240.7	266.8	304.5	332.0
100 years	79.6	127.9	161.8	187.7	225.9	265.6	294.4	336.0	366.3
1000 years	104.4	167.7	212.2	246.1	296.3	348.3	386.0	440.6	480.4

Source: GPM Level 3A Radiometer (GPROF) in the period from nov/2000 to oct/2024. Ref. [4].

Rainfall Equation - Intensity in mm/h

---

i(mm/h) = (583.5799* ln(T) +1628.2223).*((t +121.6297).^-0.7676)

where T = Return Period in years and t = duration in minutes for T >= 1 year and t >= 60 minutes.

3.4.3 Rainfall Frequency (days) above 1mm/day

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
7	6	8	8	9	7	6	6	7	8	7	6	85

Source: GPM Level 3A Radiometer (GPROF) in the period from nov/2000 to oct/2024. Ref. [4].

3.4.4 Monthly Accumulated Rainfall (mm)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
96.3	90.9	85.2	115.7	82.5	88.1	85.4	81.8	70.1	81.5	106.8	85.5	1069.7

Source: GPM Level 3A Radiometer (GPROF) in the period from nov/2000 to oct/2024. Ref. [4].

3.4.5 Maximum Absolute Accumulated Rainfall (mm)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
90.3	94.0	115.3	150.4	82.5	102.4	138.3	124.8	86.8	107.5	138.1	365.9	365.9

Source: GPM Level 3A Radiometer (GPROF) in the period from nov/2000 to oct/2024. Ref. [4].

3.4.6 Rainfall Exceedance above 1mm/time frame

Duration → % Exc ↓	1h	2h	3h	4 h	6h	9h	12h	18h	24h
100.00	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
99.99	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
99.90	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
99.80	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
99.70	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
99.60	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
99.50	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
99.00	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
98.00	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1
97.00	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
96.00	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
95.00	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2
90.00	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4
80.00	1.3	1.5	1.5	1.6	1.7	1.8	1.8	1.9	2.0
75.00	1.4	1.6	1.7	1.8	1.9	2.1	2.2	2.3	2.4
70.00	1.5	1.8	1.9	2.0	2.2	2.4	2.5	2.7	2.8
60.00	1.8	2.2	2.4	2.6	2.9	3.2	3.4	3.8	4.0
50.00	2.1	2.6	3.0	3.3	3.8	4.3	4.7	5.4	5.8
40.00	2.6	3.3	3.9	4.4	5.1	5.9	6.6	7.6	8.4
30.00	3.3	4.3	5.2	5.8	7.0	8.2	9.2	10.9	12.3
25.00	3.7	5.0	6.0	6.9	8.2	9.9	11.3	13.4	15.1
20.00	4.4	6.0	7.2	8.3	10.0	12.1	13.8	16.2	18.3
15.00	5.3	7.3	8.9	10.3	12.5	15.1	17.3	20.8	23.3
10.00	6.7	9.6	11.8	13.6	16.4	20.0	23.0	27.7	30.5
5.00	9.6	14.2	17.4	20.3	25.1	29.9	33.9	40.3	45.1
4.00	10.6	15.8	19.5	23.1	28.0	33.7	38.3	44.9	49.6
3.00	12.2	18.0	22.9	26.8	32.2	38.8	43.6	50.1	55.6
2.00	14.9	21.8	27.3	31.8	39.1	46.5	51.5	59.6	65.0
1.00	20.4	28.9	35.7	41.0	49.7	58.0	64.9	74.2	82.7
0.50	24.8	38.9	48.2	54.2	64.2	74.1	81.1	88.8	102.5
0.40	26.7	42.0	51.2	58.9	69.0	77.5	86.7	99.6	110.2
0.30	29.3	45.3	55.0	65.2	75.6	85.7	94.6	107.5	115.3
0.20	32.4	49.3	64.1	72.0	86.0	96.8	110.5	116.3	130.5
0.10	36.8	56.0	72.4	85.9	104.8	121.6	129.6	136.5	143.2
0.01	52.2	78.9	106.4	127.7	179.7	236.1	280.2	337.9	363.8
0.00	52.5	79.5	111.0	135.7	192.7	245.7	292.5	359.7	365.9

Source: GPM Level 3A Radiometer (GPROF) in the period from nov/2000 to oct/2024. Ref. [4].

3.5 Wind

The wind values are referenced to 10 meters above mean sea level and 10-minute or 1 hour duration.

Transformations to different heights and durations may be calculated as indicates in DNV Classification Notes 30.5 or any other codes.

3.5.1 Wind Speed by Return Period (m/s) with associated Wave and Current Conditions

		Return Period (Years)						
Dir	Parameter	1	10	20	30	50	100	1000
N	WS: Wind Speed (m/s)	17.30	23.07	24.79	25.81	27.09	28.81	34.55
	Hs: Associated wave in the same direction (m)	2.37	3.43	3.74	3.93	4.16	4.48	5.53
	CS: Associated current in the same direction (m/s)	0.36	0.47	0.51	0.53	0.55	0.59	0.70
NNE	WS: Wind Speed (m/s)	18.01	22.97	24.47	25.34	26.43	27.93	32.87
	Hs: Associated wave in the same direction (m)	3.14	4.19	4.50	4.69	4.92	5.23	6.27
	CS: Associated current in the same direction (m/s)	0.48	0.71	0.78	0.82	0.87	0.94	1.17
NE	WS: Wind Speed (m/s)	18.16	22.98	24.42	25.26	26.33	27.77	32.58
	Hs: Associated wave in the same direction (m)	3.34	4.35	4.66	4.83	5.06	5.36	6.37
	CS: Associated current in the same direction (m/s)	0.54	0.80	0.87	0.92	0.97	1.05	1.30
ENE	WS: Wind Speed (m/s)	17.94	22.84	24.3	25.16	26.24	27.71	32.59
	Hs: Associated wave in the same direction (m)	3.28	4.31	4.62	4.80	5.03	5.34	6.36
	CS: Associated current in the same direction (m/s)	0.52	0.78	0.86	0.90	0.96	1.04	1.30
E	WS: Wind Speed (m/s)	17.23	22.28	23.79	24.67	25.8	27.30	32.34
	Hs: Associated wave in the same direction (m)	3.14	4.20	4.52	4.71	4.94	5.26	6.32
	CS: Associated current in the same direction (m/s)	0.54	0.75	0.81	0.85	0.90	0.96	1.18
ESE	WS: Wind Speed (m/s)	16.53	21.74	23.30	24.21	25.37	26.93	32.13
	Hs: Associated wave in the same direction (m)	2.85	3.80	4.09	4.26	4.47	4.75	5.71
	CS: Associated current in the same direction (m/s)	0.42	0.64	0.71	0.76	0.81	0.89	1.13
SE	WS: Wind Speed (m/s)	16.56	21.89	23.49	24.42	25.6	27.19	32.50
	Hs: Associated wave in the same direction (m)	3.30	4.28	4.57	4.74	4.96	5.25	6.22
	CS: Associated current in the same direction (m/s)	0.41	0.60	0.66	0.70	0.74	0.80	1.00
SSE	WS: Wind Speed (m/s)	17.45	23.06	24.74	25.72	26.97	28.65	34.24
	Hs: Associated wave in the same direction (m)	3.51	4.43	4.71	4.87	5.08	5.35	6.27
	CS: Associated current in the same direction (m/s)	0.30	0.50	0.56	0.60	0.65	0.71	0.91

Continue …

		Return Period (Years)						
Dir	Parameter	1	10	20	30	50	100	1000
S	WS: Wind Speed (m/s)	19.18	25.52	27.43	28.55	29.95	31.84	38.17
	Hs: Associated wave in the same direction (m)	4.06	5.33	5.72	5.94	6.22	6.61	7.88
	CS: Associated current in the same direction (m/s)	0.30	0.46	0.51	0.53	0.57	0.61	0.77
SSW	WS: Wind Speed (m/s)	20.43	27.42	29.53	30.75	32.30	34.40	41.38
	Hs: Associated wave in the same direction (m)	4.85	6.58	7.10	7.41	7.79	8.31	10.03
	CS: Associated current in the same direction (m/s)	0.21	0.40	0.46	0.49	0.53	0.59	0.78
SW	WS: Wind Speed (m/s)	20.13	27.34	29.49	30.75	32.35	34.51	41.68
	Hs: Associated wave in the same direction (m)	5.04	6.89	7.44	7.77	8.18	8.73	10.57
	CS: Associated current in the same direction (m/s)	0.21	0.39	0.44	0.48	0.52	0.57	0.75
WSW	WS: Wind Speed (m/s)	18.92	26.19	28.37	29.65	31.26	33.44	40.68
	Hs: Associated wave in the same direction (m)	3.65	5.25	5.73	6.01	6.36	6.84	8.43
	CS: Associated current in the same direction (m/s)	0.20	0.38	0.44	0.47	0.51	0.57	0.75
W	WS: Wind Speed (m/s)	18.09	25.14	27.26	28.49	30.05	32.16	39.18
	Hs: Associated wave in the same direction (m)	3.32	4.96	5.46	5.75	6.11	6.60	8.24
	CS: Associated current in the same direction (m/s)	0.21	0.34	0.38	0.41	0.44	0.48	0.61
WNW	WS: Wind Speed (m/s)	16.82	23.38	25.35	26.51	27.95	29.92	36.45
	Hs: Associated wave in the same direction (m)	2.63	3.77	4.11	4.31	4.57	4.91	6.04
	CS: Associated current in the same direction (m/s)	0.21	0.33	0.37	0.39	0.41	0.45	0.57
NW	WS: Wind Speed (m/s)	16.06	22.12	23.94	25.00	26.33	28.16	34.19
	Hs: Associated wave in the same direction (m)	2.50	3.64	3.99	4.19	4.44	4.78	5.92
	CS: Associated current in the same direction (m/s)	0.22	0.38	0.43	0.45	0.49	0.54	0.67
NNW	WS: Wind Speed (m/s)	16.30	22.09	23.82	24.84	26.12	27.85	33.61
	Hs: Associated wave in the same direction (m)	2.16	3.32	3.67	3.88	4.13	4.48	5.64
	CS: Associated current in the same direction (m/s)	0.26	0.44	0.49	0.52	0.56	0.61	0.79

Source: Measured wind data in Caravela, Tupi and Merluza fields in Santos Basin (1994-2011). Ref. [5].
The extreme wind speed was converted to 10-minute wind using the factor 1.092 from DNV Classification Notes 30.5.

3.5.2 Joint Distribution of Wind Speed and Wind Direction (1 hour wind)

Spd↓	Dir→	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total	%
0	1	54	62	57	49	58	56	48	40	50	51	56	52	54	47	54	55	843	1.02
1	2	199	197	179	159	156	166	195	158	174	151	135	144	156	135	137	162	2603	3.15
2	3	313	377	351	314	339	407	349	296	257	286	243	199	192	186	198	250	4557	5.52
3	4	400	538	623	612	620	575	502	521	417	318	268	222	166	192	232	254	6460	7.83
4	5	416	745	859	867	884	797	688	601	534	368	281	248	209	178	186	246	8107	9.82
5	6	471	968	1127	1107	1094	949	681	566	533	391	295	216	144	128	94	166	8930	10.82
6	7	477	1156	1441	1400	1152	961	763	593	471	404	284	197	141	82	72	140	9734	11.79
7	8	381	1293	1680	1554	1060	758	632	485	390	316	267	201	115	56	52	97	9337	11.31
8	9	315	1454	1835	1508	830	535	440	365	370	292	245	184	115	38	34	77	8637	10.46
9	10	166	1500	2145	1350	695	415	305	266	262	242	209	149	86	40	22	44	7896	9.56
10	11	114	1373	1998	1015	375	259	186	199	149	145	169	106	82	25	14	14	6223	7.54
11	12	84	1076	1580	581	192	135	98	100	127	90	93	128	58	10	12	16	4380	5.31
12	13	39	738	1008	299	86	80	45	49	61	52	61	82	45	9	9	6	2669	3.23
13	14	12	424	594	97	27	28	16	16	22	36	33	42	33	5	5	2	1392	1.69
14	15	4	147	236	32	16	8	6	8	5	9	9	11	14	5	0	1	511	0.62
15	16	2	39	84	14	2	5	7	6	1	3	9	8	7	0	2	0	189	0.23
16	17	0	16	16	3	3	2	0	0	4	1	2	2	5	2	0	0	56	0.07
17	18	0	5	3	2	0	0	1	0	1	0	1	3	3	0	0	0	19	0.02
18	19	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	4	0
19	20	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	3	0
20	21	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0
21	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		3447	12110	15816	10963	7589	6136	4962	4269	3828	3155	2662	2199	1625	1138	1123	1530	82552	
% Dir		4.18	14.67	19.16	13.28	9.19	7.43	6.01	5.17	4.64	3.82	3.22	2.66	1.97	1.38	1.36	1.85		
Mean Spd		5.83	8.3	8.61	7.55	6.62	6.26	6.08	6.1	6.17	6.19	6.38	6.47	5.91	4.56	4.22	4.5		

Source: Measured wind data at Santos Basin from metocean buoy, production and drilling platforms (10-year measurement period). Ref [6]. The values should be considered representative of 1-hour wind speeds.

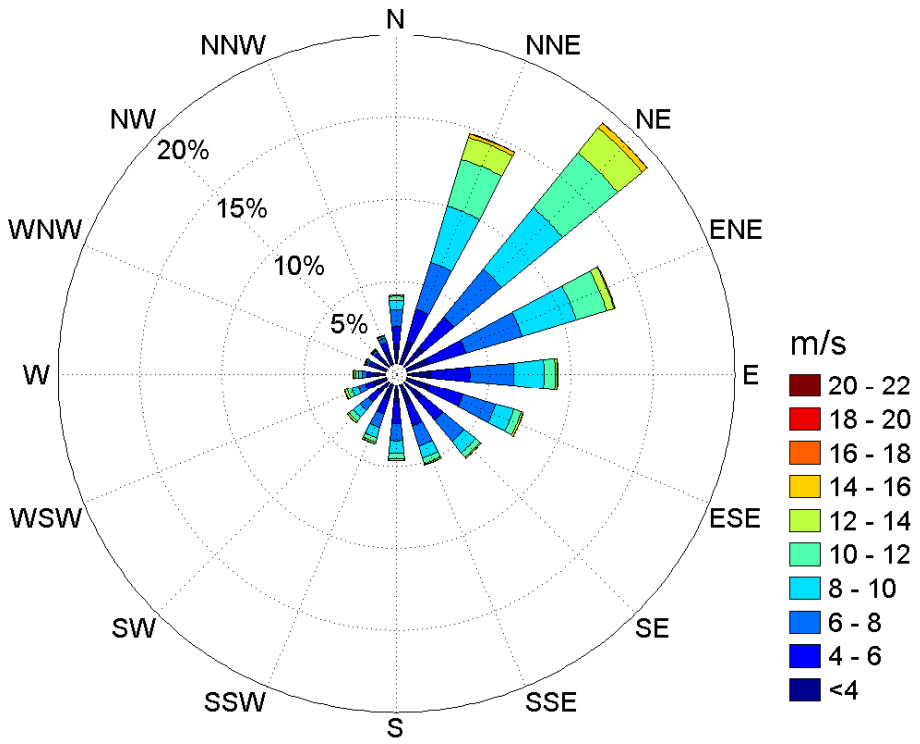

Figure 3.5.2.1 - Directional percentage of surface winds (level 10 m)

4 TIDAL DATA

The water levels are regarded to the Reduction Level of DHN

Tidal Astron. Max. + Tidal Atm. Max.	1.75 m
Tidal Astronomical Maximum	1.30 m
Mean Higher High Water (MHHW)	1.24 m
Mean Sea Level	0.68 m
Mean Low High Water (MLHW)	0.24 m
Tidal Astronomical Minimum	- 0.10 m
Tidal Astr. Min. + Tidal Atm. Min.	- 0.55 m
Band of Spring Variation (MHHW-MLHW)	1.00 m
Band of Maximum Astronomical Variation	1.40 m

Sources:

- PETROBRAS Metocean Database (Engineering measurement program – mooring P1). Ref. [7]. Central Cluster BS (mooring P1).
- *http://www.fundacaofemar.org.br* , São Sebastião Harbor (São Paulo). Ref. [8].
- Oliveira, M.M.F., Ebecken,N.F.F, “Previsão da Variação do Nível do Mar na Bacia de Santos”, COPPE/UFRJ, 2009. Ref. [9].
- *https://www.marinha.mil.br/chm/dados-do-segnav/dados-de-mare-mapa*, São Sebastião Harbor (São Paulo). Ref. [10].

5 WAVE DATA

5.1 Extreme Single Peak Wave Criteria

The most extreme wave conditions at Santos Basin happen under single peak wave spectrum conditions. Strong winds are blowing with extensive wind fetch in the same direction of the dominant wave direction. Due to non-linear wave interactions, high frequency energy gradually feeds lower frequency and a single peak sea state is merged.

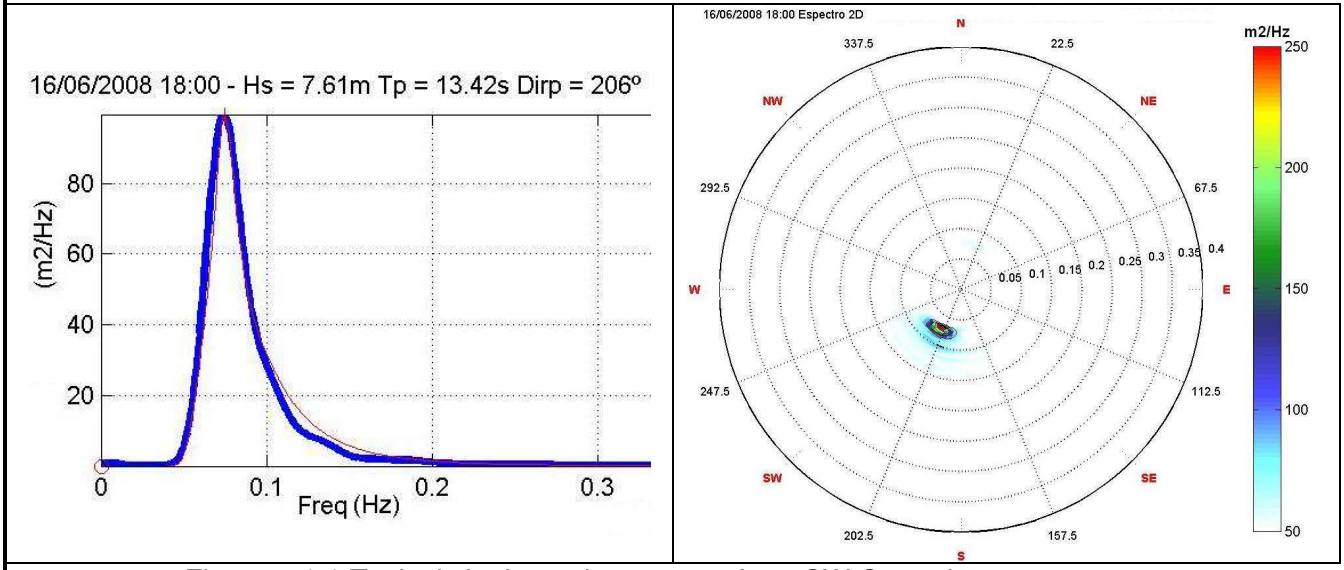

Figure 5.1.1 Typical single peak spectrum from SW-S quadrant wave storm

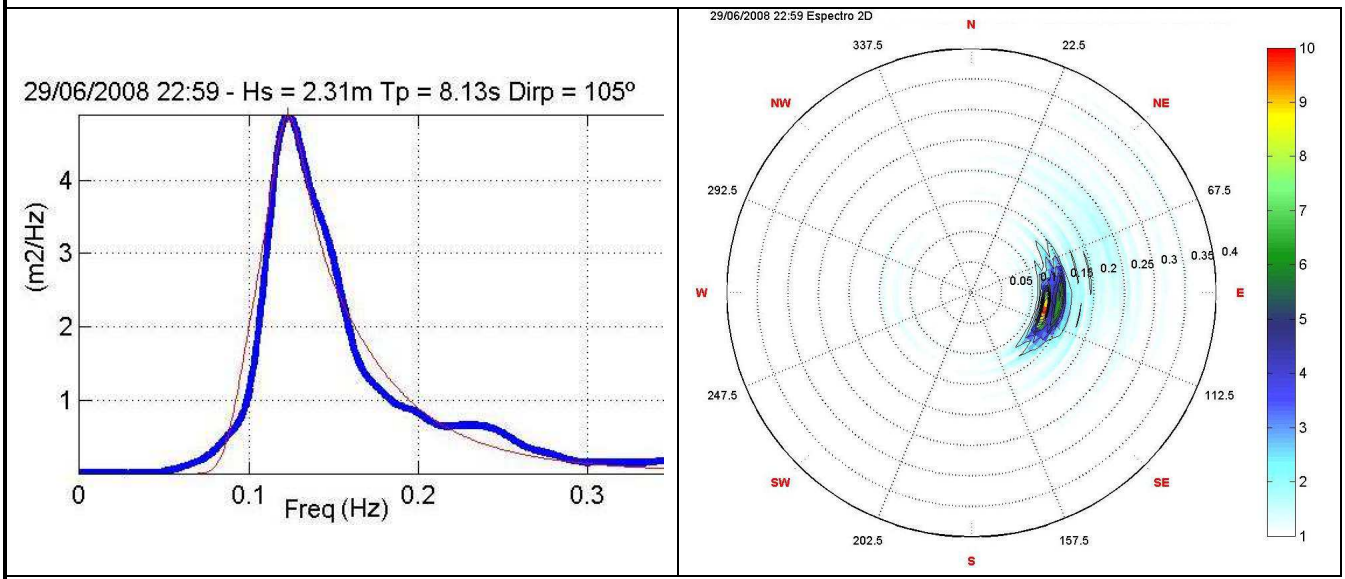

Figure 5.1.2 Typical single peak spectrum from E wave conditions

5.1.1 Extreme Single Peak Wave Parameters with associated Wind and Current Conditions by Return Periods (Years)

OBS: The table below present only the maximum significant wave height Hs (and associated parameters) from the extreme curves Hs x Tp presented on tables 5.1.2 to 5.1.17. For most design applications, it is recommended to used the full Hs x Tp curves.

		Return Period (Years)						
Dir	Parameter	1	10	20	30	50	100	1000
N	Hs: SIGNIFICANT WAVE HEIGHT (m)	3.56	4.16	4.30	4.38	4.48	4.60	4.95
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	7.50	8.30	8.30	8.50	8.50	8.80	9.00
	TZ: ZERO UP-CROSSING PERIOD (s)	5.59	6.17	6.17	6.31	6.31	6.53	6.67
	HMAX: MAXIMUM WAVE HEIGHT (m)	6.92	8.04	8.31	8.45	8.64	8.86	9.51
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	9.99	10.30	10.37	10.40	10.45	10.50	10.65
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	15.76	18.26	18.85	19.18	19.58	20.08	21.55
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.37	0.51	0.54	0.56	0.58	0.60	0.68
NNE	Hs: SIGNIFICANT WAVE HEIGHT (m)	4.03	5.25	5.61	5.82	6.09	6.45	7.65
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	8.00	9.50	9.80	10.00	10.50	10.80	12.00
	TZ: ZERO UP-CROSSING PERIOD (s)	5.95	7.03	7.24	7.39	7.74	7.96	8.81
	HMAX: MAXIMUM WAVE HEIGHT (m)	7.81	10.06	10.72	11.11	11.59	12.25	14.43
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	10.24	10.76	10.89	10.97	11.05	11.17	11.51
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	14.48	17.64	18.58	19.13	19.83	20.77	23.90
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.35	0.52	0.57	0.60	0.64	0.69	0.85
NE	Hs: SIGNIFICANT WAVE HEIGHT (m)	4.15	5.38	5.74	5.96	6.23	6.60	7.82
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	8.80	10.00	10.30	10.50	10.80	11.30	12.50
	TZ: ZERO UP-CROSSING PERIOD (s)	6.53	7.39	7.60	7.74	7.96	8.31	9.17
	HMAX: MAXIMUM WAVE HEIGHT (m)	7.99	10.27	10.94	11.34	11.83	12.50	14.70
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	10.29	10.81	10.93	11.01	11.10	11.21	11.55
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	14.56	18.37	19.51	20.17	21.01	22.15	25.93
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.53	0.76	0.83	0.87	0.92	1.00	1.22
ENE	Hs: SIGNIFICANT WAVE HEIGHT (m)	4.15	5.38	5.74	5.96	6.23	6.60	7.82
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	9.00	10.00	10.30	10.50	10.80	11.00	12.30
	TZ: ZERO UP-CROSSING PERIOD (s)	6.67	7.39	7.60	7.74	7.96	8.10	9.02
	HMAX: MAXIMUM WAVE HEIGHT (m)	7.98	10.27	10.94	11.34	11.83	12.52	14.72
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	10.28	10.81	10.93	11.01	11.10	11.21	11.55
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	13.48	17.91	19.23	20.00	20.98	22.30	26.69
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.53	0.76	0.83	0.87	0.92	1.00	1.22
E	Hs: SIGNIFICANT WAVE HEIGHT (m)	3.98	5.27	5.66	5.88	6.17	6.56	7.84
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	9.30	10.00	10.50	10.50	10.80	11.30	12.00
	TZ: ZERO UP-CROSSING PERIOD (s)	6.88	7.39	7.74	7.74	7.96	8.31	8.81
	HMAX: MAXIMUM WAVE HEIGHT (m)	7.63	10.06	10.77	11.19	11.72	12.42	14.78
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	10.19	10.76	10.90	10.98	11.08	11.20	11.56
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	11.83	16.48	17.87	18.69	19.71	21.10	25.71
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.41	0.60	0.66	0.70	0.74	0.80	1.00

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

		Return Period (Years)						
Dir	Parameter	1	10	20	30	50	100	1000
ESE	Hs: SIGNIFICANT WAVE HEIGHT (m)	3.92	5.22	5.61	5.83	6.12	6.50	7.79
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	10.30	11.30	11.50	11.80	12.00	12.00	13.00
	TZ: ZERO UP-CROSSING PERIOD (s)	7.60	8.31	8.45	8.67	8.81	8.81	9.52
	HMAX: MAXIMUM WAVE HEIGHT (m)	7.47	9.88	10.61	11.01	11.54	12.26	14.61
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	10.15	10.73	10.87	10.95	11.05	11.17	11.53
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	11.73	16.26	17.62	18.41	19.41	20.76	25.25
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.39	0.59	0.65	0.68	0.73	0.79	0.98
SE	Hs: SIGNIFICANT WAVE HEIGHT (m)	4.40	5.84	6.27	6.52	6.84	7.27	8.69
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	11.00	12.00	12.30	12.30	12.80	13.00	13.50
	TZ: ZERO UP-CROSSING PERIOD (s)	8.10	8.81	9.02	9.02	9.38	9.52	9.88
	HMAX: MAXIMUM WAVE HEIGHT (m)	8.35	11.01	11.80	12.27	12.84	13.63	16.25
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	12.02	13.30	13.68	13.91	14.18	14.56	15.82
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	12.39	16.97	18.33	19.13	20.14	21.51	26.04
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.32	0.54	0.60	0.64	0.69	0.75	0.96
SSE	Hs: SIGNIFICANT WAVE HEIGHT (m)	4.68	6.19	6.65	6.91	7.24	7.69	9.19
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	11.80	13.00	13.50	13.50	13.80	14.00	15.00
	TZ: ZERO UP-CROSSING PERIOD (s)	8.67	9.52	9.88	9.88	10.09	10.23	10.94
	HMAX: MAXIMUM WAVE HEIGHT (m)	8.83	11.61	12.44	12.92	13.52	14.35	17.06
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	12.26	13.59	13.99	14.22	14.51	14.91	16.21
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	10.04	14.58	15.94	16.73	17.73	19.08	23.58
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.30	0.49	0.55	0.58	0.63	0.68	0.88
S	Hs: SIGNIFICANT WAVE HEIGHT (m)	5.29	7.03	7.55	7.86	8.24	8.76	10.49
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	13.00	14.50	14.80	15.00	15.30	15.80	17.30
	TZ: ZERO UP-CROSSING PERIOD (s)	9.52	10.59	10.80	10.94	11.15	11.51	12.57
	HMAX: MAXIMUM WAVE HEIGHT (m)	9.92	13.08	14.03	14.59	15.28	16.21	19.28
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	12.78	14.30	14.75	15.03	15.35	15.80	17.28
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	10.92	15.28	16.58	17.35	18.31	19.61	23.93
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.24	0.42	0.47	0.50	0.54	0.60	0.77
SSW	Hs: SIGNIFICANT WAVE HEIGHT (m)	6.75	9.30	10.01	10.42	10.93	11.60	13.74
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	12.50	14.50	15.00	15.30	16.00	16.30	17.80
	TZ: ZERO UP-CROSSING PERIOD (s)	9.17	10.59	10.94	11.15	11.65	11.86	12.92
	HMAX: MAXIMUM WAVE HEIGHT (m)	12.69	17.31	18.59	19.32	20.20	21.41	25.20
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	14.11	16.33	16.95	17.30	17.72	18.30	20.13
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	14.28	20.65	22.44	23.46	24.72	26.40	31.76
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.21	0.39	0.44	0.47	0.51	0.56	0.71
SW	Hs: SIGNIFICANT WAVE HEIGHT (m)	6.86	9.18	9.81	10.16	10.60	11.17	12.95
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	12.00	14.00	14.80	15.00	15.80	16.00	17.80
	TZ: ZERO UP-CROSSING PERIOD (s)	8.81	10.23	10.80	10.94	11.51	11.65	12.92
	HMAX: MAXIMUM WAVE HEIGHT (m)	12.94	17.13	18.23	18.86	19.61	20.65	23.75
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	14.23	16.24	16.78	17.08	17.44	17.94	19.43
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	16.06	20.01	21.07	21.67	22.41	23.39	26.42
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.23	0.40	0.44	0.46	0.50	0.54	0.66

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

		Return Period (Years)						
Dir	Parameter	1	10	20	30	50	100	1000
WSW	Hs: SIGNIFICANT WAVE HEIGHT (m)	5.52	6.85	7.19	7.37	7.60	7.89	8.76
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	10.00	11.50	12.00	12.30	12.50	12.80	13.80
	TZ: ZERO UP-CROSSING PERIOD (s)	7.39	8.45	8.81	9.02	9.17	9.38	10.09
	HMAX: MAXIMUM WAVE HEIGHT (m)	10.54	12.95	13.56	13.87	14.29	14.81	16.36
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	10.86	11.28	11.38	11.43	11.49	11.56	11.77
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	16.45	19.65	20.45	20.90	21.44	22.14	24.23
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.27	0.41	0.44	0.46	0.49	0.52	0.60
W	Hs: SIGNIFICANT WAVE HEIGHT (m)	4.67	5.77	6.04	6.20	6.38	6.62	7.35
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	8.80	10.00	10.00	10.50	10.50	10.80	11.50
	TZ: ZERO UP-CROSSING PERIOD (s)	6.53	7.39	7.39	7.74	7.74	7.96	8.45
	HMAX: MAXIMUM WAVE HEIGHT (m)	8.99	11.01	11.53	11.80	12.14	12.57	13.90
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	10.53	10.95	11.04	11.09	11.15	11.22	11.43
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	16.15	19.49	20.33	20.80	21.37	22.10	24.31
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.23	0.33	0.36	0.37	0.39	0.41	0.49
WNW	Hs: SIGNIFICANT WAVE HEIGHT (m)	3.82	4.46	4.61	4.70	4.80	4.92	5.30
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	7.80	8.30	8.30	8.50	8.50	8.50	9.00
	TZ: ZERO UP-CROSSING PERIOD (s)	5.81	6.17	6.17	6.31	6.31	6.31	6.67
	HMAX: MAXIMUM WAVE HEIGHT (m)	7.41	8.62	8.91	9.07	9.26	9.49	10.19
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	10.13	10.44	10.51	10.55	10.59	10.64	10.79
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	14.75	18.09	18.89	19.32	19.84	20.51	22.45
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.29	0.42	0.45	0.47	0.49	0.51	0.58
NW	Hs: SIGNIFICANT WAVE HEIGHT (m)	3.71	4.33	4.48	4.56	4.66	4.78	5.13
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	7.00	7.50	7.80	7.80	7.80	8.00	8.00
	TZ: ZERO UP-CROSSING PERIOD (s)	5.23	5.59	5.81	5.81	5.81	5.95	5.95
	HMAX: MAXIMUM WAVE HEIGHT (m)	7.25	8.42	8.69	8.85	9.04	9.26	9.94
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	10.09	10.40	10.46	10.50	10.54	10.59	10.74
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	15.83	18.31	18.90	19.23	19.61	20.11	21.54
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.27	0.42	0.46	0.48	0.50	0.53	0.62
NNW	Hs: SIGNIFICANT WAVE HEIGHT (m)	3.44	4.05	4.20	4.28	4.38	4.50	4.87
	TP: PEAK PERIOD ASSOCIATED TO Hs (s)	6.80	7.30	7.50	7.50	7.50	7.50	7.80
	TZ: ZERO UP-CROSSING PERIOD (s)	5.09	5.45	5.59	5.59	5.59	5.59	5.81
	HMAX: MAXIMUM WAVE HEIGHT (m)	6.73	7.89	8.17	8.32	8.52	8.75	9.45
	THMAX: PERIOD ASSOCIATED TO HMAX (s)	9.93	10.26	10.33	10.37	10.42	10.48	10.63
	WS:ASSOCIATED WIND SPEED (m/s) IN THE SAME DIRECTION	14.47	17.69	18.48	18.91	19.43	20.10	22.06
	CS : ASSOCIATED CURRENT (m/s) IN THE SAME DIRECTION	0.31	0.45	0.49	0.51	0.53	0.56	0.65

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.2 Single Peak Wave Extreme Hs x Tp curves for N Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5
1	Hs(m)	0.0	2.0	2.5	2.8	3.1	3.3	3.5	3.6	3.5	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	5.4	7.2	9.0	10.7	12.4	14.1	15.8	14.8	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	1.7	2.1	2.7	3.2	3.5	3.8	3.9	4.1	4.2	4.2	4.1	0.0	0.0	0.0
	Ws (m/s)	4.1	5.8	7.9	10.6	12.4	14.0	15.3	16.7	17.8	18.3	16.5	0.0	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.4	0.0	0.0	0.0
20	Hs(m)	1.7	2.1	2.7	3.2	3.6	3.9	4.0	4.2	4.3	4.3	4.3	3.8	0.0	0.0
	Ws (m/s)	4.0	5.8	7.9	10.6	12.8	14.3	15.6	16.8	18.1	18.7	17.9	14.1	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.2	0.0	0.0
30	Hs(m)	1.7	2.1	2.7	3.2	3.7	3.9	4.1	4.3	4.3	4.4	4.4	4.2	0.0	0.0
	Ws (m/s)	4.0	5.8	7.9	10.5	13.3	14.6	15.9	17.1	18.1	19.0	18.5	16.3	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.3	0.0	0.0
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.0	4.2	4.3	4.4	4.5	4.5	4.3	0.0	0.0
	Ws (m/s)	4.0	5.8	7.9	10.5	13.5	14.8	16.0	17.3	18.5	19.6	19.2	17.5	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.5	0.4	0.0	0.0
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.1	4.3	4.4	4.5	4.6	4.6	4.5	4.1	0.0
	Ws (m/s)	4.0	5.8	7.9	10.4	13.6	15.3	16.5	17.6	18.7	19.7	20.1	18.7	15.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.5	0.2	0.0
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.3	4.5	4.7	4.8	4.9	5.0	5.0	4.9	4.6
	Ws (m/s)	4.0	5.8	7.9	10.4	13.3	16.2	17.5	18.5	19.6	20.6	21.4	21.4	20.2	17.8
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.6	0.4

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33.

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.3 Single Peak Wave Extreme Hs x Tp curves for NNE Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5
1	Hs(m)	0.0	0.0	2.3	2.7	3.1	3.4	3.7	3.9	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	6.1	7.1	8.4	9.7	11.2	12.9	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	0.0	2.1	2.7	3.1	3.5	3.8	4.1	4.4	4.7	5.0	5.2	5.3	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	5.8	6.9	8.2	9.4	10.5	11.7	12.9	14.2	15.5	16.7	17.7	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs(m)	0.0	2.1	2.7	3.2	3.6	3.9	4.2	4.6	4.9	5.2	5.4	5.6	5.6	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	5.7	6.9	8.6	9.7	10.9	11.9	13.3	14.4	15.6	16.8	17.9	18.6	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.0	0.0	0.0	0.0	0.0
30	Hs(m)	1.7	2.1	2.7	3.2	3.6	3.9	4.3	4.6	4.9	5.2	5.5	5.7	5.8	5.7	0.0	0.0	0.0	0.0
	Ws (m/s)	5.4	5.7	6.9	8.5	9.8	10.8	12.2	13.3	14.4	15.6	16.8	17.9	19.1	18.1	0.0	0.0	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.5	0.0	0.0	0.0	0.0
50	Hs(m)	1.7	2.1	2.7	3.2	3.7	4.0	4.4	4.7	5.0	5.3	5.6	5.8	6.0	6.1	0.0	0.0	0.0	0.0
	Ws (m/s)	5.3	5.7	6.9	8.5	10.0	11.0	12.2	13.4	14.7	15.5	16.9	17.9	19.1	19.8	0.0	0.0	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.0	0.0	0.0	0.0
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.1	4.4	4.8	5.1	5.4	5.7	6.0	6.3	6.4	6.5	0.0	0.0	0.0
	Ws (m/s)	5.2	5.7	6.9	8.5	10.2	11.4	12.3	13.6	14.6	15.9	16.8	18.0	19.2	20.2	20.8	0.0	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.0	0.0	0.0
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.4	4.7	5.0	5.4	5.7	6.1	6.4	6.7	7.0	7.3	7.5	7.7	7.6
	Ws (m/s)	4.9	5.7	6.9	8.5	10.3	12.1	12.8	14.0	15.2	16.1	17.3	18.5	19.6	20.7	21.6	22.6	23.8	23.5
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.8

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33.

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.4 Single Peak Wave Extreme Hs x Tp curves for NE Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	0.0	0.0	0.0	2.8	3.2	3.5	3.8	4.0	4.1	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	0.0	0.0	7.3	8.8	10.2	11.6	12.8	14.1	14.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	0.0	0.0	2.5	3.0	3.4	3.7	4.0	4.3	4.7	4.9	5.1	5.3	5.4	5.3	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	6.4	8.0	9.4	10.6	11.8	13.1	14.4	15.6	16.6	17.7	18.4	17.7	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.8	0.6	0.0	0.0	0.0	0.0	0.0
20	Hs(m)	0.0	0.0	2.7	3.1	3.5	3.9	4.2	4.5	4.8	5.1	5.3	5.6	5.7	5.7	5.6	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	7.0	8.5	9.9	11.2	12.3	13.4	14.6	16.0	17.0	18.1	19.0	19.4	18.1	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.6	0.0	0.0	0.0	0.0
30	Hs(m)	0.0	2.1	2.7	3.2	3.6	4.0	4.3	4.6	4.9	5.2	5.5	5.7	5.9	6.0	5.9	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	5.5	7.0	8.8	10.0	11.4	12.6	13.8	15.0	16.2	17.3	18.3	19.3	20.2	19.8	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.9	0.8	0.0	0.0	0.0	0.0
50	Hs(m)	0.0	2.1	2.7	3.2	3.6	4.0	4.4	4.6	5.0	5.3	5.6	5.9	6.1	6.2	6.2	6.0	0.0	0.0	0.0
	Ws (m/s)	0.0	5.6	7.0	8.8	10.2	11.7	12.9	13.9	15.2	16.5	17.7	18.8	19.7	20.5	21.0	19.5	0.0	0.0	0.0
	Cs(m/s)	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.7	0.0	0.0	0.0
100	Hs(m)	0.0	2.1	2.7	3.2	3.8	4.2	4.5	4.8	5.1	5.5	5.7	6.1	6.2	6.5	6.6	6.6	0.0	0.0	0.0
	Ws (m/s)	0.0	5.5	7.0	8.8	10.7	12.0	13.4	14.5	15.6	17.0	18.0	19.2	20.1	21.2	22.0	22.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	1.0	1.0	0.0	0.0	0.0
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.9	5.3	5.6	5.9	6.2	6.6	6.9	7.2	7.4	7.6	7.8	7.8	7.7
	Ws (m/s)	4.5	5.5	7.0	8.8	10.8	13.1	14.5	15.9	16.8	18.2	19.1	20.4	21.6	22.7	23.7	24.6	25.4	25.9	25.0
	Cs(m/s)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.1

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33.

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.5 Single Peak Wave Extreme Hs x Tp curves for ENE Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	0.0	0.0	2.8	3.2	3.4	3.7	3.8	4.0	4.1	4.2	4.1	3.9	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	0.0	3.3	5.2	6.6	8.1	9.5	11.0	12.5	13.5	12.5	10.2	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.2	4.5	4.7	4.9	5.1	5.2	5.3	5.4	5.4	5.2	4.8	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	3.0	5.0	7.9	9.8	11.2	12.2	13.5	14.7	15.8	17.1	17.9	17.4	16.1	13.2	0.0	0.0	0.0
	Cs(m/s)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.7	0.6	0.4	0.0	0.0	0.0
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.4	4.6	4.9	5.1	5.3	5.5	5.6	5.7	5.7	5.7	5.5	4.9	0.0	0.0
	Ws (m/s)	3.0	3.0	3.0	5.0	7.7	10.5	11.6	13.1	14.2	15.5	16.5	17.6	18.5	19.0	18.5	16.8	13.1	0.0	0.0
	Cs(m/s)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.8	0.8	0.6	0.4	0.0	0.0
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.8	5.1	5.3	5.5	5.7	5.8	5.9	6.0	6.0	5.8	5.5	0.0	0.0
	Ws (m/s)	3.0	3.0	3.0	5.0	7.7	10.8	12.1	13.6	14.8	15.8	17.2	18.0	19.1	20.0	19.7	18.4	16.2	0.0	0.0
	Cs(m/s)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	0.8	0.7	0.6	0.0	0.0
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.9	5.2	5.4	5.6	5.9	6.0	6.1	6.2	6.2	6.2	6.0	5.3	0.0
	Ws (m/s)	3.0	3.0	3.0	5.0	7.6	10.6	12.6	13.9	15.1	16.3	17.7	18.7	19.5	20.5	21.0	20.2	18.7	14.7	0.0
	Cs(m/s)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9	0.9	0.9	0.7	0.5	0.0
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.4	5.7	5.8	6.1	6.2	6.4	6.5	6.6	6.6	6.5	6.2	0.0
	Ws (m/s)	3.0	3.0	3.0	4.9	7.5	10.5	13.4	14.8	16.1	16.9	18.1	19.2	20.2	21.3	22.3	22.3	21.1	19.2	0.0
	Cs(m/s)	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.8	0.9	1.0	1.0	0.9	0.8	0.0
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.3	6.6	6.8	7.1	7.3	7.4	7.6	7.7	7.8	7.8	7.8
	Ws (m/s)	3.0	3.0	3.0	4.9	7.4	10.1	13.2	16.6	18.2	19.3	20.3	21.8	22.7	23.5	24.7	25.6	26.3	26.7	25.9
	Cs(m/s)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1,1	1,2	1,2	1,2

Return Period (Years)	Tp1(s)	13.5	14.0
1	Hs(m)	0.0	0.0
	Ws (m/s)	0.0	0.0
	Cs(m/s)	0.0	0.0
10	Hs(m)	0.0	0.0
	Ws (m/s)	0.0	0.0
	Cs(m/s)	0.0	0.0
20	Hs(m)	0.0	0.0
	Ws (m/s)	0.0	0.0
	Cs(m/s)	0.0	0.0
30	Hs(m)	0.0	0.0
	Ws (m/s)	0.0	0.0
	Cs(m/s)	0.0	0.0
50	Hs(m)	0.0	0.0
	Ws (m/s)	0.0	0.0
	Cs(m/s)	0.0	0.0
100	Hs(m)	0.0	0.0
	Ws (m/s)	0.0	0.0
	Cs(m/s)	0.0	0.0
1000	Hs(m)	7.5	6.8
	Ws (m/s)	24.4	20.3
	Cs(m/s)	1.0	0.8

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.6 Single Peak Wave Extreme Hs x Tp curves for E Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	0.0	2.6	2.9	3.2	3.4	3.6	3.7	3.8	3.9	4.0	4.0	4.0	3.9	3.8	3.6	3.2	0.0	0.0
	Ws (m/s)	0.0	0.0	3.0	3.0	3.0	4.2	5.9	7.0	8.4	9.7	11.1	11.8	11.1	9.7	8.2	5.9	2.9	0.0	0.0
	Cs(m/s)	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.0	0.0
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.6	4.8	4.9	5.1	5.2	5.2	5.3	5.3	5.3	5.2	5.1	4.9	4.6
	Ws (m/s)	3.0	3.0	3.0	3.0	5.4	9.1	10.2	11.4	12.4	13.5	14.4	15.3	16.3	16.3	15.9	14.8	13.5	12.1	9.8
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.4	0.3	0.2
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.9	5.1	5.2	5.4	5.5	5.6	5.6	5.7	5.7	5.6	5.5	5.4	5.2
	Ws (m/s)	3.0	3.0	3.0	3.0	5.2	8.7	11.2	12.5	13.3	14.4	15.5	16.4	17.0	17.9	17.4	16.7	15.8	14.4	12.9
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.6	0.6	0.5	0.4	0.3
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.3	5.4	5.6	5.7	5.8	5.9	5.9	5.9	5.9	5.8	5.7	5.5
	Ws (m/s)	3.0	3.0	3.0	3.0	5.1	8.5	11.9	13.2	13.9	15.2	15.9	16.9	17.7	18.4	18.4	17.7	16.9	15.9	14.4
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.6	0.6	0.5	0.4
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.5	5.7	5.8	5.9	6.0	6.1	6.2	6.2	6.2	6.1	6.0	5.8
	Ws (m/s)	3.0	3.0	3.0	3.0	5.0	8.3	12.1	14.0	14.8	15.7	16.8	17.5	18.5	19.1	19.7	19.3	18.5	17.2	16.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.5
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.7	6.0	6.1	6.2	6.3	6.5	6.5	6.6	6.6	6.5	6.5	6.3
	Ws (m/s)	3.0	3.0	3.0	3.0	4.8	8.0	11.6	14.6	16.0	16.8	17.7	18.5	19.5	20.1	20.8	20.8	20.1	19.5	18.1
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.7	0.7	0.6
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.2	7.2	7.4	7.5	7.7	7.8	7.8	7.8	7.8	7.8
	Ws (m/s)	3.0	3.0	3.0	3.0	4.6	7.5	10.7	14.3	18.5	20.4	20.9	21.9	22.8	23.6	24.4	24.9	25.7	25.4	24.7
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1,0	1,0	0.9

Return Period (Years)	Tp1(s)	13.5	14.0	14.5	15.0	15.5	16.0	16.5
1	Hs(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	4.2	3.4	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	7.5	3.1	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.2	0.2	0.0	0.0	0.0	0.0	0.0
20	Hs(m)	4.9	4.3	3.4	0.0	0.0	0.0	0.0
	Ws (m/s)	10.9	7.8	3.1	0.0	0.0	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.0	0.0	0.0	0.0
30	Hs(m)	5.2	4.8	4.1	0.0	0.0	0.0	0.0
	Ws (m/s)	12.3	10.1	6.5	0.0	0.0	0.0	0.0
	Cs(m/s)	0.3	0.2	0.2	0.0	0.0	0.0	0.0
50	Hs(m)	5.6	5.2	4.7	3.9	0.0	0.0	0.0
	Ws (m/s)	14.4	12.2	9.3	5.2	0.0	0.0	0.0
	Cs(m/s)	0.4	0.3	0.2	0.0	0.0	0.0	0.0
100	Hs(m)	6.1	5.8	5.4	4.8	3.7	0.0	0.0
	Ws (m/s)	16.8	15.1	12.6	9.6	4.2	0.0	0.0
	Cs(m/s)	0.5	0.4	0.3	0.2	0.2	0.0	0.0
1000	Hs(m)	7.7	7.5	7.3	7.1	6.6	6.0	5.1
	Ws (m/s)	24.0	22.8	21.4	19.9	17.6	14.5	10.0
	Cs(m/s)	0.9	0.8	0.7	0.6	0.5	0.4	0.2

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.7 Single Peak Wave Extreme Hs x Tp curves for ESE Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	0.0	0.0	2.5	2.8	3.1	3.3	3.4	3.6	3.7	3.8	3.9	3.9	3.9	3.9	3.9	3.8	3.7	3.5
	Ws (m/s)	0.0	0.0	0.0	3.0	3.0	3.5	4.9	5.8	7.1	8.1	9.0	10.0	10.7	11.4	11.4	10.3	9.2	8.1	6.6
	Cs(m/s)	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.2	4.4	4.6	4.7	4.8	4.9	5.1	5.1	5.2	5.2	5.2	5.2	5.2	5.1
	Ws (m/s)	3.0	3.0	3.0	3.7	6.6	8.6	9.7	10.7	11.4	12.4	13.1	14.0	14.7	15.2	15.9	16.3	15.7	15.1	14.3
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.4
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.7	4.9	5.0	5.2	5.3	5.4	5.5	5.5	5.6	5.6	5.6	5.6	5.5
	Ws (m/s)	3.0	3.0	3.0	3.6	6.4	9.7	11.0	11.7	12.5	13.6	14.2	15.3	15.8	16.3	17.1	17.6	17.3	16.8	16.1
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.6	0.6	0.5
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.9	5.0	5.2	5.4	5.5	5.6	5.7	5.8	5.8	5.8	5.8	5.8	5.8
	Ws (m/s)	3.0	3.0	3.0	3.6	6.3	9.5	11.5	12.3	13.5	14.2	14.9	15.6	16.5	17.1	17.7	18.0	18.3	17.8	17.1
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.6	0.6
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.3	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.1	6.1	6.1	6.1
	Ws (m/s)	3.0	3.0	3.0	3.5	6.2	9.3	12.2	13.5	14.3	15.1	15.8	16.5	17.2	18.1	18.6	19.1	19.4	19.1	18.4
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.6
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.6	5.8	5.9	6.1	6.2	6.3	6.4	6.4	6.5	6.5	6.5	6.5
	Ws (m/s)	3.0	3.0	3.0	3.5	6.1	9.0	12.4	14.5	15.4	16.2	17.0	17.8	18.5	19.1	19.6	20.2	20.6	20.6	20.2
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.7
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.0	7.1	7.3	7.4	7.5	7.6	7.7	7.7	7.8	7.8
	Ws (m/s)	3.0	3.0	3.0	3.4	5.8	8.6	11.7	15.1	18.9	20.0	20.5	21.4	22.3	22.7	23.4	24.0	24.4	24.8	25.3
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.9	1,0

Return Period (Years)	Tp1(s)	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0
1	Hs(m)	3.3	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	4.9	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	5.0	4.8	4.6	4.3	3.9	3.3	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	13.4	12.1	10.7	8.9	7.1	4.1	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs(m)	5.4	5.3	5.1	4.9	4.5	4.1	3.5	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	15.3	14.2	13.2	11.7	9.8	7.8	4.8	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
30	Hs(m)	5.7	5.5	5.4	5.2	4.9	4.5	4.0	3.2	0.0	0.0	0.0	0.0
	Ws (m/s)	16.3	15.3	14.2	13.1	11.5	9.4	6.9	3.3	0.0	0.0	0.0	0.0
	Cs(m/s)	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0
50	Hs(m)	6.0	5.9	5.7	5.5	5.2	4.9	4.5	3.9	0.0	0.0	0.0	0.0
	Ws (m/s)	17.8	16.9	15.8	14.7	13.0	11.3	9.5	6.5	0.0	0.0	0.0	0.0
	Cs(m/s)	0.6	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0
100	Hs(m)	6.4	6.3	6.2	6.0	5.8	5.5	5.1	4.6	4.0	0.0	0.0	0.0
	Ws (m/s)	19.4	18.8	17.8	16.6	15.4	14.1	12.2	9.8	7.0	0.0	0.0	0.0
	Cs(m/s)	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0
1000	Hs(m)	7.8	7.7	7.7	7.6	7.4	7.2	7.0	6.7	6.3	5.8	5.1	4.3
	Ws (m/s)	25.6	25.7	25.8	25.8	25.7	25.4	25.0	24.4	23.6	22.3	20.5	18.3
	Cs(m/s)	1,0	1,0	1,0	1,1	1,1	1,1	1,1	1,1	1,0	1,0	1,0	0.9

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.8 Single Peak Wave Extreme Hs x Tp curves for SE Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	0.0	0.0	0.0	2.9	3.2	3.5	3.7	3.9	4.0	4.1	4.2	4.3	4.4	4.4	4.4	4.4	4.3	4.2
	Ws (m/s)	0.0	0.0	0.0	0.0	3.0	3.0	4.3	5.5	6.7	7.7	8.7	9.6	10.4	11.3	12.4	12.4	11.5	10.5	9.4
	Cs(m/s)	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.7	4.9	5.1	5.3	5.4	5.5	5.7	5.7	5.8	5.8	5.8	5.8	5.8
	Ws (m/s)	3.0	3.0	3.0	3.0	5.1	8.1	9.2	10.3	11.4	12.1	13.1	13.7	14.7	15.2	15.9	16.4	17.0	16.6	16.2
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.3	5.4	5.7	5.8	5.9	6.0	6.1	6.2	6.2	6.3	6.3	6.3
	Ws (m/s)	3.0	3.0	3.0	3.0	5.0	7.8	10.8	11.6	12.4	13.5	14.2	14.9	15.6	16.5	17.1	17.5	18.0	18.3	17.8
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.5	5.6	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.5	6.5	6.5
	Ws (m/s)	3.0	3.0	3.0	3.0	5.0	7.7	10.9	12.2	12.9	14.2	14.9	15.6	16.3	16.9	17.5	18.3	18.8	19.1	18.8
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.8	5.9	6.1	6.3	6.4	6.5	6.6	6.7	6.8	6.8	6.8	6.8
	Ws (m/s)	3.0	3.0	3.0	3.0	4.9	7.6	10.7	13.3	14.1	15.0	15.8	16.5	17.2	17.9	18.5	19.1	19.5	19.9	19.9
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.3	6.5	6.6	6.8	6.9	7.0	7.1	7.2	7.2	7.3	7.3
	Ws (m/s)	3.0	3.0	3.0	3.0	4.8	7.5	10.4	13.8	15.2	16.0	16.9	17.7	18.5	18.8	19.5	20.1	20.7	21.1	21.5
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	7.8	7.9	8.1	8.2	8.4	8.5	8.6	8.6	8.7
	Ws (m/s)	3.0	3.0	3.0	3.0	4.7	7.2	9.9	12.9	16.2	19.0	20.7	21.2	22.2	22.6	23.5	24.0	24.6	25.2	25.4
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9

Return Period (Years)	Tp1(s)	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	20.5
1	Hs(m)	4.1	3.9	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	8.2	6.7	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	5.7	5.7	5.5	5.3	5.1	4.8	4.3	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	15.4	14.7	13.7	12.4	11.0	9.6	7.4	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs(m)	6.2	6.1	6.0	5.8	5.7	5.4	5.0	4.6	4.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	17.3	16.5	15.6	14.6	13.5	12.0	10.4	8.4	5.8	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
30	Hs(m)	6.5	6.4	6.3	6.1	5.9	5.7	5.4	5.0	4.5	3.7	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	18.1	17.5	16.6	15.6	14.6	13.3	11.7	10.0	8.0	4.6	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.6	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
50	Hs(m)	6.8	6.7	6.7	6.5	6.3	6.1	5.9	5.5	5.1	4.5	3.5	0.0	0.0	0.0	0.0
	Ws (m/s)	19.3	18.8	18.2	17.2	16.1	15.0	13.7	11.9	10.1	7.5	3.7	0.0	0.0	0.0	0.0
	Cs(m/s)	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0
100	Hs(m)	7.3	7.2	7.1	7.0	6.9	6.7	6.5	6.2	5.8	5.3	4.6	3.6	0.0	0.0	0.0
	Ws (m/s)	21.9	22.0	22.3	22.3	22.2	22.1	21.8	21.3	20.6	19.7	18.2	15.6	0.0	0.0	0.0
	Cs(m/s)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.0	0.0	0.0
1000	Hs(m)	8.7	8.7	8.7	8.6	8.5	8.4	8.2	8.0	7.8	7.5	7.1	6.5	5.9	5.1	3.9
	Ws (m/s)	25.9	25.9	25.4	24.8	24.2	23.5	22.6	21.7	20.7	19.1	17.4	15.0	12.6	9.7	5.0
	Cs(m/s)	1,0	1,0	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.6	0.5	0.4	0.2	0.2	0.2

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.9 Single Peak Wave Extreme Hs x Tp curves for SSE Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	0.0	0.0	0.0	2.9	3.3	3.5	3.7	4.0	4.1	4.3	4.4	4.5	4.6	4.6	4.7	4.7	4.7	4.6
	Ws (m/s)	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.1	5.4	6.8	7.8	9.1	10.0	8.7	7.6
	Cs(m/s)	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.8	5.0	5.2	5.3	5.5	5.6	5.8	5.9	6.0	6.1	6.1	6.2	6.2
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.9	5.8	7.2	8.1	8.9	10.3	11.0	11.8	12.9	13.5	14.3
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.3	5.5	5.7	5.9	6.0	6.1	6.3	6.4	6.5	6.5	6.6	6.6
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	4.7	6.3	7.2	8.2	9.2	10.1	11.0	11.9	12.7	13.5	14.7	15.5
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.5	5.7	5.9	6.1	6.2	6.4	6.5	6.6	6.7	6.8	6.9	6.9
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	4.1	5.7	6.8	7.8	8.8	9.8	10.8	11.7	12.7	13.4	14.3	15.1	15.9
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.7	5.9	6.1	6.3	6.5	6.6	6.7	6.9	7.0	7.1	7.1	7.2
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	6.4	7.4	8.5	9.5	10.6	11.6	12.1	13.1	14.0	14.8	15.6	16.5
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.2	6.4	6.6	6.8	6.9	7.1	7.3	7.4	7.4	7.5	7.6
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.4	7.1	8.3	9.5	10.5	11.7	12.2	13.3	14.3	15.2	15.7	16.6	17.3
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	7.8	7.9	8.1	8.3	8.4	8.6	8.7	8.9	8.9
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.9	9.4	12.4	13.9	14.6	15.5	16.5	17.1	18.3	18.9	19.9	20.4
	Cs(m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7

Return Period (Years)	Tp1(s)	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	20.5	21.0
1	Hs(m)	4.5	4.4	4.2	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	6.1	4.1	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	6.2	6.2	6.1	6.0	5.8	5.6	5.3	4.9	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	15.3	15.7	16.4	16.9	17.5	17.7	18.0	18.0	17.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs(m)	6.7	6.6	6.6	6.5	6.4	6.2	6.0	5.7	5.3	4.6	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	16.0	15.5	14.4	13.1	12.3	10.6	9.2	7.2	4.7	3.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
30	Hs(m)	6.9	6.9	6.9	6.8	6.7	6.6	6.4	6.1	5.7	5.2	4.4	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	16.7	16.7	15.5	14.7	13.4	12.2	10.8	9.3	6.8	4.2	3.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.6	0.6	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
50	Hs(m)	7.2	7.2	7.2	7.2	7.1	7.0	6.8	6.6	6.3	5.8	5.3	4.2	0.0	0.0	0.0	0.0
	Ws (m/s)	17.1	17.5	17.1	16.0	15.2	14.0	12.6	11.1	9.5	6.9	4.2	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0
100	Hs(m)	7.7	7.7	7.7	7.7	7.6	7.5	7.4	7.2	6.9	6.6	6.2	5.6	4.6	0.0	0.0	0.0
	Ws (m/s)	18.2	18.8	18.8	18.2	17.3	16.6	15.2	13.8	12.2	10.5	8.3	5.5	3.0	0.0	0.0	0.0
	Cs(m/s)	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.0	0.0	0.0
1000	Hs(m)	9.0	9.1	9.2	9.2	9.2	9.2	9.1	9.0	8.9	8.8	8.6	8.3	7.9	7.3	6.7	5.6
	Ws (m/s)	21.4	21.8	22.5	23.3	23.3	23.0	22.1	21.4	20.4	19.4	18.3	16.5	14.6	11.9	9.2	4.4
	Cs(m/s)	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.5	0.4	0.3	0.2

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.10 Single Peak Wave Extreme Hs x Tp curves for S Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	0.0	0.0	0.0	0.0	0.0	3.5	3.8	4.1	4.3	4.5	4.7	4.8	4.9	5.0	5.2	5.2	5.3	5.3
	Ws (m/s)	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.8	4.7	5.9	6.8	8.0	8.8	10.0	10.9
	Cs(m/s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
10	Hs(m)	0.0	2.1	2.7	3.2	3.8	4.5	4.9	5.1	5.4	5.6	5.7	5.9	6.2	6.3	6.5	6.6	6.7	6.8	6.9
	Ws (m/s)	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	4.9	5.7	6.5	7.3	8.5	9.3	10.1	10.9	11.6	12.3	13.3
	Cs(m/s)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.5	5.8	6.0	6.2	6.4	6.6	6.7	6.8	7.0	7.1	7.2	7.3
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	5.1	6.0	6.9	7.7	8.6	9.5	10.3	10.8	11.6	12.4	13.2	13.9
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.7	5.9	6.1	6.4	6.6	6.8	6.9	7.1	7.2	7.4	7.5	7.6
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.7	5.5	6.4	7.3	8.2	9.1	10.0	10.5	11.4	12.2	13.0	13.9	14.6
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.1	6.4	6.6	6.8	7.1	7.2	7.4	7.5	7.6	7.8	7.9
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	6.3	6.9	7.9	8.8	9.8	10.7	11.2	12.1	13.0	13.5	14.3	15.1
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.5	6.8	6.9	7.2	7.3	7.6	7.8	7.9	8.1	8.2	8.3
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.3	6.0	8.1	9.1	9.7	10.7	11.2	12.2	13.2	13.7	14.6	15.1	15.9
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	8.1	8.4	8.5	8.7	9.0	9.2	9.3	9.5	9.7
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.5	8.2	10.4	12.7	13.6	14.2	14.8	16.0	16.6	17.2	18.0	18.9
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5

Return Period (Years)	Tp1(s)	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	20.5	21.0	21.5	22.0
1	Hs(m)	5.3	5.3	5.2	5.0	4.8	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	11.5	12.2	13.0	13.8	14.5	15.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.3	0.3	0.4	0.4	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	7.0	7.0	7.0	7.0	7.0	6.9	6.8	6.6	6.3	6.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	13.9	14.5	15.1	14.7	14.2	13.3	12.3	10.9	9.3	7.7	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs(m)	7.4	7.5	7.5	7.6	7.5	7.5	7.4	7.3	7.1	6.8	6.5	5.9	4.8	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	14.6	15.5	16.0	16.3	16.0	15.5	14.6	13.5	12.4	10.8	9.1	6.4	3.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
30	Hs(m)	7.7	7.8	7.8	7.9	7.9	7.8	7.8	7.7	7.5	7.3	7.0	6.6	5.9	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	15.3	15.9	16.5	17.4	17.4	16.5	15.9	15.0	13.9	12.7	10.9	9.1	6.4	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
50	Hs(m)	8.0	8.1	8.2	8.2	8.2	8.2	8.2	8.1	8.0	7.9	7.5	7.3	6.7	6.0	0.0	0.0	0.0	0.0
	Ws (m/s)	15.9	16.6	17.2	17.8	18.1	18.1	17.2	16.6	15.5	14.7	13.0	11.7	9.3	6.4	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
100	Hs(m)	8.5	8.5	8.6	8.7	8.8	8.8	8.8	8.7	8.6	8.5	8.3	8.1	7.7	7.2	6.4	0.0	0.0	0.0
	Ws (m/s)	16.7	17.1	17.8	18.5	19.1	19.4	19.1	18.5	17.8	17.1	15.9	14.6	12.7	10.7	7.6	0.0	0.0	0.0
	Cs(m/s)	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0
1000	Hs(m)	9.8	10.0	10.1	10.2	10.3	10.4	10.5	10.5	10.5	10.5	10.4	10.4	10.2	10.0	9.8	9.4	9.0	8.2
	Ws (m/s)	19.3	20.1	20.8	21.2	22.0	22.4	23.1	23.4	23.7	24.4	24.7	24.8	25.1	25.1	25.1	24.8	24.4	23.3
	Cs(m/s)	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.11 Single Peak Wave Extreme Hs x Tp curves for SSW Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	0.0	0.0	2.9	3.6	4.0	4.4	4.8	5.1	5.4	5.7	6.0	6.1	6.3	6.5	6.6	6.7	6.8	6.7
	Ws (m/s)	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	4.9	6.5	7.7	8.8	10.3	11.8	12.8	14.3	13.6
	Cs(m/s)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.0	7.3	7.7	8.0	8.2	8.4	8.6	8.8	8.9	9.1
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	6.8	7.9	9.0	10.7	11.7	12.8	13.8	14.8	15.7	16.6	17.9
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	7.8	8.1	8.4	8.6	8.9	9.1	9.3	9.5	9.7
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	6.5	8.9	10.2	11.3	12.5	13.6	14.7	15.8	16.8	17.8	18.8
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	8.0	8.4	8.7	8.9	9.1	9.3	9.6	9.8	10.0
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.6	6.3	8.7	10.8	12.0	13.2	14.4	15.0	16.1	17.2	18.2	19.2
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	8.1	8.7	9.0	9.2	9.5	9.8	9.9	10.1	10.3
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.5	6.1	8.4	10.7	12.9	14.1	14.8	16.0	17.2	17.7	18.9	19.9
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	8.1	8.8	9.3	9.7	9.9	10.2	10.5	10.6	10.8
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.3	5.9	8.1	10.3	12.6	14.7	16.1	16.7	18.0	19.2	19.8	20.9
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	8.1	8.8	9.4	10.0	10.6	11.2	11.8	12.1	12.3
	Ws (m/s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.1	5.5	7.5	9.5	11.6	13.6	15.7	17.8	19.8	21.9	23.1	23.8
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5

Return Period (Years)	Tp1(s)	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	20.5	21.0	21.5
1	Hs(m)	6.7	6.5	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	12.1	10.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	9.2	9.3	9.3	9.3	9.2	9.1	8.8	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	18.7	19.7	20.6	20.1	19.1	17.9	16.2	13.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs(m)	9.8	9.9	10.0	10.0	10.0	10.0	9.8	9.6	9.1	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	19.6	20.4	21.5	22.2	22.2	21.2	20.0	18.3	15.8	11.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	Hs(m)	10.1	10.2	10.3	10.4	10.4	10.4	10.3	10.2	9.9	9.3	8.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	20.2	21.0	21.8	22.9	23.3	22.9	21.8	20.6	18.8	16.1	10.8	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
50	Hs(m)	10.5	10.7	10.8	10.9	10.9	10.9	10.9	10.8	10.7	10.3	9.8	8.4	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	20.9	21.8	22.7	23.4	24.1	24.7	23.8	23.0	21.8	19.9	17.2	11.6	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0
100	Hs(m)	11.1	11.1	11.3	11.4	11.5	11.6	11.6	11.6	11.5	11.3	11.1	10.6	9.5	0.0	0.0	0.0	0.0
	Ws (m/s)	22.0	22.5	23.5	24.3	25.1	25.8	26.3	25.8	24.7	23.5	22.0	19.8	15.4	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.3	0.2	0.0	0.0	0.0	0.0
1000	Hs(m)	12.5	12.8	12.9	13.2	13.3	13.5	13.5	13.7	13.7	13.7	13.7	13.7	13.5	13.4	13.0	12.5	11.3
	Ws (m/s)	24.7	25.7	26.3	27.5	28.0	29.1	29.5	30.4	31.2	31.6	31.6	30.8	29.5	28.6	26.9	24.4	20.1
	Cs(m/s)	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.3

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.12 Single Peak Wave Extreme Hs x Tp curves for SW Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.9	5.2	5.5	5.7	6.0	6.2	6.4	6.6	6.8	6.8	6.9	6.8	6.7
	Ws (m/s)	5.7	4.8	5.1	5.9	6.9	8.3	9.3	9.9	10.7	11.4	12.2	12.8	13.6	14.3	15.0	15.6	16.1	15.6	14.5
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.1	7.4	7.6	7.9	8.2	8.4	8.6	8.8	8.9	9.0
	Ws (m/s)	4.1	4.3	5.0	5.9	6.9	8.1	9.5	11.1	12.9	13.7	14.3	14.9	15.4	16.3	16.8	17.3	18.0	18.4	19.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	7.8	8.1	8.3	8.6	8.8	9.0	9.2	9.4	9.5
	Ws (m/s)	4.0	4.3	5.0	5.9	6.9	8.1	9.5	11.0	12.7	14.2	15.0	15.6	16.2	16.8	17.4	18.0	18.5	19.0	19.4
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	7.9	8.2	8.5	8.7	9.0	9.2	9.4	9.6	9.8
	Ws (m/s)	3.9	4.3	5.0	5.9	6.9	8.1	9.5	11.0	12.7	14.1	15.0	15.7	16.4	17.0	17.6	18.2	18.7	19.3	19.7
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	8.1	8.5	8.8	8.9	9.2	9.5	9.7	9.9	10.1
	Ws (m/s)	3.8	4.3	5.0	5.9	6.9	8.1	9.4	10.9	12.6	14.0	15.4	16.2	16.9	17.3	17.9	18.5	19.1	19.7	20.2
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	8.1	8.7	9.1	9.4	9.5	9.8	10.1	10.3	10.4
	Ws (m/s)	3.8	4.2	5.0	5.9	6.9	8.1	9.4	10.9	12.5	13.8	15.2	16.5	17.3	18.0	18.3	19.0	19.7	20.3	20.5
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	8.1	8.8	9.4	10.0	10.5	10.9	11.1	11.3	11.6
	Ws (m/s)	3.6	4.2	4.9	5.9	6.9	8.1	9.4	10.8	12.3	13.6	14.9	16.2	17.5	18.8	19.9	20.7	21.1	21.7	22.2
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4

Return Period (Years)	Tp1(s)	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0
1	Hs(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	9.1	9.2	9.2	9.1	9.0	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	19.5	19.9	19.9	19.3	18.6	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs(m)	9.7	9.7	9.8	9.8	9.8	9.7	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	20.0	20.4	20.8	21.1	20.6	20.0	18.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	Hs(m)	9.9	10.0	10.1	10.2	10.2	10.1	9.9	9.5	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	20.2	20.8	21.2	21.6	21.6	21.0	20.4	19.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
50	Hs(m)	10.2	10.4	10.5	10.6	10.6	10.6	10.5	10.3	9.9	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	20.7	21.1	21.5	22.0	22.3	22.1	21.7	20.9	19.7	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.0	0.0	0.0	0.0	0.0
100	Hs(m)	10.6	10.8	10.9	11.0	11.1	11.2	11.2	11.1	10.9	10.6	0.0	0.0	0.0	0.0
	Ws (m/s)	21.1	21.6	22.1	22.5	23.0	23.4	23.4	22.8	22.1	21.1	0.0	0.0	0.0	0.0
	Cs(m/s)	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.0	0.0	0.0	0.0
1000	Hs(m)	11.7	12.0	12.1	12.4	12.6	12.6	12.8	12.9	12.9	13.0	12.9	12.8	12.6	12.3
	Ws (m/s)	22.6	23.3	23.6	24.2	24.7	25.0	25.5	25.8	26.1	26.3	26.1	25.6	25.0	23.9
	Cs(m/s)	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.5

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.13 Single Peak Wave Extreme Hs x Tp curves for WSW Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	0.0	2.2	2.8	3.2	3.6	4.0	4.3	4.7	5.0	5.2	5.4	5.5	5.5	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	3.6	4.5	5.6	6.7	7.9	9.0	10.3	11.7	13.1	14.5	16.3	15.9	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.2	4.6	4.9	5.3	5.6	5.8	6.1	6.4	6.6	6.8	6.9	6.9	0.0	0.0
	Ws (m/s)	3.0	3.2	4.2	5.5	7.0	8.2	9.4	10.3	11.5	12.7	13.6	14.7	15.8	17.1	18.2	19.4	19.4	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.0	0.0
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.4	4.8	5.1	5.5	5.7	6.0	6.3	6.6	6.8	7.0	7.1	7.2	7.2	0.0
	Ws (m/s)	3.0	3.2	4.2	5.5	7.1	8.7	9.7	10.7	12.0	12.9	13.9	15.1	16.3	17.3	18.3	19.4	20.5	19.8	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.0
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.8	5.2	5.5	5.8	6.1	6.4	6.7	6.9	7.1	7.3	7.4	7.4	7.2
	Ws (m/s)	3.0	3.1	4.2	5.5	7.1	8.9	9.9	10.9	11.9	12.9	14.2	15.1	16.3	17.2	18.3	19.4	20.4	20.6	18.7
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.9	5.3	5.6	5.9	6.2	6.5	6.8	7.0	7.2	7.4	7.6	7.6	7.6
	Ws (m/s)	3.0	3.1	4.2	5.5	7.1	8.9	10.1	11.1	12.2	13.2	14.2	15.2	16.5	17.4	18.5	19.5	20.5	21.4	20.5
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.4
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.0	5.4	5.8	6.1	6.4	6.6	7.0	7.2	7.4	7.6	7.8	7.9	7.9
	Ws (m/s)	3.0	3.1	4.2	5.5	7.1	8.8	10.4	11.5	12.6	13.7	14.7	15.4	16.8	17.7	18.6	19.7	20.6	21.6	22.2
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.8	6.1	6.4	6.8	7.0	7.4	7.7	7.9	8.1	8.3	8.5	8.7
	Ws (m/s)	3.0	3.1	4.2	5.5	7.0	8.8	10.7	12.5	13.4	14.2	15.4	16.2	17.4	18.5	19.1	20.1	21.1	21.9	22.9
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5

Return Period (Years)	Tp1(s)	13.5	14.0	14.5
1	Hs(m)	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.0
10	Hs(m)	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.0
20	Hs(m)	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.0
30	Hs(m)	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.0
50	Hs(m)	0.0	0.0	0.0
	Ws (m/s)	0.0	0.0	0.0
	Cs(m/s)	0.0	0.0	0.0
100	Hs(m)	7.8	0.0	0.0
	Ws (m/s)	23.0	0.0	0.0
	Cs(m/s)	0.6	0.0	0.0
1000	Hs(m)	8.7	8.8	8.7
	Ws (m/s)	23.7	24.0	23.1
	Cs(m/s)	0.6	0.6	0.5

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.14 Single Peak Wave Extreme Hs x Tp curves for W Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
1	Hs(m)	0.0	2.1	2.7	3.2	3.6	3.9	4.2	4.4	4.6	4.7	4.7	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	3.2	4.4	6.3	8.2	9.6	11.0	12.7	14.1	15.6	16.0	12.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.9	5.1	5.3	5.5	5.6	5.8	5.8	5.7	5.3	0.0	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	4.4	6.2	8.4	11.1	12.9	14.1	15.2	16.5	17.6	18.9	19.5	18.4	14.9	0.0	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.0	5.3	5.5	5.7	5.8	6.0	6.0	6.0	5.9	0.0	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	4.4	6.2	8.4	10.9	13.1	14.4	15.6	16.8	17.8	19.0	20.1	20.1	18.6	0.0	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.4	5.6	5.8	6.0	6.1	6.2	6.2	6.1	5.8	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	4.4	6.2	8.3	10.8	13.5	14.8	15.7	17.0	18.0	19.2	20.2	20.8	19.7	17.2	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.2	0.0	0.0	0.0
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.5	5.7	5.9	6.1	6.2	6.3	6.4	6.4	6.2	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	4.4	6.2	8.3	10.8	13.7	14.9	16.2	17.1	18.3	19.4	20.4	21.2	20.9	19.1	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.0	0.0	0.0
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.6	5.9	6.1	6.3	6.4	6.5	6.6	6.6	6.6	6.3	0.0	0.0
	Ws (m/s)	3.0	3.0	4.4	6.2	8.3	10.7	13.5	15.4	16.5	17.8	18.7	19.8	20.7	21.6	21.9	20.9	18.7	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.0	0.0
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.4	6.5	6.7	6.9	7.1	7.2	7.3	7.4	7.3	7.2	6.9
	Ws (m/s)	3.0	3.0	4.4	6.2	8.2	10.5	13.1	16.2	17.9	18.6	19.7	20.7	21.6	22.6	23.4	24.3	24.0	22.6	20.4
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.3

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.15 Single Peak Wave Extreme Hs x Tp curves for WNW Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5
1	Hs(m)	0.0	2.1	2.7	3.1	3.4	3.6	3.7	3.8	3.8	3.7	0.0	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	0.0	3.0	3.2	6.4	8.7	10.7	12.4	14.1	14.8	12.1	0.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.2	4.3	4.4	4.5	4.5	4.4	4.3	3.7	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	3.2	6.4	10.6	13.6	15.0	16.4	17.5	18.1	16.7	14.6	9.6	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.1	0.0	0.0	0.0
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.3	4.4	4.5	4.6	4.6	4.6	4.5	4.3	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	3.2	6.3	10.3	14.3	15.7	17.0	17.9	18.6	17.9	16.4	14.0	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.0	0.0	0.0
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.4	4.5	4.6	4.7	4.7	4.7	4.6	4.4	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	3.2	6.3	10.2	14.7	16.1	17.1	18.5	19.3	18.5	17.4	15.3	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.3	0.0	0.0	0.0
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.6	4.7	4.8	4.8	4.8	4.7	4.6	4.2	0.0	0.0
	Ws (m/s)	3.0	3.0	3.2	6.3	10.1	15.2	16.2	17.7	18.8	19.9	19.4	18.3	16.2	12.9	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.3	0.2	0.0	0.0
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.7	4.8	4.9	4.9	4.9	4.9	4.8	4.5	0.0	0.0
	Ws (m/s)	3.0	3.0	3.1	6.3	10.0	14.9	16.9	18.3	19.1	20.1	20.1	19.3	17.8	15.4	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.0	0.0
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.1	5.2	5.3	5.3	5.3	5.3	5.2	5.0	4.5
	Ws (m/s)	3.0	3.0	3.1	6.2	9.8	14.1	18.7	19.6	20.7	21.5	22.5	22.0	21.1	19.9	17.8	14.1
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.2

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.16 Single Peak Wave Extreme Hs x Tp curves for NW Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0
1	Hs(m)	1.7	2.1	2.7	3.2	3.6	3.7	3.7	3.7	3.6	3.2	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	4.4	5.8	7.9	10.8	13.3	14.6	15.8	15.4	14.1	11.0	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.2	4.3	4.3	4.3	4.3	4.2	3.8	0.0	0.0	0.0
	Ws (m/s)	4.1	5.8	7.8	10.3	13.6	16.7	17.4	18.3	18.3	17.1	15.9	13.6	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.4	0.3	0.3	0.1	0.0	0.0	0.0
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.4	4.4	4.5	4.5	4.4	4.4	4.2	3.5	0.0	0.0
	Ws (m/s)	4.1	5.8	7.8	10.3	13.4	17.2	18.0	18.6	18.9	18.0	17.0	15.5	11.6	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.4	0.5	0.4	0.3	0.2	0.0	0.0	0.0
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.5	4.6	4.6	4.5	4.5	4.3	3.9	0.0	0.0
	Ws (m/s)	4.1	5.8	7.8	10.3	13.3	17.5	18.2	18.9	19.2	18.5	17.5	16.2	13.9	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.1	0.0	0.0
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.6	4.7	4.7	4.6	4.6	4.5	4.2	0.0	0.0
	Ws (m/s)	4.1	5.8	7.8	10.2	13.2	17.4	18.5	19.4	19.4	18.9	18.2	17.1	15.2	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.5	0.5	0.5	0.4	0.3	0.2	0.0	0.0
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.7	4.8	4.8	4.8	4.7	4.6	4.4	3.9	0.0
	Ws (m/s)	4.1	5.8	7.8	10.2	13.1	17.0	19.0	19.6	20.1	19.8	19.0	17.9	16.5	13.7	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.1	0.0
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.1	5.1	5.1	5.1	5.1	5.0	4.8	4.5
	Ws (m/s)	4.0	5.8	7.8	10.2	12.9	16.3	20.3	20.7	21.3	21.3	20.9	20.3	19.3	18.2	16.1
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.3

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.1.17 Single Peak Wave Extreme Hs x Tp curves for NNW Direction with associated Wind and Current Conditions by Return Periods

Return Period (Years)	Tp1(s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5
1	Hs(m)	1.7	2.1	2.7	3.1	3.3	3.4	3.4	0.0	0.0	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	4.7	8.2	11.0	13.8	14.5	0.0	0.0	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0
10	Hs(m)	1.7	2.1	2.7	3.2	3.8	3.9	4.0	4.1	4.0	0.0	0.0	0.0
	Ws (m/s)	3.0	3.0	4.5	8.2	13.0	14.9	17.1	17.7	15.2	0.0	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.3	0.0	0.0	0.0
20	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.1	4.2	4.2	4.2	3.8	0.0	0.0
	Ws (m/s)	3.0	3.0	4.5	8.0	12.9	15.4	17.3	18.5	16.9	12.4	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.4	0.1	0.0	0.0
30	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.1	4.2	4.3	4.3	4.0	0.0	0.0
	Ws (m/s)	3.0	3.0	4.5	8.0	12.6	15.8	17.5	18.9	17.7	14.4	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.5	0.4	0.2	0.0	0.0
50	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.2	4.3	4.4	4.4	4.2	0.0	0.0
	Ws (m/s)	3.0	3.0	4.4	7.9	12.4	15.9	17.7	19.4	18.6	15.9	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.5	0.5	0.3	0.0	0.0
100	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.3	4.4	4.5	4.5	4.4	0.0	0.0
	Ws (m/s)	3.0	3.0	4.4	7.8	12.1	16.6	18.2	19.8	19.8	17.7	0.0	0.0
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.5	0.5	0.4	0.0	0.0
1000	Hs(m)	1.7	2.1	2.7	3.2	3.8	4.5	4.7	4.8	4.9	4.9	4.7	4.2
	Ws (m/s)	3.0	3.0	4.4	7.7	11.6	16.8	19.3	20.9	21.7	21.3	19.3	14.2
	Cs(m/s)	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.6	0.6	0.6	0.5	0.2

Observation: Significant wave heights Hs of sea states with low spectral peak periods Tp were limited using steepness criteria provided by Recommended Practice DNV-RP-C205, April 2007, pag. 33

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].
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5.2 Extreme Double Peak Wave Criteria

There are a high percentage of double peak wave spectra at Santos Basin due to sea conditions associated with local blowing winds and swell conditions associated with southern extra-tropical cyclones. These spectra are usually charactherized by a peak associated with sea component with frequency higher than 0.1 Hz and a peak associated with swell component with frequency lower than 0.1 Hz. Under some conditions, one of these peaks may be associated with a local storm generating an extreme double peak wave condition.

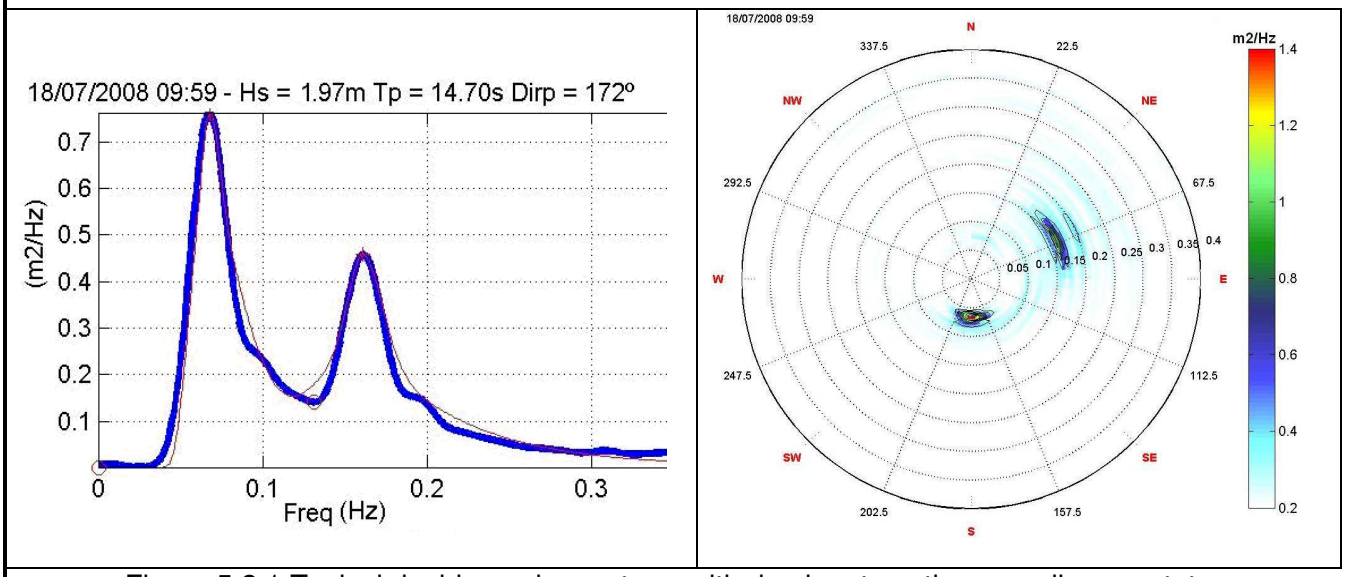

Figure 5.2.1 Typical double peak spectrum with dominant southern swell wave state.

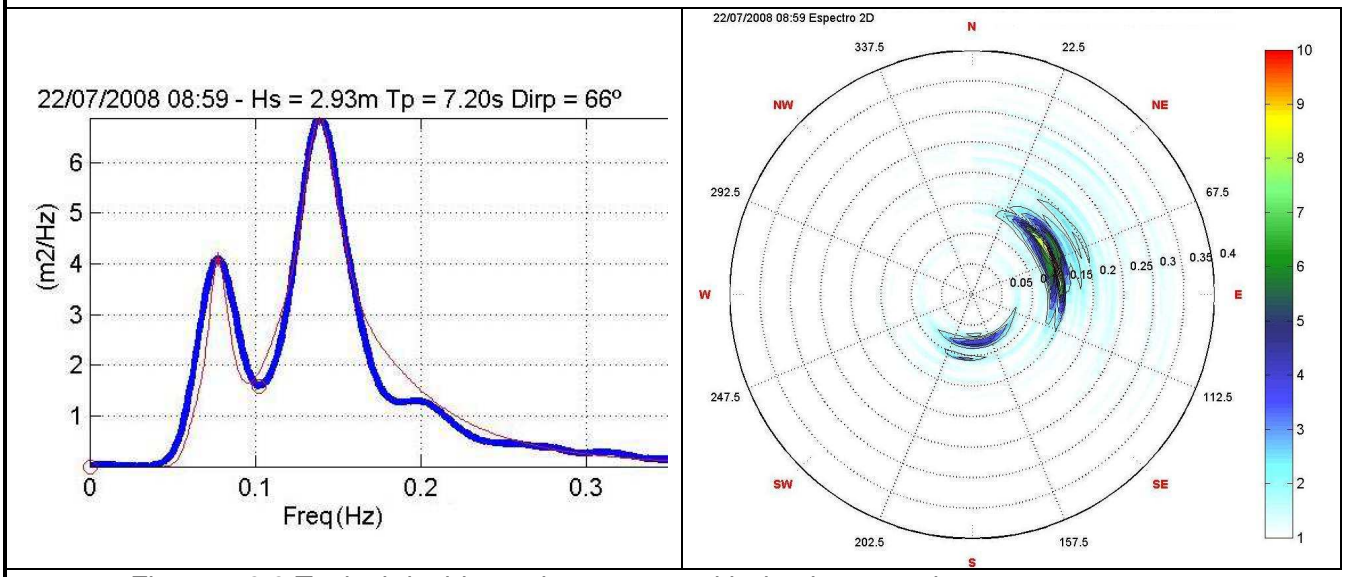

Figure 5.2.2 Typical double peak spectrum with dominant northeast sea wave state.

It is presented below extreme curves of first spectral peak (Hs1, Tp1) and associated second spectral peak (Hs2, Tp2) for some double peak seastates where the directions of both primary and secondary components are separated by a right angle (90^0). These are situations that can affect motion of units that may be aligned with one of these directions. It is only possible to calculate double-peak curves that have directions associated with existing meteorological and oceanographic local conditions. Thus, it is not possible to calculate curves for sixteen directions as it is done for single peak extreme seastates.

5.2.1 Double Peak Extreme Hs x Tp curves for Primary N Direction and Secondary E Direction

Return Period (Years)	Tp1 (s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
1	Hs1 (m)	0.0	0.0	1.6	1.9	2.3	2.5	2.8	2.9	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	0.0	0.0	0.7	0.8	0.9	1.2	1.4	1.6	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	0.0	0.0	5.1	5.4	5.9	6.4	6.9	7.2	0.0	0.0	0.0	0.0	0.0
10	Hs1 (m)	0.0	1.4	1.7	2.1	2.4	2.7	3.0	3.2	3.4	0.0	0.0	0.0	0.0
	Hs2 (m)	0.0	0.6	0.7	0.8	1.0	1.2	1.3	1.6	1.8	0.0	0.0	0.0	0.0
	Tp2 (s)	0.0	4.9	5.2	5.6	6.0	6.4	6.7	7.1	7.5	0.0	0.0	0.0	0.0
20	Hs1 (m)	0.0	1.4	1.8	2.1	2.4	2.8	3.1	3.3	3.5	3.5	0.0	0.0	0.0
	Hs2 (m)	0.0	0.6	0.7	0.9	1.0	1.2	1.4	1.5	1.8	1.9	0.0	0.0	0.0
	Tp2 (s)	0.0	4.9	5.3	5.6	6.0	6.4	6.8	7.1	7.5	7.6	0.0	0.0	0.0
30	Hs1 (m)	0.0	1.4	1.8	2.1	2.5	2.8	3.1	3.3	3.5	3.6	0.0	0.0	0.0
	Hs2 (m)	0.0	0.6	0.7	0.9	1.0	1.2	1.3	1.5	1.7	1.9	0.0	0.0	0.0
	Tp2 (s)	0.0	4.9	5.3	5.7	6.0	6.4	6.8	7.1	7.4	7.6	0.0	0.0	0.0
50	Hs1 (m)	1.0	1.5	1.9	2.2	2.5	2.8	3.1	3.4	3.6	3.7	0.0	0.0	0.0
	Hs2 (m)	0.6	0.6	0.7	0.9	1.0	1.2	1.4	1.5	1.7	1.9	0.0	0.0	0.0
	Tp2 (s)	4.8	5.0	5.3	5.7	6.1	6.4	6.8	7.1	7.4	7.7	0.0	0.0	0.0
100	Hs1 (m)	1.1	1.5	1.9	2.2	2.6	2.9	3.1	3.4	3.6	3.8	3.8	0.0	0.0
	Hs2 (m)	0.6	0.6	0.7	0.9	1.0	1.2	1.3	1.5	1.7	1.9	2.0	0.0	0.0
	Tp2 (s)	4.7	5.0	5.3	5.7	6.1	6.4	6.8	7.1	7.4	7.6	7.7	0.0	0.0
1000	Hs1 (m)	1.3	1.6	2.0	2.3	2.6	2.9	3.3	3.5	3.8	4.0	4.2	4.2	0.0
	Hs2 (m)	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.9	2.1	2.1	0.0
	Tp2 (s)	4.8	5.1	5.5	5.8	6.2	6.5	6.8	7.1	7.3	7.6	7.8	7.8	0.0

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.2.2 Double Peak Extreme Hs x Tp curves for Primary NE Direction and Secondary SE Direction

Return Period (Years)	Tp1 (s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
1	Hs1 (m)	0.0	2.1	2.7	3.1	3.3	3.5	3.7	3.8	3.9	4.0	4.0	3.9	3.7
	Hs2 (m)	0.0	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.7	1.8	1.6	1.3
	Tp2 (s)	0.0	7.1	7.2	7.4	7.6	7.8	8.1	8.3	8.5	8.8	8.9	8.6	8.2
10	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.8
	Hs2 (m)	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.9	1.9
	Tp2 (s)	7.3	7.4	7.6	7.7	7.9	8.1	8.2	8.3	8.5	8.7	8.8	9.0	9.0
20	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.3	4.5	4.6	4.7	4.8	4.9	4.9	5.0
	Hs2 (m)	0.8	0.9	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
	Tp2 (s)	7.4	7.5	7.6	7.8	8.0	8.1	8.2	8.4	8.5	8.7	8.8	8.9	9.1
30	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.4	4.6	4.7	4.8	4.9	5.0	5.0	5.1
	Hs2 (m)	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.8	1.9
	Tp2 (s)	7.4	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.5	8.7	8.8	8.9	9.1
50	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	4.6	4.8	4.9	5.0	5.1	5.2	5.2
	Hs2 (m)	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.5	1.6	1.7	1.8	1.9
	Tp2 (s)	7.5	7.6	7.7	7.9	8.0	8.1	8.3	8.4	8.5	8.7	8.8	8.9	9.1
100	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	4.8	4.9	5.1	5.2	5.3	5.3	5.4
	Hs2 (m)	0.9	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9
	Tp2 (s)	7.5	7.7	7.8	7.9	8.0	8.2	8.3	8.4	8.6	8.7	8.8	8.9	9.1
1000	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.3	5.5	5.6	5.7	5.8	5.8
	Hs2 (m)	1.0	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.7	1.8	1.9
	Tp2 (s)	7.7	7.8	7.9	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	9.0	9.0

Return Period (Years)	Tp1 (s)	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5
1	Hs1 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs1 (m)	4.7	4.6	4.4	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.7	1.6	1.4	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	8.9	8.6	8.3	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs1 (m)	4.9	4.9	4.8	4.4	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.8	1.7	1.6	1.3	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	9.0	8.8	8.6	8.2	0.0	0.0	0.0	0.0	0.0
30	Hs1 (m)	5.1	5.0	4.9	4.7	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.9	1.8	1.6	1.4	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	9.1	8.9	8.7	8.4	0.0	0.0	0.0	0.0	0.0
50	Hs1 (m)	5.2	5.2	5.1	5.0	4.6	0.0	0.0	0.0	0.0
	Hs2 (m)	1.9	1.8	1.7	1.6	1.4	0.0	0.0	0.0	0.0
	Tp2 (s)	9.1	9.0	8.8	8.6	8.3	0.0	0.0	0.0	0.0
100	Hs1 (m)	5.4	5.4	5.3	5.2	5.0	4.5	0.0	0.0	0.0
	Hs2 (m)	2.0	1.9	1.8	1.7	1.5	1.2	0.0	0.0	0.0
	Tp2 (s)	9.2	9.1	8.9	8.7	8.5	8.1	0.0	0.0	0.0
1000	Hs1 (m)	5.9	5.9	5.9	5.9	5.8	5.7	5.4	4.9	0.0
	Hs2 (m)	2.0	2.0	2.0	1.9	1.8	1.7	1.6	1.3	0.0
	Tp2 (s)	9.1	9.2	9.2	9.1	9.0	8.8	8.6	8.2	0.0

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.2.3 Double Peak Extreme Hs x Tp curves for Primary E Direction and Secondary S Direction

Return Period (Years)	Tp1 (s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
1	Hs1 (m)	0.0	0.0	0.0	2.1	2.6	2.9	3.1	3.3	3.5	3.6	3.6	3.6	3.4
	Hs2 (m)	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.0	0.7
	Tp2 (s)	0.0	0.0	0.0	5.4	5.8	6.1	6.6	7.1	7.7	8.2	8.7	8.1	7.2
10	Hs1 (m)	0.0	2.1	2.7	3.0	3.3	3.6	3.9	4.1	4.3	4.4	4.5	4.6	4.6
	Hs2 (m)	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.3
	Tp2 (s)	0.0	5.5	5.8	6.0	6.3	6.7	7.1	7.4	7.8	8.2	8.6	9.0	9.0
20	Hs1 (m)	1.7	2.1	2.7	3.2	3.5	3.9	4.1	4.3	4.5	4.7	4.8	4.8	4.9
	Hs2 (m)	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.8	0.9	1.0	1.2	1.3	1.3
	Tp2 (s)	5.4	5.6	5.9	6.2	6.4	6.8	7.1	7.5	7.9	8.3	8.6	9.0	9.2
30	Hs1 (m)	1.7	2.1	2.7	3.2	3.7	4.0	4.2	4.5	4.6	4.8	4.9	5.0	5.0
	Hs2 (m)	0.1	0.1	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4
	Tp2 (s)	5.5	5.7	6.0	6.3	6.5	6.9	7.2	7.6	7.8	8.2	8.6	9.0	9.3
50	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.1	4.4	4.5	4.8	4.9	5.1	5.1	5.2
	Hs2 (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.3	1.4
	Tp2 (s)	5.6	5.8	6.0	6.4	6.6	6.9	7.2	7.5	7.9	8.3	8.7	8.9	9.5
100	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.3	4.5	4.7	5.0	5.1	5.3	5.4	5.4
	Hs2 (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0	1.0	1.2	1.3	1.4
	Tp2 (s)	5.7	5.9	6.2	6.4	6.7	7.1	7.3	7.6	8.0	8.3	8.7	9.0	9.4
1000	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.3	5.5	5.7	5.9	6.0	6.1
	Hs2 (m)	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4
	Tp2 (s)	6.0	6.2	6.5	6.7	7.0	7.3	7.6	7.9	8.2	8.5	8.7	9.0	9.4

Return Period (Years)	Tp1 (s)	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0
1	Hs1 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs1 (m)	4.5	4.4	3.9	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.1	0.9	0.6	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	8.6	8.0	7.0	0.0	0.0	0.0	0.0	0.0
20	Hs1 (m)	4.8	4.7	4.5	3.5	0.0	0.0	0.0	0.0
	Hs2 (m)	1.3	1.1	0.9	0.4	0.0	0.0	0.0	0.0
	Tp2 (s)	9.0	8.4	7.8	6.4	0.0	0.0	0.0	0.0
30	Hs1 (m)	5.0	4.9	4.7	4.2	0.0	0.0	0.0	0.0
	Hs2 (m)	1.3	1.2	1.0	0.7	0.0	0.0	0.0	0.0
	Tp2 (s)	9.1	8.7	8.0	7.2	0.0	0.0	0.0	0.0
50	Hs1 (m)	5.2	5.1	5.0	4.7	0.0	0.0	0.0	0.0
	Hs2 (m)	1.4	1.3	1.1	0.9	0.0	0.0	0.0	0.0
	Tp2 (s)	9.5	8.9	8.4	7.7	0.0	0.0	0.0	0.0
100	Hs1 (m)	5.4	5.4	5.3	5.1	4.5	0.0	0.0	0.0
	Hs2 (m)	1.4	1.4	1.2	1.0	0.7	0.0	0.0	0.0
	Tp2 (s)	9.5	9.3	8.8	8.2	7.3	0.0	0.0	0.0
1000	Hs1 (m)	6.2	6.2	6.2	6.1	5.9	5.6	4.9	0.0
	Hs2 (m)	1.5	1.6	1.5	1.4	1.2	1.0	0.7	0.0
	Tp2 (s)	9.7	9.9	9.7	9.3	8.9	8.3	7.4	0.0

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.2.4 Double Peak Extreme Hs x Tp curves for Primary SE Direction and Secondary NE Direction

Return Period (Years)	Tp1 (s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5
1	Hs1 (m)	0.0	0.0	0.0	0.0	0.0	1.8	2.0	2.2	2.3	2.4	2.6	2.6	2.7	2.8
	Hs2 (m)	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2
	Tp2 (s)	0.0	0.0	0.0	0.0	0.0	6.2	6.4	6.7	6.9	7.2	7.4	7.6	7.9	8.1
10	Hs1 (m)	0.0	1.6	1.9	2.1	2.3	2.5	2.6	2.8	2.9	3.0	3.1	3.2	3.3	3.4
	Hs2 (m)	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.0	1.1	1.3	1.4	1.5
	Tp2 (s)	0.0	6.0	6.3	6.5	6.8	7.0	7.2	7.4	7.6	7.7	7.9	8.1	8.3	8.4
20	Hs1 (m)	1.6	1.9	2.1	2.3	2.5	2.6	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5
	Hs2 (m)	0.2	0.3	0.4	0.5	0.7	0.7	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.5
	Tp2 (s)	6.0	6.3	6.5	6.7	7.0	7.2	7.4	7.6	7.7	7.9	8.1	8.2	8.4	8.5
30	Hs1 (m)	1.7	2.0	2.2	2.4	2.6	2.7	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6
	Hs2 (m)	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.5
	Tp2 (s)	6.2	6.4	6.7	6.9	7.1	7.3	7.5	7.6	7.8	7.9	8.1	8.3	8.4	8.5
50	Hs1 (m)	1.7	2.1	2.3	2.5	2.7	2.8	2.9	3.1	3.2	3.3	3.4	3.5	3.6	3.7
	Hs2 (m)	0.3	0.4	0.5	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
	Tp2 (s)	6.3	6.5	6.8	7.0	7.2	7.4	7.5	7.7	7.9	8.1	8.2	8.3	8.5	8.6
100	Hs1 (m)	1.7	2.1	2.5	2.7	2.8	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8
	Hs2 (m)	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.6
	Tp2 (s)	6.5	6.8	7.0	7.2	7.3	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.5	8.7
1000	Hs1 (m)	1.7	2.1	2.7	3.0	3.2	3.3	3.4	3.6	3.7	3.8	3.9	4.0	4.1	4.2
	Hs2 (m)	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.5	1.6	1.7	1.8
	Tp2 (s)	7.0	7.2	7.4	7.6	7.7	7.9	8.0	8.2	8.3	8.5	8.5	8.7	8.8	8.9

Return Period (Years)	Tp1 (s)	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5
1	Hs1 (m)	2.8	2.9	2.9	2.9	2.9	2.8	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.4	1.5	1.6	1.6	1.4	1.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	8.3	8.4	8.7	8.7	8.4	8.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs1 (m)	3.4	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.4	3.3	3.1	0.0	0.0	0.0
	Hs2 (m)	1.5	1.6	1.7	1.8	1.9	1.9	1.8	1.7	1.6	1.4	1.2	0.0	0.0	0.0
	Tp2 (s)	8.5	8.7	8.8	8.9	9.0	9.1	8.9	8.8	8.6	8.4	8.0	0.0	0.0	0.0
20	Hs1 (m)	3.6	3.6	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.6	3.5	3.3	0.0	0.0
	Hs2 (m)	1.6	1.7	1.8	1.8	1.9	2.0	2.0	1.9	1.8	1.7	1.5	1.3	0.0	0.0
	Tp2 (s)	8.6	8.7	8.9	9.0	9.1	9.2	9.2	9.0	8.9	8.7	8.5	8.1	0.0	0.0
30	Hs1 (m)	3.6	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.7	3.6	3.5	3.2	0.0
	Hs2 (m)	1.6	1.7	1.8	1.9	1.9	2.0	2.0	1.9	1.9	1.7	1.6	1.4	1.2	0.0
	Tp2 (s)	8.6	8.8	8.9	9.0	9.1	9.2	9.2	9.1	9.0	8.8	8.6	8.4	7.9	0.0
50	Hs1 (m)	3.7	3.8	3.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.7	3.5	3.1
	Hs2 (m)	1.6	1.7	1.8	1.9	2.0	2.0	2.0	2.0	2.0	1.8	1.7	1.6	1.4	1.1
	Tp2 (s)	8.7	8.8	9.0	9.0	9.1	9.3	9.3	9.3	9.1	9.0	8.8	8.7	8.3	7.8
100	Hs1 (m)	3.9	3.9	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.0	3.9	3.8	3.6
	Hs2 (m)	1.7	1.8	1.8	1.9	2.0	2.1	2.2	2.2	2.1	2.0	1.9	1.8	1.6	1.4
	Tp2 (s)	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.4	9.3	9.2	9.1	8.9	8.7	8.4
1000	Hs1 (m)	4.2	4.3	4.4	4.4	4.5	4.5	4.5	4.6	4.6	4.6	4.5	4.5	4.5	4.4
	Hs2 (m)	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.1	2.0
	Tp2 (s)	9.0	9.1	9.2	9.3	9.3	9.4	9.5	9.6	9.6	9.6	9.5	9.5	9.3	9.2

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.2.5 Double Peak Extreme Hs x Tp curves for Primary SE Direction and Secondary SW Direction

Return Period (Years)	Tp1 (s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
1	Hs1 (m)	0.0	0.0	0.0	0.0	2.1	2.5	2.7	2.8	2.9	3.0	3.1	3.2	3.2
	Hs2 (m)	0.0	0.0	0.0	0.0	0.6	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7
	Tp2 (s)	0.0	0.0	0.0	0.0	4.7	5.4	6.0	6.4	6.9	7.2	7.6	8.0	8.3
10	Hs1 (m)	1.7	2.1	2.7	3.1	3.3	3.4	3.6	3.7	3.7	3.8	3.9	3.9	4.0
	Hs2 (m)	0.7	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0
	Tp2 (s)	5.1	5.7	6.1	6.6	6.9	7.3	7.6	7.8	8.0	8.3	8.5	8.7	8.8
20	Hs1 (m)	1.7	2.1	2.7	3.2	3.5	3.6	3.8	3.9	3.9	4.0	4.1	4.1	4.2
	Hs2 (m)	0.9	1.0	1.1	1.2	1.4	1.4	1.6	1.7	1.7	1.8	1.9	2.0	2.0
	Tp2 (s)	5.7	6.2	6.6	6.9	7.3	7.5	7.8	8.1	8.3	8.5	8.7	8.9	9.0
30	Hs1 (m)	1.7	2.1	2.7	3.2	3.7	3.8	3.9	4.0	4.1	4.1	4.2	4.2	4.3
	Hs2 (m)	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.1
	Tp2 (s)	6.1	6.4	6.9	7.2	7.5	7.7	8.0	8.2	8.4	8.6	8.7	8.9	9.1
50	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	3.9	4.0	4.1	4.2	4.2	4.3	4.4	4.4
	Hs2 (m)	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.9	2.0	2.1	2.1
	Tp2 (s)	6.4	6.7	7.1	7.4	7.7	7.9	8.2	8.4	8.5	8.7	8.9	9.0	9.1
100	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.1	4.2	4.3	4.4	4.4	4.5	4.5	4.6
	Hs2 (m)	1.2	1.3	1.4	1.5	1.6	1.7	1.7	1.9	1.9	2.0	2.1	2.1	2.2
	Tp2 (s)	6.7	7.1	7.4	7.6	7.9	8.1	8.3	8.6	8.7	8.9	9.0	9.1	9.3
1000	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	4.7	4.8	4.9	4.9	5.0	5.0	5.1
	Hs2 (m)	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.4
	Tp2 (s)	7.6	8.0	8.2	8.4	8.6	8.7	8.8	9.0	9.1	9.3	9.4	9.5	9.6

Return Period (Years)	Tp1 (s)	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0
1	Hs1 (m)	3.3	3.3	3.3	3.2	3.2	3.1	3.0	2.8	2.6	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.8	1.9	1.8	1.7	1.6	1.4	1.3	1.1	0.9	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	8.5	8.7	8.5	8.2	7.9	7.5	7.1	6.5	5.8	0.0	0.0	0.0	0.0	0.0
10	Hs1 (m)	4.0	4.0	4.0	4.0	4.0	3.9	3.9	3.8	3.7	3.6	3.5	3.3	3.0	2.6
	Hs2 (m)	2.1	2.1	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.1	0.8
	Tp2 (s)	9.0	9.1	9.2	9.1	8.9	8.7	8.5	8.3	8.0	7.8	7.4	7.0	6.3	5.5
20	Hs1 (m)	4.2	4.2	4.2	4.2	4.2	4.2	4.1	4.0	4.0	3.9	3.8	3.6	3.4	3.1
	Hs2 (m)	2.1	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.8	1.7	1.6	1.4	1.3	1.1
	Tp2 (s)	9.1	9.4	9.4	9.4	9.1	9.0	8.8	8.6	8.3	8.1	7.8	7.4	7.0	6.5
30	Hs1 (m)	4.3	4.3	4.3	4.3	4.3	4.3	4.2	4.2	4.1	4.0	3.9	3.8	3.6	3.3
	Hs2 (m)	2.1	2.2	2.3	2.2	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.2
	Tp2 (s)	9.2	9.3	9.4	9.3	9.2	9.1	8.9	8.7	8.5	8.3	8.0	7.7	7.4	6.9
50	Hs1 (m)	4.4	4.4	4.5	4.4	4.4	4.4	4.4	4.3	4.2	4.2	4.1	3.9	3.8	3.6
	Hs2 (m)	2.2	2.3	2.3	2.3	2.2	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4
	Tp2 (s)	9.3	9.4	9.5	9.4	9.3	9.2	9.0	8.9	8.7	8.5	8.3	8.0	7.7	7.3
100	Hs1 (m)	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5	4.4	4.3	4.2	4.0	3.9
	Hs2 (m)	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.1	2.0	1.9	1.9	1.7	1.6	1.5
	Tp2 (s)	9.4	9.5	9.6	9.6	9.5	9.4	9.2	9.1	8.9	8.7	8.6	8.3	8.0	7.7
1000	Hs1 (m)	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.0	5.0	5.0	4.9	4.8	4.7	4.6
	Hs2 (m)	2.4	2.5	2.6	2.6	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.1	2.0	1.9
	Tp2 (s)	9.7	9.8	9.9	9.9	9.8	9.8	9.7	9.5	9.5	9.4	9.2	9.0	8.8	8.7

Return Period (Years)	Tp1 (s)	17.5	18.0	18.5	19.0	19.5	20.0
1	Hs1 (m)	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs1 (m)	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs1 (m)	2.7	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	0.9	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	5.7	0.0	0.0	0.0	0.0	0.0
30	Hs1 (m)	3.1	2.4	0.0	0.0	0.0	0.0
	Hs2 (m)	1.0	0.7	0.0	0.0	0.0	0.0
	Tp2 (s)	6.3	5.0	0.0	0.0	0.0	0.0
50	Hs1 (m)	3.4	3.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.2	1.0	0.0	0.0	0.0	0.0
	Tp2 (s)	6.8	6.1	0.0	0.0	0.0	0.0
100	Hs1 (m)	3.6	3.4	3.1	0.0	0.0	0.0
	Hs2 (m)	1.4	1.2	1.0	0.0	0.0	0.0
	Tp2 (s)	7.3	6.8	6.2	0.0	0.0	0.0
1000	Hs1 (m)	4.5	4.3	4.1	3.9	3.6	3.2
	Hs2 (m)	1.8	1.7	1.6	1.4	1.3	1.1
	Tp2 (s)	8.5	8.2	7.9	7.5	7.0	6.4

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.2.6 Double Peak Extreme Hs x Tp curves for Primary S Direction and Secondary E Direction

Return Period (Years)	Tp1 (s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
1	Hs1 (m)	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.6	2.8	3.0	3.1	3.2	3.3
	Hs2 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7	0.8	0.9	1.0	1.1	1.2
	Tp2 (s)	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.2	5.4	5.7	5.9	6.1	6.4
10	Hs1 (m)	0.0	2.1	2.4	2.7	2.9	3.1	3.2	3.4	3.5	3.6	3.7	3.8	3.9
	Hs2 (m)	0.0	0.6	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3
	Tp2 (s)	0.0	4.7	5.0	5.2	5.4	5.7	5.8	6.0	6.2	6.3	6.5	6.6	6.7
20	Hs1 (m)	1.7	2.1	2.7	2.9	3.1	3.2	3.4	3.5	3.7	3.8	3.9	4.0	4.1
	Hs2 (m)	0.6	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.4
	Tp2 (s)	4.7	5.0	5.2	5.4	5.6	5.8	6.0	6.1	6.3	6.4	6.6	6.7	6.9
30	Hs1 (m)	1.7	2.1	2.7	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.0	4.1	4.2
	Hs2 (m)	0.6	0.7	0.8	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.4
	Tp2 (s)	4.9	5.1	5.4	5.5	5.7	5.9	6.1	6.2	6.4	6.5	6.6	6.8	6.9
50	Hs1 (m)	1.7	2.1	2.7	3.2	3.3	3.5	3.6	3.7	3.8	4.0	4.1	4.2	4.3
	Hs2 (m)	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4
	Tp2 (s)	5.1	5.3	5.5	5.7	5.9	6.0	6.2	6.3	6.4	6.6	6.7	6.8	6.9
100	Hs1 (m)	1.7	2.1	2.7	3.2	3.5	3.6	3.8	3.9	4.0	4.1	4.2	4.3	4.4
	Hs2 (m)	0.7	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.4	1.5
	Tp2 (s)	5.3	5.5	5.7	5.9	6.0	6.1	6.3	6.4	6.6	6.7	6.8	6.9	7.0
1000	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8
	Hs2 (m)	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.6
	Tp2 (s)	5.8	6.0	6.1	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2

Return Period (Years)	Tp1 (s)	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0
1	Hs1 (m)	3.4	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.4	0.0	0.0	0.0
	Hs2 (m)	1.3	1.3	1.4	1.5	1.6	1.7	1.7	1.9	2.0	2.1	2.2	0.0	0.0	0.0
	Tp2 (s)	6.6	6.7	6.9	7.1	7.2	7.4	7.4	7.6	7.7	7.8	7.9	0.0	0.0	0.0
10	Hs1 (m)	4.0	4.1	4.1	4.2	4.2	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.2	4.1
	Hs2 (m)	1.4	1.5	1.6	1.6	1.7	1.7	1.8	1.9	1.9	1.9	1.8	1.7	1.6	1.5
	Tp2 (s)	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.6	7.6	7.5	7.4	7.2	7.0
20	Hs1 (m)	4.2	4.2	4.3	4.3	4.4	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.4	4.3
	Hs2 (m)	1.5	1.5	1.6	1.6	1.7	1.8	1.8	1.9	2.0	2.0	1.9	1.8	1.7	1.6
	Tp2 (s)	7.0	7.1	7.2	7.3	7.3	7.5	7.5	7.6	7.7	7.7	7.6	7.5	7.4	7.3
30	Hs1 (m)	4.2	4.3	4.4	4.4	4.5	4.5	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5
	Hs2 (m)	1.5	1.5	1.6	1.7	1.7	1.8	1.9	1.9	2.0	2.0	1.9	1.9	1.8	1.7
	Tp2 (s)	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.6	7.7	7.7	7.6	7.6	7.5	7.3
50	Hs1 (m)	4.3	4.4	4.5	4.5	4.6	4.6	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.6
	Hs2 (m)	1.5	1.6	1.6	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.8
	Tp2 (s)	7.1	7.1	7.2	7.3	7.4	7.5	7.6	7.6	7.7	7.7	7.7	7.7	7.6	7.5
100	Hs1 (m)	4.5	4.5	4.6	4.7	4.7	4.7	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
	Hs2 (m)	1.5	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.1	2.1	2.0	2.0	1.9
	Tp2 (s)	7.1	7.2	7.3	7.4	7.4	7.5	7.6	7.6	7.7	7.8	7.8	7.7	7.7	7.6
1000	Hs1 (m)	4.9	4.9	5.0	5.1	5.1	5.1	5.2	5.2	5.2	5.3	5.3	5.3	5.3	5.3
	Hs2 (m)	1.7	1.7	1.8	1.8	1.8	1.9	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1
	Tp2 (s)	7.3	7.3	7.4	7.5	7.5	7.6	7.7	7.7	7.8	7.8	7.9	7.9	7.9	7.8

Return Period (Years)	Tp1 (s)	17.5	18.0	18.5	19.0	19.5	20.0	20.5	21.0	21.5
1	Hs1 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs1 (m)	3.9	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	6.8	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs1 (m)	4.2	4.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.5	1.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	7.1	6.9	6.5	0.0	0.0	0.0	0.0	0.0	0.0
30	Hs1 (m)	4.4	4.3	4.1	3.8	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.6	1.5	1.4	1.2	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	7.2	7.0	6.8	6.4	0.0	0.0	0.0	0.0	0.0
50	Hs1 (m)	4.5	4.5	4.3	4.1	3.7	0.0	0.0	0.0	0.0
	Hs2 (m)	1.7	1.6	1.5	1.4	1.1	0.0	0.0	0.0	0.0
	Tp2 (s)	7.4	7.2	7.1	6.8	6.3	0.0	0.0	0.0	0.0
100	Hs1 (m)	4.7	4.7	4.6	4.4	4.2	3.8	0.0	0.0	0.0
	Hs2 (m)	1.8	1.7	1.6	1.5	1.4	1.2	0.0	0.0	0.0
	Tp2 (s)	7.5	7.4	7.2	7.1	6.8	6.4	0.0	0.0	0.0
1000	Hs1 (m)	5.2	5.2	5.2	5.1	5.0	4.9	4.7	4.5	4.2
	Hs2 (m)	2.0	2.0	1.9	1.8	1.8	1.7	1.6	1.4	1.3
	Tp2 (s)	7.8	7.7	7.6	7.5	7.5	7.3	7.2	6.9	6.6

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.2.7 Double Peak Wave Extreme Hs x Tp curves for Primary SW Direction and Secondary SE Direction

Return Period (Years)	Tp1 (s)	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
1	Hs1 (m)	0.0	0.0	0.0	2.3	2.8	3.1	3.3	3.6	3.8	4.0	4.2	4.4	4.5
	Hs2 (m)	0.0	0.0	0.0	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
	Tp2 (s)	0.0	0.0	0.0	7.1	7.3	7.5	7.6	7.8	8.0	8.1	8.3	8.4	8.6
10	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.4	4.6	4.8	5.1	5.3	5.5	5.7	5.8
	Hs2 (m)	0.8	0.9	1.0	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.6	1.7	1.8
	Tp2 (s)	7.4	7.5	7.7	7.8	7.9	8.1	8.2	8.3	8.5	8.6	8.7	8.8	8.9
20	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	5.0	5.2	5.4	5.6	5.8	6.0	6.2
	Hs2 (m)	0.9	1.0	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9
	Tp2 (s)	7.5	7.7	7.8	7.9	8.1	8.2	8.3	8.5	8.6	8.7	8.8	8.9	9.0
30	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	5.1	5.4	5.6	5.8	6.0	6.3	6.4
	Hs2 (m)	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.7	1.8	1.9
	Tp2 (s)	7.6	7.7	7.9	8.0	8.1	8.3	8.4	8.5	8.6	8.7	8.8	9.0	9.0
50	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	5.6	5.8	6.1	6.3	6.4	6.6
	Hs2 (m)	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.8	1.8	1.9
	Tp2 (s)	7.7	7.9	8.0	8.1	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1
100	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.1	6.4	6.6	6.8	7.0
	Hs2 (m)	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9	1.9	2.0
	Tp2 (s)	7.9	8.0	8.1	8.2	8.4	8.4	8.6	8.7	8.8	8.9	9.0	9.1	9.2
1000	Hs1 (m)	1.7	2.1	2.7	3.2	3.8	4.5	5.2	6.0	6.8	7.4	7.5	7.8	8.0
	Hs2 (m)	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.8	1.9	2.0	2.0	2.1	2.2
	Tp2 (s)	8.2	8.4	8.4	8.6	8.7	8.8	8.9	8.9	9.0	9.1	9.2	9.3	9.4

Return Period (Years)	Tp1 (s)	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0
1	Hs1 (m)	4.6	4.7	4.8	4.8	4.8	4.8	4.7	4.5	4.2	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.7	1.7	1.9	2.0	2.0	1.9	1.7	1.6	1.4	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	8.7	8.9	9.0	9.1	9.1	9.0	8.9	8.6	8.3	0.0	0.0	0.0	0.0	0.0
10	Hs1 (m)	6.0	6.2	6.3	6.4	6.5	6.6	6.6	6.6	6.6	6.6	6.5	6.3	6.0	5.6
	Hs2 (m)	1.8	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.3	2.2	2.1	2.0	1.9	1.7
	Tp2 (s)	9.0	9.1	9.2	9.3	9.4	9.5	9.5	9.6	9.5	9.5	9.4	9.2	9.0	8.7
20	Hs1 (m)	6.4	6.5	6.7	6.8	6.9	7.0	7.0	7.1	7.1	7.1	7.0	7.0	6.8	6.5
	Hs2 (m)	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.1	2.0
	Tp2 (s)	9.1	9.2	9.3	9.4	9.4	9.5	9.6	9.6	9.7	9.7	9.6	9.5	9.4	9.2
30	Hs1 (m)	6.5	6.7	6.9	7.0	7.1	7.2	7.3	7.4	7.4	7.4	7.4	7.3	7.2	7.0
	Hs2 (m)	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.5	2.4	2.3	2.3	2.1
	Tp2 (s)	9.1	9.2	9.3	9.4	9.5	9.5	9.6	9.7	9.7	9.8	9.7	9.6	9.5	9.4
50	Hs1 (m)	6.8	7.0	7.1	7.3	7.4	7.5	7.6	7.7	7.7	7.8	7.8	7.7	7.7	7.5
	Hs2 (m)	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.5	2.5	2.4	2.3
	Tp2 (s)	9.2	9.3	9.3	9.4	9.5	9.6	9.7	9.7	9.8	9.8	9.8	9.8	9.7	9.6
100	Hs1 (m)	7.1	7.3	7.5	7.6	7.8	7.9	8.0	8.1	8.2	8.2	8.2	8.2	8.2	8.1
	Hs2 (m)	2.0	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.5	2.6	2.6	2.6	2.6	2.5
	Tp2 (s)	9.2	9.3	9.4	9.5	9.6	9.6	9.7	9.7	9.8	9.9	9.9	9.9	9.9	9.8
1000	Hs1 (m)	8.2	8.4	8.6	8.7	9.0	9.1	9.2	9.3	9.4	9.6	9.6	9.7	9.8	9.8
	Hs2 (m)	2.2	2.3	2.4	2.4	2.5	2.5	2.6	2.6	2.7	2.8	2.8	2.9	2.9	2.9
	Tp2 (s)	9.5	9.5	9.6	9.7	9.8	9.8	9.9	9.9	10.0	10.0	10.1	10.1	10.2	10.2

Return Period (Years)	Tp1 (s)	17.5	18.0	18.5	19.0	19.5	20.0	20.5	21.0
1	Hs1 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Hs1 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Hs1 (m)	6.1	5.3	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	1.8	1.5	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	8.9	8.5	0.0	0.0	0.0	0.0	0.0	0.0
30	Hs1 (m)	6.7	6.3	0.0	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	2.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	9.2	9.0	0.0	0.0	0.0	0.0	0.0	0.0
50	Hs1 (m)	7.3	7.0	6.5	0.0	0.0	0.0	0.0	0.0
	Hs2 (m)	2.2	2.1	1.9	0.0	0.0	0.0	0.0	0.0
	Tp2 (s)	9.5	9.3	9.0	0.0	0.0	0.0	0.0	0.0
100	Hs1 (m)	8.0	7.8	7.5	7.0	5.8	0.0	0.0	0.0
	Hs2 (m)	2.4	2.3	2.2	2.0	1.6	0.0	0.0	0.0
	Tp2 (s)	9.7	9.6	9.4	9.2	8.6	0.0	0.0	0.0
1000	Hs1 (m)	9.8	9.7	9.7	9.6	9.3	9.1	8.7	8.0
	Hs2 (m)	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1
	Tp2 (s)	10.3	10.3	10.3	10.3	10.4	10.4	10.4	10.3

Source: Modeled wave data – JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.3 JONSWAP Wave Spectrum for Santos Basins and Relation TZ / TP

The JONSWAP Wave Spectrum, adjusted for Santos/Campos Basins wave conditions, is:

$$S(f) = \frac{5}{16} * Hs^2 * Tp * \left(f_p \big/ f\right)^5 * (1 - 0.287 * \ln\gamma) * \exp\left[-1{,}25 * \left(\frac{f}{f_p}\right)^{-4}\right] * \gamma^{\exp\left[-(f-f_p)^2 / (2*\sigma^2*f_p^2)\right]}$$

$$\sigma = \begin{cases} \sigma_a = 0.07, \text{ for } & f \le f_p \\ \sigma_b = 0.09, \text{ for } & f > f_p \end{cases}$$

where: α - form parameter or Phillips constant

f - frequency (Hz)

f_p - peak frequency (Hz)

γ - peakedness parameter or peak enhancement factor

σ - shape parameter or peak width

The gamma parameter for Santos/Campos Basin (included Buzios Field area) wave data is adjusted by the expression below:

$$\gamma = 6.4 \times Tp^{(-0.491)}$$

Observation: The formulation above does not have the α (form parameter or Phillips constant) explicitly written in the formula. It is written in such way that the parameter α is included in the JONSWAP formulation above.

Relation between Tz and Tp

Mean Zero-crossing period : $T_z = \frac{1}{f_p}\sqrt{\frac{5+\gamma}{10.89+\gamma}}$ or $T_z = T_p\sqrt{\frac{5+\gamma}{10.89+\gamma}}$

where: $f_p = \frac{1}{T_p}$ and T_p - peak period.

5.4 Wave Spreading Formulation for Buzios Area

A random sea state can be described by the directional wave spectrum S(f,θ) that specifies the wave energy distribution over frequency and directions. As the directional characteristics are usually assumed to be independent of frequency, it permits that the general expression for the directional spectrum S(f, θ) = D(f, θ)*S(f) would be expressed as a product of wave directional spreading function D(θ) multiplied by the frequency spectrum:

S(f, θ) = D(θ)*S(f)

where the specified directional spreading function satisfies the constraint:

$$\int_{-\pi}^{\pi} D(\theta)^* d\theta = 1$$

The most used directionl spreading functions are:

$$D_1(\theta) = C_1(n)\cdot\left(\cos(\theta-\bar{\theta})\right)^n \qquad \text{for } -\tfrac{1}{2}\pi \leqslant (\theta-\bar{\theta}) \leqslant +\tfrac{1}{2}\pi$$

$$D_2(\theta) = C_2(s)\cdot\left[\cos\left(\frac{\theta-\bar{\theta}}{2}\right)\right]^{2s} \qquad \text{for } -\pi \leqslant (\theta-\bar{\theta}) \leqslant +\pi$$

$$D_1(\theta) = D_2(\theta) = 0 \qquad \text{for all other } (\theta-\bar{\theta})$$

where the factors $C_1(\theta)$ and $C_2(\theta)$ are calculated using the gamma function Γ:

$$C_1(n) = \frac{\Gamma(n/2+1)}{\sqrt{\pi}\Gamma(n/2+1/2)}$$

$$C_2(s) = \frac{\Gamma(s+1)}{2\sqrt{\pi}\Gamma(s+1/2)}$$

The adjusted wave spreading parameter "***s***" calculated for Santos Basin (included Buzios Field) to be used in the formulation for $D_2(\theta)$ and $C_2(s)$ is provided below:

$$s = 20.3952*\tanh(0.128*tp-1.88) + 0.3058*(hs^{1.582}) + 24$$

If the designer prefers to use the wave spreading parameter "***n***" for $D_1(\theta)$ and $C_1(n)$, a formulation from Reference [1] to convert the above calculated "***s***" to "***n***" is provided below:

aux =0.5 * (1 + s*(s-1) / ((s+1)*(s+2)))

n = (2*aux - 1) / (1 - aux)

5.5 Distribution of Total Significant Wave Heights and Wave Power

*5.5.1 Distribution of Total Significant Wave Heights and Primary Spectral Peak Directions**

Hs(m)		DIRECTION(º)																Freq	%	Mean Dir
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
0.0	0.5	0	0	0	1	1	1	0	2	3	0	0	0	0	0	0	0	8	0.01	145.6
0.5	1.0	19	51	266	342	146	135	93	104	138	143	49	6	5	4	3	8	1512	2	99.2
1.0	1.5	55	370	1622	2303	2314	1826	1303	784	577	505	105	26	8	11	9	24	11842	15.64	97
1.5	2.0	100	882	4137	4266	3161	3089	2799	2516	2291	1330	169	49	24	3	4	16	24836	32.8	103.3
2.0	2.5	68	840	3481	2557	1530	1404	1654	1965	2753	2367	348	85	27	15	8	19	19121	25.25	117.1
2.5	3.0	37	482	1722	1169	709	552	556	944	1519	1928	360	136	35	10	8	8	10175	13.44	131.9
3.0	3.5	22	170	721	428	288	212	211	365	651	1039	361	93	27	10	4	6	4608	6.09	149.2
3.5	4.0	3	41	222	134	101	108	90	115	229	555	199	53	10	4	3	0	1867	2.47	168.1
4.0	4.5	0	15	69	34	22	33	33	63	74	265	146	40	15	1	0	0	810	1.07	189.2
4.5	5.0	0	2	24	12	17	10	18	30	36	127	97	30	7	0	0	0	410	0.54	196.6
5.0	5.5	0	1	5	8	5	0	8	12	17	68	74	29	2	0	0	0	229	0.3	208.4
5.5	6.0	0	0	0	3	0	0	0	6	12	28	58	17	0	0	0	0	124	0.16	215
6.0	6.5	0	0	0	0	0	0	0	0	3	20	43	0	0	0	0	0	66	0.09	223.2
6.5	7.0	0	0	0	0	0	0	0	0	3	4	32	0	0	0	0	0	39	0.05	222.2
7.0	7.5	0	0	0	0	0	0	0	0	3	7	19	0	0	0	0	0	29	0.04	219
7.5	8.0	0	0	0	0	0	0	0	0	0	1	10	0	0	0	0	0	11	0.01	226.9
8.0	8.5	0	0	0	0	0	0	0	0	0	1	8	0	0	0	0	0	9	0.01	226.6
8.5	9.0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	10	0.01	231.4
9.0	9.5	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	4	0.01	227.2
9.5	10.0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	207.8
10.0	10.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN
10.5	11.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NaN
Freq		304	2854	12269	11257	8294	7370	6765	6906	8309	8391	2091	564	160	58	39	81	75712		
%		0.4	3.77	16.2	14.87	10.95	9.73	8.94	9.12	10.97	11.08	2.76	0.74	0.21	0.08	0.05	0.11			
Mean Hs		1.98	2.12	2.1	1.94	1.86	1.87	1.95	2.12	2.28	2.58	3.28	3.13	2.8	2.33	2.19	1.85			

(*) The Total Significant Wave Height (Hst) is obtained as Hst=4*sqrt(m_0), where m_o is the integrated area of the total wave power spectrum (sea and swell partitions). The Primary Spectral Peak Direction is the approaching direction associated with the spectral peak period.

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals, providing information equivalent to 227136 hours (=75712 * 3 hours).

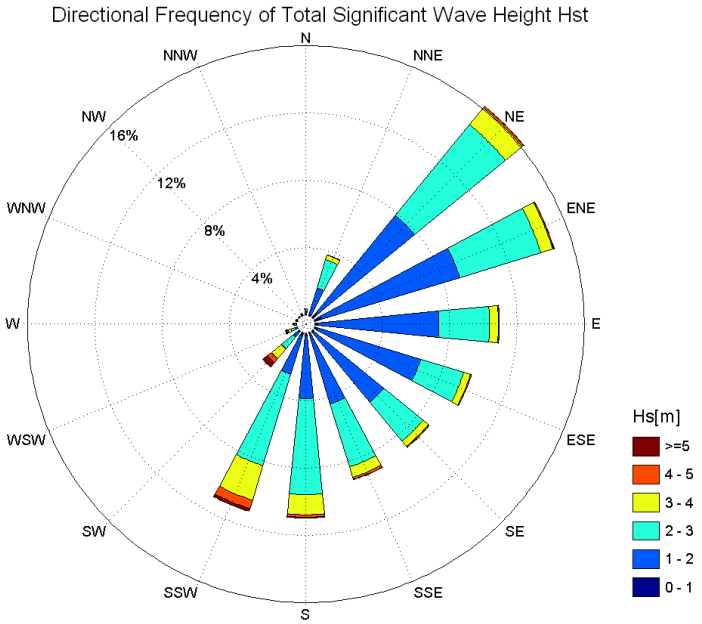

Figure 5.5.1.1 Directional percentage of Total Significant Wave Height

5.5.2 Distribution of Total Significant Wave Heights and Primary Spectral Peak Periods*

Hs(m)		Tp(s) 3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	Freq	%	Mean Tp
0.0	0.5	1	0	0	1	2	2	1	0	0	0	0	1	0	0	0	0	0	0	8	0.01	8.24
0.5	1.0	107	113	205	256	273	159	112	74	68	50	41	38	12	4	0	0	0	0	1512	2	7.73
1.0	1.5	15	938	1115	1792	3608	2505	692	373	283	260	108	103	31	11	3	0	2	3	11842	15.64	7.7
1.5	2.0	1	349	3682	3524	4602	6028	2948	1626	993	534	251	174	69	26	18	8	1	2	24836	32.8	8.12
2.0	2.5	0	13	1265	4995	2430	2755	2041	1870	1806	982	523	284	105	32	10	8	2	0	19121	25.25	8.74
2.5	3.0	0	6	109	2114	2404	1040	858	798	879	1021	514	288	108	20	8	6	1	1	10175	13.44	9.27
3.0	3.5	0	1	4	403	1240	856	277	292	294	424	431	280	77	18	8	1	1	1	4608	6.09	9.82
3.5	4.0	0	0	0	43	268	550	189	91	140	141	139	209	75	16	5	1	0	0	1867	2.47	10.45
4.0	4.5	0	0	0	3	31	207	161	48	47	63	68	89	73	17	3	0	0	0	810	1.07	11.16
4.5	5.0	0	0	0	0	4	48	116	48	15	21	41	57	35	19	6	0	0	0	410	0.54	11.75
5.0	5.5	0	0	0	0	0	16	45	60	19	15	16	22	20	7	8	1	0	0	229	0.3	11.88
5.5	6.0	0	0	0	0	0	2	22	44	19	7	6	15	9	0	0	0	0	0	124	0.16	11.5
6.0	6.5	0	0	0	0	0	0	10	18	22	0	3	11	2	0	0	0	0	0	66	0.09	11.55
6.5	7.0	0	0	0	0	0	0	3	12	12	2	0	7	3	0	0	0	0	0	39	0.05	11.99
7.0	7.5	0	0	0	0	0	0	4	4	14	1	0	1	5	0	0	0	0	0	29	0.04	11.99
7.5	8.0	0	0	0	0	0	0	2	1	1	4	0	0	3	0	0	0	0	0	11	0.01	12.51
8.0	8.5	0	0	0	0	0	0	0	5	0	1	0	1	2	0	0	0	0	0	9	0.01	12.47
8.5	9.0	0	0	0	0	0	0	1	6	3	0	0	0	0	0	0	0	0	0	10	0.01	10.82
9.0	9.5	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	4	0.01	12.88
9.5	10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	16.95
10.0	10.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.5	11.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Freq		124	1420	6380	13131	14862	14168	7482	5371	4616	3527	2141	1580	629	173	69	25	7	7	75712		
%		0.16	1.88	8.43	17.34	19.63	18.71	9.88	7.09	6.1	4.66	2.83	2.09	0.83	0.23	0.09	0.03	0.01	0.01			
Mean Hs		0.86	1.35	1.75	2.07	2.03	2.04	2.2	2.31	2.38	2.49	2.69	2.9	3.14	3.12	3.05	2.43	2.07	1.96			

(*) The Total Significant Wave Height (Hst) is obtained as Hst=4*sqrt(m_0), where m_o is the integrated area of the total wave power spectrum (sea and swell partitions). The Primary Spectral Peak is the period associated with maximum spectral energy.

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals, providing information equivalent to 227136 hours (=75712 * 3 hours).

5.5.3 Directional Distribution of Wave Power

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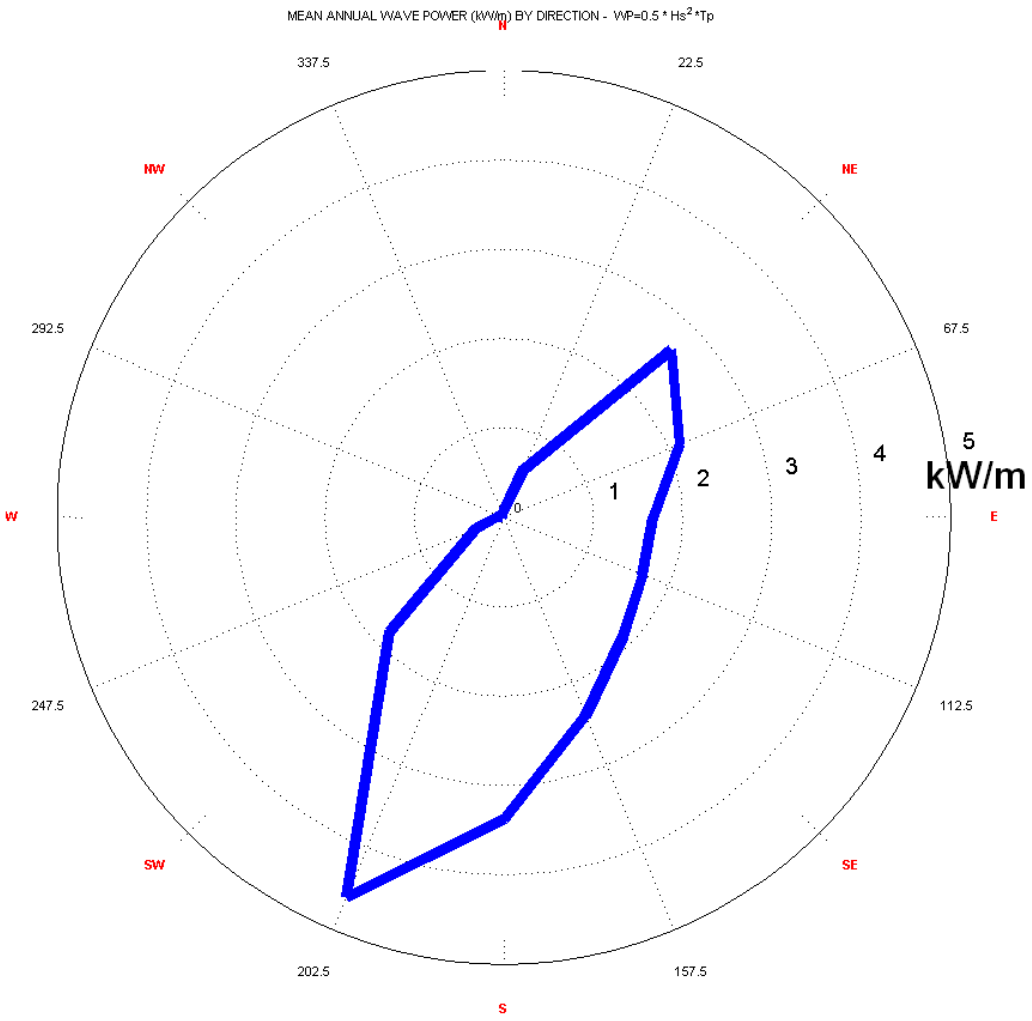


Figure 5.5.3.1 Directional distribution of mean annual wave power (Kw/m)

(*) The mean annual wave power was calculated using the equation 0.5xHs²xTp using 3-hour wave data adding the contribution of all waves for a particular direction.

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11].

5.6 Distribution of Single and Double-Peak Sea States

5.6.1 Percentage of Single and Double-Peak Sea States

Direction of Primary Sea State	Number of Spectral Peaks	Occurrences of Unimodal / Bimodal	Percentage by Direction	Total by Direction	Percentage by Direction
N	*Unimodal*	24	0.03%	304	0.40%
	Bimodal	280	0.37%		
NNE	*Unimodal*	698	0.92%	2854	3.77%
	Bimodal	2156	2.85%		
NE	*Unimodal*	3947	5.21%	12269	16.20%
	Bimodal	8322	10.99%		
ENE	*Unimodal*	3889	5.14%	11257	14.87%
	Bimodal	7368	9.73%		
E	*Unimodal*	3257	4.30%	8294	10.95%
	Bimodal	5037	6.65%		
ESE	*Unimodal*	3202	4.23%	7370	9.73%
	Bimodal	4168	5.51%		
SE	*Unimodal*	2911	3.84%	6765	8.94%
	Bimodal	3854	5.09%		
SSE	*Unimodal*	2960	3.91%	6906	9.12%
	Bimodal	3946	5.21%		
S	*Unimodal*	3519	4.65%	8309	10.97%
	Bimodal	4790	6.33%		
SSW	*Unimodal*	4284	5.66%	8391	11.08%
	Bimodal	4107	5.42%		
SW	*Unimodal*	1354	1.79%	2091	2.76%
	Bimodal	737	0.97%		
WSW	*Unimodal*	164	0.22%	564	0.74%
	Bimodal	400	0.53%		
W	*Unimodal*	21	0.03%	160	0.21%
	Bimodal	139	0.18%		
WNW	*Unimodal*	6	0.01%	58	0.08%
	Bimodal	52	0.07%		
NW	*Unimodal*	1	0.00%	39	0.05%
	Bimodal	38	0.05%		
NNW	*Unimodal*	11	0.01%	81	0.11%
	Bimodal	70	0.09%		
Total	*Unimodal*	30248	39.95%	75712	100.00%
	Bimodal	45464	60.05%		

Percentage of Unimodal Sea States: 39.95%
Percentage of Bimodal Sea States: 60.05%

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals, providing information equivalent to 227136 hours (=75712 * 3 hours).

5.6.2 Distribution of Hs versus Tp for Primary Peak Waves approaching from N Direction

5.6.2.1 Primary Hs1 versus Tp1 for Unimodal sea states (N)

Hs(m)		Tp(s)							Freq	%	MTp
		3	4	5	6	7	8	9			
		4	5	6	7	8	9	10			
0.00	0.50	0	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	2	0	0	0	3	1	0	6	25.00	6.35
1.00	1.50	0	5	1	1	2	1	0	10	41.67	5.74
1.50	2.00	0	0	5	0	0	0	0	5	20.83	5.35
2.00	2.50	0	0	1	1	0	0	0	2	8.33	5.82
2.50	3.00	0	0	0	1	0	0	0	1	4.17	6.08
3.0	3.50	0	0	0	0	0	0	0	0	0.00	0.00
Freq		2	5	7	3	5	2	0	24		
%		8.33	20.83	29.17	12.50	20.83	8.33	0.00			
MHs		0.76	1.20	1.70	2.11	0.94	1.05	0.00			

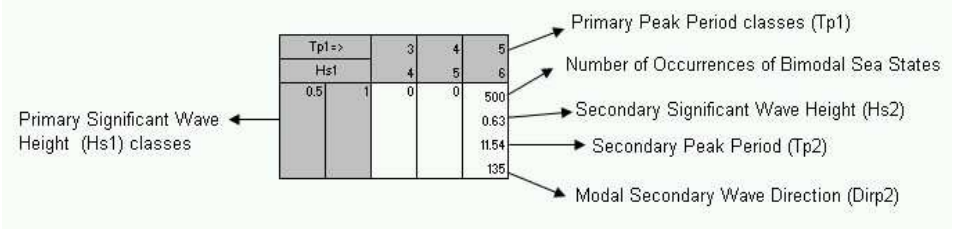
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.2.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (N)

Tp1 =>		3	4	5	6	7	8	9	Ocorr. HS1	% Hs1
Hs1		4	5	6	7	8	9	10		
0.00	0.50	0	0	0	0	0	0	0	0	0.00
0.50	1.00	4 0.51 12.00 90	24 0.84 8.40 90	0	0	1 0.47 3.77 276	1 0.46 3.59 228	0	30	10.71
1.00	1.50	0	44 0.96 7.36 68	59 1.11 7.78 68	1 0.93 6.88 58	1 0.40 3.49 309	0	1 0.49 3.45 261	106	37.86
1.50	2.00	0	0	55 1.39 7.45 68	21 1.34 7.63 68	4 1.06 8.71 180	2 1.39 6.66 225	3 0.44 3.45 270	85	30.36
2.00	2.50	0	0	1 1.62 7.43 71	34 1.69 8.52 68	4 1.11 4.77 248	2 0.85 4.63 225	0	41	14.64
2.50	3.00	0	0	0	9 1.58 8.24 68	8 1.91 8.57 68	0	0	17	6.07
3.00	3.50	0	0	0	0	1 1.46 8.24 52	0	0	1	0.36
Ocorr. Tp1		4	68	115	65	19	5	4	280	
% Tp1		1.43	24.29	41.07	23.21	6.79	1.79	1.43		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.3 Distribution of Hs versus Tp for Primary Peak Waves approaching from NNE Direction

5.6.3.1 Primary Hs1 versus Tp1 for Unimodal sea states (NNE)

Hs(m)		Tp(s)							Freq	%	MTp
		3	4	5	6	7	8	9			
		4	5	6	7	8	9	10			
0.00	0.50	0	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	3	5	1	3	1	1	0	14	2.01	5.39
1.00	1.50	2	70	42	21	4	7	0	146	20.92	5.31
1.50	2.00	0	7	122	47	21	13	0	210	30.09	6.02
2.00	2.50	0	0	36	120	16	2	2	176	25.21	6.41
2.50	3.00	0	0	0	54	41	5	0	100	14.33	7.05
3.00	3.50	0	0	0	9	18	11	0	38	5.44	7.46
3.50	4.00	0	0	0	1	6	1	4	12	1.72	8.10
4.00	4.50	0	0	0	0	0	2	0	2	0.29	8.59
Freq		5	82	201	255	107	42	6	698		
%		0.72	11.75	28.80	36.53	15.33	6.02	0.86			
MHs		0.88	1.25	1.73	2.22	2.54	2.38	3.41			

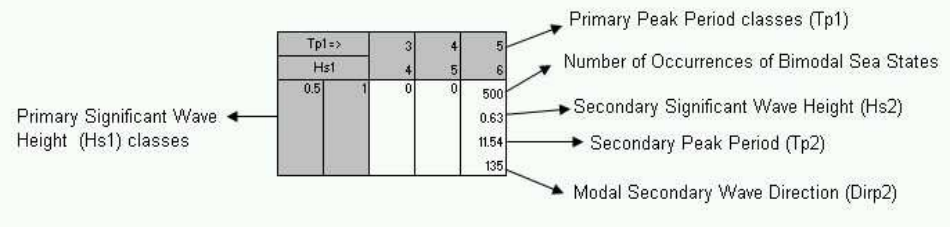
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.3.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (NNE)

Tp =>		3	4	5	6	7	8	9	Ocorr.	%
Hs1		4	5	6	7	8	9	10	Hs1	Hs1
0.00	**0.50**	1 0.44 10.57 173	0	0	0	0	0	0	**1**	**0.05**
0.50	**1.00**	16 0.37 5.18 68	60 0.70 8.33 90	8 0.47 3.48 315	7 0.42 3.43 338	3 0.42 9.73 225	7 0.61 3.88 225	0	**101**	**4.68**
1.00	**1.50**	0	103 0.92 8.39 90	429 1.04 7.85 90	47 1.07 7.88 90	27 0.81 4.22 225	9 0.44 3.45 203	0	**615**	**28.53**
1.50	**2.00**	0	1 1.41 8.68 161	310 1.22 9.03 113	391 1.14 7.86 90	31 0.52 3.58 338	30 0.95 4.65 248	1 1.04 4.57 301	**764**	**35.44**
2.00	**2.50**	0	0	2 1.65 10.62 135	377 1.19 8.16 90	58 1.09 8.31 90	19 1.01 4.35 270	3 0.79 5.15 225	**459**	**21.29**
2.50	**3.00**	0	0	0	34 1.72 11.77 180	122 1.11 8.24 90	9 1.70 5.79 293	3 2.14 7.28 225	**168**	**7.79**
3.00	**3.50**	0	0	0	0	15 2.18 12.67 180	13 1.61 9.65 158	1 1.84 5.48 283	**29**	**1.35**
3.50	**4.00**	0	0	0	0	4 3.33 14.72 180	11 1.25 9.03 90	2 0.58 7.51 113	**17**	**0.79**
4.00	**4.50**	0	0	0	0	0	2 0.99 9.06 113	0	**2**	**0.09**
Freq.		**17**	**164**	**749**	**856**	**260**	**100**	**10**	**2156**	
%		**0.79**	**7.61**	**34.74**	**39.70**	**12.06**	**4.64**	**0.46**		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.4 Distribution of Hs versus Tp for Primary Peak Waves approaching from NE Direction

5.6.4.1 Primary Hs1 versus Tp1 for Unimodal sea-states (NE)

Hs(m)		Tp(s)									Freq	%	MTp
		3	4	5	6	7	8	9	10	11			
		4	5	6	7	8	9	10	11	12			
0.00	0.50	0	0	0	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	7	17	31	68	28	14	0	0	0	165	4.18	6.31
1.00	1.50	2	148	180	267	231	53	2	0	2	885	22.42	6.33
1.50	2.00	0	10	289	350	565	255	12	1	0	1482	37.55	7.02
2.00	2.50	0	0	26	319	216	293	30	1	0	885	22.42	7.47
2.50	3.00	0	0	0	92	122	68	52	13	0	347	8.79	7.87
3.00	3.50	0	0	0	3	32	51	18	6	0	110	2.79	8.33
3.50	4.00	0	0	0	0	6	24	13	0	0	43	1.09	8.64
4.00	4.50	0	0	0	0	0	8	13	0	0	21	0.53	9.12
4.50	5.00	0	0	0	0	0	1	6	1	0	8	0.20	9.63
5.00	5.50	0	0	0	0	0	0	1	0	0	1	0.03	9.85
Freq		9	175	526	1099	1200	767	147	22	2	3947		
%		0.23	4.43	13.33	27.84	30.40	19.43	3.72	0.56	0.05			
MHs		0.93	1.23	1.56	1.81	1.88	2.17	2.93	2.90	1.25			

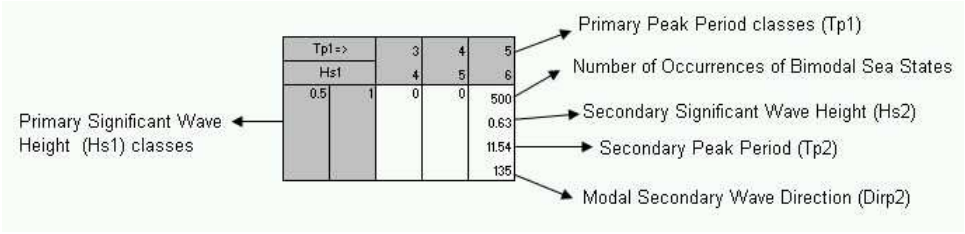
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.4.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (NE)

Tp =>		3	4	5	6	7	8	9	10	11	Ocorr.	% Hs1
Hs1		4	5	6	7	8	9	10	11	12		
0.00	0.50	3 0.39 4.71 113	0	0	0	2 0.40 3.44 225	0	0	0	0	5	0.06
0.50	1.00	17 0.47 10.87 180	69 0.66 9.22 113	20 0.88 9.40 113	37 0.61 3.73 338	34 0.45 4.00 225	18 0.39 3.45 203	0	0	0	195	2.34
1.00	1.50	0	136 0.95 8.92 113	779 0.90 8.28 113	336 0.87 7.91 113	281 0.67 3.89 0	167 0.83 4.44 203	18 0.59 4.03 203	0	1 0.36 3.27 352	1718	20.64
1.50	2.00	0	0	470 1.18 10.77 158	1642 0.99 8.44 113	486 0.72 10.32 203	406 0.86 4.58 225	46 1.15 5.96 203	2 1.88 6.17 203	0	3052	36.67
2.00	2.50	0	0	2 1.57 9.79 203	950 1.00 9.45 135	736 0.81 8.44 113	176 1.01 4.49 338	73 0.91 5.06 225	2 1.02 4.55 225	0	1939	23.30
2.50	3.00	0	0	0	55 1.62 11.69 158	667 0.95 10.74 158	141 0.76 8.94 113	37 1.15 4.82 338	4 1.02 4.99 338	0	904	10.86
3.00	3.50	0	0	0	0	140 1.30 10.16 135	217 0.81 9.39 135	8 0.53 10.56 180	1 1.57 5.51 351	0	366	4.40
3.50	4.00	0	0	0	0	1 1.58 8.39 127	77 0.75 10.07 158	22 0.35 8.77 135	0	0	100	1.20
4.00	4.50	0	0	0	0	0	12 2.05 12.11 135	18 1.21 9.41 90	1 0.18 15.91 209	0	31	0.37
4.50	5.00	0	0	0	0	0	0	10 0.91 11.30 135	1 0.18 15.82 181	0	11	0.13
5.00	5.50	0	0	0	0	0	0	1 1.96 9.89 126	0	0	1	0.01
Freq.		20	205	1271	3020	2347	1214	233	11	1	8322	
%		0.24	2.46	15.27	36.29	28.20	14.59	2.80	0.13	0.01		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.5 Distribution of Hs versus Tp for Primary Peak Waves approaching from ENE Direction

5.6.5.1 Primary Hs1 versus Tp1 for Unimodal sea-states (ENE)

Hs(m)		Tp(s)													Freq	%	MTp
		3	4	5	6	7	8	9	10	11	12	13	14	15			
		4	5	6	7	8	9	10	11	12	13	14	15	16			
0.00	0.50	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.03	7.74
0.50	1.00	9	10	65	80	62	13	4	0	1	0	3	0	0	247	6.35	6.58
1.00	1.50	2	89	161	367	510	142	8	9	7	2	2	1	0	1300	33.43	6.96
1.50	2.00	0	12	196	275	595	422	32	2	2	2	1	1	0	1540	39.60	7.38
2.00	2.50	0	0	17	141	134	244	57	5	0	0	0	0	0	598	15.38	7.83
2.50	3.00	0	0	0	29	24	66	20	0	0	0	0	0	1	140	3.60	8.18
3.00	3.50	0	0	0	2	14	12	10	1	0	0	0	0	0	39	1.00	8.26
3.50	4.00	0	0	0	0	1	4	2	0	0	0	0	0	0	7	0.18	8.63
4.00	4.50	0	0	0	0	0	2	5	0	0	0	0	0	0	7	0.18	9.16
4.50	5.00	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0.05	10.82
5.00	5.50	0	0	0	0	0	0	3	4	0	0	0	0	0	7	0.18	10.36
5.50	6.00	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.03	11.11
Freq		11	111	439	894	1341	905	141	22	12	4	6	2	1	3889		
%		0.28	2.85	11.29	22.99	34.48	23.27	3.63	0.57	0.31	0.10	0.15	0.05	0.03			
MHs		0.91	1.24	1.45	1.58	1.61	1.90	2.35	2.51	1.95	1.50	1.13	1.52	2.62			

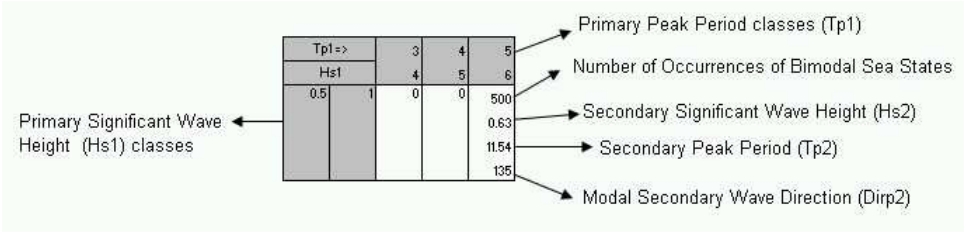
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.5.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (ENE)

Tp =>		3	4	5	6	7	8	9	10	11	12	13	14	15	Ocorr.	% Hs1
Hs1		4	5	6	7	8	9	10	11	12	13	14	15	16		
0.00	0.50	0	0	0	0	0	0	1 0.46 3.59 217	0	0	0	0	0	0	1	0.01
0.50	1.00	5 0.52 10.40 158	42 0.68 9.85 135	33 0.51 3.60 0	70 0.56 3.68 0	57 0.53 3.55 225	22 0.40 3.37 203	2 0.18 3.05 293	0	2 0.18 3.05 270	0	1 0.40 3.45 21	0	0	234	3.18
1.00	1.50	0	108 0.99 9.31 158	532 0.94 9.05 135	334 0.86 7.55 135	618 0.73 4.11 23	366 0.83 4.38 23	52 1.02 4.77 23	9 0.38 3.40 338	9 0.66 3.94 203	0	0	2 0.46 3.59 338	0	2030	27.55
1.50	2.00	0	1 0.62 6.38 173	563 1.16 10.55 180	1029 0.90 9.13 135	493 0.89 4.25 0	506 0.86 4.22 0	82 0.60 3.92 248	13 0.82 5.84 203	9 0.96 4.35 270	9 0.36 3.31 23	2 1.12 4.53 338	2 0.76 4.04 23	1 0.31 3.06 120	2710	36.78
2.00	2.50	0	0	13 1.34 10.03 180	846 1.06 10.36 158	377 0.72 10.59 158	183 1.18 4.84 0	62 1.05 4.82 0	6 1.24 8.93 203	2 0.76 7.32 270	0	0	1 1.05 4.49 300	2 1.78 5.55 270	1492	20.25
2.50	3.00	0	0	0	87 1.38 10.97 158	471 0.97 9.36 135	45 0.86 9.16 135	23 1.37 5.00 338	2 2.57 7.00 23	0	0	0	0	0	628	8.52
3.00	3.50	0	0	0	0	111 1.17 10.08 158	77 0.84 9.17 135	2 2.40 6.66 0	0	1 0.98 5.09 319	0	1 1.71 10.90 213	0	0	192	2.61
3.50	4.00	0	0	0	0	4 1.05 11.30 158	45 1.25 10.27 135	7 0.60 10.20 135	0	0	0	0	0	0	56	0.76
4.00	4.50	0	0	0	0	0	11 1.37 10.88 135	5 0.31 14.63 158	0	1 0.69 4.96 351	0	0	0	0	17	0.23
4.50	5.00	0	0	0	0	0	0	4 1.24 9.35 113	1 0.36 9.81 159	0	0	0	0	0	5	0.07
5.00	5.50	0	0	0	0	0	0	0	1 0.40 10.79 141	0	0	0	0	0	1	0.01
5.50	6.00	0	0	0	0	0	0	0	0	2 0.55 7.07 158	0	0	0	0	2	0.03
Freq.		5	151	1141	2366	2131	1255	240	32	26	9	4	5	3	7368	
%		0.07	2.05	15.49	32.11	28.92	17.03	3.26	0.43	0.35	0.12	0.05	0.07	0.04		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.6 Distribution of Hs versus Tp for Primary Peak Waves approaching from E Direction

5.6.6.1 Primary Hs1 versus Tp1 for Unimodal sea-states (E)

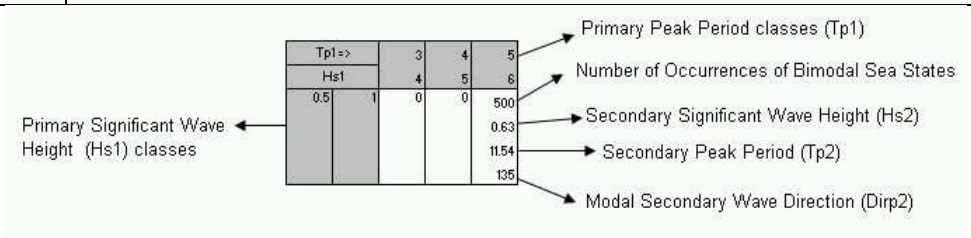
Hs(m)		Tp(s)													Freq	%	MTp
		3	4	5	6	7	8	9	10	11	12	13	14	15			
		4	5	6	7	8	9	10	11	12	13	14	15	16			
0.00	0.50	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.03	8.77
0.50	1.00	0	7	25	20	18	11	13	2	3	1	2	1	0	103	3.16	7.36
1.00	1.50	2	46	74	230	520	262	54	25	12	14	2	3	4	1248	38.32	7.60
1.50	2.00	0	5	107	176	307	425	156	17	10	4	5	3	0	1215	37.30	7.92
2.00	2.50	0	0	9	121	64	100	39	25	9	3	11	3	0	384	11.79	8.14
2.50	3.00	0	0	1	42	54	50	22	11	6	0	5	1	0	192	5.89	8.29
3.00	3.50	0	0	0	7	14	25	16	6	0	0	0	0	0	68	2.09	8.51
3.50	4.00	0	0	0	0	5	13	3	2	0	0	0	0	0	23	0.71	8.48
4.00	4.50	0	0	0	0	0	5	2	0	0	0	0	0	0	7	0.21	8.75
4.50	5.00	0	0	0	0	0	4	2	6	0	0	0	0	0	12	0.37	9.86
5.00	5.50	0	0	0	0	0	0	2	2	0	0	0	0	0	4	0.12	10.17
Freq		2	58	216	596	982	896	309	96	40	22	25	11	4	3257		
%		0.06	1.78	6.63	18.30	30.15	27.51	9.49	2.95	1.23	0.68	0.77	0.34	0.12			
MHs		1.14	1.26	1.49	1.72	1.58	1.80	1.91	2.20	1.77	1.51	2.05	1.72	1.09			

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.6.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (E)

Tp =>		3	4	5	6	7	8	9	10	11	12	13	14	15	16	Ocorr.	%
Hs1		4	5	6	7	8	9	10	11	12	13	14	15	16	17	Hs1	Hs1
0.00	0.50	0	0	0	0	0	0	1 0.44 3.59 222	0	0	0	0	0	0	0	1	0.02
0.50	1.00	1 0.91 8.80 165	16 0.76 10.14 180	18 0.42 4.13 158	39 0.72 4.19 23	59 0.63 3.84 23	29 0.62 3.79 23	7 0.80 4.52 45	7 0.46 3.47 45	4 0.62 4.09 248	5 0.61 3.85 45	3 0.52 3.36 270	1 0.54 3.36 154	1 0.33 3.21 43	0	190	3.77
1.00	1.50	0	62 1.06 9.58 180	207 1.05 9.42 158	220 0.79 4.22 23	581 0.77 4.24 23	599 0.75 4.12 23	154 0.84 4.24 23	22 0.80 4.35 225	23 0.60 3.71 23	14 0.72 3.93 23	8 0.75 3.95 0	2 0.87 4.22 23	0	0	1892	37.56
1.50	2.00	0	0	214 1.24 9.95 180	426 1.09 9.34 158	321 0.91 4.38 23	470 0.92 4.47 23	181 0.80 4.12 23	65 0.74 4.29 45	36 0.83 4.08 0	23 0.91 4.45 0	21 1.12 4.98 45	10 0.84 4.03 23	4 0.40 3.44 203	1 1.30 4.63 191	1772	35.18
2.00	2.50	0	0	0	279 1.44 9.96 158	204 1.06 9.15 158	95 1.21 4.84 23	74 0.97 4.53 23	24 0.73 3.83 23	14 1.05 4.21 248	15 0.99 4.50 23	23 0.74 3.96 338	12 1.21 4.63 23	3 0.96 4.13 338	0	743	14.75
2.50	3.00	0	0	0	27 1.63 13.19 180	206 1.30 10.31 158	59 0.83 9.54 158	11 1.53 5.18 0	1 0.74 8.07 161	5 0.28 3.05 248	0	1 1.25 4.95 339	6 0.79 4.06 45	1 1.10 5.02 42	0	317	6.29
3.00	3.50	0	0	0	2 2.53 13.79 203	27 1.23 11.57 180	44 1.58 12.22 180	5 0.78 9.67 135	0	0	0	1 0.77 3.72 10	1 1.57 5.47 23	0	0	80	1.59
3.50	4.00	0	0	0	0	1 1.35 13.89 142	24 1.30 9.64 180	6 0.89 9.33 135	0	0	0	0	0	0	0	31	0.62
4.00	4.50	0	0	0	0	0	3 0.70 9.55 180	4 0.77 9.43 135	0	0	0	0	0	0	0	7	0.14
4.50	5.00	0	0	0	0	0	0	2 0.83 8.96 158	1 0.44 11.85 144	0	0	0	0	0	0	3	0.06
5.00	5.50	0	0	0	0	0	0	0	1 0.36 10.74 175	0	0	0	0	0	0	1	0.02
Freq.		1	78	439	993	1399	1323	445	121	82	57	57	32	9	1	5037	
%		0.02	1.55	8.72	19.71	27.77	26.27	8.83	2.40	1.63	1.13	1.13	0.64	0.18	0.02		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.



5.6.7 Distribution of Hs versus Tp for Primary Peak Waves approaching from ESE Direction

5.6.7.1 Primary Hs1 versus Tp1 for Unimodal sea-states (ESE)

Hs(m)		Tp(s)														Freq	%	MTp
		3	4	5	6	7	8	9	10	11	12	13	14	15	16			
		4	5	6	7	8	9	10	11	12	13	14	15	16	17			
0.00	0.50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.03	8.11
0.50	1.00	0	0	12	8	24	25	11	2	1	3	3	9	0	0	98	3.06	8.70
1.00	1.50	0	21	39	140	298	276	73	21	15	9	4	8	7	1	912	28.48	8.00
1.50	2.00	0	3	74	129	268	451	201	62	20	21	8	10	5	0	1252	39.10	8.41
2.00	2.50	0	0	14	81	78	147	97	54	14	5	4	8	0	0	502	15.68	8.60
2.50	3.00	0	0	0	25	49	44	52	49	2	2	0	7	0	0	230	7.18	9.02
3.00	3.50	0	0	0	7	26	24	11	27	7	0	0	0	0	0	102	3.19	9.00
3.50	4.00	0	0	0	1	6	30	14	12	9	0	0	0	0	0	72	2.25	9.23
4.00	4.50	0	0	0	0	1	7	11	3	2	0	0	0	0	0	24	0.75	9.42
4.50	5.00	0	0	0	0	0	3	6	0	0	0	0	0	0	0	9	0.28	9.21
Freq		0	24	139	391	750	1008	476	230	70	40	19	42	12	1	3202		
%		0.00	0.75	4.34	12.21	23.42	31.48	14.87	7.18	2.19	1.25	0.59	1.31	0.37	0.03			
MHs		0.00	1.33	1.56	1.75	1.71	1.83	2.06	2.33	2.23	1.70	1.62	1.71	1.39	1.32			

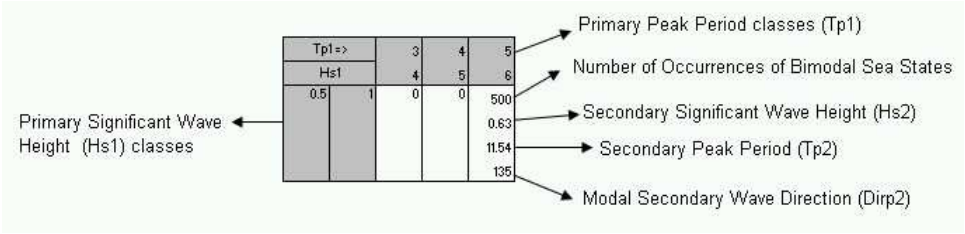
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.7.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (ESE)

Tp =>		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Ocorr Hs1	% Hs1
Hs1		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
0.00	0.50	0	1 0.40 3.52 53	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.02
0.50	1.00	0	4 0.61 7.46 158	3 0.46 3.56 68	15 0.65 3.91 45	48 0.68 4.38 45	21 0.77 4.28 45	14 0.59 3.84 45	7 0.63 4.36 45	7 0.50 3.41 23	7 0.39 3.44 0	3 0.40 3.46 248	0	0	0	0	129	3.10
1.00	1.50	0	7 1.08 9.85 203	68 1.11 9.21 180	115 0.79 4.30 45	449 0.72 4.29 45	649 0.84 4.48 45	232 0.81 4.36 45	88 0.73 4.19 45	51 0.74 3.96 23	44 0.78 4.13 23	18 0.79 4.07 338	10 0.81 4.26 45	5 0.83 4.32 45	1 0.47 3.59 11	1 0.92 5.40 168	1738	41.70
1.50	2.00	0	0	80 1.17 9.73 180	199 1.23 9.52 180	202 0.96 4.51 23	399 0.82 4.34 45	305 0.92 4.48 45	159 1.02 4.84 45	103 0.82 4.17 23	70 0.88 4.34 45	36 0.72 3.92 23	26 1.05 4.50 23	11 0.95 4.21 315	0	0	1590	38.15
2.00	2.50	0	0	2 1.94 12.98 203	127 1.36 10.91 180	98 1.24 10.02 180	71 0.97 7.90 180	76 1.22 5.11 68	47 1.17 5.10 68	39 0.78 3.97 23	24 0.69 3.89 23	23 0.75 3.84 23	15 1.41 5.12 23	6 1.54 5.31 0	0	1 1.06 4.49 335	529	12.69
2.50	3.00	0	0	0	8 2.07 11.47 180	60 1.59 11.47 180	23 1.29 9.82 180	13 1.76 5.90 45	5 2.17 7.29 225	2 0.95 4.16 203	7 1.65 5.53 23	1 1.39 5.01 40	10 1.53 5.34 23	0	0	0	129	3.10
3.00	3.50	0	0	0	0	12 2.00 11.39 180	24 1.46 11.18 180	2 1.68 12.18 158	0	0	0	2 0.40 3.29 315	8 1.08 4.08 338	0	0	0	48	1.15
3.50	4.00	0	0	0	0	0	3 1.68 12.59 203	0	0	0	0	0	1 0.70 3.31 342	0	0	0	4	0.10
Freq.		0	12	153	464	869	1190	642	306	202	152	83	70	22	1	2	4168	
%		0.00	0.29	3.67	11.13	20.85	28.55	15.40	7.34	4.85	3.65	1.99	1.68	0.53	0.02	0.05		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.8 Distribution of Hs versus Tp for Primary Peak Waves approaching from SE Direction

5.6.8.1 Primary Hs1 versus Tp1 for Unimodal sea-states (SE)

Hs(m)	Tp(s)																		Freq	%	MTp
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21			
0.0 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00
0.5 1.0	1	0	4	1	13	8	20	3	3	1	2	3	0	0	0	0	0	0	59	2.03	9.16
1.0 1.5	0	7	20	42	193	183	67	26	18	9	4	6	2	1	0	0	0	1	579	19.89	8.39
1.5 2.0	0	2	58	70	210	392	217	130	51	31	13	7	7	0	1	0	0	0	1189	40.85	8.86
2.0 2.5	0	0	15	91	96	155	179	65	53	14	9	12	5	0	0	0	0	0	694	23.84	9.04
2.5 3.0	0	0	1	22	34	31	44	38	19	5	3	12	12	0	0	0	0	0	221	7.59	9.84
3.0 3.5	0	0	0	8	15	17	17	20	6	9	0	0	3	0	0	0	0	0	95	3.26	9.57
3.5 4.0	0	0	0	2	1	11	9	6	7	8	2	0	0	0	0	0	0	0	46	1.58	10.22
4.0 4.5	0	0	0	0	0	1	4	0	4	1	2	0	0	0	0	0	0	0	12	0.41	10.91
4.5 5.0	0	0	0	0	0	0	4	2	0	1	2	1	0	0	0	0	0	0	10	0.34	11.36
5.0 5.5	0	0	0	0	0	0	0	2	0	2	2	0	0	0	0	0	0	0	6	0.21	12.09
Freq	1	9	98	236	562	798	561	292	161	81	39	41	29	1	1	0	0	1	2911		
%	.03	.31	3.37	8.11	19.31	27.41	19.27	10.03	5.53	2.78	1.34	1.41	1.00	.03	.03	0	0	.03			
MHs	.82	1.33	1.70	2.00	1.77	1.84	2.01	2.12	2.18	2.38	2.42	2.12	2.38	1.44	1.98	0	0	1.34			

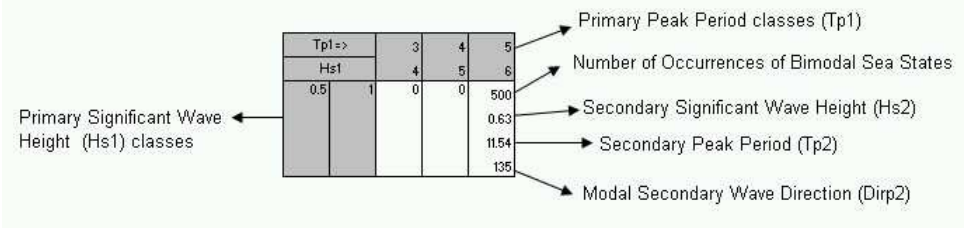
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.8.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (SE)

Tp =>		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Ocorr	%
Hs1		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Hs1	Hs1
0.0	0.5	0	0	0	0	0	0	0	1 0.42 3.59 33	0	0	0	0	0	0	0	0	0	0	1	0.03
0.5	1.0	0	2 0.86 8.21 90	0	8 0.45 3.51 68	48 0.64 4.32 68	18 0.88 4.28 45	8 0.58 3.80 338	7 0.45 3.40 45	4 0.45 3.37 45	11 0.74 4.08 45	2 0.57 5.44 23	1 0.40 3.50 78	0	0	0	0	0	0	109	2.83
1.0	1.5	0	2 1.01 8.66 68	40 1.20 8.83 203	51 0.83 5.14 90	307 0.76 4.57 45	473 0.80 4.74 68	204 0.89 4.74 68	117 0.80 4.49 68	54 1.01 4.77 45	45 0.92 4.67 45	26 0.87 4.53 45	28 0.80 4.11 0	6 1.00 4.66 45	2 0.38 3.40 23	1 0.64 3.82 7	0	1 0.94 5.02 101	0	1357	35.21
1.5	2.0	0	2 1.09 8.54 45	36 1.32 9.56 203	96 1.38 9.44 203	97 0.82 4.49 68	342 0.72 4.30 68	311 0.87 4.53 68	275 0.98 4.70 45	249 1.06 4.80 68	93 1.24 5.30 68	50 1.13 4.84 45	37 1.03 4.91 45	12 1.04 4.64 0	7 0.94 5.16 45	3 0.31 3.11 0	0	0	1 0.44 3.59 344	1611	41.80
2.0	2.5	0	0	1 1.75 11.98 195	47 1.59 10.17 203	42 1.40 10.29 203	47 1.11 4.77 68	75 1.12 4.84 68	45 1.04 4.47 68	115 1.01 4.59 45	83 1.16 4.86 45	37 1.16 4.86 45	32 1.20 4.72 23	13 1.71 5.85 45	0	0	0	0	0	0	537	13.93
2.5	3.0	0	0	0	4 1.74 11.01 203	37 1.47 10.42 203	15 0.97 10.14 203	5 2.00 6.49 45	7 0.76 5.07 293	23 1.04 4.61 90	31 0.74 4.07 68	17 0.71 3.90 45	19 2.24 6.90 45	1 2.93 7.39 47	3 1.32 5.29 248	0	0	0	0	162	4.20
3.0	3.5	0	0	0	1 3.01 14.88 200	12 1.77 11.98 203	10 1.54 11.36 203	3 0.90 15.38 180	0	1 0.40 3.62 73	1 1.62 5.97 93	1 1.28 4.93 4	10 0.88 4.08 315	8 2.67 6.72 23	2 1.27 5.09 248	2 1.42 5.65 248	0	0	0	51	1.32
3.5	4.0	0	0	0	0	0	6 2.47 13.51 203	2 1.30 10.84 203	0	3 0.37 3.61 68	0	0	5 2.59 7.07 203	3 2.56 6.63 45	1 2.48 6.32 48	0	0	0	0	20	0.52
4.0	4.5	0	0	0	0	0	0	2 0.28 9.78 203	0	0	2 0.34 3.34 68	0	0	0	0	0	0	0	0	4	0.10
4.5	5.0	0	0	0	0	0	0	1 1.42 11.57 184	0	0	1 0.18 3.05 80	0	0	0	0	0	0	0	0	2	0.05
Freq.		0	6	77	207	543	911	611	452	449	267	133	132	43	15	6	0	1	1	3854	
%		0	0.16	2.00	5.37	14.09	23.64	15.85	11.73	11.65	6.93	3.45	3.43	1.12	0.39	0.16	0	0.03	0.03		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.9 Distribution of Hs versus Tp for Primary Peak Waves approaching from SSE Direction

5.6.9.1 Primary Hs1 versus Tp1 for Unimodal sea-states (SSE)

Hs(m)		Tp(s)															Freq	%	MTp
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
0.00	0.50	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.03	3.33
0.50	1.00	4	2	12	1	7	9	10	3	6	3	0	10	0	0	0	67	2.26	8.91
1.00	1.50	0	16	16	32	112	74	35	19	17	8	9	10	3	0	0	351	11.86	8.53
1.50	2.00	0	3	53	52	164	281	204	112	64	30	12	4	2	2	1	984	33.24	8.95
2.00	2.50	0	0	33	105	73	151	151	96	94	57	44	13	5	1	0	823	27.80	9.51
2.50	3.00	0	0	4	46	38	55	104	63	38	35	12	10	0	0	1	406	13.72	9.71
3.00	3.50	0	0	0	4	37	26	27	26	20	18	9	5	0	0	0	172	5.81	9.96
3.50	4.00	0	0	0	1	7	12	6	10	3	12	3	9	1	1	0	65	2.20	10.93
4.00	4.50	0	0	0	0	0	4	4	7	6	12	10	2	4	2	0	51	1.72	12.32
4.50	5.00	0	0	0	0	0	2	2	0	1	6	8	0	0	3	0	22	0.74	12.83
5.00	5.50	0	0	0	0	0	0	0	2	1	2	5	0	0	2	0	12	0.41	13.23
5.50	6.00	0	0	0	0	0	0	0	1	4	0	1	0	0	0	0	6	0.20	11.48
Freq		5	21	118	241	438	614	543	339	254	183	113	63	15	11	2	2960		
%		0.17	0.71	3.99	8.14	14.80	20.74	18.34	11.45	8.58	6.18	3.82	2.13	0.51	0.37	0.07			
MHs		0.60	1.24	1.77	2.15	1.95	2.01	2.16	2.30	2.31	2.63	2.84	2.26	2.70	3.93	2.35			

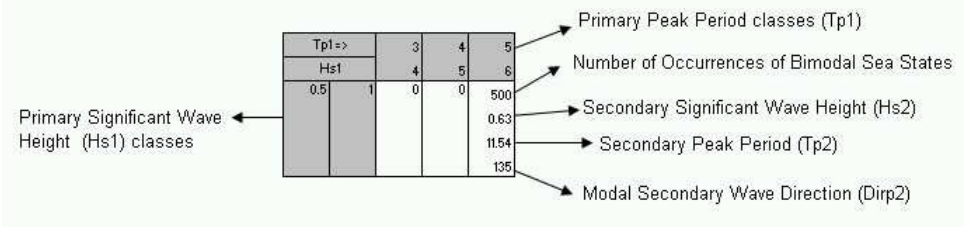
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.9.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (SSE)

Tp =>		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Ocorr	%
Hs1		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Hs1	Hs1
0.0	0.5	0	0	0	0	1 0.40 3.44 44	1 0.42 3.58 69	2 0.21 3.05 45	2 0.42 3.54 45	0	0	0	0	0	0	0	0	0	0	6	0.15
0.5	1.0	0	6 0.69 7.41 68	0	8 0.33 3.14 68	14 0.79 5.24 68	19 0.76 4.67 68	8 0.58 6.05 225	14 0.54 3.50 45	11 0.50 3.44 45	5 0.62 3.73 0	5 0.53 4.31 90	2 0.33 3.13 315	0	0	0	0	0	0	92	2.33
1.0	1.5	0	13 0.88 8.60 90	34 1.01 7.72 68	23 0.98 5.59 90	156 0.76 4.55 90	331 0.88 4.91 90	225 0.84 4.74 90	121 0.96 4.86 45	63 0.83 4.74 68	48 0.98 4.89 45	13 0.88 5.02 23	14 0.90 4.35 45	9 0.55 3.92 0	5 1.17 5.17 23	3 0.73 3.76 45	1 1.15 4.58 71	0	2 0.40 3.49 90	1061	26.89
1.5	2.0	0	3 1.31 9.50 90	24 1.17 8.16 68	62 1.40 8.89 203	80 0.94 4.62 90	244 0.90 4.80 113	299 0.78 4.63 90	393 0.97 4.66 68	291 1.09 4.90 68	134 1.10 4.81 45	51 1.07 4.68 23	33 1.50 5.68 45	17 1.26 4.99 45	4 0.87 4.12 45	0	1 0.38 3.39 105	1 0.42 3.56 345	0	1637	41.49
2.0	2.5	0	1 1.43 5.57 69	1 0.95 6.91 59	47 1.68 9.69 203	22 1.31 10.16 203	50 1.13 5.01 113	54 0.94 4.53 113	94 0.97 4.71 113	156 1.01 4.58 68	199 1.38 5.26 68	90 1.09 4.62 90	54 1.30 4.85 23	18 1.64 5.62 23	1 0.38 3.43 57	1 0.57 3.75 281	2 0.49 3.32 338	0	0	790	20.02
2.5	3.0	0	0	0	5 1.84 12.15 203	38 1.50 10.48 203	12 1.13 9.45 203	5 0.45 3.56 113	13 0.56 3.80 113	10 0.65 4.51 90	71 1.42 5.54 113	66 1.53 5.63 90	31 2.09 6.30 45	21 1.17 4.83 45	3 1.33 4.65 225	0	0	0	0	275	6.97
3.0	3.5	0	0	0	0	6 1.47 10.21 203	11 1.08 9.75 203	0	0	1 0.92 4.87 93	7 0.87 4.49 90	7 1.75 5.47 113	13 1.56 5.23 68	5 1.68 5.30 0	1 1.21 4.98 247	1 1.16 5.06 247	0	0	0	52	1.32
3.5	4.0	0	0	0	0	1 2.38 10.58 217	5 1.89 11.07 203	4 0.68 8.82 45	1 1.39 5.59 216	1 0.69 4.68 108	2 0.73 4.64 113	0	0	5 0.83 4.98 68	0	0	0	0	0	19	0.48
4.0	4.5	0	0	0	0	0	1 0.94 9.79 108	2 1.09 9.81 113	0	0	2 0.63 4.41 113	0	0	0	8 1.73 5.31 90	0	0	0	0	13	0.33
4.5	5.0	0	0	0	0	0	0	1 1.25 11.01 196	0	0	0	0	0	0	0	0	0	0	0	1	0.03
Freq.		0	23	59	145	318	674	600	638	533	468	232	147	75	22	5	4	1	2	3946	
%		0	0.58	1.50	3.67	8.06	17.08	15.21	16.17	13.51	11.86	5.88	3.73	1.90	0.56	0.13	0.10	0.03	0.05		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.10 Distribution of Hs versus Tp for Primary Peak Waves approaching from S Direction

5.6.10.1 Primary Hs1 versus Tp1 for Unimodal sea-states (S)

Hs(m)		Tp(s)																		Freq	%	MTp
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21			
0.0	0.5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.03	7.31
0.5	1.0	3	4	8	2	6	10	10	4	10	2	12	1	7	0	0	0	0	0	79	2.24	9.87
1.0	1.5	0	15	6	23	53	44	38	33	24	15	5	8	0	0	0	0	0	0	264	7.50	9.02
1.5	2.0	0	2	40	44	119	266	146	139	71	40	15	11	2	3	1	1	0	0	900	25.58	9.24
2.0	2.5	0	0	25	115	70	183	171	167	152	86	58	14	6	1	1	0	0	0	1049	29.81	9.81
2.5	3.0	0	0	0	87	78	64	100	105	60	56	28	26	6	6	1	1	0	0	618	17.56	9.94
3.0	3.5	0	0	0	11	47	42	31	40	43	38	44	36	11	3	0	0	1	1	348	9.89	11.08
3.5	4.0	0	0	0	2	10	23	8	13	26	10	15	24	11	1	2	1	0	0	146	4.15	11.73
4.0	4.5	0	0	0	0	6	13	1	4	7	8	3	8	2	0	0	0	0	0	52	1.48	10.98
4.5	5.0	0	0	0	0	0	1	2	2	2	2	6	6	5	1	0	0	0	0	27	0.77	13.24
5.0	5.5	0	0	0	0	0	2	4	0	1	2	3	2	0	1	0	0	0	0	15	0.43	11.85
5.5	6.0	0	0	0	0	0	1	2	2	2	1	0	3	0	0	0	0	0	0	11	0.31	11.58
6.0	6.5	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	3	0.09	11.80
6.5	7.0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	3	0.09	13.64
7.0	7.5	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	3	0.09	13.86
Freq		3	21	79	284	390	649	514	509	401	260	189	141	53	16	5	3	1	1	3519		
%		0.09	0.60	2.24	8.07	11.08	18.44	14.61	14.46	11.40	7.39	5.37	4.01	1.51	0.45	0.14	0.09	0.03	0.03			
MHs		0.87	1.19	1.80	2.28	2.23	2.19	2.24	2.32	2.45	2.55	2.68	3.15	3.20	2.96	2.93	2.74	3.32	3.06			

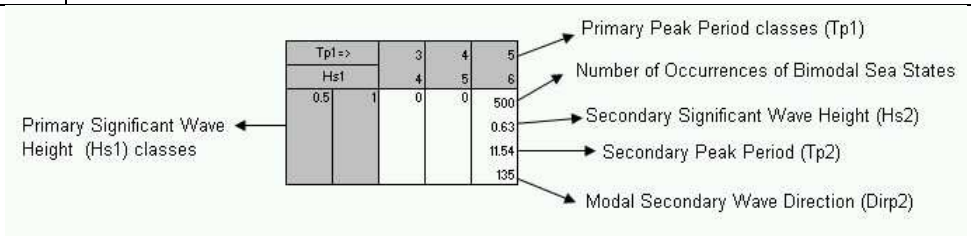
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.10.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (S)

Tp =>		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Ocorr Hs1	% Hs1
Hs1		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		
0.0	0.5	0	0	0	1 0.13 3.05 65	0	0	0	0	0	0	1 0.42 3.58 48	2 0.42 3.52 45	0	0	0	0	0	0	4	0.08
0.5	1.0	2 0.62 8.36 90	9 0.76 8.32 90	0	5 0.42 4.21 113	15 0.70 4.60 68	12 0.41 4.08 90	16 0.60 3.74 68	4 0.60 3.88 23	12 0.36 5.56 293	13 0.60 3.58 0	4 0.65 3.96 0	15 0.43 3.54 90	5 0.38 3.42 45	1 0.79 3.86 356	0	0	0	0	113	2.36
1.0	1.5	1 1.06 6.96 63	25 1.04 7.78 68	59 1.02 9.03 113	15 0.74 5.32 113	57 0.77 4.49 113	164 0.78 4.74 113	214 1.01 5.12 90	105 1.03 4.95 90	59 0.93 4.63 45	46 0.96 4.75 45	18 0.96 4.84 113	11 0.64 4.05 90	7 0.49 3.62 90	4 1.21 4.80 68	6 0.92 4.86 90	2 0.77 3.77 45	2 0.52 3.56 68	0	795	16.60
1.5	2.0	0	2 1.40 7.55 45	53 1.07 7.74 68	57 1.09 8.04 68	56 0.84 4.63 113	219 0.82 4.59 113	301 0.81 4.57 113	446 1.01 4.82 90	440 1.18 5.17 90	195 1.23 5.06 68	87 1.18 4.88 68	44 0.95 4.39 68	20 0.89 4.25 90	12 1.26 5.24 23	5 1.12 4.55 68	6 1.07 4.52 113	1 0.51 3.59 28	1 0.72 3.89 37	1945	40.61
2.0	2.5	0	0	3 1.21 7.20 45	46 1.02 7.74 68	25 1.11 8.23 45	30 1.27 5.19 135	76 1.01 4.81 113	152 0.79 4.41 113	296 1.15 4.97 90	371 1.25 4.99 68	162 1.24 5.01 68	89 1.38 5.30 45	33 1.15 4.73 68	12 1.32 5.59 45	5 0.70 4.39 248	3 0.38 3.38 23	1 1.37 4.84 315	1 1.20 4.56 320	1305	27.24
2.5	3.0	0	0	0	13 1.16 8.07 68	31 0.84 8.17 68	7 0.71 7.33 135	5 0.62 4.66 113	21 1.03 5.05 135	46 0.69 4.05 113	108 0.81 4.66 113	122 0.96 4.61 113	76 1.92 5.95 45	17 1.58 5.30 68	4 1.36 5.45 90	0	0	0	0	450	9.39
3.0	3.5	0	0	0	0	4 0.89 7.55 45	9 1.71 9.78 225	2 1.21 5.71 113	4 0.51 3.92 135	2 0.86 4.51 113	19 0.52 4.52 113	46 0.80 4.46 113	39 1.62 5.95 113	10 1.23 4.76 68	0	1 0.70 3.40 113	0	0	0	136	2.84
3.5	4.0	0	0	0	0	0	6 0.71 8.87 113	1 0.22 10.44 128	0	0	2 0.38 5.20 113	2 2.93 7.81 270	12 1.35 5.28 113	7 1.88 5.43 68	1 0.68 3.78 85	1 0.61 3.36 91	0	0	0	32	0.67
4.0	4.5	0	0	0	0	0	3 1.02 8.82 68	3 0.82 8.89 113	0	0	0	0	0	2 2.06 6.42 113	0	0	0	0	0	8	0.17
4.5	5.0	0	0	0	0	0	0	0	1 1.29 10.54 146	0	0	0	0	0	0	0	0	0	0	1	0.02
5.0	5.5	0	0	0	0	0	0	0	0	1 1.39 11.34 135	0	0	0	0	0	0	0	0	0	1	0.02
Freq.		3	36	115	137	188	450	618	733	856	754	442	288	101	34	18	11	4	2	4790	
%		0.06	0.75	2.40	2.86	3.92	9.39	12.90	15.30	17.87	15.74	9.23	6.01	2.11	0.71	0.38	0.23	0.08	0.04		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.11 Distribution of Hs versus Tp for Primary Peak Waves approaching from SSW Direction

5.6.11.1 Primary Hs1 versus Tp1 for Unimodal sea-states (SSW)

Hs(m)		Tp(s)																Freq	%	MTp
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
0.00	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	1	6	8	7	3	6	4	20	11	8	8	2	0	1	0	0	85	1.98	9.63
1.00	1.50	1	19	13	19	29	35	27	20	27	26	19	6	0	0	0	0	241	5.63	9.32
1.50	2.00	0	0	28	36	82	151	94	72	70	28	18	14	0	1	0	0	594	13.87	9.39
2.00	2.50	0	0	3	78	66	185	251	213	129	71	31	21	2	4	1	1	1056	24.65	9.92
2.50	3.00	0	0	0	48	68	75	150	217	155	122	68	11	11	3	2	2	932	21.76	10.61
3.00	3.50	0	0	0	11	53	40	44	86	100	125	71	43	13	2	2	0	590	13.77	11.36
3.50	4.00	0	0	0	1	24	54	15	21	63	74	53	43	2	5	0	0	355	8.29	11.59
4.00	4.50	0	0	0	0	0	30	17	13	15	23	40	36	17	9	3	0	203	4.74	12.51
4.50	5.00	0	0	0	0	1	6	15	8	6	5	11	29	14	9	6	0	110	2.57	13.19
5.00	5.50	0	0	0	0	0	2	3	2	3	8	3	15	11	4	8	1	60	1.40	14.26
5.50	6.00	0	0	0	0	0	0	5	4	1	2	1	8	4	0	0	0	25	0.58	12.63
6.00	6.50	0	0	0	0	0	0	0	1	3	0	3	9	2	0	0	0	18	0.42	13.67
6.50	7.00	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	3	0.07	13.05
7.00	7.50	0	0	0	0	0	0	0	0	3	0	0	1	3	0	0	0	7	0.16	13.56
7.50	8.00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0.02	15.52
8.00	8.50	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.02	14.70
8.50	9.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00
9.00	9.50	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.02	16.90
9.50	10.00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0.05	16.95
Freq		2	25	52	200	326	584	625	678	586	492	326	241	80	41	22	4	4284		
%		0.05	0.58	1.21	4.67	7.61	13.63	14.59	15.83	13.68	11.48	7.61	5.63	1.87	0.96	0.51	0.09			
MHs		0.95	1.16	1.52	2.22	2.40	2.46	2.51	2.58	2.74	2.92	3.10	3.79	4.32	4.29	4.45	3.19			

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.11.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (SSW)

Tp =>		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Ocorr	%
Hs1		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Hs1	Hs1
0.00	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
0.50	1.00	7 0.63 7.36 45	25 0.57 9.28 90	0 0.00 0.00 0	1 0.13 3.05 67	6 0.51 4.90 45	10 0.42 3.43 23	8 0.49 3.42 45	15 0.45 3.29 270	17 0.60 3.82 23	29 0.47 3.52 68	3 0.59 3.79 23	2 0.13 3.05 338	0	3 0.67 3.75 68	0	0	126	3.07
1.00	1.50	1 1.02 7.48 60	19 1.04 8.08 45	64 0.97 7.83 45	18 0.80 6.66 135	20 0.77 4.28 158	63 0.95 5.01 135	72 0.85 4.58 90	62 0.74 4.33 45	42 0.85 4.96 68	54 0.61 3.85 90	26 0.57 3.73 23	23 0.53 3.54 0	7 0.65 4.08 23	2 1.00 6.14 45	0	0	473	11.52
1.50	2.00	0	4 1.31 7.53 68	58 1.21 8.27 45	120 1.14 8.75 90	54 1.07 6.61 135	89 0.84 4.43 135	205 0.99 4.91 135	225 0.97 4.82 113	236 1.19 5.13 90	111 1.17 5.19 135	41 1.20 5.27 90	37 1.07 4.87 68	21 0.73 4.01 90	2 1.37 4.92 45	0	0	1203	29.29
2.00	2.50	0	0	9 1.48 7.44 45	70 1.33 8.27 45	70 1.02 8.73 90	30 0.96 4.96 135	81 1.04 4.91 135	221 1.00 4.80 135	318 0.96 4.93 113	265 1.14 5.14 90	91 1.18 5.07 90	54 1.15 4.96 45	20 1.38 4.91 68	4 1.29 6.09 68	2 0.76 5.03 68	1 0.61 3.92 333	1236	30.09
2.50	3.00	0	0	0	10 1.01 7.82 68	65 1.10 8.33 68	37 0.88 8.45 68	9 1.04 5.06 135	27 1.14 4.89 158	88 0.65 4.36 113	137 0.73 4.33 135	145 1.37 5.17 90	80 1.34 5.15 45	13 1.84 5.67 113	2 2.78 6.85 45	2 0.69 4.21 315	2 1.79 7.13 113	617	15.02
3.00	3.50	0	0	0	0	10 1.52 8.85 45	32 0.90 8.50 68	6 0.50 12.47 90	1 3.10 7.42 265	6 0.80 4.31 135	31 0.92 4.65 135	76 0.82 4.52 135	78 1.11 5.04 113	37 1.66 5.56 135	5 1.17 4.68 113	3 0.83 4.59 293	0	285	6.94
3.50	4.00	0	0	0	0	0	7 1.26 8.85 68	15 0.70 9.32 90	2 0.36 8.21 90	0	6 0.65 4.67 135	8 0.93 3.96 23	30 0.91 4.57 135	39 1.04 4.60 135	6 1.38 5.53 113	1 1.46 5.01 121	0	114	2.78
4.00	4.50	0	0	0	0	0	1 0.79 8.23 64	7 1.22 9.52 68	1 1.03 10.75 79	1 1.76 6.02 148	2 0.13 3.05 135	5 3.22 8.01 270	4 0.68 4.51 135	18 1.13 4.85 135	1 0.25 3.05 127	0	0	40	0.97
4.50	5.00	0	0	0	0	0	0	0	0	0	1 3.08 7.40 233	0	2 0.80 4.18 135	3 1.34 5.06 158	1 0.42 3.53 146	0	0	7	0.17
5.00	5.50	0	0	0	0	0	0	1 0.77 9.71 95	2 0.72 10.74 135	0	0	0	0	0	0	0	0	3	0.07
5.50	6.00	0	0	0	0	0	0	0	1 1.43 9.81 161	1 1.13 11.82 173	0	0	0	0	0	0	0	2	0.05
6.00	6.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
6.50	7.00	0	0	0	0	0	0	0	1 1.14 11.91 139	0	0	0	0	0	0	0	0	1	0.02
Freq.		8	48	131	219	225	269	404	558	709	636	395	310	158	26	8	3	4107	
%		0.19	1.17	3.19	5.33	5.48	6.55	9.84	13.59	17.26	15.49	9.62	7.55	3.85	0.63	0.19	0.07		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.12 Distribution of Hs versus Tp for Primary Peak Waves approaching from SW Direction

5.6.12.1 Primary Hs1 versus Tp1 for Unimodal sea-states (SW)

Hs(m)		Tp(s)														Freq	%	MTp
		3	4	5	6	7	8	9	10	11	12	13	14	15	16			
		4	5	6	7	8	9	10	11	12	13	14	15	16	17			
0.00	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	0	1	7	1	3	3	2	5	8	1	1	0	0	2	34	2.51	9.38
1.00	1.50	1	9	8	10	19	5	3	2	1	3	3	0	0	2	66	4.87	7.76
1.50	2.00	0	1	6	22	28	18	6	4	2	4	1	2	0	0	94	6.94	8.08
2.00	2.50	0	0	2	34	21	33	35	14	3	7	12	0	0	0	161	11.89	8.97
2.50	3.00	0	0	0	23	33	22	36	49	27	6	8	0	0	0	204	15.07	9.51
3.00	3.50	0	0	0	4	37	48	19	39	64	22	12	0	0	0	245	18.09	10.14
3.50	4.00	0	0	0	1	5	52	20	13	22	17	7	5	2	0	144	10.64	10.19
4.00	4.50	0	0	0	0	1	23	25	11	12	13	9	8	3	0	105	7.75	10.82
4.50	5.00	0	0	0	0	0	10	24	15	4	6	11	14	3	0	87	6.43	11.39
5.00	5.50	0	0	0	0	0	6	15	23	8	0	2	5	4	0	63	4.65	10.92
5.50	6.00	0	0	0	0	0	0	7	22	8	1	3	4	5	0	50	3.69	11.56
6.00	6.50	0	0	0	0	0	0	6	10	13	0	0	1	0	0	30	2.22	10.79
6.50	7.00	0	0	0	0	0	0	2	5	10	2	0	4	2	0	25	1.85	12.07
7.00	7.50	0	0	0	0	0	0	4	4	6	1	0	0	0	0	15	1.11	10.94
7.50	8.00	0	0	0	0	0	0	2	1	1	4	0	0	2	0	10	0.74	12.21
8.00	8.50	0	0	0	0	0	0	0	5	0	1	0	0	2	0	8	0.59	12.19
8.50	9.00	0	0	0	0	0	0	1	6	3	0	0	0	0	0	10	0.74	10.82
9.00	9.50	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3	0.22	11.53
Freq		1	11	23	95	147	220	207	229	193	89	69	43	23	4	1354		
%		0.07	0.81	1.70	7.02	10.8	16.2	15.2	16.9	14.2	6.57	5.10	3.18	1.70	0.30			
MHs		1.02	1.24	1.38	2.22	2.43	3.18	3.74	4.20	4.03	3.76	3.48	4.77	5.63	1.04			

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.12.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (SW)

Tp =>		3	4	5	6	7	8	9	10	11	12	13	14	15	Ocorr. Hs1	% Hs1
Hs1		4	5	6	7	8	9	10	11	12	13	14	15	16		
0.00	0.50	1 0.44 9.28 98	0	0	0	0	0	0	0	0	0	0	0	0	1	0.14
0.50	1.00	6 0.58 7.71 45	10 0.65 8.23 45	3 0.72 6.05 0	3 0.22 3.05 45	0	1 0.90 8.55 44	1 0.38 3.36 262	0	1 0.38 3.42 316	1 0.38 3.34 341	0	1 0.96 4.58 319	0	27	3.66
1.00	1.50	0	8 0.83 7.90 90	47 1.09 8.06 68	10 0.79 7.91 68	3 0.79 4.07 270	6 1.07 4.75 158	2 1.32 6.92 68	4 1.17 5.09 158	0	2 0.40 3.45 270	0	0	0	82	11.13
1.50	2.00	0	2 1.66 11.08 113	37 1.34 8.08 45	75 1.20 8.28 68	18 1.50 8.55 68	9 1.26 7.70 135	2 0.28 3.05 135	8 1.63 5.14 45	0	1 1.77 6.62 23	1 1.57 5.96 22	0	0	153	20.76
2.00	2.50	0	1 1.49 8.63 48	6 1.16 7.37 45	71 1.29 8.06 68	50 1.16 8.47 90	14 1.20 9.23 90	2 1.88 13.02 135	13 1.06 6.92 158	6 1.05 5.63 68	1 1.68 5.50 41	0	1 1.39 5.62 167	0	165	22.39
2.50	3.00	0	0	0	6 1.89 8.79 45	45 1.30 9.52 90	43 1.30 9.52 90	3 0.69 8.21 68	8 1.01 4.38 158	11 0.93 4.58 293	4 1.20 3.77 45	2 0.98 6.68 68	1 1.77 6.22 238	0	123	16.69
3.00	3.50	0	0	0	0	8 1.14 7.91 45	28 0.81 9.44 68	13 1.05 8.97 68	1 1.74 10.97 132	2 0.28 3.05 293	2 0.28 4.11 135	6 0.70 6.29 68	6 2.45 6.57 270	0	66	8.96
3.50	4.00	0	0	0	0	1 1.43 8.85 126	17 0.95 12.94 113	24 1.23 9.00 45	3 0.28 8.52 23	1 0.40 3.76 281	0	0	3 1.93 5.99 270	1 1.48 5.19 159	50	6.78
4.00	4.50	0	0	0	0	0	4 1.00 9.05 45	13 1.25 8.98 68	6 0.86 10.29 180	0	0	0	0	0	23	3.12
4.50	5.00	0	0	0	0	0	1 1.25 9.09 140	6 1.60 10.69 180	3 0.63 10.62 90	1 0.78 10.74 95	0	0	0	0	11	1.49
5.00	5.50	0	0	0	0	0	0	3 2.27 9.99 135	9 0.78 10.33 68	2 0.72 9.18 45	1 0.33 10.14 39	0	0	0	15	2.04
5.50	6.00	0	0	0	0	0	0	1 4.02 14.09 218	4 1.05 10.72 90	0	1 0.18 10.29 38	0	0	0	6	0.81
6.00	6.50	0	0	0	0	0	0	0	6 2.22 14.20 135	4 0.64 8.82 0	0	0	0	0	10	1.36
6.50	7.00	0	0	0	0	0	0	0	0	4 2.26 13.18 158	0	0	0	0	4	0.54
7.00	7.50	0	0	0	0	0	0	0	0	1 1.28 11.89 194	0	0	0	0	1	0.14
Freq.		7	21	93	165	125	123	70	65	33	13	9	12	1	737	
%		0.95	2.85	12.62	22.39	16.96	16.69	9.50	8.82	4.48	1.76	1.22	1.63	0.14		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.13 Distribution of Hs versus Tp for Primary Peak Waves approaching from WSW Direction

5.6.13.1 Primary Hs1 versus Tp1 for Unimodal sea-states (WSW)

Hs(m)		Tp(s)									Freq	%	MTp
		3	4	5	6	7	8	9	10	11			
		4	5	6	7	8	9	10	11	12			
0.00	0.50	0	0	0	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	2	0	0	0	1	0	0	1	0	4	2.44	6.38
1.00	1.50	0	1	2	0	1	2	0	0	0	6	3.66	6.64
1.50	2.00	0	0	6	0	2	1	0	0	2	11	6.71	7.37
2.00	2.50	0	0	2	4	4	2	2	0	0	14	8.54	7.48
2.50	3.00	0	0	0	5	10	11	1	0	0	27	16.46	7.76
3.00	3.50	0	0	0	1	20	10	1	0	0	32	19.51	7.86
3.50	4.00	0	0	0	0	2	6	1	0	0	9	5.49	8.28
4.00	4.50	0	0	0	0	0	11	5	0	0	16	9.76	8.74
4.50	5.00	0	0	0	0	0	0	16	4	0	20	12.20	9.69
5.00	5.50	0	0	0	0	0	2	4	7	3	16	9.76	10.19
5.50	6.00	0	0	0	0	0	0	4	5	0	9	5.49	9.91
Freq		2	1	10	10	40	45	34	17	5	164		
%		1.22	0.61	6.10	6.10	24.39	27.44	20.73	10.37	3.05			
MHs		0.84	1.17	1.74	2.69	2.93	3.39	4.58	4.99	4.05			

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.13.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (WSW)

Tp =>		3	4	5	6	7	8	9	10	11	Ocorr. Hs1	% Hs1
Hs1		4	5	6	7	8	9	10	11	12		
0.00	0.50	0	0	0	0	0	0	0	0	0	0	0.00
0.50	1.00	2 0.57 12.90 113	6 0.89 7.26 90	0	0	0	0	0	2 0.50 3.42 315	0	10	2.50
1.00	1.50	0	9 0.92 10.24 113	25 1.00 8.30 68	0	0	0	0	1 0.42 3.53 324	0	35	8.75
1.50	2.00	0	0	24 1.49 8.74 90	51 1.32 8.90 90	9 1.41 7.87 68	2 1.69 11.21 180	1 1.83 7.95 157	0	1 1.60 7.54 43	88	22.00
2.00	2.50	0	1 1.83 10.47 123	4 2.03 12.58 90	45 1.34 8.10 68	29 1.59 10.04 113	8 1.69 9.23 113	1 1.78 11.69 156	0	0	88	22.00
2.50	3.00	0	0	0	7 1.41 9.43 90	40 1.39 10.94 180	16 1.13 9.72 90	0	0	0	63	15.75
3.00	3.50	0	0	0	0	17 1.54 8.83 45	27 1.17 9.47 113	2 1.16 14.65 90	0	0	46	11.50
3.50	4.00	0	0	0	0	1 0.86 8.10 115	13 1.75 11.86 180	9 0.99 8.97 90	0	0	23	5.75
4.00	4.50	0	0	0	0	0	10 1.36 8.43 90	8 1.02 9.34 68	1 1.25 10.80 168	0	19	4.75
4.50	5.00	0	0	0	0	0	0	10 1.10 9.79 68	3 1.66 10.29 180	0	13	3.25
5.00	5.50	0	0	0	0	0	0	2 0.90 8.35 68	7 1.02 10.32 68	0	9	2.25
5.50	6.00	0	0	0	0	0	0	0	6 1.32 10.76 203	0	6	1.50
Freq.		2	16	53	103	96	76	33	20	1	400	
%		0.50	4.00	13.25	25.75	24.00	19.00	8.25	5.00	0.25		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.14 Distribution of Hs versus Tp for Primary Peak Waves approaching from W Direction

5.6.14.1 Primary Hs1 versus Tp1 for Unimodal sea-states (W)

Hs(m)		Tp(s)							Freq	%	MTp
		3	4	5	6	7	8	9			
		4	5	6	7	8	9	10			
0.00	0.50	0	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	3	0	0	0	0	0	0	3	14.29	3.69
1.00	1.50	0	1	0	0	0	1	0	2	9.52	6.90
1.50	2.00	0	0	1	4	1	1	0	7	33.33	6.63
2.00	2.50	0	0	0	0	2	0	0	2	9.52	7.86
2.50	3.00	0	0	0	0	1	1	0	2	9.52	7.77
3.00	3.50	0	0	0	1	1	0	0	2	9.52	7.11
3.50	4.00	0	0	0	0	0	0	0	0	0.00	0.00
4.00	4.50	0	0	0	0	0	2	1	3	14.29	8.58
Freq		3	1	1	5	5	5	1	21		
%		14.29	4.76	4.76	23.81	23.81	23.81	4.76			
MHs		0.68	1.28	1.96	2.09	2.46	2.82	4.46			

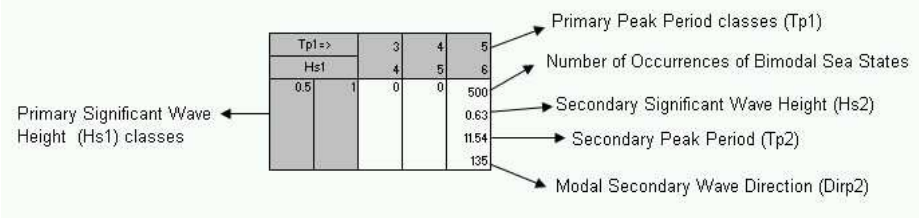
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.14.2 Primary Hs_1 versus Tp_1 and associated Secondary Hs_2, Tp_2, $Dirp_2$ for Bimodal sea states (W)

Tp =>		3	4	5	6	7	8	9	10	Ocorr. Hs1	% Hs1
Hs1		4	5	6	7	8	9	10	11		
0.00	0.50	0	0	0	0	0	0	0	0	0	0.00
0.50	1.00	2 0.47 8.74 113	2 0.89 6.54 45	0	0	0	0	0	0	4	2.88
1.00	1.50	0	6 1.08 8.95 68	7 1.05 11.11 203	1 0.31 3.06 207	0	0	0	0	14	10.07
1.50	2.00	0	2 0.90 6.64 90	15 1.33 8.08 45	12 1.41 8.82 113	1 1.44 7.84 71	2 1.57 9.70 68	1 1.49 6.77 40	0	33	23.74
2.00	2.50	0	1 2.24 10.47 117	2 1.94 7.48 68	18 1.48 11.00 113	5 1.93 9.68 45	3 0.60 4.04 225	1 1.67 7.11 42	0	30	21.58
2.50	3.00	0	0	0	8 1.61 7.80 68	11 1.69 9.51 203	3 1.50 9.79 113	0	0	22	15.83
3.00	3.50	0	0	0	1 1.99 8.17 182	6 0.80 7.54 68	6 0.77 8.21 45	0	0	13	9.35
3.50	4.00	0	0	0	0	1 1.17 7.80 83	8 1.50 9.60 135	1 1.36 9.12 171	0	10	7.19
4.00	4.50	0	0	0	0	0	7 1.22 8.84 45	4 1.30 8.97 113	0	11	7.91
4.50	5.00	0	0	0	0	0	0	1 2.32 14.04 161	1 1.52 9.79 143	2	1.44
Freq.		2	11	24	40	24	29	8	1	139	
%		1.44	7.91	17.27	28.78	17.27	20.86	5.76	0.72		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.15 Distribution of Hs versus Tp for Primary Peak Waves approaching from WNW Direction

5.6.15.1 Primary Hs1 versus Tp1 for Unimodal sea-states (WNW)

Hs(m)		Tp(s)						Freq	%	MTp
		3	4	5	6	7	8			
		4	5	6	7	8	9			
0.00	0.50	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	1	0	0	0	0	0	1	16.67	3.38
1.00	1.50	0	0	0	1	0	1	2	33.33	7.46
1.50	2.00	0	0	0	0	0	1	1	16.67	8.56
2.00	2.50	0	0	0	0	1	0	1	16.67	7.62
2.50	3.00	0	0	0	1	0	0	1	16.67	6.75
3.00	3.50	0	0	0	0	0	0	0	0.00	0.00
3.50	4.00	0	0	0	0	0	0	0	0.00	0.00
4.00	4.50	0	0	0	0	0	0	0	0.00	0.00
4.50	5.00	0	0	0	0	0	0	0	0.00	0.00
Freq		1	0	0	2	1	2	6		
%		16.67	0.00	0.00	33.33	16.67	33.33			
MHs		0.78	0.00	0.00	1.96	2.32	1.52			

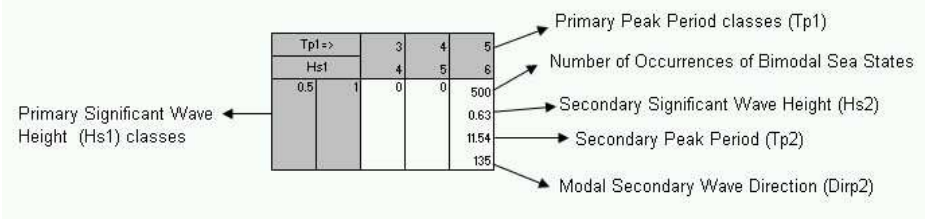
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.15.2 Primary Hs_1 versus Tp_1 and associated Secondary Hs_2, Tp_2, $Dirp_2$ for Bimodal sea states (WNW)

Tp =>		3	4	5	6	7	8	Ocorr. Hs1	% Hs1
Hs1		4	5	6	7	8	9		
0.00	0.50	0	0	0	0	0	0	0	0.00
0.50	1.00	3 0.46 4.87 23	2 0.58 9.45 45	0	1 0.54 4.17 216	0	0	6	11.54
1.00	1.50	0	4 0.52 9.95 158	4 0.51 7.34 68	0	0	0	8	15.38
1.50	2.00	0	0	7 1.55 8.03 68	2 1.43 8.75 113	2 1.31 5.48 203	0	11	21.15
2.00	2.50	0	1 1.49 9.72 161	0	10 1.54 7.95 45	1 0.49 3.30 19	1 0.36 3.32 232	13	25.00
2.50	3.00	0	0	1 1.77 10.34 174	4 1.78 6.77 180	4 1.76 9.14 113	0	9	17.31
3.00	3.50	0	0	0	0	3 1.58 9.30 113	1 1.48 8.37 120	4	7.69
3.50	4.00	0	0	0	0	0	0	0	0.00
4.00	4.50	0	0	0	0	0	1 1.50 10.35 62	1	1.92
4.50	5.00	0	0	0	0	0	0	0	0.00
Freq.		3	7	12	17	10	3	52	
%		5.77	13.46	23.08	32.69	19.23	5.77		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.16 Distribution of Hs versus Tp for Primary Peak Waves approaching from NW Direction

5.6.16.1 Primary Hs1 versus Tp1 for Unimodal sea-states (NW)

Hs(m)		Tp(s)						Freq	%	MTp
		3	4	5	6	7	8			
		4	5	6	7	8	9			
0.00	0.50	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	0	0	0	0	0	0	0	0.00	0.00
1.00	1.50	0	1	0	0	0	0	1	100.00	4.22
1.50	2.00	0	0	0	0	0	0	0	0.00	0.00
2.00	2.50	0	0	0	0	0	0	0	0.00	0.00
2.50	3.00	0	0	0	0	0	0	0	0.00	0.00
3.00	3.50	0	0	0	0	0	0	0	0.00	0.00
3.50	4.00	0	0	0	0	0	0	0	0.00	0.00
Freq		0	1	0	0	0	0	1		
%		0.00	100.00	0.00	0.00	0.00	0.00			
MHs		0.00	1.10	0.00	0.00	0.00	0.00			

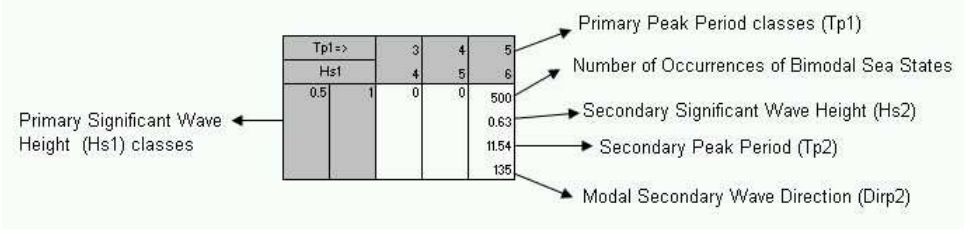
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.16.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (NW)

Tp =>		3	4	5	6	7	8	Ocorr. Hs1	% Hs1
Hs1		4	5	6	7	8	9		
0.00	0.50	0	0	0	0	0	0	0	0.00
0.50	1.00	1 0.55 5.22 28	4 0.89 7.30 90	0	0	1 0.13 3.05 258	0	6	15.79
1.00	1.50	0	6 0.75 5.63 68	2 0.96 7.63 45	0	0	0	8	21.05
1.50	2.00	0	1 1.56 9.83 99	5 1.70 7.79 45	1 1.80 7.64 54	2 1.33 5.50 203	2 0.83 4.46 180	11	28.95
2.00	2.50	0	0	0	6 1.98 8.43 45	0	2 2.04 9.29 90	8	21.05
2.50	3.00	0	0	0	2 1.63 6.93 90	1 2.27 9.32 86	0	3	7.89
3.00	3.50	0	0	0	0	1 1.83 7.59 114	0	1	2.63
3.50	4.00	0	0	0	0	1 1.65 8.21 77	0	1	2.63
Freq.		1	11	7	9	6	4	38	
%		2.63	28.95	18.42	23.68	15.79	10.53		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



5.6.17 Distribution of Hs versus Tp for Primary Peak Waves approaching from NNW Direction

5.6.17.1 Primary Hs1 versus Tp1 for Unimodal sea-states (NNW)

Hs(m)		Tp(s) 3–4	4–5	5–6	6–7	7–8	8–9	Freq	%	MTp
0.00	0.50	0	0	0	0	0	0	0	0.00	0.00
0.50	1.00	0	1	0	0	1	0	2	18.18	5.91
1.00	1.50	0	2	4	0	0	3	9	81.82	6.15
1.50	2.00	0	0	0	0	0	0	0	0.00	0.00
2.00	2.50	0	0	0	0	0	0	0	0.00	0.00
2.50	3.00	0	0	0	0	0	0	0	0.00	0.00
Freq		0	3	4	0	1	3	11		
%		0.00	27.27	36.36	0.00	9.09	27.27			
MHs		0.00	1.20	1.36	0.00	0.90	1.26			

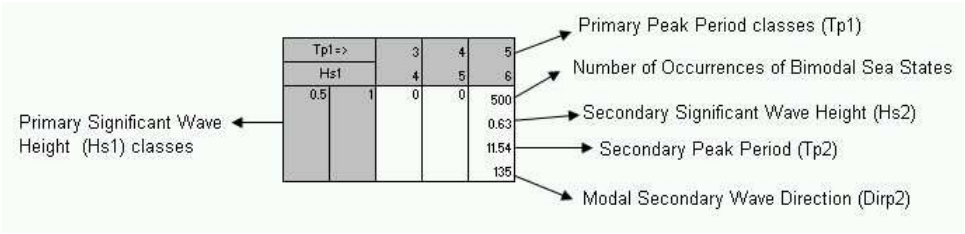
Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

5.6.17.2 Primary Hs1 versus Tp1 and associated Secondary Hs2, Tp2, Dirp2 for Bimodal sea states (NNW)

Tp =>		3	4	5	6	7	8	Ocorr. Hs1	% Hs1
Hs1		4	5	6	7	8	9		
0.00	0.50	0	0	0	0	0	0	0	0.00
0.50	1.00	4 0.55 11.79 113	5 0.69 10.56 158	0	0	2 0.40 3.51 225	0	11	15.71
1.00	1.50	0	10 1.03 7.68 68	14 1.14 7.16 68	1 1.01 5.01 232	0	2 0.13 3.05 225	27	38.57
1.50	2.00	0	0	13 1.58 7.49 68	5 1.73 8.06 45	1 1.31 5.42 203	0	19	27.14
2.00	2.50	0	0	1 2.05 8.28 52	5 1.83 7.87 90	1 0.31 3.05 241	0	7	10.00
2.50	3.00	0	0	0	3 2.21 8.71 45	3 1.86 8.45 45	0	6	8.57
Freq.		4	15	28	14	7	2	70	
%		5.71	21.43	40.00	20.00	10.00	2.86		

Source: Modeled wave data - JIP BOMOSHU (Brazil Offshore Metocean Storm Hindcast Update) and GROW Fine SAB, OceanWeather Inc., evaluated with in-situ wave measured data. Ref. [11]. The wave data was tabulated at 3-hour intervals.

The legend below explains how to interpret the information on the cells of the table.



6 CURRENT DATA

The Buzios Field is located at the northern border of São Paulo Plateau, where the oceanic flow is highly variable and sometimes affected by large scale eddies. The Brazil Current is mainly flowing southwestward (Figure 6.1) with its surface jet core between the isobath contours of 200 m and 1000 m, close to the upper continental slope, when sometimes it is observed strong westward currents. Under some perturbed conditions, mesoscale activity such as eddies and meanders can cause a southward displacement of the jet to a position further down the 2000 m isobath (Figure 6.2).

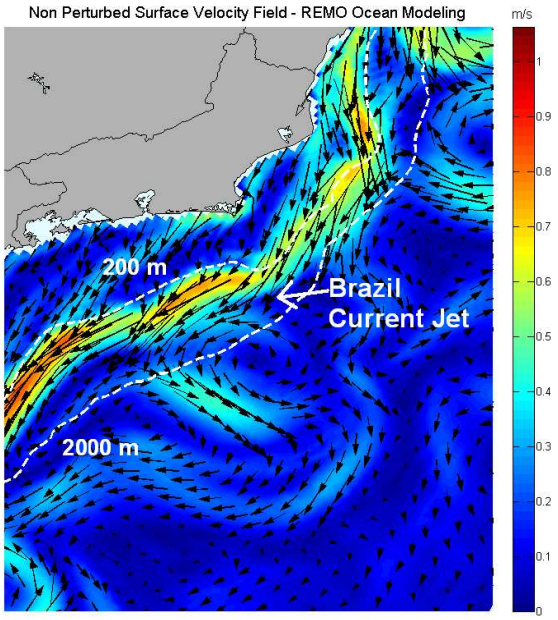


Figure 6.1 – Surface current field with the Brazil Current flowing into Santos Basin.

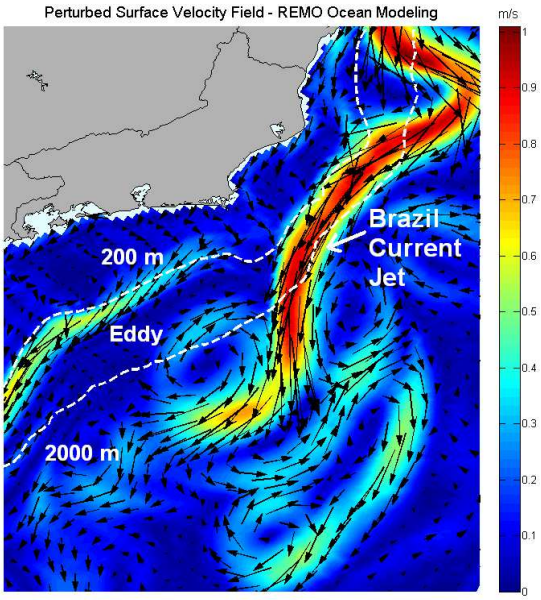


Figure 6.2 – Surface current field with a cyclonic eddy offshore

Source: Oceanographic Modeling and Observation Network (REMO)
PETROBRAS research project PT-128.01.11660. Ref. [12].

6.1 Joint Distribution of Current Speed and Direction at Specific Levels

6.1.1 Joint Distribution of Near Surface Current Speed and Direction

		DIRECTION (º)																	
m/s		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	%
0.00	0.05	23	35	27	24	18	15	19	20	22	25	26	27	25	29	27	17	379	2.48
0.05	0.10	83	95	89	71	70	68	94	71	82	78	89	86	87	79	85	77	1304	8.52
0.10	0.15	111	95	100	67	87	88	90	76	82	90	143	154	155	137	132	102	1709	11.16
0.15	0.20	108	123	96	60	62	96	74	75	105	120	119	142	205	178	116	107	1786	11.66
0.20	0.25	92	102	71	28	46	70	63	98	97	89	121	137	180	167	103	87	1551	10.13
0.25	0.30	49	85	48	19	27	39	36	67	123	101	155	153	141	163	101	65	1372	8.96
0.30	0.35	40	56	26	12	10	14	23	39	148	143	146	195	151	122	99	47	1271	8.30
0.35	0.40	19	13	6	4	6	6	12	39	96	142	135	208	118	85	59	47	995	6.50
0.40	0.45	21	9	4	3	1	3	10	48	86	100	137	183	103	76	59	39	882	5.76
0.45	0.50	14	4	1	0	0	0	3	31	106	134	136	145	83	77	46	54	834	5.45
0.50	0.55	11	0	0	0	0	0	0	26	84	134	132	116	51	60	43	46	703	4.59
0.55	0.60	10	0	0	0	0	0	0	5	42	103	113	121	52	53	48	18	565	3.69
0.60	0.65	8	0	0	0	0	0	0	3	15	63	125	97	38	46	43	9	447	2.92
0.65	0.70	4	0	0	0	0	0	0	1	13	48	107	71	22	24	15	14	319	2.08
0.70	0.75	2	0	0	0	0	0	0	0	6	43	107	62	19	14	16	16	285	1.86
0.75	0.80	3	0	0	0	0	0	0	0	0	46	101	76	12	12	15	13	278	1.82
0.80	0.85	1	0	0	0	0	0	0	0	0	30	93	53	13	31	19	10	250	1.63
0.85	0.90	0	0	0	0	0	0	0	0	0	10	52	34	6	19	9	2	132	0.86
0.90	0.95	0	0	0	0	0	0	0	0	0	0	60	27	10	13	7	1	118	0.77
0.95	1.00	0	0	0	0	0	0	0	0	0	0	35	10	5	10	1	0	61	0.40
1.00	1.05	0	0	0	0	0	0	0	0	0	0	24	3	1	4	3	0	35	0.23
1.05	1.10	0	0	0	0	0	0	0	0	0	0	11	1	0	5	0	0	17	0.11
1.10	1.15	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	13	0.08
1.15	1.20	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	0.02
1.20	1.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1.25	1.30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0.01
1.30	1.35	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0.01
Freq		599	617	468	288	327	399	424	599	1107	1499	2185	2101	1477	1404	1046	771	15311	
%		3.91	4.03	3.06	1.88	2.14	2.61	2.77	3.91	7.23	9.79	14.27	13.72	9.65	9.17	6.83	5.04		
Avg		0.22	0.19	0.17	0.15	0.16	0.17	0.17	0.25	0.32	0.40	0.48	0.42	0.32	0.34	0.33	0.30		

Source: PETROBRAS Proprietary Metocean Data (Measured hourly values). Ref. [13].

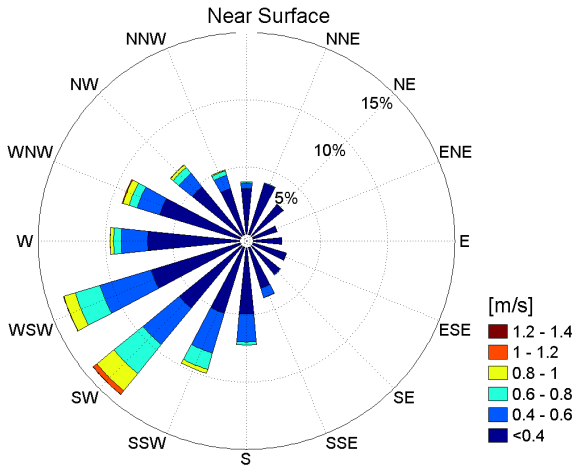


Figure 6.1.1.1 Directional percentage of currents at level 50 m (near surface layer)

6.1.2 Joint Distribution of Current Speed and Direction at Level 100 m

m/s		DIRECTION (º)																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	%
0.00	0.05	30	38	30	30	30	23	25	23	14	23	19	27	21	20	25	24	402	2.63
0.05	0.10	89	96	106	88	56	81	64	61	58	69	69	92	97	106	76	70	1278	8.35
0.10	0.15	133	121	131	94	85	82	91	86	75	103	142	188	143	139	160	132	1905	12.44
0.15	0.20	115	100	89	54	82	97	95	104	103	100	118	175	184	146	136	142	1840	12.02
0.20	0.25	89	63	42	40	54	59	57	81	106	108	97	173	196	156	122	83	1526	9.97
0.25	0.30	50	60	46	21	16	26	30	69	142	152	165	165	165	188	87	76	1458	9.52
0.30	0.35	35	23	46	5	10	18	17	68	141	157	192	216	138	109	104	45	1324	8.65
0.35	0.40	24	3	15	3	5	8	8	40	160	122	184	239	111	94	102	67	1185	7.74
0.40	0.45	15	2	7	0	1	7	4	21	110	88	136	203	61	112	60	55	882	5.76
0.45	0.50	15	1	0	0	0	0	5	9	50	87	114	146	62	77	66	52	684	4.47
0.50	0.55	13	1	0	0	0	0	2	9	36	104	117	138	62	70	51	32	635	4.15
0.55	0.60	8	0	0	0	0	0	0	8	27	105	100	111	52	55	54	23	543	3.55
0.60	0.65	5	0	0	0	0	0	0	3	6	55	113	73	47	29	25	14	370	2.42
0.65	0.70	1	0	0	0	0	0	0	0	8	53	101	72	26	13	9	9	292	1.91
0.70	0.75	0	0	0	0	0	0	0	0	8	50	81	74	16	15	12	2	258	1.69
0.75	0.80	0	0	0	0	0	0	0	0	2	41	97	81	11	30	6	0	268	1.75
0.80	0.85	0	0	0	0	0	0	0	0	0	19	81	51	20	21	5	0	197	1.29
0.85	0.90	0	0	0	0	0	0	0	0	0	1	62	25	7	27	0	0	122	0.80
0.90	0.95	0	0	0	0	0	0	0	0	0	0	43	14	8	8	0	0	73	0.48
0.95	1.00	0	0	0	0	0	0	0	0	0	0	22	7	3	0	0	0	32	0.21
1.00	1.05	0	0	0	0	0	0	0	0	0	0	12	3	0	0	0	0	15	0.10
1.05	1.10	0	0	0	0	0	0	0	0	0	0	17	1	0	0	0	0	18	0.12
1.10	1.15	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	0.02
1.15	1.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1.20	1.25	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0.01
Freq		599	617	468	288	327	399	424	599	1107	1499	2185	2101	1477	1404	1046	771	15311	
%		3.91	4.03	3.06	1.88	2.14	2.61	2.77	3.91	7.23	9.79	14.27	13.72	9.65	9.17	6.83	5.04		
Avg		0.22	0.19	0.17	0.15	0.16	0.17	0.17	0.25	0.32	0.40	0.48	0.42	0.32	0.34	0.33	0.30		

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

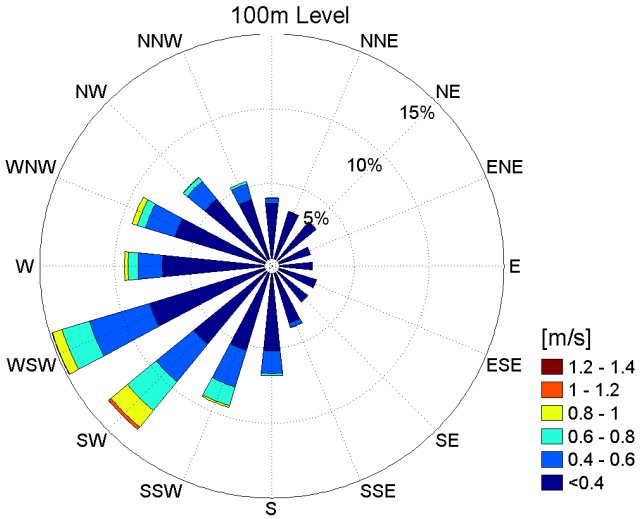


Figure 6.1.2.1 Directional percentage of currents at level 100 m

6.1.3 Joint Distribution of Current Speed and Direction at Level 200 m

		DIRECTION (º)																	
m/s		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	%
0.00	0.05	49	42	39	49	35	36	37	27	29	23	35	28	42	30	26	34	561	3.66
0.05	0.10	100	96	95	88	103	75	76	64	82	107	110	134	170	135	140	124	1699	11.10
0.10	0.15	164	147	99	79	62	76	72	84	113	173	154	204	289	294	240	158	2408	15.73
0.15	0.20	111	104	82	60	77	93	69	99	159	125	164	265	299	265	187	115	2274	14.85
0.20	0.25	45	71	65	69	77	85	58	71	173	130	184	279	221	180	183	82	1973	12.89
0.25	0.30	42	25	34	27	40	47	52	72	161	126	178	220	166	108	171	81	1550	10.12
0.30	0.35	45	3	3	7	11	36	71	62	93	120	159	151	99	59	101	59	1079	7.05
0.35	0.40	27	11	0	0	3	34	40	42	75	95	115	177	82	52	51	54	858	5.6
0.40	0.45	12	0	0	0	0	3	4	18	62	98	147	193	110	48	65	21	781	5.1
0.45	0.50	1	0	0	0	0	0	0	2	36	104	210	178	63	51	36	9	690	4.51
0.50	0.55	1	0	0	0	0	0	0	6	9	47	164	134	59	43	8	5	476	3.11
0.55	0.60	0	0	0	0	0	0	0	0	1	41	140	85	38	43	7	0	355	2.32
0.60	0.65	0	0	0	0	0	0	0	0	1	43	113	65	20	33	2	0	277	1.81
0.65	0.70	0	0	0	0	0	0	0	0	0	28	75	43	28	11	0	0	185	1.21
0.70	0.75	0	0	0	0	0	0	0	0	0	22	25	27	9	6	0	0	89	0.58
0.75	0.80	0	0	0	0	0	0	0	0	0	7	16	12	5	1	0	0	41	0.27
0.80	0.85	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	4	0.03
0.85	0.90	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	0.05
0.90	0.95	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0.01
0.95	1.00	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0.01
Freq		597	499	417	379	408	485	479	547	994	1289	2002	2195	1702	1359	1217	742	15311	
%		3.9	3.3	2.7	2.5	2.7	3.17	3.13	3.57	6.49	8.42	13.08	14.34	11.12	8.88	7.95	4.85		
Avg		0.2	0.2	0.1	0.1	0.2	0.19	0.2	0.21	0.24	0.31	0.37	0.33	0.26	0.24	0.22	0.2		

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

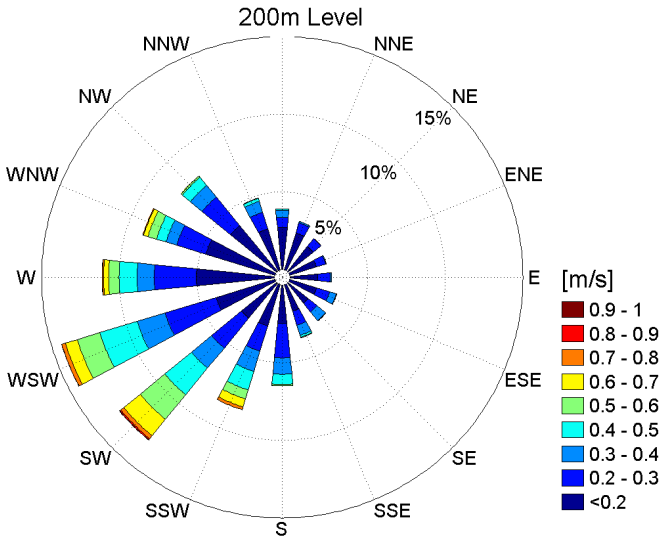


Figure 6.1.3.1 Directional percentage of currents at level 200 m

6.1.4 Joint Distribution of Current Speed and Direction at Level 300 m

		DIRECTION (º)																	
m/s		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	%
0.00	0.05	59	55	63	75	43	56	52	45	56	37	57	58	54	49	73	47	879	5.74
0.05	0.10	184	158	155	106	103	113	106	109	135	147	153	197	185	179	169	193	2392	15.62
0.10	0.15	141	137	157	82	90	100	108	163	211	225	208	298	372	303	292	175	3062	20.00
0.15	0.20	62	55	97	47	57	69	95	151	179	170	225	315	323	205	232	141	2423	15.83
0.20	0.25	53	17	40	58	84	47	67	145	158	141	200	281	202	119	175	116	1903	12.43
0.25	0.30	43	9	10	58	33	75	85	85	116	142	171	225	118	64	91	88	1413	9.23
0.30	0.35	19	7	0	7	3	34	52	37	73	110	207	250	89	69	43	51	1051	6.86
0.35	0.40	2	1	0	1	0	6	25	15	32	113	225	197	85	87	61	21	871	5.69
0.40	0.45	0	0	0	0	0	1	2	4	10	68	183	92	73	54	28	0	515	3.36
0.45	0.50	0	0	0	0	0	0	0	0	6	37	139	82	72	27	5	0	368	2.4
0.50	0.55	0	0	0	0	0	0	0	0	6	44	63	70	37	17	0	0	237	1.55
0.55	0.60	0	0	0	0	0	0	0	0	0	12	30	47	26	8	0	0	123	0.8
0.60	0.65	0	0	0	0	0	0	0	0	0	12	21	12	1	3	0	0	49	0.32
0.65	0.70	0	0	0	0	0	0	0	0	0	4	11	0	0	0	0	0	15	0.1
0.70	0.75	0	0	0	0	0	0	0	0	0	4	5	0	0	0	0	0	9	0.06
0.75	0.80	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0.01
Freq		563	439	522	434	413	501	592	754	982	1266	1899	2124	1637	1184	1169	832	15311	
%		3.7	2.9	3.4	2.8	2.7	3.27	3.87	4.92	6.41	8.27	12.40	13.87	10.69	7.73	7.64	5.43		
Avg		0.1	0.1	0.1	0.1	0.1	0.16	0.18	0.18	0.19	0.25	0.29	0.26	0.22	0.2	0.18	0.17		

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

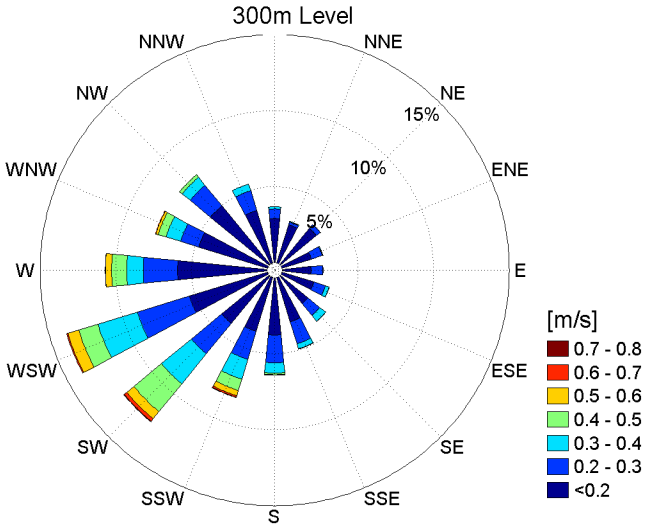


Figure 6.1.4.1 Directional percentage of currents at level 300 m

6.1.5 Joint Distribution of Current Speed and Direction at Level 800 m

m/s		DIRECTION (º)																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	%
0.00	0.05	147	174	192	187	172	151	150	142	155	126	170	171	193	207	196	173	2706	17.68
0.05	0.10	257	330	271	332	288	247	251	249	298	278	283	367	430	462	404	371	5118	33.44
0.10	0.15	242	236	190	200	254	259	258	240	193	228	236	373	415	365	212	237	4138	27.04
0.15	0.20	142	126	106	69	97	108	129	110	148	154	146	203	182	125	75	96	2016	13.17
0.20	0.25	38	32	31	12	10	25	47	94	89	94	30	64	49	31	39	67	752	4.91
0.25	0.30	26	2	3	4	4	1	28	61	68	39	17	12	8	4	25	120	422	2.76
0.30	0.35	8	0	0	0	1	0	0	15	13	14	3	1	3	1	10	66	135	0.88
0.35	0.40	1	0	0	0	0	0	0	0	6	1	0	0	0	0	0	4	12	0.08
0.40	0.45	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	5	0.03
Freq		861	900	793	804	826	791	863	911	975	934	885	1191	1280	1195	961	1134	15304	
%		5.6	5.9	5.2	5.3	5.4	5.17	5.64	5.95	6.37	6.1	5.78	7.78	8.36	7.81	6.28	7.41		
Avg		0.1	0.1	0.1	0.1	0.1	0.1	0.12	0.13	0.13	0.13	0.11	0.11	0.11	0.1	0.1	0.14		

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

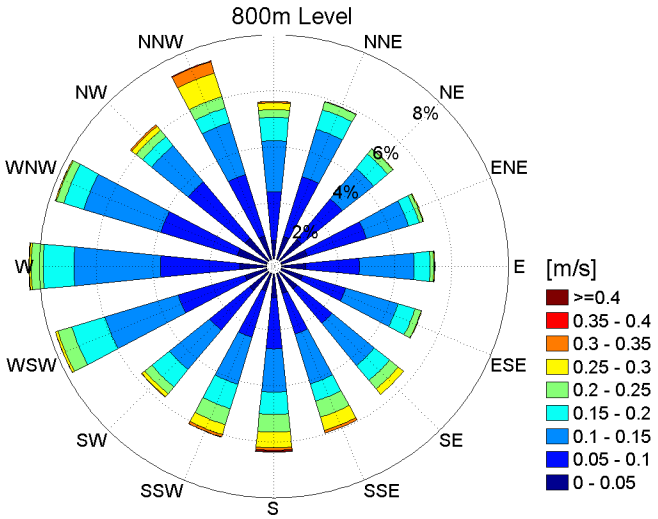


Figure 6.1.5.1 Directional percentage of currents at level 800 m

6.1.6 Joint Distribution of Current Speed and Direction at Level 1200 m

		DIRECTION (º)																	
m/s		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	%
0.00	0.05	196	237	223	288	264	281	260	217	194	211	250	257	273	282	271	253	3957	25.86
0.05	0.10	252	382	406	503	475	430	386	330	316	285	403	521	521	480	430	352	6472	42.30
0.10	0.15	127	134	214	337	403	304	228	181	200	149	226	288	199	130	144	152	3416	22.32
0.15	0.20	72	22	45	60	110	124	69	85	95	113	67	62	34	30	47	110	1145	7.48
0.20	0.25	13	4	2	23	27	16	11	29	45	28	11	0	3	2	1	17	232	1.52
0.25	0.30	0	0	0	2	5	0	0	12	22	3	0	0	0	0	0	0	44	0.29
0.30	0.35	0	0	0	0	0	0	0	5	21	0	0	0	0	0	0	0	26	0.17
0.35	0.40	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	10	0.07
Freq		660	779	890	1213	1284	1155	954	859	903	789	957	1128	1030	924	893	884	15302	
%		4.3	5.1	5.8	7.93	8.39	7.55	6.23	5.61	5.9	5.16	6.25	7.37	6.73	6.04	5.84	5.78		
Avg		0.1	0.1	0.1	0.09	0.1	0.09	0.09	0.1	0.11	0.1	0.09	0.09	0.08	0.07	0.08	0.09		

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

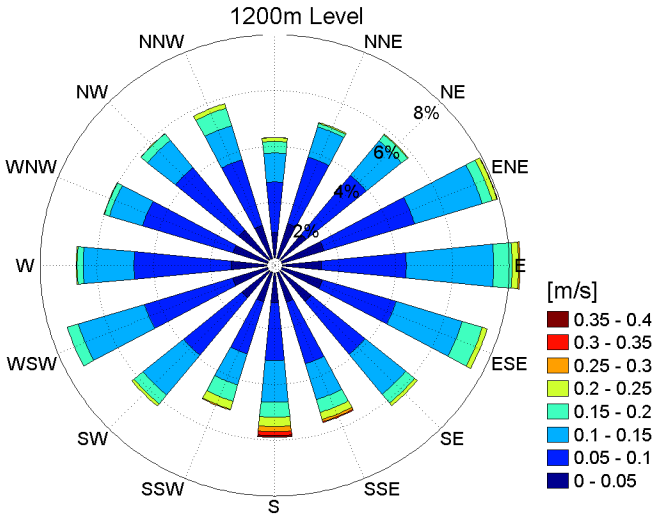


Figure 6.1.6.1 Directional percentage of currents at level 1200 m

6.1.7 Joint Distribution of Current Speed and Direction at Level 1600 m

		DIRECTION (º)																	
m/s		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	%
0.00	0.05	144	240	321	350	366	349	258	297	268	270	319	358	307	323	253	221	4644	30.35
0.05	0.10	165	237	468	748	750	573	317	235	310	375	512	588	578	342	251	188	6637	43.38
0.10	0.15	16	60	182	533	701	427	130	66	85	147	231	279	184	75	9	11	3136	20.50
0.15	0.20	1	1	25	158	231	127	14	10	25	38	40	59	27	8	0	1	765	5
0.20	0.25	0	0	3	25	41	8	6	5	2	2	3	12	2	0	0	0	109	0.71
0.25	0.30	0	0	0	0	4	0	0	1	3	0	0	0	0	0	0	0	8	0.05
Freq		326	538	999	1814	2093	1484	725	614	693	832	1105	1296	1098	748	513	421	15299	
%		2.1	3.5	6.5	11.86	13.68	9.7	4.74	4.01	4.53	5.44	7.22	8.47	7.18	4.89	3.35	2.75		
Avg		0.1	0.1	0.1	0.09	0.1	0.09	0.07	0.06	0.07	0.08	0.08	0.08	0.08	0.06	0.06	0.05		

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

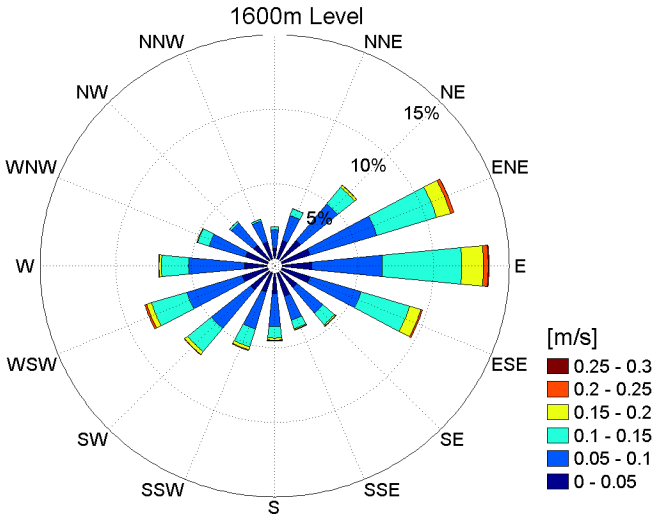


Figure 6.1.7.1 Directional percentage of currents at level 1600 m

6.1.8 Joint Distribution of Current Speed and Direction at Level 1800 m

		DIRECTION (º)																	
m/s		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	%
0.00	0.05	212	295	401	445	437	490	475	464	403	328	339	327	302	307	250	256	5731	37.44
0.05	0.10	197	209	360	469	530	574	616	622	493	398	494	554	452	380	346	236	6930	45.27
0.10	0.15	22	32	96	153	264	250	194	200	136	112	173	214	200	121	66	38	2271	14.83
0.15	0.20	2	6	5	18	36	53	19	23	12	17	43	35	42	21	9	4	345	2.25
0.20	0.25	0	0	0	0	5	6	2	0	0	2	5	0	0	7	1	0	28	0.18
0.25	0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0.03
Freq		433	542	862	1085	1272	1373	1306	1309	1044	857	1054	1130	996	840	672	534	15309	
%		2.8	3.5	5.6	7.09	8.31	8.97	8.53	8.55	6.82	5.6	6.88	7.38	6.51	5.49	4.39	3.49		
Avg		0.1	0.1	0.1	0.07	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.08	0.08	0.07	0.07	0.06		

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

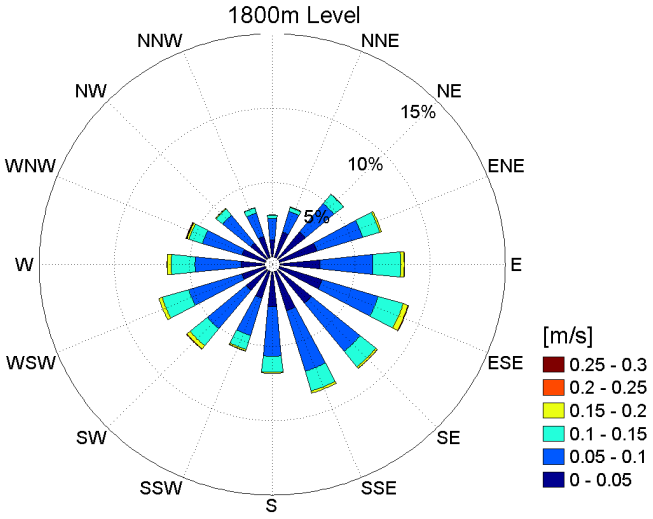


Figure 6.1.8.1 Directional percentage of currents at level 1800 m

6.1.9 Joint Distribution of Current Speed and Direction at Level 2150 m

		DIRECTION (º)																	
m/s		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Freq	%
0.00	0.05	289	316	449	496	494	397	362	267	192	208	165	174	170	183	221	276	4659	30.43
0.05	0.10	397	599	898	1106	965	764	502	380	230	187	235	225	191	221	247	328	7475	48.82
0.10	0.15	141	187	340	499	419	265	163	93	53	56	51	59	67	71	74	101	2639	17.24
0.15	0.20	16	77	97	93	81	49	15	4	3	7	15	7	0	9	7	11	491	3.21
0.20	0.25	1	7	17	5	13	2	0	0	0	0	0	0	0	0	1	1	47	0.31
Freq		844	1186	1801	2199	1972	1477	1042	744	478	458	466	465	428	484	550	717	15311	
%		5.51	7.75	11.76	14.36	12.88	9.65	6.81	4.86	3.12	2.99	3.04	3.04	2.8	3.16	3.59	4.68		
Avg		0.07	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07		

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

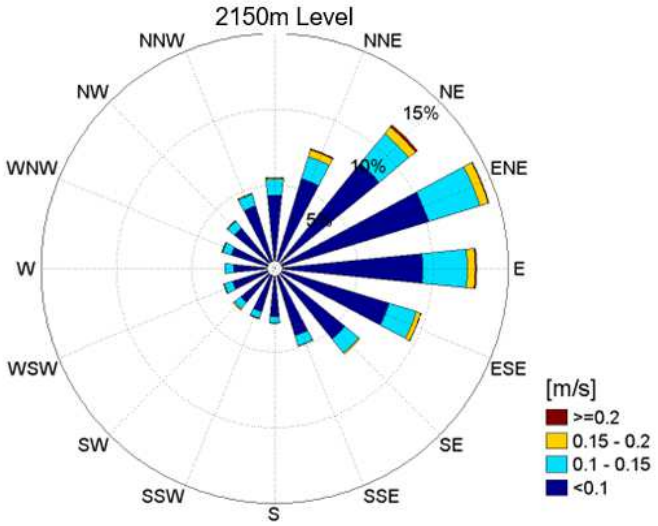


Figure 6.1.9.1 Directional percentage of currents at level 2150 m

6.2 Extreme Current Profile

Figure 6.2.1 presents examples of two measured current profiles from oceanographic mooring deployed on Santos Basin. It is observed that the profile with maximum currents on the surface layer is not correlated with the profile with maximum deep layer currents. Thus, it is presented two sets of extreme current tables in this metocean document. A first set is related to extreme surface currents (tables 6.2.1 to 6.2.16) and the second set is related with extreme mid-water currents (tables 6.2.17 to 6.2.24).

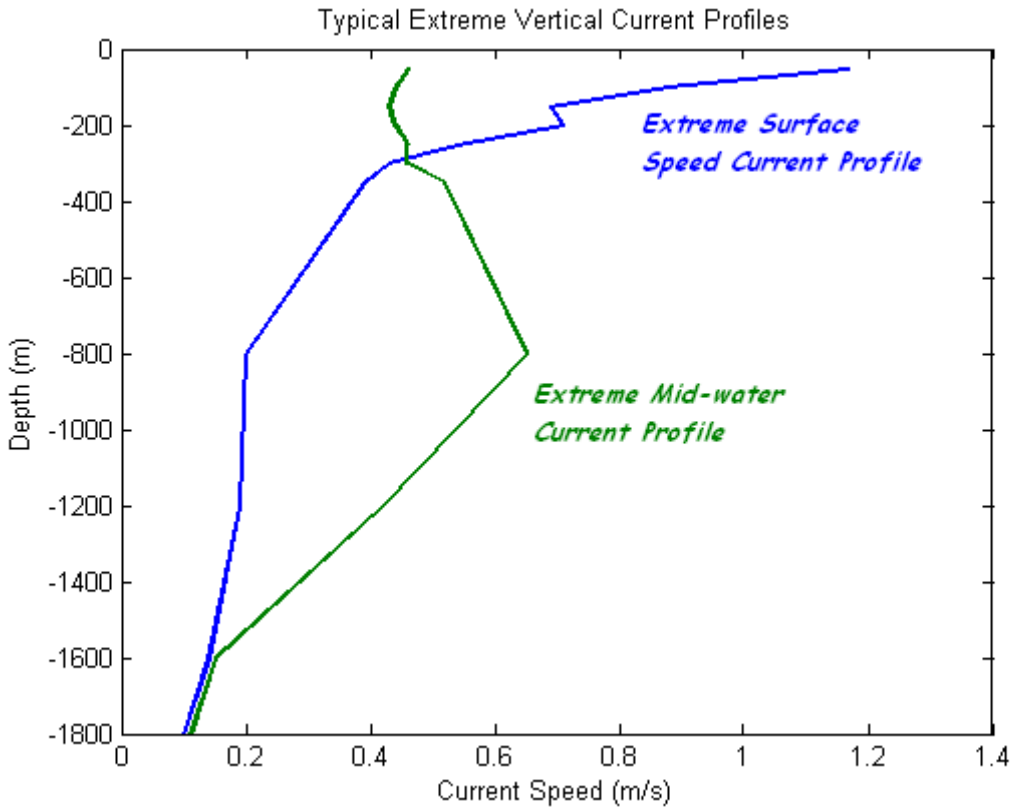


Figure 6.2.1 – Measured profiles with maximum surface (blue) and mid-water (green) currents.

6.2.1 Profile of Extreme Currents (m/s) With Surface N Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.79**	**1.00**	**1.06**	**1.09**	**1.13**	**1.18**	**1.32**	**N**
100 m	0.71	0.93	0.98	1.01	1.05	1.10	1.24	N
150 m	0.53	0.75	0.80	0.83	0.87	0.92	1.06	N
200 m	0.51	0.65	0.68	0.70	0.73	0.76	0.85	N
250 m	0.44	0.56	0.59	0.61	0.63	0.66	0.74	N
300 m	0.41	0.52	0.55	0.57	0.59	0.61	0.69	N
350 m	0.37	0.47	0.50	0.51	0.53	0.55	0.62	N
800 m	0.20	0.34	0.38	0.40	0.43	0.46	0.56	N
1200 m	0.18	0.23	0.25	0.26	0.28	0.30	0.36	NNE
1600 m	0.18	0.25	0.27	0.28	0.29	0.31	0.36	NE
1800 m	0.16	0.22	0.24	0.25	0.26	0.27	0.31	ENE
2150 m	0.19	0.24	0.25	0.26	0.26	0.27	0.31	ENE
2200 m	0.10	0.14	0.15	0.16	0.17	0.18	0.22	E

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.2 Profile of Extreme Currents (m/s) With Surface NNE Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.6**	**0.74**	**0.78**	**0.8**	**0.82**	**0.86**	**0.95**	**NNE**
100 m	0.6	0.74	0.78	0.8	0.82	0.86	0.95	NNE
150 m	0.54	0.7	0.74	0.76	0.78	0.81	0.9	NNE
200 m	0.49	0.60	0.64	0.65	0.67	0.70	0.78	NNE
250 m	0.43	0.53	0.56	0.57	0.59	0.62	0.68	NNE
300 m	0.39	0.48	0.51	0.52	0.53	0.56	0.62	NNE
350 m	0.36	0.44	0.47	0.48	0.49	0.52	0.57	NNE
800 m	0.22	0.34	0.37	0.38	0.4	0.42	0.49	NNE
1200 m	0.2	0.3	0.32	0.33	0.34	0.36	0.41	NNE
1600 m	0.18	0.26	0.27	0.28	0.29	0.31	0.35	NE
1800 m	0.17	0.23	0.24	0.25	0.26	0.27	0.3	NE
2150 m	0.15	0.2	0.21	0.22	0.22	0.23	0.26	ENE
2200 m	0.09	0.13	0.14	0.15	0.15	0.16	0.18	E

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.3 Profile of Extreme Currents (m/s) With Surface NE Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.6**	**0.69**	**0.72**	**0.74**	**0.76**	**0.79**	**0.88**	**NE**
100 m	0.6	0.69	0.72	0.74	0.76	0.79	0.88	NE
150 m	0.42	0.57	0.61	0.63	0.65	0.68	0.77	NE
200 m	0.37	0.52	0.55	0.57	0.59	0.62	0.7	NE
250 m	0.33	0.47	0.51	0.52	0.55	0.57	0.66	NE
300 m	0.31	0.46	0.49	0.51	0.53	0.56	0.64	NE
350 m	0.29	0.44	0.47	0.49	0.51	0.54	0.62	NE
800 m	0.2	0.3	0.33	0.34	0.36	0.38	0.44	NE
1200 m	0.17	0.24	0.26	0.27	0.28	0.3	0.34	ENE
1600 m	0.17	0.24	0.25	0.26	0.27	0.28	0.32	ENE
1800 m	0.16	0.21	0.23	0.23	0.24	0.25	0.28	E
2150 m	0.15	0.19	0.2	0.21	0.21	0.22	0.25	E
2200 m	0.08	0.11	0.12	0.13	0.13	0.14	0.16	ESE

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.4 Profile of Extreme Currents (m/s) With Surface ENE Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.56**	**0.66**	**0.69**	**0.71**	**0.72**	**0.74**	**0.79**	**ENE**
100 m	0.46	0.6	0.63	0.65	0.67	0.69	0.77	ENE
150 m	0.46	0.6	0.63	0.65	0.67	0.69	0.77	ENE
200 m	0.41	0.55	0.58	0.59	0.62	0.64	0.72	ENE
250 m	0.39	0.5	0.53	0.55	0.57	0.59	0.66	ENE
300 m	0.35	0.43	0.46	0.48	0.5	0.52	0.6	ENE
350 m	0.27	0.4	0.43	0.44	0.46	0.49	0.56	ENE
800 m	0.21	0.28	0.3	0.31	0.32	0.34	0.39	E
1200 m	0.2	0.23	0.24	0.25	0.25	0.26	0.29	E
1600 m	0.14	0.19	0.2	0.2	0.21	0.22	0.25	E
1800 m	0.13	0.17	0.18	0.19	0.19	0.2	0.22	E
2150 m	0.14	0.17	0.17	0.18	0.18	0.18	0.2	E
2200 m	0.08	0.1	0.1	0.1	0.11	0.11	0.12	SE

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.5 Profile of Extreme Currents (m/s) With Surface E Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.49**	**0.59**	**0.63**	**0.64**	**0.67**	**0.69**	**0.77**	**E**
100 m	0.46	0.55	0.62	0.62	0.65	0.67	0.75	E
150 m	0.46	0.55	0.61	0.61	0.62	0.65	0.73	E
200 m	0.39	0.52	0.55	0.57	0.59	0.61	0.69	E
250 m	0.35	0.48	0.51	0.52	0.54	0.57	0.65	E
300 m	0.3	0.42	0.45	0.47	0.49	0.51	0.55	E
350 m	0.25	0.37	0.4	0.42	0.44	0.46	0.5	E
800 m	0.2	0.27	0.29	0.3	0.31	0.33	0.38	ESE
1200 m	0.17	0.21	0.23	0.23	0.24	0.25	0.29	ESE
1600 m	0.12	0.18	0.19	0.2	0.21	0.22	0.25	ESE
1800 m	0.12	0.17	0.18	0.18	0.19	0.2	0.23	ESE
2150 m	0.14	0.17	0.17	0.18	0.18	0.19	0.2	ESE
2200 m	0.09	0.1	0.11	0.11	0.11	0.12	0.13	ESE

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.6 Profile of Extreme Currents (m/s) With Surface ESE Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.51**	**0.62**	**0.65**	**0.67**	**0.69**	**0.72**	**0.79**	**ESE**
100 m	0.45	0.6	0.64	0.66	0.68	0.71	0.78	ESE
150 m	0.45	0.6	0.64	0.66	0.68	0.71	0.78	ESE
200 m	0.38	0.53	0.56	0.58	0.6	0.63	0.72	ESE
250 m	0.35	0.49	0.52	0.54	0.56	0.59	0.67	ESE
300 m	0.29	0.43	0.46	0.48	0.5	0.53	0.58	ESE
350 m	0.24	0.38	0.41	0.43	0.45	0.48	0.53	ESE
800 m	0.19	0.27	0.29	0.3	0.32	0.33	0.39	ESE
1200 m	0.16	0.21	0.22	0.23	0.24	0.25	0.29	ESE
1600 m	0.15	0.17	0.18	0.19	0.2	0.21	0.23	ESE
1800 m	0.15	0.16	0.17	0.18	0.19	0.2	0.21	ESE
2150 m	0.13	0.15	0.16	0.16	0.16	0.17	0.18	SE
2200 m	0.08	0.09	0.09	0.09	0.1	0.1	0.11	SSE

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.7 Profile of Extreme Currents (m/s) With Surface SE Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.61**	**0.74**	**0.78**	**0.8**	**0.82**	**0.85**	**0.94**	**SE**
100 m	0.59	0.72	0.75	0.77	0.81	0.84	0.93	SE
150 m	0.52	0.68	0.71	0.73	0.76	0.79	0.88	SE
200 m	0.47	0.62	0.66	0.68	0.7	0.73	0.82	SE
250 m	0.43	0.58	0.62	0.64	0.66	0.69	0.77	SE
300 m	0.38	0.53	0.57	0.59	0.61	0.64	0.72	SE
350 m	0.35	0.5	0.53	0.55	0.57	0.6	0.69	SE
800 m	0.24	0.35	0.37	0.39	0.4	0.42	0.49	ESE
1200 m	0.17	0.25	0.27	0.28	0.3	0.31	0.36	E
1600 m	0.16	0.21	0.22	0.23	0.24	0.25	0.28	E
1800 m	0.15	0.19	0.2	0.21	0.21	0.22	0.24	E
2150 m	0.14	0.17	0.18	0.18	0.19	0.19	0.21	ENE
2200 m	0.06	0.07	0.07	0.07	0.07	0.08	0.08	ENE

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.8 Profile of Extreme Currents (m/s) With Surface SSE Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.7**	**0.8**	**0.83**	**0.84**	**0.86**	**0.88**	**0.93**	**SSE**
100 m	0.64	0.75	0.78	0.79	0.81	0.83	0.9	SSE
150 m	0.59	0.71	0.74	0.76	0.79	0.81	0.85	SSE
200 m	0.52	0.64	0.66	0.68	0.7	0.72	0.79	SSE
250 m	0.46	0.57	0.6	0.62	0.63	0.66	0.73	SSE
300 m	0.42	0.53	0.56	0.57	0.59	0.61	0.68	SSE
350 m	0.39	0.5	0.53	0.54	0.56	0.58	0.65	SSE
800 m	0.28	0.36	0.38	0.39	0.41	0.42	0.47	SE
1200 m	0.19	0.25	0.27	0.28	0.29	0.3	0.34	SE
1600 m	0.16	0.2	0.21	0.22	0.22	0.23	0.26	ESE
1800 m	0.14	0.18	0.19	0.19	0.2	0.2	0.22	ESE
2150 m	0.13	0.16	0.17	0.17	0.18	0.18	0.2	E
2200 m	0.06	0.07	0.08	0.08	0.08	0.09	0.1	E

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.9 Profile of Extreme Currents (m/s) With Surface S Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.82**	**1.02**	**1.06**	**1.09**	**1.12**	**1.16**	**1.27**	**S**
100 m	0.74	0.93	0.98	1	1.03	1.07	1.18	S
150 m	0.74	0.93	0.98	1	1.03	1.07	1.17	S
200 m	0.67	0.86	0.9	0.92	0.95	0.99	1.09	S
250 m	0.63	0.81	0.86	0.88	0.91	0.94	1.05	S
300 m	0.53	0.72	0.76	0.78	0.81	0.84	0.94	S
350 m	0.46	0.64	0.69	0.71	0.73	0.77	0.87	S
800 m	0.23	0.35	0.38	0.39	0.41	0.43	0.5	S
1200 m	0.16	0.23	0.25	0.26	0.27	0.29	0.33	S
1600 m	0.18	0.23	0.24	0.24	0.25	0.26	0.28	WSW
1800 m	0.13	0.18	0.2	0.2	0.21	0.22	0.26	NNW
2150 m	0.13	0.18	0.2	0.2	0.21	0.22	0.26	N
2200 m	0.07	0.1	0.11	0.12	0.12	0.13	0.16	N

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.10 Profile of Extreme Currents (m/s) With Surface SSW Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**1.01**	**1.21**	**1.3**	**1.35**	**1.42**	**1.5**	**1.7**	**SSW**
100 m	0.93	1.18	1.24	1.27	1.31	1.36	1.51	SSW
150 m	0.92	1.16	1.22	1.25	1.29	1.34	1.49	SSW
200 m	0.72	0.96	1.02	1.05	1.09	1.13	1.28	SSW
250 m	0.64	0.87	0.93	0.96	1	1.04	1.19	SSW
300 m	0.57	0.79	0.85	0.88	0.92	0.96	1.1	SSW
350 m	0.51	0.74	0.79	0.82	0.86	0.9	1.04	SSW
800 m	0.21	0.36	0.4	0.42	0.44	0.47	0.57	SSW
1200 m	0.19	0.28	0.3	0.31	0.33	0.35	0.41	SSW
1600 m	0.19	0.23	0.25	0.25	0.26	0.27	0.3	WSW
1800 m	0.11	0.17	0.18	0.19	0.2	0.21	0.24	N
2150 m	0.14	0.21	0.23	0.23	0.25	0.26	0.3	N
2200 m	0.06	0.12	0.13	0.14	0.15	0.16	0.2	N

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.11 Profile of Extreme Currents (m/s) With Surface SW Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**1.24**	**1.56**	**1.64**	**1.69**	**1.74**	**1.81**	**2.03**	**SW**
100 m	1.17	1.5	1.58	1.62	1.68	1.75	1.96	SW
150 m	1.04	1.37	1.45	1.49	1.55	1.62	1.83	SW
200 m	0.97	1.29	1.37	1.41	1.47	1.54	1.75	SW
250 m	0.81	1.13	1.21	1.25	1.31	1.37	1.58	SW
300 m	0.74	1.05	1.13	1.17	1.23	1.3	1.5	SW
350 m	0.67	0.98	1.05	1.1	1.15	1.21	1.42	SW
800 m	0.32	0.53	0.58	0.61	0.64	0.69	0.83	SW
1200 m	0.19	0.34	0.38	0.4	0.42	0.46	0.55	SSW
1600 m	0.12	0.21	0.23	0.24	0.26	0.27	0.33	WSW
1800 m	0.15	0.19	0.2	0.21	0.22	0.23	0.26	NW
2150 m	0.13	0.17	0.18	0.19	0.2	0.21	0.25	N
2200 m	0.06	0.12	0.14	0.14	0.16	0.17	0.21	NNW

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.12 Profile of Extreme Currents (m/s) With Surface WSW Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**1.1**	**1.38**	**1.45**	**1.49**	**1.54**	**1.6**	**1.79**	**WSW**
100 m	1.07	1.35	1.42	1.46	1.51	1.57	1.76	WSW
150 m	0.98	1.26	1.33	1.37	1.42	1.48	1.67	WSW
200 m	0.83	1.1	1.17	1.21	1.26	1.32	1.51	WSW
250 m	0.72	0.99	1.06	1.1	1.15	1.21	1.39	WSW
300 m	0.63	0.9	0.97	1	1.05	1.11	1.29	WSW
350 m	0.56	0.83	0.89	0.93	0.98	1.04	1.21	WSW
800 m	0.25	0.43	0.48	0.51	0.54	0.58	0.71	WSW
1200 m	0.18	0.32	0.35	0.37	0.39	0.42	0.51	SW
1600 m	0.15	0.21	0.23	0.24	0.25	0.27	0.32	SW
1800 m	0.17	0.2	0.21	0.21	0.22	0.22	0.24	S
2150 m	0.16	0.21	0.22	0.23	0.23	0.25	0.28	SSE
2200 m	0.08	0.11	0.12	0.12	0.13	0.14	0.16	E

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.13 Profile of Extreme Currents (m/s) With Surface W Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**1.1**	**1.38**	**1.45**	**1.5**	**1.54**	**1.61**	**1.8**	**W**
100 m	1.07	1.35	1.42	1.46	1.51	1.57	1.77	W
150 m	0.98	1.26	1.33	1.37	1.42	1.48	1.67	W
200 m	0.83	1.1	1.17	1.21	1.26	1.32	1.51	W
250 m	0.72	0.99	1.06	1.1	1.15	1.21	1.4	W
300 m	0.63	0.9	0.97	1	1.05	1.11	1.3	W
350 m	0.56	0.83	0.89	0.93	0.98	1.04	1.22	W
800 m	0.24	0.43	0.48	0.5	0.54	0.58	0.71	WSW
1200 m	0.18	0.31	0.35	0.37	0.39	0.42	0.51	SW
1600 m	0.14	0.21	0.23	0.24	0.25	0.26	0.31	SW
1800 m	0.17	0.2	0.21	0.21	0.22	0.23	0.25	S
2150 m	0.16	0.21	0.22	0.23	0.24	0.25	0.29	SSE
2200 m	0.09	0.12	0.13	0.13	0.14	0.15	0.17	E

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.14 Profile of Extreme Currents (m/s) With Surface WNW Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.97**	**1.28**	**1.36**	**1.41**	**1.47**	**1.55**	**1.8**	**WNW**
100 m	0.87	1.17	1.25	1.3	1.36	1.44	1.7	WNW
150 m	0.75	1.05	1.13	1.18	1.24	1.32	1.58	WNW
200 m	0.62	0.92	1	1.05	1.11	1.18	1.44	WNW
250 m	0.52	0.81	0.89	0.94	0.99	1.07	1.32	WNW
300 m	0.48	0.76	0.85	0.89	0.95	1.02	1.27	WNW
350 m	0.41	0.69	0.77	0.82	0.87	0.95	1.19	WNW
800 m	0.27	0.31	0.33	0.36	0.40	0.45	0.61	W
1200 m	0.12	0.16	0.2	0.22	0.24	0.27	0.38	WSW
1600 m	0.15	0.18	0.18	0.19	0.19	0.2	0.22	SW
1800 m	0.1	0.17	0.19	0.2	0.21	0.23	0.28	SE
2150 m	0.11	0.19	0.22	0.23	0.25	0.27	0.34	SE
2200 m	0.05	0.12	0.14	0.15	0.16	0.18	0.23	ESE

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.15 Profile of Extreme Currents (m/s) With Surface NW Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**1.04**	**1.37**	**1.45**	**1.5**	**1.56**	**1.64**	**1.88**	**NW**
100 m	0.99	1.30	1.38	1.43	1.49	1.56	1.79	NW
150 m	0.88	1.16	1.23	1.27	1.32	1.39	1.59	NW
200 m	0.75	0.99	1.05	1.08	1.13	1.18	1.36	NW
250 m	0.65	0.86	0.91	0.94	0.98	1.03	1.18	NW
300 m	0.57	0.75	0.79	0.82	0.86	0.90	1.03	NW
350 m	0.51	0.67	0.71	0.74	0.77	0.80	0.92	NW
800 m	0.2	0.33	0.35	0.36	0.30	0.42	0.49	WNW
1200 m	0.2	0.26	0.28	0.29	0.30	0.32	0.36	WNW
1600 m	0.13	0.21	0.22	0.24	0.25	0.27	0.32	NW
1800 m	0.11	0.18	0.19	0.20	0.21	0.23	0.27	E
2150 m	0.15	0.20	0.21	0.22	0.23	0.24	0.27	E
2200 m	0.07	0.14	0.16	0.17	0.18	0.2	0.25	E

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.16 Profile of Extreme Currents (m/s) With Surface NNW Direction

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	**0.85**	**1.13**	**1.20**	**1.24**	**1.29**	**1.36**	**1.56**	**NNW**
100 m	0.78	1.04	1.10	1.14	1.18	1.25	1.43	NNW
150 m	0.60	0.80	0.85	0.88	0.91	0.96	1.10	NNW
200 m	0.57	0.76	0.80	0.83	0.87	0.91	1.05	NNW
250 m	0.50	0.66	0.71	0.73	0.76	0.80	0.92	NNW
300 m	0.46	0.61	0.65	0.67	0.70	0.74	0.84	NNW
350 m	0.43	0.57	0.61	0.63	0.65	0.69	0.79	NNW
800 m	0.22	0.29	0.31	0.32	0.33	0.35	0.40	NNW
1200 m	0.18	0.24	0.25	0.26	0.27	0.29	0.33	N
1600 m	0.18	0.24	0.25	0.26	0.27	0.29	0.33	NE
1800 m	0.17	0.23	0.24	0.25	0.26	0.27	0.31	E
2150 m	0.17	0.23	0.24	0.25	0.26	0.27	0.31	ESE
2200 m	0.08	0.11	0.11	0.12	0.12	0.13	0.15	ESE

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.17 Profile of Extreme Currents (m/s) With N Direction at Reference Level 800 m

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	0.31	0.38	0.40	0.41	0.42	0.43	0.48	NW
100 m	0.28	0.33	0.34	0.35	0.36	0.37	0.42	NW
150 m	0.26	0.33	0.35	0.36	0.38	0.39	0.44	NW
200 m	0.28	0.35	0.36	0.37	0.39	0.40	0.45	NW
250 m	0.30	0.38	0.40	0.41	0.42	0.44	0.49	N
300 m	0.31	0.39	0.41	0.42	0.44	0.46	0.51	N
350 m	0.38	0.46	0.48	0.49	0.51	0.53	0.58	N
800 m	**0.45**	**0.52**	**0.54**	**0.55**	**0.56**	**0.58**	**0.62**	**N**
1200 m	0.26	0.32	0.34	0.35	0.37	0.38	0.42	N
1600 m	0.08	0.13	0.14	0.15	0.16	0.17	0.20	NE
1800 m	0.12	0.15	0.16	0.16	0.17	0.18	0.20	E
2150 m	0.13	0.16	0.17	0.17	0.18	0.18	0.20	E
2200 m	0.12	0.16	0.16	0.17	0.17	0.18	0.21	E

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.18 Profile of Extreme Currents (m/s) With NE Direction at Reference Level 800 m

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	0.75	0.87	0.90	0.92	0.95	0.98	1.07	NW
100 m	0.65	0.78	0.82	0.84	0.86	0.89	0.99	N
150 m	0.59	0.73	0.77	0.79	0.81	0.85	0.95	N
200 m	0.66	0.80	0.84	0.86	0.89	0.92	1.02	N
250 m	0.50	0.64	0.68	0.70	0.73	0.76	0.86	N
300 m	0.43	0.57	0.61	0.63	0.66	0.69	0.80	N
350 m	0.46	0.61	0.64	0.66	0.69	0.72	0.83	N
800 m	**0.30**	**0.40**	**0.43**	**0.44**	**0.46**	**0.48**	**0.55**	**NE**
1200 m	0.17	0.26	0.28	0.29	0.31	0.33	0.39	NE
1600 m	0.21	0.25	0.26	0.26	0.27	0.28	0.31	NE
1800 m	0.12	0.15	0.16	0.17	0.18	0.19	0.21	NE
2150 m	0.11	0.15	0.16	0.16	0.17	0.18	0.21	NE
2200 m	0.11	0.15	0.16	0.17	0.18	0.19	0.22	E

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.19 Profile of Extreme Currents (m/s) With E Direction at Reference Level 800 m

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	0.52	0.57	0.59	0.59	0.60	0.61	0.65	SE
100 m	0.46	0.51	0.52	0.53	0.54	0.55	0.59	SE
150 m	0.49	0.54	0.55	0.56	0.57	0.58	0.62	SE
200 m	0.47	0.52	0.53	0.53	0.54	0.55	0.59	S
250 m	0.43	0.47	0.49	0.49	0.50	0.51	0.54	S
300 m	0.35	0.40	0.41	0.41	0.42	0.43	0.46	SE
350 m	0.28	0.32	0.33	0.34	0.35	0.35	0.38	SE
800 m	**0.35**	**0.38**	**0.39**	**0.39**	**0.40**	**0.40**	**0.43**	**E**
1200 m	0.18	0.24	0.26	0.26	0.28	0.29	0.33	SE
1600 m	0.15	0.20	0.22	0.22	0.23	0.24	0.28	S
1800 m	0.21	0.24	0.25	0.26	0.27	0.28	0.30	S
2150 m	0.16	0.20	0.20	0.21	0.22	0.22	0.25	S
2200 m	0.08	0.10	0.10	0.11	0.11	0.11	0.13	S

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.20 Profile of Extreme Currents (m/s) With SE Direction at Reference Level 800 m

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	0.48	0.53	0.54	0.55	0.56	0.57	0.61	SE
100 m	0.57	0.62	0.63	0.64	0.65	0.67	0.70	SE
150 m	0.46	0.52	0.53	0.54	0.55	0.57	0.61	SE
200 m	0.31	0.36	0.38	0.39	0.40	0.41	0.45	SE
250 m	0.32	0.38	0.39	0.40	0.41	0.43	0.47	SE
300 m	0.32	0.37	0.39	0.40	0.41	0.42	0.46	SE
350 m	0.25	0.31	0.32	0.33	0.34	0.35	0.39	SE
800 m	**0.35**	**0.38**	**0.39**	**0.39**	**0.40**	**0.41**	**0.43**	**SE**
1200 m	0.23	0.25	0.25	0.25	0.26	0.26	0.27	S
1600 m	0.29	0.33	0.34	0.34	0.35	0.36	0.39	SW
1800 m	0.26	0.32	0.33	0.34	0.35	0.37	0.41	SW
2150 m	0.22	0.28	0.30	0.31	0.32	0.34	0.38	W
2200 m	0.20	0.26	0.28	0.29	0.30	0.32	0.36	W

6.2.21 Profile of Extreme Currents (m/s) With S Direction at Reference Level 800 m

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	0.92	1.02	1.04	1.06	1.08	1.10	1.16	SW
100 m	0.88	0.98	1.00	1.02	1.03	1.06	1.12	SW
150 m	0.74	0.85	0.87	0.89	0.91	0.93	0.99	SW
200 m	0.63	0.73	0.76	0.77	0.79	0.81	0.88	SW
250 m	0.61	0.72	0.74	0.75	0.77	0.79	0.86	SW
300 m	0.51	0.61	0.63	0.64	0.66	0.68	0.74	SW
350 m	0.51	0.61	0.63	0.65	0.66	0.68	0.75	SW
800 m	**0.49**	**0.55**	**0.57**	**0.57**	**0.58**	**0.60**	**0.64**	**S**
1200 m	0.17	0.22	0.23	0.24	0.25	0.26	0.29	S
1600 m	0.11	0.15	0.16	0.17	0.17	0.18	0.20	SW
1800 m	0.13	0.18	0.19	0.19	0.20	0.21	0.24	SW
2150 m	0.20	0.24	0.25	0.26	0.27	0.28	0.31	W
2200 m	0.06	0.11	0.12	0.12	0.13	0.14	0.16	W

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.22 Profile of Extreme Currents (m/s) With SW Direction at Reference Level 800 m

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	0.97	1.09	1.12	1.14	1.15	1.18	1.26	SW
100 m	0.99	1.10	1.13	1.15	1.17	1.20	1.28	SW
150 m	0.95	1.07	1.10	1.12	1.14	1.16	1.24	SW
200 m	0.80	0.92	0.95	0.97	0.99	1.02	1.10	SW
250 m	0.75	0.87	0.90	0.92	0.94	0.97	1.04	SW
300 m	0.71	0.83	0.86	0.87	0.89	0.92	1.00	SW
350 m	0.58	0.70	0.73	0.74	0.76	0.79	0.86	SW
800 m	**0.35**	**0.43**	**0.45**	**0.46**	**0.48**	**0.50**	**0.55**	**SW**
1200 m	0.27	0.33	0.35	0.35	0.37	0.38	0.42	SW
1600 m	0.19	0.23	0.24	0.25	0.26	0.27	0.30	SW
1800 m	0.10	0.12	0.13	0.13	0.14	0.14	0.16	S
2150 m	0.12	0.12	0.13	0.13	0.14	0.14	0.16	E
2200 m	0.11	0.11	0.12	0.12	0.13	0.13	0.14	NE

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.23 Profile of Extreme Currents (m/s) With W Direction at Reference Level 800 m

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	0.94	1.06	1.10	1.11	1.13	1.16	1.25	SW
100 m	0.93	1.05	1.08	1.10	1.12	1.15	1.24	SW
150 m	0.89	1.01	1.05	1.06	1.09	1.11	1.20	SW
200 m	0.75	0.87	0.90	0.92	0.94	0.97	1.06	SW
250 m	0.75	0.87	0.91	0.92	0.95	0.97	1.06	SW
300 m	0.60	0.72	0.75	0.77	0.79	0.82	0.90	SW
350 m	0.54	0.66	0.69	0.70	0.73	0.75	0.84	SW
800 m	**0.30**	**0.35**	**0.37**	**0.38**	**0.39**	**0.40**	**0.45**	**W**
1200 m	0.14	0.16	0.17	0.18	0.18	0.19	0.21	SW
1600 m	0.15	0.18	0.19	0.19	0.20	0.20	0.23	SE
1800 m	0.10	0.13	0.14	0.14	0.15	0.16	0.18	SE
2150 m	0.17	0.20	0.21	0.22	0.22	0.23	0.25	E
2200 m	0.08	0.11	0.12	0.13	0.13	0.14	0.16	NE

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.2.24 Profile of Extreme Currents (m/s) With NW Direction at Reference Level 800 m

LEVEL	1	10	20	30	50	100	1000	DIRECTION
50 m	0.56	0.63	0.65	0.66	0.67	0.69	0.74	W
100 m	0.50	0.57	0.59	0.60	0.61	0.63	0.68	W
150 m	0.52	0.60	0.62	0.63	0.64	0.66	0.71	W
200 m	0.60	0.68	0.70	0.71	0.72	0.74	0.80	W
250 m	0.54	0.62	0.64	0.65	0.67	0.69	0.74	W
300 m	0.53	0.61	0.63	0.64	0.66	0.68	0.73	W
350 m	0.49	0.57	0.59	0.60	0.61	0.63	0.68	W
800 m	**0.39**	**0.45**	**0.47**	**0.48**	**0.49**	**0.50**	**0.54**	**NW**
1200 m	0.28	0.35	0.36	0.37	0.38	0.40	0.44	NW
1600 m	0.20	0.25	0.26	0.27	0.27	0.29	0.32	W
1800 m	0.18	0.21	0.22	0.23	0.24	0.24	0.27	W
2150 m	0.15	0.18	0.19	0.20	0.20	0.21	0.24	NW
2200 m	0.17	0.21	0.22	0.22	0.23	0.24	0.26	NW

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].

6.3 Current Profiles for Fatigue Analysis

The following tables present current data divided into 4 Classes or Groups of reference levels that can be used for fatigue design. The first sixteen tables are related with a near-surface reference level for the flow direction. This Group was mounted using simultaneous data from all the other levels when the surface flow was going to that specific surface direction. The second Group assumes the 800 m level as reference and represents current profiles with strong mid-water events for which the currents measured at both levels of 800-m and 1200-m were greater than 0.20 and 0.18 m/s respectively. The third Group classifies the profiles into grouped current data whose speeds were greater than 0.15 m/s at 1600 m and 1800 m levels, considering the reference level as 1800 m. And the last Group presents all the current profiles for which the current speeds were greater than 0.12 m/s at 2150m, that were not considered in the other groups. The complete data set covers 15311 hourly profiles (approximately 1.75 years of measured data), of which 12088 are clustered at surface reference level, 1815 at 800 m, 939 at 1800 m and 469 at 2150 m.

6.3.1 Current Profile (m/s) for Fatigue Analysis with N Direction at surface

	0.00		**0.10**		**0.20**		**0.30**		**0.40**		**0.50**		**0.60**		**0.70**	
	0.10		**0.20**		**0.30**		**0.40**		**0.50**		**0.60**		**0.70**		**0.80**	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	**0.09**	**1**	**0.17**	**358.9**	**0.27**	**1.6**	**0.36**	**1.7**	**0.46**	**356.3**	**0.57**	**354.3**	**0.65**	**353.6**	**0.76**	**351.8**
100	0.19	291.7	0.18	340.5	0.27	359.9	0.35	359.1	0.52	0.9	0.51	2.1	0.5	353.2	0.55	352.7
150	0.21	312.6	0.17	315.6	0.25	359.9	0.31	358.9	0.43	357	0.43	355.8	0.42	342.7	0.42	343
200	0.13	313.5	0.16	1.8	0.19	0.9	0.26	0.9	0.38	358.3	0.36	0.5	0.36	340	0.38	345.2
250	0.1	0.8	0.13	2.8	0.17	23.2	0.22	17.8	0.34	2.7	0.29	354.6	0.36	353.5	0.25	359.1
300	0.1	65.8	0.1	43.2	0.16	41.8	0.21	18.1	0.31	0.8	0.24	0.8	0.32	343.3	0.31	343.7
350	0.11	291.4	0.11	43	0.13	23.7	0.2	1.5	0.25	0.7	0.2	356.5	0.26	358.8	0.24	358.1
800	0.09	72	0.12	359.7	0.1	88.9	0.12	48.5	0.15	334.1	0.15	294.7	0.1	339.9	0.08	343.1
1200	0.11	65.7	0.1	110.2	0.09	108.2	0.09	21.4	0.08	45	0.1	69.3	0.13	106.8	0.13	91
1600	0.11	70	0.11	69	0.12	68.2	0.12	90.8	0.06	67.5	0.09	45.8	0.19	67.8	0.17	58.6
1800	0.07	314.4	0.08	134.3	0.06	113.1	0.11	87.2	0.05	87.1	0.12	120.3	0.09	95.7	0.08	81.9
2150	0.08	87.9	0.08	66.5	0.08	67.8	0.14	68.4	0.1	86.3	0.14	64.4	0.12	69.8	0.1	81.3
2200	0.04	357.4	0.05	358.7	0.04	89.5	0.08	109.8	0.04	69.1	0.04	92.3	0.05	45	0.03	43
Sum	95		164		104		50		21		12		12		5	
Perc	0.62%		1.07%		0.68%		0.33%		0.14%		0.08%		0.08%		0.03%	

	0.80		
	0.90		
Depth	Int.	Dir.	
50	**0.81**	**349.8**	
100	0.65	346.3	
150	0.44	344.8	
200	0.42	348.6	
250	0.34	350.4	
300	0.32	340.8	
350	0.27	351.9	
800	0.16	10.6	
1200	0.11	109.8	
1600	0.13	53.5	
1800	0.07	133.1	
2150	0.04	104.9	
2200	0.05	13	
Sum	1	Tot.Dir	464
Perc	0.01%		3.03%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.2 Current Profile (m/s) for Fatigue Analysis with NNE Direction at surface

	0.00		0.10		0.20		0.30		0.40		
	0.10		0.20		0.30		0.40		0.50		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.09**	**22.6**	**0.17**	**22.3**	**0.27**	**22.2**	**0.34**	**20.6**	**0.45**	**22**	
100	0.14	22.2	0.21	1.3	0.28	23	0.3	22.2	0.29	18.5	
150	0.11	68.4	0.22	21.5	0.24	1.2	0.28	23.4	0.18	39	
200	0.16	1.9	0.14	1.2	0.24	42.5	0.25	43.6	0.11	359.4	
250	0.12	45.7	0.14	42.7	0.18	43.5	0.18	43.6	0.31	0	
300	0.13	68.1	0.14	21.5	0.17	43.4	0.16	27.3	0.18	1.2	
350	0.1	337.4	0.1	23.9	0.15	22.6	0.15	21.2	0.17	2.9	
800	0.1	91	0.1	69.1	0.14	47.4	0.13	66.8	0.09	24.4	
1200	0.12	90.2	0.12	89.8	0.11	68.8	0.1	109.7	0.07	70.6	
1600	0.1	69.1	0.12	90.9	0.12	89.4	0.11	65.8	0.1	93	
1800	0.07	222.9	0.08	111.9	0.07	66.8	0.12	44.6	0.11	163.2	
2150	0.07	85.9	0.09	69.4	0.12	45.3	0.14	43.2	0.09	157.5	
2200	0.04	43.4	0.06	0.7	0.04	90.6	0.05	90.1	0.05	103.7	
Sum	110		151		156		63		10	Tot.Dir	490
Perc	0.72%		0.99%		1.02%		0.41%		0.07%		3.20%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.3 Current Profile (m/s) for Fatigue Analysis with NE Direction at surface

	0.00		0.10		0.20		0.30		0.40		
	0.10		0.20		0.30		0.40		0.50		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.08**	**44.6**	**0.17**	**45.3**	**0.27**	**43.4**	**0.34**	**42**	**0.44**	**42.9**	
100	0.12	64.5	0.19	44	0.33	42.9	0.34	43.3	0.33	51.7	
150	0.11	45.8	0.21	43.6	0.26	25.3	0.25	44.6	0.31	45.4	
200	0.14	359.8	0.22	66.1	0.21	24.9	0.22	40.8	0.21	1.1	
250	0.17	66.1	0.16	45.2	0.2	43.1	0.2	42.3	0.13	21.2	
300	0.13	91.8	0.16	67.3	0.2	48	0.2	46	0.16	24.6	
350	0.08	90.1	0.15	45.5	0.2	42.9	0.24	66.8	0.21	66.5	
800	0.13	22.7	0.15	20.5	0.1	67.1	0.13	89.9	0.11	43.2	
1200	0.1	44.6	0.11	65.7	0.1	69.3	0.08	68.6	0.06	67.9	
1600	0.1	88.7	0.1	89	0.12	89.3	0.09	86	0.14	117.6	
1800	0.06	288.2	0.09	157.8	0.06	111.1	0.11	164.4	0.07	148.2	
2150	0.09	43.1	0.08	65.5	0.1	67	0.14	71.7	0.07	111.2	
2200	0.04	46.3	0.04	44.2	0.04	68	0.04	70.3	0.04	87.9	
Sum	103		151		82		29		5	Tot.Dir	370
Perc	0.67%		0.99%		0.54%		0.19%		0.03%		2.42%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.4 Current Profile (m/s) for Fatigue Analysis with ENE Direction at surface

	0.00		0.10		0.20		0.30		0.40		
	0.10		0.20		0.30		0.40		0.50		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.09**	**68.7**	**0.17**	**67.2**	**0.26**	**65.1**	**0.35**	**62.6**	**0.42**	**73**	
100	0.11	68.6	0.2	68.9	0.28	47.1	0.36	45.1	0.34	50.1	
150	0.12	92.4	0.21	69	0.18	88.6	0.26	41.9	0.29	49.9	
200	0.15	70.8	0.2	87.7	0.22	65.7	0.23	40.8	0.2	49.9	
250	0.1	87.8	0.2	86.7	0.19	65.8	0.22	40.5	0.13	17.1	
300	0.15	111.6	0.2	70	0.14	45	0.21	43.2	0.15	40	
350	0.1	93	0.15	89	0.17	46.3	0.18	47	0.12	45.8	
800	0.12	92.2	0.14	25.4	0.09	44.9	0.12	67.9	0.08	45	
1200	0.1	95.8	0.09	109.5	0.09	87	0.11	83.5	0.03	2.4	
1600	0.1	90.8	0.09	89.3	0.11	71.4	0.11	90.3	0.12	101.6	
1800	0.07	155.1	0.09	158.9	0.08	112.3	0.11	85.1	0.04	81.4	
2150	0.08	43	0.08	89.6	0.07	67.9	0.08	68.5	0.08	67.4	
2200	0.06	1.8	0.04	46.7	0.04	113.2	0.04	63.3	0.03	79.5	
Sum	80		114		36		13		3	Tot.Dir	246
Perc	0.52%		0.74%		0.24%		0.08%		0.02%		1.61%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.5 Current Profile (m/s) for Fatigue Analysis with E Direction at surface

	0.00		0.10		0.20		0.30		0.40		
	0.10		0.20		0.30		0.40		0.50		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.09**	**89.9**	**0.16**	**91.2**	**0.27**	**92**	**0.36**	**95.1**	**0.4**	**98.8**	
100	0.13	66.1	0.16	91.1	0.2	88	0.32	108.5	0.41	95.7	
150	0.13	66.7	0.2	112.8	0.24	111.8	0.42	107.2	0.39	104.8	
200	0.24	67.7	0.24	67.8	0.17	113.6	0.36	107.4	0.36	103.6	
250	0.28	65.7	0.26	70.9	0.24	112.4	0.4	111.5	0.34	92.3	
300	0.12	113.3	0.26	67.9	0.17	108.5	0.25	105.1	0.22	110.1	
350	0.1	110.4	0.19	113.5	0.15	113.7	0.26	110.6	0.2	123.1	
800	0.09	23.6	0.13	110.8	0.16	90.9	0.15	136	0.1	126.4	
1200	0.08	70.2	0.08	335.2	0.13	90.6	0.11	186.6	0.11	180.7	
1600	0.08	111.4	0.12	88.9	0.09	86	0.05	294.1	0.04	305.9	
1800	0.07	133	0.09	156.2	0.09	293.2	0.07	153.7	0.07	106.6	
2150	0.08	66.2	0.08	110.9	0.09	315.6	0.08	84.4	0.09	81.1	
2200	0.03	112.8	0.04	65.9	0.03	87.9	0.03	48.7	0.03	52.1	
Sum	74		130		61		13		1	Tot.Dir	279
Perc	0.48%		0.85%		0.40%		0.08%		0.01%		1.82%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.6 Current Profile (m/s) for Fatigue Analysis with ESE Direction at surface

	0.00		0.10		0.20		0.30		0.40		
	0.10		0.20		0.30		0.40		0.50		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.09**	**111.7**	**0.17**	**113.7**	**0.26**	**111.6**	**0.35**	**108.2**	**0.44**	**118.9**	
100	0.17	113.7	0.19	113.2	0.26	108.5	0.39	110.4	0.44	106.1	
150	0.22	135.3	0.2	115.2	0.31	112.9	0.42	110.7	0.43	117.1	
200	0.3	131.7	0.31	133	0.3	113.9	0.38	111.5	0.41	128.3	
250	0.23	134.6	0.34	132.1	0.29	116	0.32	115.3	0.35	129.4	
300	0.18	86.4	0.32	132.5	0.27	112.4	0.31	129.5	0.28	118.7	
350	0.13	113.7	0.25	132.9	0.23	115	0.25	94	0.26	138.1	
800	0.13	67.3	0.11	43.2	0.15	134.1	0.14	138.4	0.14	150.1	
1200	0.1	91.1	0.12	90.8	0.15	89.1	0.11	182.5	0.06	152.4	
1600	0.08	269.7	0.1	89.7	0.1	290.1	0.07	246.4	0.06	6.4	
1800	0.08	244.7	0.07	135	0.08	313.3	0.09	334	0.05	87	
2150	0.08	110.1	0.07	68.3	0.09	0.2	0.11	26.9	0.08	109.2	
2200	0.05	335.3	0.05	24.2	0.04	22.9	0.03	86.5	0.03	66.2	
Sum	66		157		97		14		3	Tot.Dir	337
Perc	0.43%		1.03%		0.63%		0.09%		0.02%		2.20%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.7 Current Profile (m/s) for Fatigue Analysis with SE Direction at surface

	0.00		0.10		0.20		0.30		0.40		
	0.10		0.20		0.30		0.40		0.50		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.08**	**134.5**	**0.17**	**135.6**	**0.26**	**136.4**	**0.35**	**134.1**	**0.44**	**134.8**	
100	0.12	133.2	0.16	113.6	0.27	133.3	0.32	133.8	0.36	130.6	
150	0.2	132.2	0.22	112.3	0.23	115.2	0.33	117.9	0.41	129.8	
200	0.19	67.2	0.27	111.5	0.32	115.3	0.37	117.2	0.38	117.9	
250	0.24	66.7	0.26	114.3	0.29	133.5	0.25	136.8	0.29	131.8	
300	0.26	67.2	0.32	131.9	0.3	114.4	0.27	133.5	0.3	133.6	
350	0.32	115.5	0.26	114.4	0.23	114.3	0.22	133	0.25	138.5	
800	0.14	23.9	0.17	1.3	0.1	178.5	0.13	181.4	0.12	133.3	
1200	0.13	89.5	0.09	314.2	0.12	93.6	0.11	157.3	0.06	139.1	
1600	0.11	90	0.1	87.4	0.1	65.8	0.1	198.3	0.14	228.1	
1800	0.07	132.2	0.09	135.9	0.09	296.2	0.08	156.1	0.12	91	
2150	0.09	89.9	0.08	44.6	0.09	360	0.12	68.4	0.12	69.8	
2200	0.04	66.4	0.04	45.4	0.04	67.3	0.05	50	0.03	81.6	
Sum	88		134		79		31		9	Tot.Dir	341
Perc	0.57%		0.88%		0.52%		0.20%		0.06%		2.23%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.8 Current Profile (m/s) for Fatigue Analysis with SSE Direction at surface

	0.00		0.10		0.20		0.30		0.40		0.50		0.60		
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.08**	**158**	**0.17**	**158.4**	**0.26**	**156.7**	**0.36**	**161.7**	**0.46**	**159.3**	**0.53**	**166.3**	**0.64**	**167.1**	
100	0.13	155.5	0.21	154.8	0.27	158	0.3	154.3	0.34	176.2	0.42	178.5	0.37	164.8	
150	0.11	249.5	0.16	113.4	0.25	156.5	0.22	155.1	0.36	156.5	0.58	161.2	0.22	148.9	
200	0.14	131.5	0.13	133	0.28	136.7	0.37	176.9	0.35	155.3	0.47	159.4	0.15	216.8	
250	0.11	223.6	0.16	155.9	0.18	155.3	0.32	157	0.32	158.2	0.18	183	0.19	205.9	
300	0.18	111.2	0.18	157.1	0.21	155.9	0.18	155.7	0.22	178.5	0.29	158.1	0.17	197.7	
350	0.1	89.8	0.12	158.5	0.15	134.2	0.21	157.4	0.22	158.4	0.18	201.6	0.11	181.9	
800	0.11	88.3	0.14	93.3	0.14	89.7	0.17	91.9	0.14	156.4	0.16	91.4	0.09	109.8	
1200	0.09	46.8	0.13	91.6	0.12	90.4	0.11	91.6	0.11	90.8	0.14	228.2	0.12	67.4	
1600	0.07	248.2	0.11	89.4	0.12	88	0.12	90	0.11	67.6	0.12	91.1	0.13	70.4	
1800	0.06	68.8	0.09	230	0.07	159	0.06	113.2	0.12	336.2	0.12	110.4	0.14	330.8	
2150	0.09	43.2	0.07	90.3	0.08	44.9	0.08	92.1	0.09	44.9	0.12	68	0.14	341.9	
2200	0.05	0.7	0.04	1.7	0.04	89.7	0.05	44.7	0.06	18.2	0.05	88	0.02	219.4	
Sum	76		119		131		45		50		9		4	Tot.Dir	434
Perc	0.50%		0.78%		0.86%		0.29%		0.33%		0.06%		0.03%		2.83%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.9 Current Profile (m/s) for Fatigue Analysis with S Direction at surface

	0.00		**0.10**		**0.20**		**0.30**		**0.40**		**0.50**		**0.60**	
	0.10		**0.20**		**0.30**		**0.40**		**0.50**		**0.60**		**0.70**	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	**0.08**	**181.3**	**0.18**	**180.3**	**0.27**	**180.5**	**0.37**	**181.2**	**0.47**	**182.8**	**0.55**	**181.8**	**0.67**	**180.9**
100	0.23	182.7	0.2	200.4	0.29	181.2	0.36	180.9	0.42	181.1	0.53	182	0.52	179.4
150	0.24	200.9	0.21	179.7	0.27	181.3	0.29	180	0.38	181.8	0.46	179.6	0.26	160.1
200	0.13	112	0.23	179.3	0.28	178.9	0.28	178.8	0.36	181.5	0.41	181.3	0.47	180.7
250	0.13	133.7	0.19	180.1	0.22	180.6	0.24	179.7	0.34	181.3	0.36	179.8	0.54	177.7
300	0.09	226.8	0.15	177.3	0.23	181	0.19	180.1	0.28	180.5	0.31	179.5	0.48	178.5
350	0.17	183.6	0.13	179.8	0.19	178.6	0.19	180	0.24	180	0.23	178.3	0.32	176.6
800	0.13	86	0.14	134.1	0.14	114.2	0.14	132.8	0.17	110.7	0.16	139.8	0.14	134.3
1200	0.07	292.6	0.1	115.1	0.13	114.9	0.13	110.7	0.14	109.9	0.12	226.8	0.12	69.7
1600	0.11	71.5	0.11	88.7	0.11	108.8	0.13	88.3	0.12	89	0.1	90.4	0.15	117.4
1800	0.12	270.1	0.07	226.4	0.08	134.1	0.07	90.6	0.09	181.7	0.06	111.8	0.08	67.1
2150	0.07	66.6	0.08	68.7	0.08	69.9	0.1	88.8	0.08	91.5	0.11	69.2	0.12	41.9
2200	0.06	0.4	0.04	358.7	0.05	45.7	0.05	94.3	0.04	21.3	0.06	18.2	0.02	20.3
Sum	85		150		152		182		136		94		20	
Perc	0.56%		0.98%		0.99%		1.19%		0.89%		0.61%		0.13%	

	0.70		
	0.80		
Depth	Int.	Dir.	
50	**0.74**	**181.3**	
100	0.72	180.6	
150	0.64	180.7	
200	0.52	187.1	
250	0.43	183.8	
300	0.37	182.2	
350	0.29	182.5	
800	0.12	93.4	
1200	0.06	45	
1600	0.09	322	
1800	0.07	180.3	
2150	0.1	81.3	
2200	0.04	21	
Sum	6	Tot.Dir	825
Perc	0.04%		5.39%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.10 Current Profile (m/s) for Fatigue Analysis with SSW Direction at surface

	0.00		0.10		0.20		0.30		0.40		0.50		0.60	
	0.10		0.20		0.30		0.40		0.50		0.60		0.70	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	**0.09**	**203.9**	**0.17**	**203**	**0.27**	**203**	**0.37**	**201.6**	**0.47**	**202.3**	**0.57**	**202.7**	**0.67**	**205.2**
100	0.15	247.6	0.19	204.1	0.3	202.1	0.37	202.8	0.46	201.5	0.55	202.1	0.67	204.6
150	0.16	246.2	0.19	223	0.32	202.2	0.3	200.5	0.38	200.6	0.53	203.6	0.6	204.6
200	0.18	248.7	0.24	179.8	0.28	202.4	0.27	180	0.37	203.4	0.46	202.4	0.63	204.2
250	0.15	269.8	0.14	200.1	0.24	180.5	0.24	180.4	0.36	201.4	0.41	201.7	0.54	203
300	0.15	269.4	0.19	248.7	0.19	179.4	0.25	203.3	0.35	202.6	0.41	204.5	0.49	203.2
350	0.14	269.7	0.2	159.5	0.17	202.5	0.18	179.6	0.23	180.3	0.36	203.4	0.49	204.5
800	0.11	64.5	0.16	66.1	0.12	113.5	0.12	111.9	0.16	159.7	0.16	158.6	0.15	181.8
1200	0.09	113.7	0.1	271.4	0.13	114.1	0.12	112.8	0.1	69	0.11	66.8	0.15	247
1600	0.12	87.4	0.12	91.7	0.11	45.1	0.11	112.3	0.1	66.7	0.09	89.9	0.08	134.5
1800	0.11	270.7	0.11	270.2	0.11	135.7	0.09	179.2	0.08	133.3	0.08	135.9	0.12	134.8
2150	0.1	65.7	0.09	65.9	0.09	67	0.12	68.9	0.12	67	0.11	91.8	0.09	69.3
2200	0.05	65.8	0.05	1.2	0.05	89	0.05	68	0.04	45.8	0.06	18.2	0.05	20.9
Sum	88		162		156		223		172		182		93	
Perc	0.57%		1.06%		1.02%		1.46%		1.12%		1.19%		0.61%	

	0.70		0.80		
	0.80		0.90		
Depth	Int.	Dir.	Int.	Dir.	
50	**0.78**	**209.1**	**0.85**	**208**	
100	0.77	208.9	0.79	209	
150	0.74	207.4	0.81	209.3	
200	0.65	206.1	0.69	207.3	
250	0.59	205.4	0.55	218.3	
300	0.51	205.3	0.45	208.7	
350	0.42	203	0.42	205	
800	0.17	202.6	0.17	202.9	
1200	0.15	154.3	0.15	155.8	
1600	0.19	247.3	0.17	248.2	
1800	0.07	160.6	0.09	159.1	
2150	0.08	91.9	0.08	88.9	
2200	0.03	23.1	0.03	157.9	
Sum	70		38	Tot.Dir	1184
Perc	0.46%		0.25%		7.73%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.11 Current Profile (m/s) for Fatigue Analysis with SW Direction at surface

	0.00		0.10		0.20		0.30		0.40		0.50		0.60	
	0.10		0.20		0.30		0.40		0.50		0.60		0.70	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	**0.09**	**226.5**	**0.16**	**226.3**	**0.28**	**225**	**0.38**	**226.5**	**0.47**	**225.8**	**0.57**	**226.7**	**0.67**	**222.7**
100	0.11	227.3	0.18	226	0.31	226.9	0.36	226.8	0.44	227	0.54	225.6	0.66	223.5
150	0.14	244.8	0.19	247	0.32	226.8	0.37	226	0.45	227.2	0.55	225	0.62	222.8
200	0.14	269	0.21	246.5	0.3	225.3	0.33	227.1	0.48	225.3	0.47	224.4	0.52	223.7
250	0.16	248.9	0.22	247.7	0.27	225.8	0.29	226.3	0.48	226.2	0.42	223.4	0.44	223
300	0.15	271.2	0.19	248.4	0.21	225.4	0.26	226.7	0.42	225.4	0.38	224	0.39	222.7
350	0.14	246.7	0.16	247.2	0.2	224.2	0.26	225.2	0.36	225.7	0.33	223.2	0.33	222.4
800	0.11	272.7	0.13	245.9	0.12	246.7	0.14	249.4	0.13	268.8	0.17	203.3	0.16	203.8
1200	0.08	245	0.08	268.1	0.1	314.8	0.08	291.2	0.1	294.8	0.14	200.6	0.14	177.9
1600	0.09	66.2	0.08	247.3	0.11	91.6	0.12	87.9	0.1	269.5	0.12	248.1	0.12	227.4
1800	0.08	224.7	0.1	247.5	0.08	271.2	0.09	315	0.08	224.7	0.11	247.7	0.15	267.6
2150	0.08	68.7	0.07	89.7	0.1	113.5	0.11	67.4	0.12	43.8	0.06	89.5	0.09	336.6
2200	0.04	67.9	0.04	359.5	0.04	46.9	0.06	20.5	0.05	21.7	0.07	19.5	0.08	18.8
Sum	94		202		210		212		223		155		158	
Perc	0.61%		1.32%		1.37%		1.38%		1.46%		1.01%		1.03%	

	0.70		0.80		0.90		1.00		1.10		1.20		1.30		
	0.80		0.90		1.00		1.10		1.20		1.30		1.40		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.78**	**224.1**	**0.87**	**223.6**	**0.96**	**224.8**	**1.05**	**222.6**	**1.15**	**223.6**	**1.28**	**219.2**	**1.35**	**221.2**	
100	0.76	224.4	0.83	224.2	0.93	225.2	1.01	223.8	1.09	225.4	1.22	219.6	1.07	231	
150	0.71	225	0.79	224.4	0.8	224.9	0.9	225.5	0.97	225.5	0.99	220.7	0.88	240	
200	0.61	225.6	0.6	226.1	0.67	224.5	0.65	224.1	0.89	224.9	0.62	217	0.9	230.8	
250	0.53	225.2	0.53	225.8	0.59	224.8	0.56	225.1	0.69	226.8	0.52	222.1	0.73	229	
300	0.49	224.8	0.47	225.4	0.48	224.5	0.49	225.4	0.61	227.3	0.47	223.2	0.62	231.8	
350	0.4	225.7	0.42	226.7	0.45	225.3	0.45	226.8	0.56	231.3	0.33	228.2	0.58	233.9	
800	0.17	203	0.17	177.8	0.27	200.2	0.29	196.5	0.26	246.9	0.26	179.4	0.18	242.9	
1200	0.14	226.8	0.1	179.3	0.17	201.2	0.18	183.6	0.16	178.9	0.14	183.5	0.2	213	
1600	0.12	222.8	0.13	249.2	0.13	180.3	0.2	181.9	0.06	246.1	0.19	187.2	0.01	147.6	
1800	0.09	225.9	0.09	224.6	0.1	227.2	0.11	246.1	0.09	218.9	0.04	228.8	0.03	285.9	
2150	0.11	43.6	0.1	202.4	0.12	223.8	0.12	221.1	0.07	132	0.03	254.4	0.05	7.8	
2200	0.07	19.5	0.04	315	0.04	293.4	0.08	313.3	0.03	357.8	0.02	216.2	0.04	2.8	
Sum	160		104		95		35		16		1		1	Tot.Dir	1666
Perc	1.05%		0.68%		0.62%		0.23%		0.10%		0.01%		0.01%		10.88%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.12 Current Profile (m/s) for Fatigue Analysis with WSW Direction at surface

	0.00		0.10		0.20		0.30		0.40		0.50		0.60	
	0.10		0.20		0.30		0.40		0.50		0.60		0.70	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	**0.09**	**248.4**	**0.17**	**246.7**	**0.28**	**247.9**	**0.38**	**246.9**	**0.47**	**246.6**	**0.57**	**248.5**	**0.67**	**249.3**
100	0.13	246.4	0.18	248.2	0.3	249.5	0.38	247.9	0.46	247.2	0.57	248.4	0.68	248.8
150	0.19	243.5	0.19	247.1	0.29	247.2	0.37	247.6	0.45	248.8	0.53	248.1	0.61	248.7
200	0.17	271.2	0.16	269	0.26	245.9	0.36	247.5	0.44	247.9	0.47	247.7	0.53	249.3
250	0.19	245.4	0.19	268.4	0.26	249	0.35	248	0.42	247.9	0.41	247.8	0.45	248.5
300	0.18	247.9	0.17	248.9	0.23	247.6	0.3	247.8	0.35	247.2	0.38	247.7	0.39	248.9
350	0.11	223	0.16	269.3	0.21	268.2	0.27	247.1	0.33	247.5	0.34	247.3	0.36	248.7
800	0.13	248.1	0.12	246.7	0.1	293.7	0.12	248.1	0.13	247.7	0.16	270.1	0.17	266.7
1200	0.07	270.4	0.09	249.4	0.11	247.7	0.12	223.7	0.12	247.5	0.1	270.1	0.13	248.1
1600	0.08	248.5	0.08	246.1	0.08	269.8	0.1	225.3	0.11	249	0.09	227.4	0.11	203.4
1800	0.05	157.2	0.09	247.2	0.09	245.8	0.11	249.2	0.08	270.9	0.1	202.3	0.06	269
2150	0.06	68.6	0.08	90	0.08	135.6	0.11	67	0.12	45.1	0.06	46.7	0.06	19.5
2200	0.05	1.7	0.05	359.9	0.04	43.7	0.06	18.8	0.07	18.3	0.05	0.3	0.06	21.1
Sum	97		237		218		336		287		192		123	
Perc	0.63%		1.55%		1.42%		2.19%		1.87%		1.25%		0.80%	

	0.70		0.80		0.90		1.00		
	0.80		0.90		1.00		1.10		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.77**	**247.2**	**0.86**	**246.1**	**0.95**	**249.4**	**1.04**	**245.1**	
100	0.77	248.8	0.84	245.3	0.92	248.9	1.02	242.4	
150	0.72	247.7	0.71	246.3	0.77	247.7	0.85	238.7	
200	0.62	246.9	0.6	246.8	0.75	252.3	0.54	232	
250	0.53	247	0.49	245.7	0.62	252.5	0.52	230.3	
300	0.44	245.9	0.47	246.4	0.53	251.5	0.42	230.7	
350	0.41	246.9	0.42	247.6	0.46	250.6	0.36	228.5	
800	0.15	249	0.11	159.6	0.22	230.1	0.07	179.6	
1200	0.14	246.9	0.09	224.5	0.15	247.3	0.05	227.6	
1600	0.11	244.5	0.1	247.3	0.11	248.6	0.12	250.2	
1800	0.1	224.3	0.1	225.2	0.13	243.9	0.08	193.7	
2150	0.09	46.1	0.15	67.8	0.16	225.6	0.08	132.1	
2200	0.05	20.7	0.04	22.3	0.04	315.6	0.03	91.8	
Sum	106		72		37		4	Tot.Dir	1709
Perc	0.69%		0.47%		0.24%		0.03%		11.16%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.13 Current Profile (m/s) for Fatigue Analysis with W Direction at surface

	0.00		0.10		0.20		0.30		0.40		0.50		0.60	
	0.10		0.20		0.30		0.40		0.50		0.60		0.70	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	**0.09**	**269.8**	**0.17**	**269.5**	**0.27**	**269.9**	**0.37**	**270.3**	**0.46**	**267.9**	**0.57**	**266.8**	**0.66**	**266.4**
100	0.13	270	0.2	268.7	0.28	271	0.37	269.4	0.49	266.6	0.58	267.3	0.66	268.2
150	0.15	271.3	0.2	268.9	0.29	270.3	0.36	269.7	0.53	267.8	0.58	267.7	0.62	268.2
200	0.16	269.3	0.18	270.9	0.24	270.5	0.34	270.5	0.46	266.9	0.46	267.9	0.51	269
250	0.16	250.2	0.17	270	0.24	270.3	0.33	269.9	0.45	269	0.49	270.1	0.5	269.7
300	0.15	270.3	0.15	269.7	0.21	270.3	0.28	270.4	0.43	268.8	0.36	250.3	0.43	270.6
350	0.11	249.9	0.14	270.5	0.19	268	0.27	271.6	0.41	269.8	0.36	250.4	0.4	269.8
800	0.13	245	0.13	270.1	0.12	293.5	0.14	271.9	0.14	271	0.14	290.1	0.15	274
1200	0.07	243.8	0.09	269.4	0.12	248.2	0.1	247.4	0.12	246.2	0.1	289.3	0.11	289.1
1600	0.07	246.1	0.09	245.7	0.09	224.4	0.11	224.6	0.1	268.5	0.08	287.6	0.08	337.2
1800	0.12	270.4	0.07	223.8	0.08	155.6	0.07	180.4	0.1	266.7	0.05	67.9	0.07	64.8
2150	0.07	246.8	0.08	44.6	0.1	65.7	0.07	66.4	0.1	65.3	0.16	65.3	0.09	24.8
2200	0.05	0.7	0.04	357.7	0.04	91	0.05	22.4	0.07	18.7	0.07	20.9	0.07	17.1
Sum	97		288		254		244		161		94		60	
Perc	0.63%		1.88%		1.66%		1.59%		1.05%		0.61%		0.39%	

	0.70		0.80		0.90		1.00		
	0.80		0.90		1.00		1.10		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.76**	**267.4**	**0.85**	**266.9**	**0.95**	**273.6**	**1.02**	**280.7**	
100	0.75	268.4	0.85	265.5	0.93	274.2	0.98	278.8	
150	0.69	270.3	0.82	264.6	0.8	270.7	0.79	282.8	
200	0.55	270.6	0.71	266.2	0.7	271.2	0.64	281.7	
250	0.52	270.1	0.66	268	0.56	273.4	0.49	280.7	
300	0.54	267.2	0.56	267	0.47	286	0.48	280.4	
350	0.45	267.3	0.48	269.6	0.43	286.9	0.4	281	
800	0.14	273.5	0.13	274.1	0.17	273.9	0.15	319	
1200	0.06	85.5	0.11	315.5	0.14	250.3	0.1	233.2	
1600	0.08	114.1	0.1	221	0.11	252.7	0.11	236.3	
1800	0.11	43.2	0.11	266	0.13	110.1	0.05	48.6	
2150	0.09	94.2	0.15	85.2	0.14	95.1	0.1	49.7	
2200	0.07	20.1	0.06	21.5	0.04	113.6	0.03	101.3	
Sum	31		18		15		1	Tot.Dir	1263
Perc	0.20%		0.12%		0.10%		0.01%		8.25%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.14 Current Profile (m/s) for Fatigue Analysis with WNW Direction at surface

	0.00		0.10		0.20		0.30		0.40		0.50		0.60	
	0.10		0.20		0.30		0.40		0.50		0.60		0.70	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	**0.09**	**292.9**	**0.17**	**291.6**	**0.27**	**292**	**0.36**	**291.7**	**0.47**	**293.6**	**0.57**	**294.3**	**0.65**	**292**
100	0.18	292.7	0.22	291.8	0.3	292.3	0.43	292.5	0.53	293.1	0.56	291.7	0.59	292.7
150	0.23	291.6	0.2	270.1	0.3	293.1	0.45	294	0.51	293.3	0.47	292.4	0.58	293.9
200	0.21	271.8	0.2	292.3	0.24	292.7	0.37	291.8	0.41	294	0.39	293.6	0.51	292.2
250	0.17	268.9	0.14	290.7	0.21	292	0.34	291.4	0.28	312.8	0.47	271.3	0.41	271.7
300	0.19	269.4	0.15	271.7	0.21	292.8	0.3	289.8	0.23	314.4	0.37	272.1	0.37	289.3
350	0.13	288.9	0.15	269.3	0.19	292.6	0.23	291.8	0.24	313.9	0.28	291.8	0.32	272.2
800	0.11	291.9	0.1	293.3	0.1	317.8	0.11	315.6	0.13	336.7	0.11	266	0.14	246.9
1200	0.08	227.1	0.11	248.5	0.08	291.9	0.1	289.6	0.05	289.1	0.05	20.7	0.09	67.7
1600	0.07	248	0.09	247	0.09	66.8	0.08	68.3	0.09	46.6	0.08	112.1	0.07	88.5
1800	0.1	271.3	0.07	158.6	0.09	157.1	0.11	90.5	0.05	158.6	0.05	67.9	0.07	161
2150	0.09	335.7	0.08	89.5	0.09	67.4	0.11	89	0.07	65.9	0.08	68.6	0.07	65
2200	0.04	18.2	0.05	21.3	0.04	66.7	0.04	43.2	0.04	66.7	0.03	44.6	0.04	46.6
Sum	84		255		261		182		142		105		68	
Perc	0.55%		1.67%		1.70%		1.19%		0.93%		0.69%		0.44%	

	0.70		0.80		0.90		1.00		
	0.80		0.90		1.00		1.10		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.76**	**296.2**	**0.86**	**296.4**	**0.96**	**291.6**	**1.06**	**285.7**	
100	0.77	294.2	0.84	295.6	0.9	290.5	0.9	282.2	
150	0.69	289.1	0.75	294.2	0.73	289.8	0.81	276.2	
200	0.56	296.3	0.65	293.6	0.62	292.6	0.66	279.3	
250	0.37	313.7	0.58	292.6	0.58	290.1	0.6	274.8	
300	0.4	297.4	0.5	290.2	0.55	286.1	0.56	277.7	
350	0.45	295.8	0.47	290.8	0.49	278.2	0.48	275.6	
800	0.17	244.9	0.16	293.7	0.18	295.6	0.11	313.7	
1200	0.09	271.3	0.05	339.6	0.08	247.5	0.12	272.4	
1600	0.12	73.2	0.05	338.6	0.08	268.9	0.11	225.2	
1800	0.06	67.1	0.09	113.4	0.07	107.4	0.04	179.7	
2150	0.06	44.9	0.1	89	0.12	88.9	0.04	87	
2200	0.05	43.2	0.05	65.6	0.07	64.4	0.05	42	
Sum	25		43		23		9	Tot.Dir	1197
Perc	0.16%		0.28%		0.15%		0.06%		7.82%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.15 Current Profile (m/s) for Fatigue Analysis with NW Direction at surface

	0.00		**0.10**		**0.20**		**0.30**		**0.40**		**0.50**		**0.60**	
	0.10		**0.20**		**0.30**		**0.40**		**0.50**		**0.60**		**0.70**	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	**0.08**	**315.2**	**0.17**	**314.3**	**0.27**	**313.7**	**0.36**	**314.5**	**0.46**	**312.4**	**0.57**	**314.7**	**0.65**	**315.2**
100	0.14	294.8	0.17	314	0.31	314.6	0.39	314.6	0.47	313.3	0.56	314.6	0.61	314.5
150	0.15	270.9	0.17	294.1	0.29	312.5	0.33	314.8	0.37	316.9	0.52	315.1	0.56	314.3
200	0.17	270.8	0.18	294.9	0.27	314.6	0.3	315.4	0.36	314.5	0.42	314.7	0.46	314.5
250	0.16	290.4	0.15	271.6	0.24	316.4	0.26	313.6	0.33	312.6	0.39	313.6	0.39	314
300	0.13	268.5	0.12	292.4	0.22	314	0.26	313.9	0.3	313.6	0.36	314	0.3	309.9
350	0.13	269.9	0.13	267.7	0.19	316.5	0.23	293.3	0.32	314.1	0.34	312.9	0.29	314.1
800	0.07	67.5	0.09	291.9	0.12	338.7	0.11	335.9	0.13	292	0.12	313.9	0.15	293.8
1200	0.08	271.6	0.07	246.6	0.08	336.7	0.09	294.1	0.12	268.1	0.09	270.2	0.09	44.2
1600	0.09	112.9	0.12	68.4	0.09	88.8	0.07	90.5	0.11	109.9	0.1	87.8	0.12	108.4
1800	0.06	289.8	0.07	157.4	0.07	155.6	0.12	111.7	0.09	160.4	0.08	89.7	0.13	109.4
2150	0.08	68.8	0.07	111.1	0.08	91.9	0.1	69.7	0.12	68.1	0.11	86.9	0.13	90.3
2200	0.04	24.1	0.04	47.1	0.04	64.4	0.05	67.5	0.05	46.3	0.05	46.2	0.06	88.3
Sum	82		169		148		126		64		57		48	
Perc	0.54%		1.10%		0.97%		0.82%		0.42%		0.37%		0.31%	

	0.70		**0.80**		**0.90**		**1.00**		
	0.80		**0.90**		**1.00**		**1.10**		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.77**	**313.7**	**0.84**	**309.7**	**0.93**	**310.4**	**1.03**	**308.3**	
100	0.71	311.4	0.74	310.7	0.89	302.1	0.83	299.4	
150	0.64	311.9	0.66	308.1	0.56	299.3	0.61	300.2	
200	0.52	310.1	0.6	295.8	0.5	297.1	0.5	294.4	
250	0.41	311.8	0.5	298.1	0.45	298.4	0.44	301.9	
300	0.4	314	0.51	296.9	0.42	296.5	0.43	307.1	
350	0.35	310.6	0.45	293.1	0.4	293	0.35	296.6	
800	0.08	317	0.17	245.2	0.23	265.7	0.21	266.3	
1200	0.17	42.8	0.07	293.5	0.11	218.8	0.14	208	
1600	0.12	68.2	0.09	68.8	0.15	95.6	0.1	104.8	
1800	0.1	134.6	0.06	109.3	0.13	107.9	0.11	138.2	
2150	0.07	69.9	0.08	89	0.12	108.4	0.12	123.5	
2200	0.04	70.7	0.04	93.2	0.05	42.7	0.05	78.7	
Sum	29		20		8		3	Tot.Dir	754
Perc	0.19%		0.13%		0.05%		0.02%		4.92%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.16 Current Profile (m/s) for Fatigue Analysis with NNW Direction at surface

	0.00		0.10		0.20		0.30		0.40		0.50		0.60	
	0.10		0.20		0.30		0.40		0.50		0.60		0.70	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	**0.08**	**337.7**	**0.18**	**337.5**	**0.27**	**337.1**	**0.37**	**335.9**	**0.47**	**337**	**0.55**	**340.6**	**0.66**	**334.2**
100	0.13	316.6	0.17	337.2	0.25	316.8	0.38	334.1	0.43	337.1	0.55	337.4	0.5	337.4
150	0.18	314.2	0.18	336.6	0.28	316.2	0.28	319.5	0.37	337.1	0.42	334.7	0.48	338.7
200	0.18	246.6	0.16	339	0.3	314.6	0.27	336.7	0.33	356.3	0.38	339.4	0.48	335.5
250	0.14	291.5	0.13	359.9	0.33	292.6	0.22	337.5	0.28	338.9	0.32	339.4	0.32	337.8
300	0.13	291.6	0.12	357	0.19	314.6	0.23	336.1	0.26	318.8	0.31	334.7	0.22	318.4
350	0.1	0.2	0.12	338.7	0.13	338.2	0.2	314	0.23	314.5	0.25	358.4	0.26	337.9
800	0.09	90.6	0.09	337.5	0.07	314.7	0.16	335.3	0.15	1.6	0.15	359.3	0.12	336.3
1200	0.11	110.8	0.1	90.1	0.09	228.9	0.12	316.9	0.15	1.8	0.11	70.7	0.06	90.2
1600	0.08	71.2	0.09	67.4	0.1	68.6	0.11	67	0.12	112.1	0.13	91.8	0.14	93.4
1800	0.06	155.4	0.08	156.3	0.07	131.1	0.08	112.5	0.1	133.1	0.12	114.5	0.07	66.1
2150	0.08	48.1	0.08	23.8	0.11	90.8	0.09	88.5	0.1	89.2	0.12	112.8	0.1	65.1
2200	0.06	2.7	0.04	359.2	0.03	113.8	0.04	90.5	0.05	44.6	0.05	67.3	0.04	90.8
Sum	76		145		94		65		49		42		18	
Perc	0.50%		0.95%		0.61%		0.42%		0.32%		0.27%		0.12%	

	0.70		0.80		0.90		
	0.80		0.90		1.00		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	**0.76**	**342**	**0.84**	**339.5**	**0.9**	**338.3**	
100	0.63	340.9	0.58	342.8	0.56	343	
150	0.48	341.1	0.34	339.1	0.31	334.5	
200	0.44	340.3	0.21	1.7	0.23	20.3	
250	0.38	338.8	0.3	359.7	0.27	3.3	
300	0.34	343.4	0.35	344	0.23	3.6	
350	0.29	340.6	0.24	342.5	0.23	357.7	
800	0.16	1	0.08	72.1	0.04	47.8	
1200	0.16	93	0.17	308	0.15	80.1	
1600	0.15	47.1	0.13	90	0.14	75.9	
1800	0.12	110	0.11	97.8	0.06	117.6	
2150	0.14	89.2	0.1	70.6	0.07	113.1	
2200	0.06	46.9	0.04	31.3	0.02	79.7	
Sum	27		12		1	Tot.Dir	529
Perc	0.18%		0.08%		0.01%		3.46%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.17 Current Profile (m/s) for Fatigue Analysis with N Direction at 800m

	0.05		0.10		0.15		0.20		0.25		0.30		0.35		
	0.10		0.15		0.20		0.25		0.30		0.35		0.40		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.41	358	0.25	0.1	0.19	132.4	0.49	315	0.28	293.8	0.2	266.9	0.22	294.9	
100	0.4	332.9	0.17	43.9	0.13	158.1	0.18	159.3	0.35	293.2	0.31	318.6	0.22	284.6	
150	0.19	319.8	0.36	331.8	0.25	130.9	0.2	313.1	0.2	315	0.14	293.9	0.12	298.6	
200	0.3	335.2	0.31	336.5	0.34	131.4	0.18	297	0.17	314.8	0.17	312.7	0.16	288.9	
250	0.29	340.2	0.27	341.2	0.33	115	0.22	93.1	0.17	315.8	0.17	315	0.12	317.4	
300	0.12	47.2	0.27	335.6	0.18	335.6	0.18	314.7	0.16	315.7	0.16	336.5	0.16	336.5	
350	0.11	357.3	0.27	338.5	0.34	115.3	0.16	316	0.16	316	0.16	337.8	0.18	338.6	
800	**0.09**	**18.8**	**0.14**	**357.2**	**0.2**	**1.1**	**0.24**	**341.4**	**0.29**	**344.1**	**0.33**	**343.3**	**0.37**	**344.2**	
1200	0.19	298.1	0.21	68.7	0.14	0.2	0.16	338	0.18	339.7	0.18	357.2	0.17	336.2	
1600	0.27	85.1	0.15	90.2	0.1	111.1	0.06	67.2	0.08	247.5	0.09	269.8	0.05	196.2	
1800	0.12	129.9	0.14	135	0.07	42.9	0.04	181	0.07	135.9	0.09	135.8	0.06	130.6	
2150	0.14	0.5	0.13	113.7	0.09	44.2	0.12	46.3	0.07	24.3	0.08	65.7	0.06	87.6	
2200	0.04	69.3	0.05	89.4	0.05	69.1	0.05	43.9	0.04	44	0.04	68.4	0.04	66.7	
Sum	11		18		39		94		86		50		4	Tot.Dir	302
Perc	0.07%		0.12%		0.25%		0.61%		0.56%		0.33%		0.03%		1.97%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.18 Current Profile (m/s) for Fatigue Analysis with NE Direction at 800m

	0.00		0.05		0.10		0.15		0.20		0.25		
	0.05		0.10		0.15		0.20		0.25		0.30		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.71	319.8	0.48	340.4	0.24	44.9	0.22	70.6	0.16	204.3	0.38	284.4	
100	0.43	316.2	0.39	335.5	0.24	64.8	0.24	65.8	0.15	221.8	0.38	273.4	
150	0.3	314.5	0.34	329.3	0.21	66.2	0.22	64.4	0.16	226.8	0.32	294.4	
200	0.19	335.3	0.34	333.9	0.21	68.5	0.23	45.3	0.13	201.5	0.27	312.6	
250	0.19	329.4	0.31	339.3	0.21	46.8	0.16	64	0.1	202.1	0.22	291.4	
300	0.3	331.7	0.3	332.6	0.19	46.2	0.16	62	0.12	202.3	0.2	248.7	
350	0.29	336.3	0.32	0	0.15	48.3	0.15	44.9	0.09	203.4	0.17	295.6	
800	**0.04**	**55**	**0.09**	**29.7**	**0.14**	**39.3**	**0.2**	**41.9**	**0.22**	**44.2**	**0.26**	**48.3**	
1200	0.18	62.6	0.2	78.3	0.22	67.4	0.22	87.1	0.11	67.7	0.11	74.7	
1600	0.12	62.3	0.25	88.5	0.11	88.1	0.11	63.4	0.06	41.4	0.04	40.4	
1800	0.03	29.5	0.12	116.9	0.11	153.6	0.09	111.8	0.06	154.9	0.04	337.7	
2150	0.04	43.4	0.1	110	0.1	136	0.1	90.5	0.07	68.3	0.06	44.6	
2200	0.04	12.7	0.04	97.3	0.05	90	0.05	69.6	0.04	63.5	0.03	47.3	
Sum	1		3		26		25		55		6	Tot.Dir	116
Perc	0.01%		0.02%		0.17%		0.16%		0.36%		0.04%		0.76%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.19 Current Profile (m/s) for Fatigue Analysis with E Direction at 800m

	0.00		0.05		0.10		0.15		0.20		0.25		0.30		
	0.05		0.10		0.15		0.20		0.25		0.30		0.35		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.05	161	0.3	184.1	0.33	181.3	0.41	157	0.45	160.8	0.35	308.9	0.28	281.5	
100	0.09	356.2	0.37	173.8	0.33	177.8	0.43	180.4	0.47	160.7	0.35	310	0.27	272.1	
150	0.03	273.5	0.36	217.7	0.29	158.7	0.47	177.4	0.39	157.4	0.33	298.1	0.34	298.4	
200	0.08	79.9	0.38	196.2	0.31	136.4	0.22	92.9	0.33	161.6	0.34	313.5	0.34	310.4	
250	0.06	15.3	0.25	203.5	0.31	136	0.18	88.6	0.32	201	0.29	314.8	0.24	303.6	
300	0.04	63	0.27	195.3	0.25	134.5	0.34	183.4	0.25	156.7	0.29	319.6	0.21	298.6	
350	0.01	112.8	0.19	176.5	0.17	133	0.25	155.1	0.23	111.4	0.25	319.2	0.16	299.8	
800	**0.05**	**81**	**0.1**	**106.5**	**0.14**	**94.1**	**0.2**	**93.2**	**0.22**	**109.6**	**0.27**	**83.5**	**0.31**	**79.3**	
1200	0.18	86.8	0.2	91.1	0.22	111.6	0.21	88	0.24	86.7	0.08	2.8	0.03	273.4	
1600	0.07	75.9	0.14	87.3	0.18	91.3	0.14	91.2	0.15	90.4	0.06	88.8	0.05	58.3	
1800	0.06	237.3	0.09	110.9	0.1	153.2	0.06	111	0.08	220.1	0.05	331.4	0.04	307.7	
2150	0.02	179.4	0.1	85.8	0.12	68.6	0.09	70.2	0.09	87.5	0.08	21.4	0.04	14.6	
2200	0.04	76	0.06	84.8	0.05	95.2	0.05	65.2	0.05	68.7	0.03	16.3	0.02	2.7	
Sum	1		11		32		41		24		6		1	Tot.Dir	116
Perc	0.01%		0.07%		0.21%		0.27%		0.16%		0.04%		0.01%		0.76%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.20 Current Profile (m/s) for Fatigue Analysis with SE Direction at 800m

	0.05		0.10		0.15		0.20		0.25		0.30		
	0.10		0.15		0.20		0.25		0.30		0.35		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.34	180.5	0.4	181.9	0.51	161.2	0.55	198.4	0.5	183	0.28	276.3	
100	0.46	207.5	0.29	161	0.36	156.4	0.52	181.8	0.4	178.8	0.12	261.7	
150	0.36	206.4	0.15	229	0.48	156.5	0.53	200.5	0.29	178.1	0.23	287.1	
200	0.44	198.8	0.42	182.1	0.41	158	0.47	201.5	0.25	158.8	0.24	276.5	
250	0.31	206.4	0.4	181.1	0.34	154.5	0.27	178.9	0.25	159.3	0.18	277	
300	0.3	202.3	0.4	182.9	0.29	156.8	0.26	157.5	0.24	159	0.17	266.1	
350	0.21	226.5	0.3	181.6	0.24	136.7	0.27	181	0.24	157	0.08	220.3	
800	**0.1**	**134.4**	**0.14**	**117.5**	**0.2**	**136.7**	**0.24**	**135.6**	**0.28**	**141.7**	**0.32**	**154.1**	
1200	0.19	112	0.19	108.8	0.19	111.5	0.17	112.2	0.17	117.3	0.16	145.7	
1600	0.15	85.2	0.16	111.2	0.16	90.4	0.14	69.4	0.17	94.7	0.1	247.2	
1800	0.12	274.6	0.1	111.9	0.11	114.5	0.1	111.2	0.1	133.9	0.08	252.3	
2150	0.08	85.9	0.1	88.7	0.09	67.9	0.11	87.7	0.11	111.8	0.06	56.9	
2200	0.04	25.5	0.05	110.7	0.05	89.3	0.05	65.3	0.05	134.4	0.01	315.2	
Sum	9		36		64		103		51		4	Tot.Dir	267
Perc	0.06%		0.24%		0.42%		0.67%		0.33%		0.03%		1.74%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.21 Current Profile (m/s) for Fatigue Analysis with S Direction at 800m

	0.05		0.10		0.15		0.20		0.25	
	0.10		0.15		0.20		0.25		0.30	
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.
50	0.54	181.3	0.61	250	0.68	225.7	0.66	225.9	0.64	244.4
100	0.44	188.7	0.56	251	0.67	225.4	0.61	225.4	0.56	227.6
150	0.4	182.7	0.8	222	0.57	225.8	0.55	225.1	0.52	226.5
200	0.45	186.7	0.54	225	0.43	244.3	0.46	224.1	0.38	225.6
250	0.45	177.1	0.37	223.4	0.39	225.6	0.41	225.4	0.33	223.5
300	0.41	174.1	0.42	222.8	0.32	221.9	0.33	224.9	0.32	225.1
350	0.34	184.8	0.39	222	0.3	224.7	0.32	225.8	0.33	221.8
800	**0.1**	**165**	**0.15**	**183.2**	**0.2**	**179.7**	**0.23**	**179.8**	**0.28**	**180**
1200	0.2	270.8	0.24	153.8	0.3	178.5	0.29	178.4	0.27	179.9
1600	0.13	238.7	0.18	247.1	0.16	227.5	0.13	202.8	0.15	201.8
1800	0.1	131	0.19	143.1	0.11	202.5	0.13	246.7	0.08	248.6
2150	0.08	117.7	0.16	46.2	0.12	116.1	0.12	91.6	0.12	24.9
2200	0.04	110.4	0.04	352.4	0.04	359.4	0.03	0.9	0.06	21.5
Sum	2		22		64		181		111	
Perc	0.01%		0.14%		0.42%		1.18%		0.72%	

	0.30		0.35		0.40		
	0.35		0.40		0.45		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.86	225.4	0.85	226.2	0.85	229.4	
100	0.81	225.7	0.78	228.7	0.79	227.5	
150	0.72	226.7	0.56	223.1	0.67	226.8	
200	0.61	226.5	0.58	228.9	0.56	223.8	
250	0.49	225.6	0.48	224.1	0.52	222.4	
300	0.23	180.1	0.45	222.1	0.42	217.3	
350	0.4	223	0.21	177.1	0.42	211.3	
800	**0.34**	**164.8**	**0.37**	**179.9**	**0.44**	**187.9**	
1200	0.17	200.1	0.2	179.8	0.18	184.5	
1600	0.1	248.4	0.16	218.1	0.11	240.7	
1800	0.11	265.3	0.11	191.7	0.1	184.6	
2150	0.09	294.7	0.11	286.3	0.15	265.7	
2200	0.03	92.7	0.04	158.4	0.02	183.3	
Sum	22		3		5	Tot.Dir	410
Perc	0.14%		0.02%		0.03%		2.68%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.22 Current Profile (m/s) for Fatigue Analysis with SW Direction at 800m

	0.00		0.05		0.10		0.15		0.20		0.25		0.30		
	0.05		0.10		0.15		0.20		0.25		0.30		0.35		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.35	298.8	0.76	225.1	0.7	222.7	0.67	226.4	0.78	223	0.58	201	0.59	207.6	
100	0.37	300.5	0.41	247.1	0.65	224	0.67	225.8	0.76	222.6	0.58	203	0.58	209.1	
150	0.31	300.2	0.46	252.3	0.67	223.3	0.65	225.5	0.72	223.1	0.68	222.2	0.5	207.9	
200	0.29	311.2	0.48	250	0.52	222.6	0.58	226.7	0.62	223.6	0.59	223.1	0.47	197.6	
250	0.21	320.4	0.48	251.6	0.44	222	0.46	226.5	0.57	224	0.47	204.1	0.41	203.8	
300	0.22	306.2	0.56	254.4	0.36	208.6	0.4	225.1	0.48	225.4	0.4	200.7	0.37	194.9	
350	0.13	313.1	0.38	270.8	0.33	223.8	0.38	224	0.47	225.9	0.52	225.1	0.32	200.5	
800	**0.02**	**226.7**	**0.1**	**238.7**	**0.14**	**224.4**	**0.2**	**224.2**	**0.23**	**208.2**	**0.29**	**226.7**	**0.31**	**222.8**	
1200	0.19	173.1	0.19	211.2	0.2	202.4	0.21	204.3	0.17	201	0.18	200.7	0.15	200.3	
1600	0.12	65.9	0.13	213.7	0.18	156	0.14	249.5	0.13	199	0.1	201.5	0.09	240.3	
1800	0.13	89.9	0.12	223.9	0.11	202.2	0.11	250.3	0.11	248.3	0.12	247	0.09	243.8	
2150	0.11	90	0.08	20.7	0.08	292.5	0.1	201.7	0.1	246.9	0.1	243.3	0.09	249.2	
2200	0.05	74.6	0.03	158.4	0.05	3.7	0.03	250.4	0.05	20.8	0.04	316.2	0.04	235.2	
Sum	2		5		19		63		90		24		4	Tot.Dir	207
Perc	0.01%		0.03%		0.12%		0.41%		0.59%		0.16%		0.03%		1.35%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.23 Current Profile (m/s) for Fatigue Analysis with W Direction at 800m

	0.00		0.05		0.10		0.15		0.20		0.25		0.30		
	0.05		0.10		0.15		0.20		0.25		0.30		0.35		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.2	318.2	0.85	250.6	0.62	221.6	0.61	252.1	0.76	242.2	0.77	240.5	0.66	307.6	
100	0.34	307	0.31	297.2	0.6	222.9	0.61	221.4	0.74	244.8	0.78	243	0.6	318.2	
150	0.32	311.5	0.23	296.7	0.56	261.7	0.37	254.1	0.64	248.6	0.65	240.9	0.54	318.3	
200	0.26	315.6	0.56	252.3	0.43	256.7	0.48	249.2	0.59	248.4	0.64	240.3	0.44	314.3	
250	0.27	317.7	0.5	255.2	0.52	217.2	0.41	221.3	0.54	245.8	0.58	241.1	0.41	320.3	
300	0.21	310	0.18	317.6	0.43	221.2	0.3	250.6	0.47	247.2	0.56	243.2	0.41	320.1	
350	0.18	313.6	0.41	253.8	0.28	267	0.22	246.7	0.46	245.7	0.46	245.5	0.41	316.7	
800	**0.04**	**263.9**	**0.09**	**272.6**	**0.15**	**266.4**	**0.2**	**268.7**	**0.23**	**266.7**	**0.28**	**265.5**	**0.34**	**263.2**	
1200	0.18	159.4	0.19	251.1	0.19	249.7	0.16	247.3	0.15	267.4	0.1	312	0.11	100	
1600	0.11	81.4	0.07	249.5	0.11	185	0.09	250.6	0.1	295.1	0.14	66.4	0.12	108	
1800	0.11	70.7	0.17	241.4	0.17	225.7	0.1	227.5	0.06	134.6	0.15	93.3	0.16	94.3	
2150	0.17	89.5	0.11	109.4	0.04	174.8	0.1	50	0.12	22.1	0.13	47.7	0.18	87.5	
2200	0.05	65.3	0.04	92.1	0.03	199.1	0.09	19.4	0.07	20.8	0.06	71.1	0.04	83.8	
Sum	6		7		9		36		86		13		4	Tot.Dir	161
Perc	0.04%		0.05%		0.06%		0.24%		0.56%		0.08%		0.03%		1.05%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.24 Current Profile (m/s) for Fatigue Analysis with NW Direction at 800m

	0.05		**0.10**		**0.15**		**0.20**		**0.25**		**0.30**		**0.35**		
	0.10		**0.15**		**0.20**		**0.25**		**0.30**		**0.35**		**0.40**		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.67	347.1	0.3	345	0.28	294.9	0.41	246.4	0.26	317.3	0.32	319.8	0.17	280.3	
100	0.28	339.1	0.37	267	0.63	298	0.33	248.7	0.22	317.3	0.27	292.9	0.19	267.5	
150	0.3	319.8	0.21	314.7	0.46	313	0.33	266.7	0.23	316.7	0.24	315.1	0.11	278.9	
200	0.26	333.3	0.17	321	0.28	273	0.23	293.7	0.23	293.6	0.2	314.3	0.1	286.4	
250	0.14	317.8	0.15	330.6	0.43	291.7	0.19	292	0.19	293.4	0.17	312.5	0.1	304.8	
300	0.09	18.4	0.19	259.8	0.37	293.3	0.25	268.7	0.2	293.2	0.19	313.7	0.11	321.9	
350	0.1	322.1	0.2	275.3	0.2	272.6	0.2	269.2	0.17	292.9	0.19	292.9	0.14	324.4	
800	**0.09**	**333.7**	**0.15**	**299.8**	**0.2**	**315.9**	**0.24**	**315.1**	**0.29**	**332.2**	**0.33**	**333.2**	**0.36**	**337**	
1200	0.22	314.8	0.2	18.5	0.14	319.7	0.15	336.4	0.19	340.2	0.19	340.7	0.17	343.4	
1600	0.07	288.5	0.15	46.3	0.11	69.7	0.11	135.4	0.08	205	0.15	128.7	0.01	129.5	
1800	0.13	117.2	0.09	145.6	0.17	112.4	0.11	114.9	0.12	157.1	0.09	156.9	0.04	101.9	
2150	0.12	114.8	0.08	117	0.09	45.4	0.13	87.4	0.11	136.5	0.08	111	0.08	71.6	
2200	0.04	90.7	0.06	74.4	0.04	110.6	0.07	66.8	0.04	67.2	0.05	68.5	0.04	93.2	
Sum	9		4		20		81		87		34		1	Tot.Dir	236
Perc	0.06%		0.03%		0.13%		0.53%		0.57%		0.22%		0.01%		1.54%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.25 Current Profile (m/s) for Fatigue Analysis with N Direction at 1800 m

	0.00		0.05		0.10		0.15		
	0.05		0.10		0.15		0.20		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.43	175.8	0.54	269.5	0.44	246.8	0.54	268.9	
100	0.17	181.6	0.48	337.7	0.45	248.2	0.53	267.9	
150	0.21	338.4	0.36	335.8	0.47	248.1	0.58	264	
200	0.18	177.2	0.36	330.9	0.53	238.4	0.55	266.9	
250	0.19	84.9	0.31	340.1	0.57	240.7	0.52	265	
300	0.24	90.9	0.3	336.4	0.55	238.7	0.52	232.1	
350	0.16	87.7	0.24	333.2	0.52	234.3	0.48	236	
800	0.17	338	0.15	90	0.19	136	0.16	283.5	
1200	0.11	92	0.14	113.1	0.07	318	0.06	337.5	
1600	0.16	79.3	0.17	91	0.04	345.5	0.05	33	
1800	**0.04**	**14.7**	**0.08**	**16.4**	**0.15**	**2.7**	**0.16**	**9**	
2150	0.08	20.9	0.1	23.8	0.16	56	0.13	64	
2200	0.06	26	0.04	107.5	0.07	18.5	0.05	19.3	
Sum	7		9		6		2	Tot.Dir	24
Perc	0.05%		0.06%		0.04%		0.01%		0.16%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.26 Current Profile (m/s) for Fatigue Analysis with NE Direction at 1800 m

	0.00		0.05		0.10		0.15		
	0.05		0.10		0.15		0.20		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.45	181	0.43	335.9	0.36	246.2	0.55	276.5	
100	0.36	344	0.48	338	0.43	337.9	0.58	275.1	
150	0.26	338.3	0.38	340.6	0.32	247.5	0.47	269.5	
200	0.25	182	0.37	358.6	0.31	3.6	0.41	251	
250	0.28	180.8	0.31	358.9	0.24	246.8	0.32	261.3	
300	0.23	180.1	0.3	332.8	0.19	7.6	0.18	273.7	
350	0.18	180.7	0.25	355	0.19	41.9	0.17	283.6	
800	0.14	136.6	0.13	47.4	0.15	38.8	0.11	0.5	
1200	0.15	90.2	0.13	88.1	0.09	3.3	0.14	42.4	
1600	0.18	93	0.18	88.7	0.17	67.7	0.18	66.4	
1800	**0.04**	**45.7**	**0.08**	**62.8**	**0.15**	**62.6**	**0.17**	**60.7**	
2150	0.09	45.4	0.11	47.2	0.15	46.2	0.17	45.1	
2200	0.05	25.1	0.06	67	0.07	64.3	0.12	20.3	
Sum	29		44		19		11	Tot.Dir	103
Perc	0.19%		0.29%		0.12%		0.07%		0.67%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.27 Current Profile (m/s) for Fatigue Analysis with E Direction at 1800 m

	0.00		0.05		0.10		0.15		0.20		
	0.05		0.10		0.15		0.20		0.25		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.38	183.2	0.44	179.8	0.42	338.2	0.3	312.3	0.29	315.8	
100	0.35	201.5	0.47	338.4	0.39	338.1	0.31	314.8	0.26	321.6	
150	0.4	201.5	0.42	337.9	0.39	335.8	0.37	336.2	0.34	330.6	
200	0.37	204.1	0.36	335.5	0.3	316.4	0.35	334.1	0.32	332.3	
250	0.27	201.2	0.29	180.6	0.23	315.3	0.31	333.8	0.23	335.8	
300	0.25	179.4	0.29	160.5	0.29	336.7	0.26	336.9	0.26	322.6	
350	0.17	182.3	0.24	158.8	0.27	340.1	0.24	337.4	0.24	342.1	
800	0.06	91.3	0.14	21.8	0.14	22.6	0.17	2	0.02	289.4	
1200	0.13	68.4	0.14	92.3	0.12	69.6	0.14	157.3	0.15	161.6	
1600	0.18	68.8	0.18	90.5	0.18	67.9	0.14	89.3	0.17	91.4	
1800	**0.04**	**89.1**	**0.08**	**90.6**	**0.13**	**89.6**	**0.17**	**107.1**	**0.23**	**106.4**	
2150	0.07	68.1	0.1	69.5	0.14	87.7	0.18	90.6	0.21	96.2	
2200	0.06	66.9	0.06	67.2	0.07	67.7	0.07	89.4	0.09	85.5	
Sum	35		143		119		57		2	Tot.Dir	356
Perc	0.23%		0.93%		0.78%		0.37%		0.01%		2.33%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.28 Current Profile (m/s) for Fatigue Analysis with SE Direction at 1800 m

	0.00		0.05		0.10		0.15		0.20		
	0.05		0.10		0.15		0.20		0.25		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.36	189.9	0.36	181.2	0.43	356.7	0.37	338.3	0.26	310.3	
100	0.38	206.6	0.33	201.2	0.39	338	0.42	338.7	0.21	321.4	
150	0.16	67.1	0.38	182.4	0.32	336	0.37	338.4	0.35	332	
200	0.27	181.1	0.31	199.3	0.3	340.2	0.29	336.7	0.25	330.8	
250	0.12	47.9	0.22	200.2	0.23	180.8	0.23	339.8	0.23	6.3	
300	0.22	197.8	0.21	179.8	0.25	339.1	0.27	338.4	0.26	330.5	
350	0.17	184.2	0.18	177.9	0.22	312.4	0.26	341.6	0.23	341.4	
800	0.14	113.5	0.14	114.3	0.15	116.9	0.15	132	0.17	4.1	
1200	0.12	92.1	0.14	89.5	0.16	88.5	0.13	45.7	0.17	152.9	
1600	0.17	91.3	0.18	89.9	0.18	91.3	0.18	86.9	0.15	90.4	
1800	**0.04**	**116**	**0.09**	**132.5**	**0.13**	**133**	**0.16**	**120.4**	**0.21**	**113.5**	
2150	0.07	90.2	0.09	111	0.13	113.2	0.17	112.4	0.19	113.9	
2200	0.05	73.6	0.06	67.3	0.04	89.2	0.06	112.6	0.06	115.4	
Sum	15		87		45		30		3	Tot.Dir	180
Perc	0.10%		0.57%		0.29%		0.20%		0.02%		1.18%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.29 Current Profile (m/s) for Fatigue Analysis with S Direction at 1800 m

	0.00		0.05		0.10		0.15		0.20		
	0.05		0.10		0.15		0.20		0.25		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.48	178.5	0.48	202.5	0.47	315.3	0.51	182.3	0.26	164.3	
100	0.36	194.6	0.47	200.2	0.5	311.5	0.34	181.2	0.21	178.5	
150	0.28	173	0.47	203.9	0.52	204.4	0.31	186	0.19	162	
200	0.32	188.3	0.36	200.7	0.48	316.7	0.27	181.5	0.18	148.4	
250	0.4	187.7	0.37	204.4	0.36	323	0.28	163.7	0.1	166.9	
300	0.24	202.3	0.15	245.7	0.41	316.4	0.25	156	0.11	139.9	
350	0.25	182.3	0.24	178.2	0.28	299.8	0.24	131.2	0.08	138.4	
800	0.1	116.5	0.14	114.6	0.15	289	0.13	153.6	0.17	155.7	
1200	0.13	93.7	0.1	91.1	0.16	69.9	0.1	180.5	0.08	190.3	
1600	0.19	75.5	0.16	114.1	0.22	85.3	0.12	109	0.07	246.3	
1800	**0.04**	**184.8**	**0.09**	**182.4**	**0.13**	**161.3**	**0.17**	**177**	**0.2**	**194.9**	
2150	0.03	100.2	0.06	179.1	0.11	153.4	0.14	157	0.19	190.1	
2200	0.04	1.7	0.05	67.8	0.05	133.3	0.05	158	0.04	211.3	
Sum	9		20		9		23		2	Tot.Dir	63
	0.06%		0.13%		0.06%		0.15%		0.01%		0.41%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.30 Current Profile (m/s) for Fatigue Analysis with SW Direction at 1800 m

	0.00		0.05		0.10		0.15		0.20		
	0.05		0.10		0.15		0.20		0.25		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.53	225	0.56	226.3	0.54	226.8	0.55	224.4	0.43	178.8	
100	0.05	51.4	0.27	202.5	0.31	247.9	0.52	225.4	0.33	164.6	
150	0.05	46.6	0.18	206.8	0.22	245.3	0.48	225	0.36	170.4	
200	0.35	204.6	0.41	206.2	0.5	227.7	0.44	225.7	0.4	158.4	
250	0.34	186.1	0.21	250.6	0.27	249.2	0.4	221.8	0.28	151.9	
300	0.24	92.3	0.31	274.9	0.36	227.2	0.36	220.9	0.18	153.5	
350	0.16	4.6	0.32	264.8	0.38	247.4	0.32	223.6	0.19	133	
800	0.19	358.5	0.12	248.3	0.15	256.1	0.16	179.6	0.14	172.2	
1200	0.07	130	0.12	202.5	0.15	242	0.13	203	0.11	134.2	
1600	0.17	113.2	0.16	223.1	0.19	229.4	0.14	225.2	0.1	199.8	
1800	**0.05**	**209.6**	**0.09**	**223.3**	**0.15**	**244.3**	**0.17**	**225.7**	**0.25**	**228.8**	
2150	0.12	169.3	0.09	241.8	0.14	244	0.14	204.1	0.18	226.4	
2200	0.02	48.2	0.05	316.2	0.07	318.9	0.07	242.4	0.05	267.6	
Sum	7		16		19		39		5	Tot.Dir	86
Perc	0.05%		0.10%		0.12%		0.25%		0.03%		0.56%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.31 Current Profile (m/s) for Fatigue Analysis with W Direction at 1800 m

	0.00		0.05		0.10		0.15		0.20		0.25		
	0.05		0.10		0.15		0.20		0.25		0.30		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.35	176.4	0.51	231.1	0.19	248.2	0.56	228.7	0.55	246.8	0.54	246.2	
100	0.41	170.2	0.49	237.9	0.19	248.3	0.56	228.3	0.61	231.2	0.57	240.4	
150	0.3	182.4	0.4	225.1	0.22	248.2	0.45	245.9	0.59	222.6	0.61	224.4	
200	0.31	178.1	0.39	233.1	0.25	250.3	0.68	232.5	0.53	228.4	0.53	227.2	
250	0.27	166.1	0.29	225.4	0.26	247.8	0.55	227.6	0.48	219.3	0.51	220.7	
300	0.26	156.4	0.33	229.5	0.38	243.2	0.39	224.7	0.37	224.8	0.4	224.9	
350	0.17	157.7	0.31	225.6	0.43	245.2	0.28	222.3	0.28	229.2	0.31	225.7	
800	0.12	196.9	0.11	267.1	0.14	252	0.13	252.5	0.13	265.7	0.09	274.2	
1200	0.11	177.4	0.13	307.2	0.11	246.2	0.11	251.1	0.05	256	0.05	209	
1600	0.15	117.1	0.15	249	0.16	270.1	0.11	270.7	0.11	294	0.07	274	
1800	**0.04**	**289**	**0.08**	**268.3**	**0.15**	**267.9**	**0.17**	**268.7**	**0.25**	**286**	**0.27**	**289.7**	
2150	0.05	1.3	0.09	268.1	0.13	313	0.14	293	0.13	318	0.11	294	
2200	0.04	58.4	0.04	354.7	0.08	319.5	0.1	16.7	0.07	15	0.06	13.9	
Sum	4		8		30		39		3		4	Tot.Dir	88
Perc	0.03%		0.05%		0.20%		0.25%		0.02%		0.03%		0.57%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.32 Current Profile (m/s) for Fatigue Analysis with NW Direction at 1800 m

	0.00		0.05		0.10		0.15		0.20		
	0.05		0.10		0.15		0.20		0.25		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.51	225.4	0.36	159.8	0.52	226.2	0.55	230	0.46	150.3	
100	0.5	223.2	0.34	163.2	0.56	225.8	0.57	229	0.48	239.9	
150	0.31	334.1	0.3	173.1	0.48	232.3	0.58	226.7	0.56	231.9	
200	0.27	180.5	0.25	183.6	0.49	229.8	0.5	205.1	0.52	234.6	
250	0.3	166.2	0.26	180.5	0.52	246.6	0.63	231.3	0.48	231.1	
300	0.24	163.4	0.18	185.9	0.27	197.5	0.53	229.2	0.38	227.9	
350	0.17	205.5	0.21	181.2	0.34	221.9	0.25	201.5	0.31	217.8	
800	0.06	230.6	0.17	131	0.18	149.4	0.11	247.7	0.15	155.9	
1200	0.15	7.9	0.16	98.8	0.15	269	0.16	133.9	0.17	155.3	
1600	0.15	118.3	0.17	265.8	0.17	251.4	0.09	241.9	0.08	251	
1800	**0.04**	**331.3**	**0.07**	**330.9**	**0.15**	**297.8**	**0.19**	**297**	**0.23**	**296.7**	
2150	0.06	3.8	0.1	3.2	0.12	315.2	0.16	315.5	0.19	314.5	
2200	0.04	69.9	0.06	24.3	0.05	1.7	0.1	15.2	0.09	353.9	
Sum	7		7		6		15		4	Tot.Dir	39
Perc	0.05%		0.05%		0.04%		0.10%		0.03%		0.25%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.33 Current Profile (m/s) for Fatigue Analysis with N Direction at 2150 m

	0.10		**0.15**		
	0.15		**0.20**		
Depth	Int.	Dir.	Int.	Dir.	
50	0.2	198.7	0.19	356.8	
100	0.18	222.3	0.18	357	
150	0.18	224.4	0.36	224.7	
200	0.2	227.2	0.24	225.3	
250	0.15	226.8	0.11	4.2	
300	0.16	248.7	0.14	270.4	
350	0.13	245.4	0.23	252.6	
800	0.07	155.9	0.07	359.6	
1200	0.07	135.1	0.12	289.4	
1600	0.07	271.3	0.06	4.3	
1800	0.11	339.4	0.11	83	
2150	**0.14**	**359.2**	**0.19**	**18**	
2200	0.06	21.4	0.09	18	
Sum	48		6	Tot.Dir	54
Perc	0.31%		0.04%		0.35%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.34 Current Profile (m/s) for Fatigue Analysis with NE Direction at 2150 m

	0.10		**0.15**		**0.20**		
	0.15		**0.20**		**0.25**		
Depth	Int.	Dir.	Int.	Dir.	Int.	Dir.	
50	0.22	23.7	0.21	22.1	0.2	20.4	
100	0.22	23.2	0.21	22.6	0.22	22.9	
150	0.19	1.3	0.24	22	0.18	342.3	
200	0.17	22.1	0.14	293.2	0.19	335.1	
250	0.15	23.7	0.15	0.2	0.15	334.1	
300	0.11	336.3	0.19	270.4	0.1	338.3	
350	0.11	336.8	0.11	357.8	0.06	333.8	
800	0.08	24.2	0.07	340.5	0.05	273.1	
1200	0.05	224	0.07	243.3	0.08	138.6	
1600	0.1	67.4	0.09	45.3	0.06	138.6	
1800	0.11	68.7	0.11	66.9	0.12	62.3	
2150	**0.14**	**45.8**	**0.18**	**47.5**	**0.22**	**39.8**	
2200	0.06	90	0.07	90.2	0.07	89.9	
Sum	146		70		11	Tot.Dir	227
Perc	0.95%		0.46%		0.07%		1.48%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.35 Current Profile (m/s) for Fatigue Analysis with E Direction at 2150 m

	0.10		**0.15**		
	0.15		**0.20**		
Depth	Int.	Dir.	Int.	Dir.	
50	0.22	227.1	0.24	228.7	
100	0.18	338.2	0.3	229.1	
150	0.16	339.3	0.27	245.2	
200	0.17	25	0.23	246.5	
250	0.17	273.9	0.26	248.9	
300	0.15	358.1	0.28	92.3	
350	0.23	87.6	0.19	200.8	
800	0.11	359	0.14	353.9	
1200	0.12	88.3	0.14	39.6	
1600	0.12	90.2	0.11	95.6	
1800	0.11	90.8	0.14	91	
2150	**0.13**	**89.4**	**0.16**	**91.7**	
2200	0.05	69.8	0.06	87.5	
Sum	82		12	Tot.Dir	94
Perc	0.54%		0.08%		0.61%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.36 Current Profile (m/s) for Fatigue Analysis with SE Direction at 2150 m

	0.10		**0.15**		
	0.15		**0.20**		
Depth	Int.	Dir.	Int.	Dir.	
50	0.23	289	0.17	334.2	
100	0.29	269.4	0.24	334.7	
150	0.23	248.9	0.22	342.2	
200	0.13	291.5	0.23	345	
250	0.33	132.4	0.18	318	
300	0.2	314.1	0.12	314.3	
350	0.2	314.6	0.14	333.7	
800	0.14	3.4	0.09	261.5	
1200	0.14	44.9	0.09	277.1	
1600	0.13	89.2	0.07	97.7	
1800	0.14	136.5	0.14	131.2	
2150	**0.14**	**133.3**	**0.16**	**122.2**	
2200	0.05	114.7	0.06	117.1	
Sum	35		1	Tot.Dir	36
Perc	0.23%		0.01%		0.24%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.37 Current Profile (m/s) for Fatigue Analysis with S Direction at 2150 m

	0.10		
	0.15		
Depth	Int.	Dir.	
50	0.21	242.5	
100	0.12	266.7	
150	0.13	288.3	
200	0.32	244.9	
250	0.21	263.6	
300	0.28	221.4	
350	0.32	206.9	
800	0.1	332.5	
1200	0.07	248.8	
1600	0.12	225.1	
1800	0.11	247.7	
2150	**0.14**	**198.6**	
2200	0.03	264.2	
Sum	10	Tot.Dir	10
Perc	0.07%		0.07%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.38 Current Profile (m/s) for Fatigue Analysis with SW Direction at 2150 m

	0.10		0.15		
	0.15		0.20		
Depth	Int.	Dir.	Int.	Dir.	
50	0.18	41.7	0.24	239	
100	0.13	16.6	0.18	251.6	
150	0.14	248.2	0.16	249.3	
200	0.19	241.3	0.17	232.5	
250	0.19	254.3	0.18	257.1	
300	0.11	341.1	0.17	229.7	
350	0.37	246.3	0.16	226.6	
800	0.05	145.7	0.05	359	
1200	0.07	342.6	0.05	315	
1600	0.07	316	0.09	295	
1800	0.1	225.1	0.1	228	
2150	**0.13**	**243.5**	**0.16**	**225**	
2200	0.03	199.8	0.03	221.2	
Sum	9		2	Tot.Dir	11
Perc	0.06%		0.01%		0.07%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.39 Current Profile (m/s) for Fatigue Analysis with W Direction at 2150 m

	0.10		0.15		
	0.15		0.20		
Depth	Int.	Dir.	Int.	Dir.	
50	0.2	266.4	0.23	303.8	
100	0.17	251.1	0.13	272.3	
150	0.21	247.9	0.11	197.6	
200	0.2	244.5	0.09	80.3	
250	0.26	254.5	0.12	26.3	
300	0.26	251.8	0.08	68.1	
350	0.18	252.8	0.1	51	
800	0.1	227.3	0.03	339.9	
1200	0.07	273	0.04	216.1	
1600	0.11	290	0.06	263.6	
1800	0.12	249	0.09	262	
2150	**0.13**	**271.5**	**0.17**	**288.6**	
2200	0.1	316.5	0.07	329.6	
Sum	14		1	Tot.Dir	15
Perc	0.09%		0.01%		0.10%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

6.3.40 Current Profile (m/s) for Fatigue Analysis with NW Direction at 2150 m

	0.10		0.15		
	0.15		0.20		
Depth	Int.	Dir.	Int.	Dir.	
50	0.23	247.2	0.24	325.9	
100	0.23	232.4	0.28	237.4	
150	0.2	226.3	0.28	230.6	
200	0.21	224.1	0.22	222.7	
250	0.29	244.3	0.19	228.8	
300	0.33	248.4	0.17	266.3	
350	0.36	244.4	0.26	245.6	
800	0.15	163.6	0.17	186.2	
1200	0.1	245.1	0.12	122.5	
1600	0.08	251.9	0.1	255.2	
1800	0.09	271.4	0.15	293.4	
2150	**0.14**	**314.9**	**0.17**	**335**	
2200	0.07	331.8	0.02	25.7	
Sum	19		3	Tot.Dir	22
Perc	0.12%		0.02%		0.14%

Source: PETROBRAS Propriety Metocean Data (Measured hourly values). Ref. [13].
The complete data set covers 15311 hourly profiles (1.75 years).

7 SEA WATER CHARACTERISTICS

7.1 Table with Vertical Distribution of Sea Water Temperature

Depth (m)	Tmin	p5	Tavg	p95	Tmax
5	20.76	21.67	24.33	27.45	29.25
20	20.10	21.71	24.31	27.22	28.78
40	19.85	21.64	24.04	26.88	28.67
60	19.15	21.28	23.20	26.06	28.58
80	18.39	20.17	22.29	24.85	26.97
100	17.11	19.05	21.44	23.90	25.88
125	14.96	17.80	20.39	23.08	24.42
150	13.89	16.76	19.34	21.97	23.91
200	12.91	15.21	17.38	19.77	21.76
250	12.13	14.10	15.82	17.73	21.50
300	11.71	12.99	14.64	16.22	17.58
400	9.50	11.54	13.05	14.11	15.01
500	7.65	8.92	10.40	11.79	13.71
600	5.62	6.82	8.07	9.22	10.92
700	4.58	5.51	6.23	7.01	8.18
800	4.23	4.82	5.36	5.89	6.46
900	3.84	4.12	4.48	4.78	5.18
1000	3.46	3.69	3.92	4.15	4.24
1200	3.19	3.33	3.41	3.48	3.70
1400	3.19	3.47	3.60	3.72	3.79
1600	3.49	3.77	3.86	3.94	4.01
1800	3.78	3.84	3.91	3.97	4.07
2000	3.53	3.64	3.72	3.78	3.87
2200	2.82	2.97	3.11	3.27	3.48

Where: Tmin = Temperature lowest value (ºC)
P5 = Percentile 5% Temperature (ºC)
Tavg = Temperature average (ºC)
P95 = Percentile 95% Temperature (ºC)
Tmax = Temperature highest value (ºC)

Source: PETROBRAS Metocean Database (Engineering measurement program – moorings and CTD profiles on Santos Basin Area) and Ocean Modeling Results. Ref. [14].

7.2 Table with Vertical Distribution of Sea Water Salinity

Depth (m)	Smin	p5	Savg	p95	Smax
5	35.30	36.19	36.82	37.24	37.29
20	35.56	36.43	36.87	37.18	37.29
40	36.13	36.61	36.90	37.19	37.29
60	36.31	36.64	36.92	37.19	37.29
80	35.99	36.45	36.86	37.17	37.26
100	35.75	36.24	36.78	37.08	37.24
120	35.63	36.00	36.65	36.97	37.15
150	35.49	35.72	36.39	36.84	36.94
200	35.34	35.52	35.94	36.34	36.82
250	35.24	35.37	35.64	35.84	36.16
300	35.10	35.25	35.44	35.59	35.78
400	34.83	35.00	35.18	35.32	35.40
500	34.59	34.72	34.91	35.04	35.32
600	34.31	34.48	34.64	34.75	34.95
700	34.26	34.35	34.43	34.53	34.64
800	34.23	34.26	34.33	34.39	34.45
900	34.19	34.25	34.32	34.36	34.40
1000	34.21	34.27	34.35	34.41	34.44
1200	34.34	34.38	34.47	34.54	34.58
1400	34.49	34.54	34.65	34.72	34.77
1600	34.65	34.71	34.80	34.86	34.90
1800	34.76	34.81	34.89	34.95	34.96
2000	34.79	34.85	34.93	34.98	34.99
2100	34.81	34.86	34.93	34.99	35.00
2200	34.85	34.85	34.92	34.99	34.99

Where: Smin = Salinity lowest value
P5 = Percentile 5% Salinity
Savg = Salinity average
P95 = Percentile 95% Salinity
Smax = Salinity highest value

Source: PETROBRAS Metocean Database (Engineering measurement program – moorings and CTD profiles on Santos Basin Area). Ref. [15].

7.3 Table with Vertical Distribution of Sea Water Density

Depth (m)	Dmin	p5	Davg	p95	Dmax
5	1023.4	1024.1	1024.9	1025.5	1025.6
20	1023.9	1024.2	1025.0	1025.6	1025.7
40	1024.0	1024.4	1025.2	1025.7	1025.8
60	1024.1	1024.7	1025.4	1025.9	1026.0
80	1024.7	1025.2	1025.7	1026.0	1026.4
100	1025.1	1025.6	1025.9	1026.3	1026.7
120	1025.6	1025.8	1026.1	1026.6	1026.9
150	1025.9	1026.0	1026.4	1026.8	1027.1
200	1026.3	1026.6	1026.9	1027.2	1027.4
250	1026.9	1027.1	1027.3	1027.5	1027.7
300	1027.3	1027.5	1027.6	1027.9	1028.1
400	1028.0	1028.2	1028.3	1028.5	1028.6
500	1028.7	1028.8	1028.9	1029.1	1029.3
600	1029.3	1029.5	1029.6	1029.7	1029.9
700	1030.0	1030.1	1030.2	1030.3	1030.5
800	1030.6	1030.7	1030.8	1030.9	1031.0
900	1031.2	1031.3	1031.4	1031.5	1031.6
1000	1031.8	1031.8	1031.9	1032.0	1032.1
1200	1032.8	1032.9	1033.0	1033.1	1033.2
1400	1033.9	1034.0	1034.0	1034.1	1034.2
1600	1034.9	1035.0	1035.0	1035.1	1035.2
1800	1035.9	1035.9	1036.0	1036.1	1036.1
2000	1036.9	1036.9	1037.0	1037.1	1037.1
2100	1037.4	1037.4	1037.5	1037.6	1037.6
2200	1037.9	1037.9	1038.0	1038.1	1038.1

Unit: kg/m^3 (Density was calculated from T,S,P data using UNESCO standards)

Where: Dmin = Density lowest value
P5 = Percentile 5% Density
Davg = Average Density
P95 = Percentile 95% Density
Dmax = Density highest value

Source: PETROBRAS Metocean Database (Engineering measurement program – moorings and CTD profiles on Santos Basin Area). Ref. [15].

7.4 Vertical Profile of Marine Fouling (mm)

DEPTH (m)	MARINE FOULING THICKNESS (mm)
+ 1.3	20
0.0	20
- 10	80
- 20	80
- 30	80
- 40	80
- 50	60
- 60	45
- 70	30
- 80	28
- 90	26
- 100	24
- 110	22
- 120	20
- 130	0
Bottom	0

Source: PETROBRAS – Vertical Profile of Marine Fouling (mm) for Campos Basin (RT/MC 113 /2003). Ref. [16].

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[16] PETROBRAS – Vertical Profile of Marine Fouling (mm) for Campos Basin (RT/MC 113 /2003).

CTD	Conductivity, Temperature and Depth
DHN	Directorate of Hydrography and Navigation of the Brazilian Navy
GPM	Global Precipitation Measurement
GPROF	GPM Profiling Algorithm
IDF	Intensity-duration-frequency
MC	Scientific Methods
REMO	Oceanographic Modeling and Observation Network

Data Processing and Contribuition to Document Execution

Original. Execution CENPES/PDEP/TEO (Alphabetical order)

Eric O Ribeiro	execution	(Wave)
Guisela S. Grossmann Matheson	execution	(Current profiles, Fatigue profiles, Sea Water Characteristics)
Guisela S. Grossmann Matheson	revision	(Edition)
Jose A M Lima	revision	(Current profiles, Fatigue profiles, Sea Water Characteristics, Wave)
Luiz Claudio R. Antunes	execution	(Wind)

Document Version : I-ET-3A36.00-1000-941-PPC-001 – 15/Jul/2013

Rev. A. Execution CENPES/PDEP/TEO (Alphabetical order)

Eric O Ribeiro	execution	(Wave)
Guisela S. Grossmann Matheson	revision	(Sea Water Characteristics)
Jose A M Lima	execution	(Sea Water Characteristics)
Jose A M Lima	revision	(Wave)

Document Version : I-ET-3A36.00-1000-941-PPC-001 – Rev. A - 10/Nov/2014

Rev. B. Execution CENPES/PDDP/TEO (Alphabetical order)

Eric O. Ribeiro	revision	(Fatigue profiles)
Gabriela Fonseca Medeiros	execution	(Fatigue profiles)
Gilmara D. L. Furtado	revision	(Edition)
Jose A M Lima	execution	(Current profiles, Scatter tables)
Wellington Ceccopieri Belo	revision	(Current profiles, Scatter tables)

Document Version : I-ET-3A36.00-1000-941-PPC-001 – Rev. B - 14/Jun/2017

Rev. C. Execution CENPES/PDDP/TEO (Alphabetical order)

Anderson S. Rodrigues	revision	(Edition)
Eric O. Ribeiro	revision	(Simultaneous extreme wind, wave and surface currents)
Jose A M Lima	execution	(Simultaneous extreme wind, wave and surface currents)

Document Version : I-ET-3A36.00-1000-941-PPC-001 – Rev. C – 20/Apr/2018

Rev. D. Execution CENPES/PDDP/TEO (Alphabetical order)

Jose A M Lima	revision	(Edition)
Wellington Ceccopieri Belo	execution	(included property notice provided by Law Department)

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Rev. E. Execution CENPES/PDIDP/ESUP/TEO (Alphabetical order)

Jose A.M. Lima	execution	(Wind)
Luis M.P. Nunes	revision	(Wind)

Document Version : I-ET-3A36.00-1000-941-PPC-001 – Rev. E – 25/Sep/2020

Rev. F. Execution CENPES/PDIDP/ESUP/TEO (Alphabetical order)

Andre L. T. Mendes	execution	(Sea Water Characteristics)
Wellington C. Belo	revision	(Sea Water Characteristics)

Document Version : I-ET-3A36.00-1000-941-PPC-001 – Rev. F – 21/Jul/2021

Rev. G. Execution CENPES/PDIDP/ESUP/TEO (Alphabetical order)

Gilmara Duarte Lima Furtado	execution	(Rainfall)
Karine dos Santos Rodrigues	revision	(Rainfall / Edition)
Luiz Claudio R. Antunes	execution	(Air temperature/ HVAC/ Rainfall)
Wellington Ceccopieri Belo	revision	(Air temperature/ HVAC / Rainfall / Edition)

Document Version : I-ET-3A36.00-1000-941-PPC-001 – Rev. G – 26/03/2025