



TECHNICAL SPECIFICATION	Nº: I-ET-3000.00-1500-941-PZ9-001
CLIENT: SUB/ES/EISE/EDF	PAGE: 1 de 10
PROJECT: INSTALLATION OF SUBSEA FACILITIES	
AREA: SUBSEA FACILITIES	
TITLE: PLSV 550 TON - TECHNICAL DATA AND RAO CURVES	

**INDEX OF REVISIONS**

REV	DESCRIPTION AND/OR AFFECTED PAGES
0	ORIGINAL EMISSION

	Rev 0	Rev A	Rev B	Rev C	Rev D	Rev E	Rev F	Rev G	Rev H
DATE	20/01/17								
EXECUTED BY	P.TAVARES								
CHECKED BY	E.VARDARO								
APPROVED BY	F.CASTRO								



TECHNICAL SPECIFICATION	Nº: I-ET-3000.00-1500-941-PZ9-001
CLIENT: SUB/ES/EISE/EDF	PAGE: 2 de 10
TITLE: PLSV 550 TON - TECHNICAL DATA AND RAO CURVES	

<b>1</b>	<b>VESSEL CHARACTERISTICS .....</b>	<b>3</b>
1.1	Dimensions and positions.....	3
1.2	RAO Conventions.....	3
1.3	RAO Tables.....	3



TECHNICAL SPECIFICATION	Nº: I-ET-3000.00-1500-941-PZ9-001
CLIENT: SUB/ES/EISE/EDF	PAGE: 3 de 10
TITLE: PLSV 550 TON - TECHNICAL DATA AND RAO CURVES	

## 1 VESSEL CHARACTERISTICS

### 1.1 Dimensions and positions

Length Between Perpendiculars (m)	134.52	
Moulded Breadth (m)	29.94	
Operational Draught (m)	7.13	
RAO Origin Coordinates <sup>1</sup>	X (m)	2.76
	Y (m)	0.00
	Z (m)	4.51
Working Table Coordinates <sup>1</sup>	X (m)	0.00
	Y (m)	0.00
	Z (m)	5.55

Note (1): Coordinates Origin described in 1.2

### 1.2 RAO Conventions

**Coordinates System:** X Axis is positive forward, with its origin in the Working Table; Y Axis is positive to portside, with its origins in ship's centerline; Z Axis is positive to up, with its origins in the Water line at Operational Draught. The longitudinal distance between the After Perpendicular and the Working Table is 60.24 m.

**RAO convention:** Rotational Amplitudes are in degrees due to a wave of unit amplitude. Phases are leads in degrees relative to wave's crest. Waves are referred to by frequency in rad/s. A 0° wave incidence means waves coming from the stern towards the bow of the vessel and 90° wave incidence means waves coming from starboard to portside. The ship is symmetric in relation to X-Z plane;

### 1.3 RAO Tables





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TECHNICAL SPECIFICATION

Nº: I-ET-3000.00-1500-941-PZ9-001

CLIENT:

SUB/ES/EISE/EDF

PAGE: 5 de 10

TITLE:

PLSV 550 TON - TECHNICAL DATA AND RAO CURVES

30.00 Deg Heading

Table with 13 columns: Frequency (rad/s), Surge motion in COG (Amp (m/m), Phase (deg)), Sway motion in COG (Amp (m/m), Phase (deg)), Heave motion in COG (Amp (m/m), Phase (deg)), Roll motion in COG (Amp (deg/m), Phase (deg)), Pitch motion in COG (Amp (deg/m), Phase (deg)), Yaw motion in COG (Amp (deg/m), Phase (deg)). Rows range from 0.05 to 2.00 Hz.

45.00 Deg Heading

Table with 13 columns: Frequency (rad/s), Surge motion in COG (Amp (m/m), Phase (deg)), Sway motion in COG (Amp (m/m), Phase (deg)), Heave motion in COG (Amp (m/m), Phase (deg)), Roll motion in COG (Amp (deg/m), Phase (deg)), Pitch motion in COG (Amp (deg/m), Phase (deg)), Yaw motion in COG (Amp (deg/m), Phase (deg)). Rows range from 0.05 to 2.00 Hz.



PETROBRAS

TECHNICAL SPECIFICATION

Nº: I-ET-3000.00-1500-941-PZ9-001

CLIENT: SUB/ES/EISE/EDF

PAGE: 6 de 10

TITLE: PLSV 550 TON - TECHNICAL DATA AND RAO CURVES

60.00 Deg Heading

Table with 13 columns: Frequency (rad/s), Surge motion in COG (Amp (m/m), Phase (deg)), Sway motion in COG (Amp (m/m), Phase (deg)), Heave motion in COG (Amp (m/m), Phase (deg)), Roll motion in COG (Amp (deg/m), Phase (deg)), Pitch motion in COG (Amp (deg/m), Phase (deg)), Yaw motion in COG (Amp (deg/m), Phase (deg)). Rows range from 0.05 to 2.00.

75.00 Deg Heading

Table with 13 columns: Frequency (rad/s), Surge motion in COG (Amp (m/m), Phase (deg)), Sway motion in COG (Amp (m/m), Phase (deg)), Heave motion in COG (Amp (m/m), Phase (deg)), Roll motion in COG (Amp (deg/m), Phase (deg)), Pitch motion in COG (Amp (deg/m), Phase (deg)), Yaw motion in COG (Amp (deg/m), Phase (deg)). Rows range from 0.05 to 2.00.





PETROBRAS

TECHNICAL SPECIFICATION

Nº: I-ET-3000.00-1500-941-PZ9-001

CLIENT:

SUB/ES/EISE/EDF

PAGE: 8 de 10

TITLE:

PLSV 550 TON - TECHNICAL DATA AND RAO CURVES

120.00 Deg Heading

Table with 13 columns: Frequency (rad/s), Surge motion in COG (Amp, Phase), Sway motion in COG (Amp, Phase), Heave motion in COG (Amp, Phase), Roll motion in COG (Amp, Phase), Pitch motion in COG (Amp, Phase), and Yaw motion in COG (Amp, Phase). Rows range from 0.05 to 2.00 Hz.

135.00 Deg Heading

Table with 13 columns: Frequency (rad/s), Surge motion in COG (Amp, Phase), Sway motion in COG (Amp, Phase), Heave motion in COG (Amp, Phase), Roll motion in COG (Amp, Phase), Pitch motion in COG (Amp, Phase), and Yaw motion in COG (Amp, Phase). Rows range from 0.05 to 2.00 Hz.





TECHNICAL SPECIFICATION

Nº: I-ET-3000.00-1500-941-PZ9-001

CLIENT:

SUB/ES/EISE/EDF

PAGE: 9 de 10

TITLE:

PLSV 550 TON - TECHNICAL DATA AND RAO CURVES

150.00 Deg Heading

Frequency (rad/s)	Surge motion in COG		Sway motion in COG		Heave motion in COG		Roll motion in COG		Pitch motion in COG		Yaw motion in COG	
	Amp (m/m)	Phase (deg)	Amp (m/m)	Phase (deg)	Amp (m/m)	Phase (deg)	Amp (deg/m)	Phase (deg)	Amp (deg/m)	Phase (deg)	Amp (deg/m)	Phase (deg)
0.05	0.818	90.0	0.502	-90.0	1.000	1.0	0.007	-90.0	0.012	-89.0	0.012	-60.0
0.10	0.806	90.0	0.495	-90.0	1.000	3.0	0.028	-91.0	0.048	-87.0	0.025	-24.0
0.15	0.802	90.0	0.488	-90.0	1.000	7.0	0.067	-92.0	0.108	-84.0	0.052	-11.0
0.20	0.793	90.0	0.478	-90.0	0.998	11.0	0.131	-94.0	0.192	-80.0	0.090	-6.0
0.25	0.780	90.0	0.464	-91.0	0.992	17.0	0.238	-97.0	0.300	-75.0	0.138	-3.0
0.30	0.759	90.0	0.444	-92.0	0.980	23.0	0.438	-99.0	0.431	-69.0	0.191	-2.0
0.35	0.729	89.0	0.416	-94.0	0.957	29.0	0.979	-98.0	0.582	-64.0	0.249	0.0
0.40	0.686	89.0	0.376	-99.0	0.918	35.0	3.900	-32.0	0.746	-58.0	0.238	2.0
0.45	0.630	88.0	0.350	-101.0	0.858	42.0	1.060	31.0	0.913	-51.0	0.339	-9.0
0.50	0.560	88.0	0.304	-105.0	0.773	49.0	0.515	25.0	1.070	-45.0	0.386	-10.0
0.55	0.477	87.0	0.254	-110.0	0.659	57.0	0.309	8.0	1.190	-38.0	0.413	-11.0
0.60	0.382	86.0	0.200	-115.0	0.513	65.0	0.207	-19.0	1.260	-32.0	0.420	-12.0
0.65	0.281	85.0	0.146	-120.0	0.337	76.0	0.177	-54.0	1.240	-24.0	0.405	-13.0
0.70	0.179	85.0	0.093	-127.0	0.140	93.0	0.193	-84.0	1.120	-17.0	0.367	-13.0
0.75	0.084	85.0	0.046	-141.0	0.067	-105.0	0.221	-103.0	0.878	-8.0	0.306	-12.0
0.80	0.005	91.0	0.020	152.0	0.221	-71.0	0.242	-117.0	0.530	-2.0	0.228	-10.0
0.85	0.052	-96.0	0.037	96.0	0.276	-49.0	0.244	-128.0	0.169	-18.0	0.139	-7.0
0.90	0.082	-95.0	0.052	86.0	0.222	-31.0	0.227	-138.0	0.208	-114.0	0.050	5.0
0.95	0.085	-94.0	0.053	84.0	0.121	-18.0	0.190	-150.0	0.335	-118.0	0.031	153.0
1.00	0.066	-93.0	0.042	85.0	0.032	-19.0	0.140	-166.0	0.317	-115.0	0.082	171.0
1.05	0.035	-91.0	0.021	89.0	0.024	-156.0	0.088	167.0	0.212	-115.0	0.100	179.0
1.10	0.003	-60.0	0.002	-152.0	0.041	-163.0	0.061	112.0	0.092	-127.0	0.085	-172.0
1.15	0.019	81.0	0.017	-91.0	0.034	-163.0	0.078	63.0	0.041	153.0	0.048	-156.0
1.20	0.026	84.0	0.022	-83.0	0.017	-164.0	0.096	39.0	0.064	111.0	0.019	-77.0
1.25	0.018	86.0	0.017	-72.0	0.002	161.0	0.090	24.0	0.056	101.0	0.039	-12.0
1.30	0.003	98.0	0.006	-35.0	0.007	28.0	0.059	8.0	0.025	90.0	0.045	8.0
1.35	0.009	-100.0	0.008	72.0	0.007	27.0	0.018	-39.0	0.006	-38.0	0.030	31.0
1.40	0.013	-98.0	0.011	98.0	0.002	47.0	0.032	-145.0	0.017	-76.0	0.015	105.0
1.45	0.007	-99.0	0.008	121.0	0.003	168.0	0.046	-163.0	0.012	-87.0	0.024	169.0
1.50	0.003	93.0	0.004	-159.0	0.004	175.0	0.032	-173.0	0.002	139.0	0.024	-164.0
1.55	0.008	86.0	0.007	-94.0	0.001	158.0	0.005	134.0	0.010	88.0	0.012	-115.0
1.60	0.006	86.0	0.006	-64.0	0.002	10.0	0.020	13.0	0.009	68.0	0.014	-27.0
1.65	0.000	-65.0	0.003	2.0	0.003	-12.0	0.021	3.0	0.004	-4.0	0.016	11.0
1.70	0.005	-89.0	0.004	80.0	0.002	-46.0	0.005	-21.0	0.007	-80.0	0.010	61.0
1.75	0.004	-81.0	0.004	120.0	0.001	-134.0	0.011	-170.0	0.006	-116.0	0.010	148.0
1.80	0.001	22.0	0.003	-166.0	0.002	-180.0	0.012	179.0	0.004	-180.0	0.011	-168.0
1.85	0.004	84.0	0.003	-100.0	0.001	133.0	0.001	103.0	0.005	114.0	0.007	-101.0
1.90	0.002	114.0	0.002	-47.0	0.001	54.0	0.010	1.0	0.004	66.0	0.009	-27.0
1.95	0.002	-141.0	0.002	38.0	0.001	9.0	0.007	-11.0	0.003	-5.0	0.007	19.0
2.00	0.003	-108.0	0.002	84.0	0.001	-50.0	0.004	-165.0	0.002	-62.0	0.006	114.0

165.00 Deg Heading

Frequency (rad/s)	Surge motion in COG		Sway motion in COG		Heave motion in COG		Roll motion in COG		Pitch motion in COG		Yaw motion in COG	
	Amp (m/m)	Phase (deg)	Amp (m/m)	Phase (deg)	Amp (m/m)	Phase (deg)	Amp (deg/m)	Phase (deg)	Amp (deg/m)	Phase (deg)	Amp (deg/m)	Phase (deg)
0.05	0.913	90.0	0.260	-90.0	1.000	1.0	0.004	-90.0	0.014	-89.0	0.006	-58.0
0.10	0.899	90.0	0.256	-90.0	1.000	3.0	0.015	-91.0	0.054	-87.0	0.014	-22.0
0.15	0.894	90.0	0.253	-90.0	0.999	7.0	0.035	-93.0	0.121	-84.0	0.030	-10.0
0.20	0.883	90.0	0.247	-90.0	0.996	11.0	0.068	-95.0	0.215	-80.0	0.052	-5.0
0.25	0.866	90.0	0.239	-91.0	0.988	17.0	0.123	-98.0	0.336	-75.0	0.079	-3.0
0.30	0.839	90.0	0.228	-92.0	0.971	23.0	0.225	-101.0	0.482	-70.0	0.110	-2.0
0.35	0.800	90.0	0.212	-94.0	0.940	29.0	0.498	-100.0	0.647	-64.0	0.142	0.0
0.40	0.745	89.0	0.189	-99.0	0.889	35.0	1.960	-35.0	0.823	-58.0	0.141	2.0
0.45	0.674	88.0	0.173	-101.0	0.814	42.0	0.518	27.0	0.995	-52.0	0.191	-8.0
0.50	0.584	88.0	0.147	-105.0	0.708	49.0	0.246	17.0	1.140	-46.0	0.214	-9.0
0.55	0.478	87.0	0.118	-110.0	0.570	57.0	0.144	-5.0	1.240	-39.0	0.224	-10.0
0.60	0.361	86.0	0.088	-116.0	0.400	66.0	0.104	-39.0	1.270	-33.0	0.221	-11.0
0.65	0.239	85.0	0.058	-123.0	0.204	78.0	0.104	-75.0	1.180	-26.0	0.204	-12.0
0.70	0.123	85.0	0.030	-135.0	0.026	-179.0	0.121	-100.0	0.975	-19.0	0.173	-12.0
0.75	0.022	86.0	0.012	174.0	0.190	-91.0	0.136	-116.0	0.646	-13.0	0.130	-10.0
0.80	0.052	-96.0	0.018	101.0	0.298	-70.0	0.141	-128.0	0.250	-18.0	0.081	-8.0
0.85	0.093	-95.0	0.027	87.0	0.283	-50.0	0.133	-139.0	0.189	-125.0	0.030	0.0
0.90	0.101	-95.0	0.028	84.0	0.173	-33.0	0.111	-150.0	0.389	-134.0	0.015	156.0
0.95	0.079	-94.0	0.022	84.0	0.051	-28.0	0.080	-166.0	0.401	-130.0	0.044	173.0
1.00	0.042	-93.0	0.011	86.0	0.031	-167.0	0.047	164.0	0.275	-129.0	0.054	180.0
1.05	0.004	-67.0	0.001	-96.0	0.056	-173.0	0.035	101.0	0.120	-145.0	0.045	-171.0
1.10	0.023	81.0	0.010	-88.0	0.046	-175.0	0.050	56.0	0.068	136.0	0.022	-152.0
1.15	0.029	83.0	0.012	-82.0	0.022	176.0	0.060	35.0	0.095	99.0	0.011	-52.0
1.20	0.018	82.0	0.008	-70.0	0.006	92.0	0.051	21.0	0.076	84.0	0.023	-5.0
1.25	0.001	33.0	0.002	0.0	0.012	32.0	0.027	2.0	0.034	53.0	0.023	14.0
1.30	0.012	-97.0	0.005	87.0	0.009	16.0	0.011	-101.0	0.025	-37.0	0.012	46.0
1.35	0.012	-103.0	0.006	107.0	0.002	-43.0	0.027	-153.0	0.029	-75.0	0.010	146.0
1.40	0.004	-137.0	0.003	143.0	0.005	-147.0	0.028	-166.0	0.016	-110.0	0.015	-175.0
1.45	0.008	102.0	0.003	-105.0	0.004	-168.0	0.013	179.0	0.012	149.0	0.010	-145.0
1.50	0.009	90.0	0.004	-73.0	0.001	104.0	0.008	29.0	0.017	105.0	0.006	-50.0
1.55	0.003	64.0	0.002	-35.0	0.004	27.0	0.016	8.0	0.010	60.0	0.010	5.0
1.60	0.005	-65.0	0.002	76.0	0.003	-2.0	0.010	-7.0	0.010	-33.0	0.008	40.0
1.65	0.007	-72.0	0.003	116.0	0.002	-87.0	0.004	-141.0	0.012	-80.0	0.005	136.0
1.70	0.002	-65.0	0.002	167.0	0.003	-152.0	0.009	-173.0	0.008	-137.0	0.008	-166.0
1.75	0.004	112.0	0.002	-93.0	0.002	165.0	0.003	156.0	0.008	142.0	0.005	-116.0
1.80	0.005	132.0	0.002	-42.0	0.002	79.0	0.005	20.0	0.008	90.0	0.005	-27.0
1.85	0.003	-167.0	0.002	25.0	0.002	21.0	0.005	1.0	0.006	18.0	0.005	35.0
1.90	0.002	-76.0	0.001	105.0	0.001	-41.0	0.002	-156.0	0.006	-52.0	0.005	108.0
1.95	0.004	1.0	0.002	-176.0	0.001	-123.0	0.005	179.0	0.005	-117.0	0.004	172.0
2.00	0.004	34.0	0.001	-126.0	0.001	179.0	0.001	104.0	0.004	166.0	0.003	-92.0



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Nº: I-ET-3000.00-1500-941-PZ9-001

CLIENT:

SUB/ES/EISE/EDF

PAGE: 10 de 10

TITLE:

PLSV 550 TON - TECHNICAL DATA AND RAO CURVES

180.00 Deg Heading

Frequency (rad/s)	Surge motion in COG		Sway motion in COG		Heave motion in COG		Roll motion in COG		Pitch motion in COG		Yaw motion in COG	
	Amp (m/m)	Phase (deg)	Amp (m/m)	Phase (deg)	Amp (m/m)	Phase (deg)	Amp (deg/m)	Phase (deg)	Amp (deg/m)	Phase (deg)	Amp (deg/m)	Phase (deg)
0.05	0.945	90.0	0.000	0.0	1.000	1.0	0.000	1.0	0.014	-89.0	0.000	1.0
0.10	0.931	90.0	0.000	3.0	1.000	3.0	0.000	-1.0	0.056	-87.0	0.000	2.0
0.15	0.925	90.0	0.000	12.0	0.999	7.0	0.000	-2.0	0.125	-84.0	0.000	1.0
0.20	0.914	90.0	0.000	-177.0	0.995	11.0	0.000	2.0	0.223	-80.0	0.000	-147.0
0.25	0.895	90.0	0.000	-25.0	0.986	17.0	0.000	-8.0	0.349	-75.0	0.000	-171.0
0.30	0.866	90.0	0.000	-25.0	0.968	23.0	0.000	2.0	0.499	-70.0	0.000	-168.0
0.35	0.823	90.0	0.000	134.0	0.934	29.0	0.000	138.0	0.668	-64.0	0.000	5.0
0.40	0.764	89.0	0.000	-1.0	0.879	35.0	0.000	-103.0	0.848	-58.0	0.000	101.0
0.45	0.686	88.0	0.000	2.0	0.797	42.0	0.000	-26.0	1.020	-52.0	0.000	-140.0
0.50	0.589	88.0	0.000	-32.0	0.685	49.0	0.000	14.0	1.170	-46.0	0.000	148.0
0.55	0.475	87.0	0.000	137.0	0.539	57.0	0.000	123.0	1.260	-39.0	0.000	-26.0
0.60	0.350	86.0	0.000	-108.0	0.361	66.0	0.000	153.0	1.260	-33.0	0.000	79.0
0.65	0.222	85.0	0.000	72.0	0.161	80.0	0.000	45.0	1.150	-26.0	0.000	101.0
0.70	0.102	85.0	0.000	-59.0	0.054	-126.0	0.000	12.0	0.914	-20.0	0.000	16.0
0.75	0.001	103.0	0.000	142.0	0.224	-90.0	0.000	-55.0	0.559	-15.0	0.000	120.0
0.80	0.070	-95.0	0.000	15.0	0.312	-70.0	0.000	-75.0	0.166	-33.0	0.000	-123.0
0.85	0.104	-95.0	0.000	165.0	0.274	-51.0	0.000	-44.0	0.262	-137.0	0.000	30.0
0.90	0.102	-95.0	0.000	167.0	0.148	-35.0	0.000	113.0	0.432	-138.0	0.000	-5.0
0.95	0.073	-94.0	0.000	60.0	0.026	-43.0	0.000	68.0	0.399	-134.0	0.000	160.0
1.00	0.031	-92.0	0.000	30.0	0.048	-176.0	0.000	171.0	0.243	-136.0	0.000	-58.0
1.05	0.007	72.0	0.000	72.0	0.061	-177.0	0.000	-79.0	0.093	-168.0	0.000	50.0
1.10	0.028	82.0	0.000	43.0	0.042	180.0	0.000	102.0	0.090	113.0	0.000	-147.0
1.15	0.028	82.0	0.000	61.0	0.016	159.0	0.000	80.0	0.105	90.0	0.000	-104.0
1.20	0.012	79.0	0.000	-45.0	0.010	55.0	0.000	-33.0	0.069	71.0	0.000	-55.0
1.25	0.006	-91.0	0.000	-145.0	0.013	24.0	0.000	-105.0	0.030	16.0	0.000	72.0
1.30	0.014	-99.0	0.000	-49.0	0.007	-1.0	0.000	-147.0	0.034	-56.0	0.000	-83.0
1.35	0.009	-111.0	0.000	37.0	0.004	-109.0	0.000	-27.0	0.029	-88.0	0.000	-55.0
1.40	0.004	136.0	0.000	11.0	0.006	-150.0	0.000	8.0	0.014	-152.0	0.000	118.0
1.45	0.010	98.0	0.000	166.0	0.003	176.0	0.000	-63.0	0.019	129.0	0.000	-167.0
1.50	0.007	84.0	0.000	67.0	0.003	55.0	0.000	79.0	0.017	92.0	0.000	-67.0
1.55	0.003	-32.0	0.000	-149.0	0.004	21.0	0.000	-59.0	0.010	16.0	0.000	-50.0
1.60	0.008	-67.0	0.000	56.0	0.002	-25.0	0.000	29.0	0.014	-55.0	0.000	-91.0
1.65	0.005	-70.0	0.000	-55.0	0.003	-128.0	0.000	-30.0	0.012	-100.0	0.000	166.0
1.70	0.002	123.0	0.000	-174.0	0.003	-169.0	0.000	158.0	0.009	179.0	0.000	-26.0
1.75	0.006	129.0	0.000	143.0	0.002	124.0	0.000	149.0	0.010	115.0	0.000	150.0
1.80	0.004	157.0	0.000	157.0	0.002	43.0	0.000	134.0	0.008	55.0	0.000	-81.0
1.85	0.002	-102.0	0.000	-143.0	0.002	-10.0	0.000	-160.0	0.007	-27.0	0.000	161.0
1.90	0.004	-12.0	0.000	-180.0	0.002	-97.0	0.000	-71.0	0.007	-91.0	0.000	114.0
1.95	0.005	19.0	0.000	-47.0	0.002	-162.0	0.000	55.0	0.006	-168.0	0.000	170.0
2.00	0.001	47.0	0.000	-76.0	0.001	121.0	0.000	-17.0	0.005	118.0	0.000	43.0