

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted										Figures of Merit (FM): :Mean FM = simulation mean - measured mean /[measured (Max-Min)] :							
Hurricane Wind Only		:All tests use API "net loads best estimate" algorithm" unless otherwise noted										:Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. /[measured Std. Dev.]							
Test 102006 (.5 hr)												:MaxMin FM = simulation MaxMin - measured MaxMin /[measured (Max-Min)]							
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit					
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.		
Translations of FPSO (Earth fixed)																			
x - Turntable	m	-15.60	1.11			-13.50	-17.80	-14.64	2.18	2.18	0.00	-10.07	-19.20	22%	96%			80%	-33%
y - Turntable	m	-16.10	1.48			-13.50	-19.50	-16.85	1.22	1.22	0.00	-14.28	-19.41	-13%	-18%			-13%	2%
xy - Turntable	m							22.32	2.50	2.50	0.00	27.30	17.47						
z - Turntable	m	-0.13	0.03			-0.03	-0.23	0.00	0.00	0.00	0.00	0.00	0.00	65%	-100%			15%	115%
Rotations of FPSO																			
Roll	deg	0.09	0.07			0.37	-0.10	0.09	0.00	0.00	0.00	0.09	0.09	0%	-100%			-60%	40%
Pitch	deg	0.25	0.04			0.38	0.11	0.25	0.00	0.00	0.00	0.25	0.25	0%	-100%			-48%	52%
Yaw	deg	27.55	0.90			29.23	25.59	27.53	0.10	0.10	0.00	27.74	27.33	-1%	-89%			-41%	48%
Forces and Moments acting on the turntable																			
Fx Turntab	kN	926	69			1118	748	940	232	232	0	1365	733	4%	235%			67%	-4%
Fy Turntab	kN	439	121			781	168	398	31	31	0	366	355	-7%	-74%			-68%	31%
Fxy Turntable	kN							1021	234	234	0	1365	741						
Fz Turntab	kN	82	59			286	-141	-67	16	16	0	-36	-101	-35%	-72%			-75%	9%
Mx Turntable	kN m	510	461			2077	-1282	-228	43	43	0	-148	-321	-22%	-91%			-66%	29%
My Turntable	kN m	-1671	312			-409	-2835	1951	412	412	0	2811	1090	149%	32%			133%	162%
Mxy Turntable	kN m							1964	414	414	0	2827	1102						
Forces in mooring lines																			
F line 1(LTM)	kN	1329	13			1360	1299	1276	22	22	0	1322	1232	-86%	70%			-62%	-110%
F line 2 (LTM)	kN	1265	10			1290	1241	1249	22	22	0	1297	1204	-32%	122%			14%	-75%
F line 3 (LTM)	kN	1290	12			1321	1261	1224	23	23	0	1272	1178	-110%	92%			-81%	-138%
F line 4	kN	1368	17			1411	1332	1361	16	16	0	1396	1328	-8%	-3%			-20%	-5%
F line 5	kN	1231	14			1267	1201	1266	13	13	0	1293	1240	52%	-8%			39%	59%
F line 6	kN	1331	17			1376	1295	1341	12	12	0	1366	1317	13%	-33%			-13%	27%
F line 7 (HTM)	kN	968	9			988	946	1024	16	16	0	1058	992	135%	76%			165%	110%
F line 8 (HTM)	kN	967	19			1005	848	1020	17	17	0	1055	986	33%	-9%			32%	88%
F line 9 (HTM)	kN	958	8			978	937	1015	18	18	0	1052	981	139%	116%			180%	105%
F line 10	kN	975	12			1005	942	995	10	10	0	1017	974	32%	-15%			19%	50%
F line 11	kN	1000	13			1028	964	981	9	9	0	1000	963	-29%	-33%			-44%	-1%
F line 12	kN	977	13			1007	945	1002	7	7	0	1018	987	40%	-44%			17%	67%
Riser Top Tensions																			
Liquid Production #13	kN	1169	6			1188	1150	1196	4	4	0	1205	1188	72%	-30%			45%	99%
Water Injection #22	kN	2001	7			2028	1977	2010	4	4	0	2018	2003	18%	-48%			-19%	50%
Gas Injection #24	kN	1197	6			1216	1178	1241	3	3	0	1247	1235	115%	-49%			81%	151%
Gas Export #25	kN	511	7			537	489	517	0	0	0	517	517	13%	-99%			-42%	58%
Greenwater																			
Rel. wave elev. at bow	m	-0.14	0.28			1.12	-1.03	0.00	0.00	0.00	0.00	NaN	NaN	7%	-100%			#VALUE!	#VALUE!

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted										Figures of Merit (FM): Mean FM = simulation mean - measured mean / measured (Max-Min)							
Hurricane Current Only		:All tests use API "net loads best estimate" algorithm unless otherwise noted										Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. / measured Std. Dev.							
Test 102007 (.5 hr)												MaxMin FM = simulation MaxMin - measured MaxMin / measured (Max-Min)							
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit					
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.		
Translations of FPSO (Earth fixed)																			
x - Turntable	m	-11.30	2.70			-5.67	-16.10	-4.47	0.42	0.42	0.00	-3.57	-5.35	65%	-84%			20%	103%
y - Turntable	m	9.45	2.69			14.32	4.32	8.63	3.51	3.51	0.00	15.99	1.27	-8%	30%			17%	-31%
xy - Turntable	m							9.72	3.53	3.53	0.00	16.86	3.79						
z - Turntable	m	-0.21	0.02			-0.16	-0.26	0.00	0.00	0.00	0.00	0.00	0.00	210%	-100%			160%	260%
Rotations of FPSO																			
Roll	deg	0.08	0.03			0.17	0.00	0.08	0.00	0.00	0.00	0.08	0.08	0%	-100%			-53%	47%
Pitch	deg	0.07	0.04			0.20	-0.07	0.07	0.00	0.00	0.00	0.07	0.07	0%	-100%			-48%	52%
Yaw	deg	-17.80	2.01			-14.80	-22.60	-19.61	1.84	1.84	0.00	-15.74	-23.48	-23%	-8%			-12%	-11%
Forces and Moments acting on the turntable																			
Fx Turntab	kN	6	95			364	-365	125	138	138	0	403	-53	16%	44%			5%	43%
Fy Turntab	kN	-188	176			237	-627	-332	217	217	0	8	-770	-17%	23%			-26%	-17%
Fxy Turntable	kN							355	257	257	0	789	74						
Fz Turntab	kN	-42	46			129	-222	-12	12	12	0	2	-40	9%	-74%			-36%	52%
Mx Turntable	kN m	2837	1083			5392	-246	3674	615	615	0	4965	2446	15%	-43%			-8%	48%
My Turntable	kN m	8893	2020			13440	4913	3961	371	371	0	4758	3343	-58%	-82%			-102%	-18%
Mxy Turntable	kN m							5403	718	718	0	6682	4256						
Forces in mooring lines																			
F line 1(LTM)	kN	1306	30			1367	1239	1197	7	7	0	1212	1182	-85%	-76%			-121%	-44%
F line 2 (LTM)	kN	1233	22			1278	1185	1151	4	4	0	1160	1143	-88%	-82%			-127%	-45%
F line 3 (LTM)	kN	1221	28			1278	1159	1110	1	1	0	1112	1107	-94%	-96%			-140%	-43%
F line 4	kN	1098	23			1150	1049	1103	30	30	0	1167	1044	5%	31%			17%	-5%
F line 5	kN	1038	23			1088	994	1037	28	28	0	1097	982	-1%	22%			9%	-13%
F line 6	kN	1084	23			1132	1040	1102	31	31	0	1168	1042	20%	36%			39%	2%
F line 7 (HTM)	kN	986	21			1033	944	1087	6	6	0	1100	1075	113%	-71%			75%	147%
F line 8 (HTM)	kN	1000	29			1077	941	1101	3	3	0	1108	1094	74%	-88%			23%	112%
F line 9 (HTM)	kN	1011	21			1061	969	1115	1	1	0	1117	1113	113%	-96%			61%	157%
F line 10	kN	1246	29			1306	1179	1218	35	35	0	1292	1150	-22%	18%			-11%	-23%
F line 11	kN	1216	28			1273	1161	1192	34	34	0	1265	1125	-21%	21%			-7%	-32%
F line 12	kN	1236	29			1314	1156	1210	35	35	0	1285	1141	-16%	21%			-19%	-9%
Riser Top Tensions																			
Liquid Production #13	kN	1176	10			1225	1152	1177	1	1	0	1179	1175	2%	-91%			-63%	32%
Water Injection #22	kN	2010	9			2037	1981	2011	4	4	0	2019	2002	1%	-52%			-31%	38%
Gas Injection #24	kN	1209	9			1238	1176	1266	2	2	0	1270	1263	92%	-81%			51%	140%
Gas Export #25	kN	504	18			555	432	532	3	3	0	538	525	23%	-83%			-13%	76%
Greenwater																			
Rel. wave elev. at bow	m	0.02	0.02			0.08	-0.01	0.00	0.00	0.00	0.00	NaN	NaN	-22%	-100%			#VALUE!	#VALUE!

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted										Figures of Merit (FM): Mean FM = simulation mean - measured mean /measured (Max-Min) :							
Hurricane Wind & Current On		All tests use API "net loads best estimate" algorithm unless otherwise noted										Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. /(measured Std. Dev.)							
Test 102008 (.5 hr)												MaxMin FM = simulation MaxMin - measured MaxMin /measured (Max-Min)							
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit					
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.		
Translations of FPSO (Earth fixed)																			
x - Turntable	m	-30.50	1.78			-26.00	-33.90	-27.12	2.65	2.65	0.00	-21.54	-32.65	43%	49%			56%	16%
y - Turntable	m	9.36	2.70			13.63	3.89	10.49	5.45	5.45	0.00	21.91	-0.95	12%	102%			85%	-50%
xy - Turntable	m							29.08	6.06	6.06	0.00	39.32	21.56						
z - Turntable	m	-0.27	0.03			-0.16	-0.37	0.00	0.00	0.00	0.00	0.00	0.00	129%	-100%			76%	176%
Rotations of FPSO																			
Roll	deg	0.26	0.10			0.55	-0.01	0.26	0.00	0.00	0.00	0.26	0.26	0%	-100%			-52%	48%
Pitch	deg	0.19	0.03			0.28	0.09	0.19	0.00	0.00	0.00	0.19	0.19	0%	-100%			-47%	53%
Yaw	deg	10.40	1.31			13.84	7.45	10.40	2.90	2.90	0.00	16.48	4.32	0%	121%			41%	-49%
Forces and Moments acting on the turntable																			
Fx Turntab	kN	1014	123			1296	659	990	219	219	0	1422	797	-4%	78%			20%	22%
Fy Turntab	kN	-448	195			13	-926	-488	488	488	0	198	-1453	-4%	150%			20%	-56%
Fxy Turntable	kN							1104	535	535	0	1737	779						
Fz Turntab	kN	-89	73			174	-326	-126	45	45	0	-61	-231	-7%	-39%			-47%	19%
Mx Turntable	kN m	7580	1097			10301	3047	5500	1138	1138	0	7896	3166	-29%	4%			-33%	2%
My Turntable	kN m	6378	842			9191	3840	4830	465	465	0	5862	4197	-29%	-45%			-62%	7%
Mxy Turntable	kN m							7320	1229	1229	0	9264	5539						
Forces in mooring lines																			
F line 1(LTM)	kN	1539	23			1594	1477	1442	36	36	0	1519	1369	-83%	55%			-64%	-93%
F line 2 (LTM)	kN	1438	24			1493	1375	1383	31	31	0	1449	1320	-46%	28%			-37%	-46%
F line 3 (LTM)	kN	1452	23			1504	1389	1328	27	27	0	1384	1273	-108%	15%			-104%	-101%
F line 4	kN	1116	24			1169	1074	1105	47	47	0	1206	1016	-12%	97%			39%	-61%
F line 5	kN	1034	23			1089	996	1023	43	43	0	1116	942	-11%	88%			29%	-59%
F line 6	kN	1069	22			1122	1030	1071	47	47	0	1173	982	3%	115%			55%	-52%
F line 7 (HTM)	kN	845	11			877	818	919	20	20	0	960	881	125%	77%			140%	107%
F line 8 (HTM)	kN	856	16			902	809	931	18	18	0	968	895	79%	8%			70%	92%
F line 9 (HTM)	kN	865	12			897	839	943	16	16	0	978	910	133%	38%			138%	122%
F line 10	kN	1228	30			1285	1161	1218	54	54	0	1334	1115	-8%	80%			40%	-37%
F line 11	kN	1215	28			1268	1156	1211	55	55	0	1330	1107	-3%	98%			55%	-44%
F line 12	kN	1256	45			1351	1124	1249	59	59	0	1374	1138	-3%	30%			10%	6%
Riser Top Tensions																			
Liquid Production #13	kN	1204	9			1235	1178	1221	6	6	0	1233	1209	31%	-39%			-3%	55%
Water Injection #22	kN	2050	10			2083	2014	2066	11	11	0	2089	2044	23%	16%			9%	43%
Gas Injection #24	kN	1189	8			1216	1163	1244	3	3	0	1250	1238	104%	-64%			64%	142%
Gas Export #25	kN	504	17			554	440	544	5	5	0	556	533	35%	-69%			2%	82%
Greenwater																			
Rel. wave elev. at bow	m	-0.03	0.23			0.88	-0.76	0.00	0.00	0.00	0.00	NaN	NaN	2%	-100%			#VALUE!	#VALUE!

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted						Figures of Merit (FM): Mean FM = simulation mean - measured mean / measured (Max-Min)													
Hurricane WW&C		:All tests use API "net loads best estimate" algorithm" unless otherwise noted						Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. / measured Std. Dev.													
Test 102009								MaxMin FM = simulation MaxMin - measured MaxMin / measured (Max-Min)													
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit							
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min		
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.				
Translations of FPSO (Earth fixed)																					
x - Turntable	m	-50.46	6.94	6.89	0.80	-34.57	-80.06	-50.88	8.37	8.36	0.48	-32.19	-78.69	-1%	21%	21%	-40%	5%	3%		
y - Turntable	m	12.27	5.54	5.51	0.56	28.61	-5.28	20.92	3.84	3.83	0.26	32.42	12.29	26%	-31%	-31%	-54%	11%	52%		
xy - Turntable	m							55.01	9.21	9.19	0.55	86.02	33.57								
z - Turntable	m	-0.42	2.16	0.06	2.16	7.47	-7.65	0.00	2.21	0.00	2.21	8.07	-8.07	3%	2%		2%	4%	-3%		
XYZ Average Abs(FM)														10%	18%	26%	32%	7%	19%		
Rotations of FPSO																					
Roll	deg	0.37	1.11	0.12	1.10	4.55	-4.25	0.44	1.63	0.00	1.63	6.40	-5.52	1%	47%		48%	21%	-14%		
Pitch	deg	0.23	1.06	0.03	1.06	3.86	-3.05	0.20	1.32	0.00	1.32	5.01	-4.61	0%	25%		25%	17%	-23%		
Yaw	deg	8.12	2.70	2.69	0.20	16.70	1.93	7.21	1.42	1.41	0.12	11.30	3.13	-6%	-47%	-48%	-41%	-37%	8%		
RPY Average Abs(FM)														2%	40%	48%	38%	25%	15%		
Forces and Moments acting on the turntable																					
Fx Turntab	kN	2275	907	574	702	6172	-627	2647	1033	603	838	7104	-949	5%	14%	5%	19%	14%	-5%		
Fy Turntab	kN	-756	832	484	677	1544	-5683	-1499	1037	409	952	3274	-7279	-10%	25%	-16%	41%	24%	-22%		
Fxy Turntable	kN							3041	1463	729	1269	7740	0								
Fz Turntab	kN	-274	3947	201	3942	13159	-20298	-467	3924	183	3920	24837	-26007	-1%	-1%	-9%	-1%	35%	-17%		
Mx Turntable	kN m	8892	7063	2426	6633	46163	-17926	8120	5119	1043	5012	25855	-9400	-1%	-28%	-57%	-24%	-32%	13%		
My Turntable	kN m	12775	8570	2126	8303	56696	-17660	10346	4183	1369	3953	29337	-5892	-3%	-51%	-36%	-52%	-37%	16%		
Mxy Turntable	kN m							13152	6611	1721	6383	31085	0								
F-M Average Abs(FM)														4%	24%	24%	28%	28%	15%		
Forces in mooring lines																					
F line 1(LTM)	kN	1843	230	121	196	2968	1019	1783	195	139	137	2829	778	-3%	-15%	15%	-30%	-7%	-12%		
F line 2 (LTM)	kN	1785	235	127	198	2930	920	1695	187	131	134	2720	710	-4%	-20%	4%	-33%	-10%	-10%		
F line 3 (LTM)	kN	1746	204	109	173	2746	1007	1610	179	123	131	2612	645	-8%	-12%	13%	-24%	-8%	-21%		
F line 4	kN	1111	142	46	135	1754	433	1041	115	32	110	1839	347	-5%	-19%	-31%	-18%	6%	-6%		
F line 5	kN	1003	139	44	132	1691	368	951	112	27	108	1737	338	-4%	-20%	-38%	-18%	4%	-2%		
F line 6	kN	1032	142	46	135	1619	392	979	114	29	110	1780	341	-4%	-20%	-37%	-18%	13%	-4%		
F line 7 (HTM)	kN	730	119	35	114	1270	288	781	129	44	122	1708	320	5%	8%	26%	7%	45%	3%		
F line 8 (HTM)	kN	740	118	35	113	1396	288	793	131	46	123	1732	321	5%	11%	32%	9%	30%	3%		
F line 9 (HTM)	kN	750	122	35	117	1315	294	808	133	47	125	1758	322	6%	9%	35%	6%	43%	3%		
F line 10	kN	1249	198	61	188	2214	391	1308	152	43	146	2319	362	3%	-23%	-30%	-22%	6%	-2%		
F line 11	kN	1314	215	73	203	2470	426	1323	152	43	146	2326	364	0%	-30%	-41%	-28%	-7%	-3%		
F line 12	kN	1321	210	72	198	2380	396	1388	155	47	147	2399	384	3%	-27%	-35%	-25%	1%	-1%		
Tension Average Abs(FM)														4%	18%	28%	20%	15%	6%		
Riser Top Tensions																					
Liquid Production #13	kN	1239	212	18	211	2478	578	1275	289	21	288	3241	725	2%	36%	16%	36%	40%	8%		
Water Injection #22	kN	2071	307	21	307	3871	999	2141	316	25	315	4118	1359	2%	3%	19%	3%	9%	13%		
Gas Injection #24	kN	1185	150	10	150	2074	558	1229	92	7	92	1710	926	3%	-38%	-33%	-38%	-24%	24%		
Gas Export #25	kN	515	154	23	152	1772	69	565	225	7	224	2172	315	3%	46%	-71%	48%	24%	14%		
Tension Average Abs(FM)														3%	31%	35%	31%	24%	15%		
Greenwater																					
Rel. wave elev. at bow	m	0.28	5.56	0.17	5.55	23.29	-19.86	0.19	5.24	0.00	5.24	22.97	-17.94	0%	-6%		-6%	-1%	4%		
														Average ABS(FM)		4%	23%	30%	26%	19%	12%
														Meta ABS(FM)		5%	28%	29%	32%	24%	15%

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted						Figures of Merit (FM): Mean FM = simulation mean - measured mean / measured (Max-Min) :													
Hurricane Waves		:All tests use API "net loads best estimate" algorithm" unless otherwise noted						Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. / measured Std. Dev.													
Test 105001								MaxMin FM = simulation MaxMin - measured MaxMin / measured (Max-Min)													
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit							
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min		
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.				
Translations of FPSO (Earth fixed)																					
x - Turntable	m	-20.00	8.49	8.45	0.83	0.42	-46.55	-23.38	11.56	11.55	0.49	4.37	-64.11	-7%	36%	37%	-41%	8%	-37%		
y - Turntable	m	0.62	4.50	4.45	0.62	14.81	-9.00	4.94	5.43	5.41	0.42	22.53	-9.91	18%	21%	22%	-32%	32%	-4%		
xy - Turntable	m							23.90	12.78	12.76	0.64	65.63	0.00								
z - Turntable	m	-0.51	2.03	0.07	2.03	6.85	-7.84	0.00	2.22	0.00	2.22	8.10	-8.10	4%	9%		9%	9%	-2%		
XYZ Average Abs(FM)														10%	22%	29%	28%	16%	14%		
Rotations of FPSO																					
Roll	deg	0.31	1.36	0.13	1.35	5.08	-5.31	0.30	3.02	0.00	3.02	11.31	-10.71	0%	122%		123%	60%	-52%		
Pitch	deg	0.21	1.01	0.04	1.01	3.83	-3.22	0.21	1.32	0.00	1.32	5.04	-4.62	0%	31%		31%	17%	-20%		
Yaw	deg	10.65	6.20	6.20	0.27	24.71	-6.38	8.73	4.41	4.41	0.15	21.07	-3.62	-6%	-29%	-29%	-45%	-12%	9%		
RPY Average Abs(FM)														2%	61%	29%	66%	30%	27%		
Forces and Moments acting on the turntable																					
Fx Turntab	kN	982	881	565	677	5132	-2224	1463	1053	766	722	5868	-2497	7%	19%	36%	7%	10%	-4%		
Fy Turntab	kN	-428	874	449	749	2713	-4258	-659	1678	595	1569	4315	-6467	-3%	92%	32%	109%	23%	-32%		
Fxy Turntable	kN							1605	1981	970	1727	7694	0								
Fz Turntab	kN	164	3540	125	3538	13337	-17038	-78	4056	116	4054	26846	-27342	-1%	15%	-7%	15%	44%	-34%		
Mx Turntable	kN m	638	6624	1642	6417	40255	-25804	2485	11552	1355	11472	53128	-44370	3%	74%	-18%	79%	19%	-28%		
My Turntable	kN m	431	6378	1299	6244	32281	-27257	2638	4426	1785	4050	20771	-13647	4%	-31%	37%	-35%	-19%	23%		
Mxy Turntable	kN m							3624	12371	2240	12166	54794	0								
F-M Average Abs(FM)														3%	46%	26%	49%	23%	24%		
Forces in mooring lines																					
F line 1(LTM)	kN	1391	181	104	148	2253	754	1392	191	139	131	2454	404	0%	6%	34%	-12%	13%	-23%		
F line 2 (LTM)	kN	1318	161	91	132	2132	794	1341	183	131	127	2375	400	2%	14%	44%	-4%	18%	-29%		
F line 3 (LTM)	kN	1328	164	95	134	2034	737	1293	174	122	124	2299	396	-3%	17%	28%	-7%	20%	-26%		
F line 4	kN	1185	137	37	132	1846	483	1150	117	27	113	1946	358	-3%	-15%	-27%	-14%	7%	-9%		
F line 5	kN	1090	121	35	116	1724	445	1067	115	29	112	1865	350	-2%	-5%	-16%	-4%	11%	-7%		
F line 6	kN	1151	144	45	136	1795	459	1121	121	37	116	1952	356	-2%	-16%	-18%	-15%	12%	-8%		
F line 7 (HTM)	kN	916	145	62	131	1573	341	947	161	83	138	2035	341	3%	11%	35%	5%	37%	0%		
F line 8 (HTM)	kN	924	142	57	130	1574	357	955	163	83	140	2053	341	3%	15%	46%	8%	39%	-1%		
F line 9 (HTM)	kN	934	148	59	136	1593	349	965	164	83	141	2070	341	3%	11%	39%	4%	38%	-1%		
F line 10	kN	1141	160	42	155	1933	418	1168	145	29	143	2151	347	2%	-9%	-31%	-8%	14%	-5%		
F line 11	kN	1159	159	49	151	2042	435	1159	145	34	141	2142	348	0%	-9%	-31%	-7%	6%	-5%		
F line 12	kN	1163	163	53	154	2022	426	1192	148	41	143	2192	353	2%	-9%	-22%	-8%	11%	-5%		
Tension Average Abs(FM)														2%	10%	31%	8%	19%	10%		
Riser Top Tensions																					
Liquid Production #13	kN	1186	175	15	175	1986	626	1213	273	23	272	3060	727	2%	56%	60%	56%	79%	7%		
Water Injection #22	kN	1972	240	21	239	3037	1084	2051	296	30	294	3872	1363	4%	23%	40%	23%	43%	14%		
Gas Injection #24	kN	1202	156	10	156	2047	600	1245	99	10	99	1788	923	3%	-36%	-3%	-36%	-18%	22%		
Gas Export #25	kN	532	125	14	124	1350	149	538	210	8	210	2039	316	1%	68%	-45%	69%	57%	14%		
Tension Average Abs(FM)														2%	46%	37%	46%	49%	14%		
Greenwater																					
Rel. wave elev. at bow	m	0.77	5.34	0.18	5.34	23.92	-19.24	0.19	5.25	0.00	5.25	22.99	-17.95	-1%	-2%		-2%	-2%	3%		
														Average ABS(FM)		3%	30%	31%	30%	25%	16%
														Meta ABS(FM)		5%	28%	29%	32%	24%	15%

DeepStar FPSO		All tests of 3 hour duration unless otherwise noted										Figures of Merit (FM): Mean FM = simulation mean - measured mean /measured (Max-Min) ;							
Loop Current Wind Only		All tests use API "net loads best estimate" algorithm unless otherwise noted										Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. /(measured Std. Dev.)							
Test 108002 (.5 hr)												MaxMin FM = simulation MaxMin - measured MaxMin /measured (Max-Min)							
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit					
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.		
Translations of FPSO (Earth fixed)																			
x - Turntable	m	-0.94	0.46			-0.07	-1.90	-1.22	0.02	0.02	0.00	-1.19	-1.26	-15%	-96%			-61%	35%
y - Turntable	m	4.78	0.40			5.54	3.89	5.11	0.84	0.84	0.00	6.88	3.33	20%	110%			81%	-34%
xy - Turntable	m							5.25	0.84	0.84	0.00	6.99	3.54						
z - Turntable	m	-0.21	0.01			-0.19	-0.26	0.00	0.00	0.00	0.00	0.00	0.00	300%	-100%			271%	371%
Rotations of FPSO																			
Roll	deg	0.17	0.02			0.24	0.10	0.17	0.00	0.00	0.00	0.17	0.17	0%	-100%			-50%	50%
Pitch	deg	0.25	0.03			0.33	0.16	0.25	0.00	0.00	0.00	0.25	0.25	0%	-100%			-47%	53%
Yaw	deg	266.90	0.53			267.90	265.90	-93.10	0.07	0.07	0.00	-92.96	-93.24	0%	-87%			-43%	43%
Forces and Moments acting on the turntable																			
Fx Turntab	kN	311	34			416	208	314	134	134	0	531	316	1%	298%			56%	52%
Fy Turntab	kN	129	40			245	-1	115	60	60	0	50	32	-5%	52%			-79%	13%
Fxy Turntable	kN							334	147	147	0	531	232						
Fz Turntab	kN	35	36			148	-93	1	2	2	0	3	-3	-14%	-95%			-60%	37%
Mx Turntable	kN m	-168	585			1509	-1744	1441	13	13	0	1467	1415	49%	-98%			-1%	97%
My Turntable	kN m	-446	465			831	-1859	2845	152	152	0	3165	2532	122%	-67%			87%	163%
Mxy Turntable	kN m							3189	152	152	0	3467	2926						
Forces in mooring lines																			
F line 1(LTM)	kN	1127	6			1144	1113	1155	1	1	0	1156	1154	90%	-91%			39%	131%
F line 2 (LTM)	kN	1115	4			1128	1102	1148	0	0	0	1148	1148	127%	-97%			78%	176%
F line 3 (LTM)	kN	1117	5			1131	1102	1156	1	1	0	1157	1154	133%	-85%			91%	179%
F line 4	kN	1126	4			1141	1114	1147	7	7	0	1163	1131	77%	73%			80%	63%
F line 5	kN	1107	4			1118	1095	1104	7	7	0	1120	1090	-12%	93%			7%	-24%
F line 6	kN	1155	4			1170	1142	1168	8	8	0	1185	1152	47%	79%			53%	37%
F line 7 (HTM)	kN	1254	5			1267	1240	1216	1	1	0	1217	1215	-141%	-89%			-184%	-93%
F line 8 (HTM)	kN	1206	3			1217	1196	1168	0	0	0	1169	1168	-179%	-95%			-230%	-133%
F line 9 (HTM)	kN	1243	5			1257	1230	1216	1	1	0	1218	1214	-100%	-81%			-145%	-59%
F line 10	kN	1242	5			1256	1226	1228	8	8	0	1246	1211	-46%	66%			-33%	-50%
F line 11	kN	1215	4			1226	1203	1217	8	8	0	1234	1200	7%	116%			36%	-14%
F line 12	kN	1214	5			1227	1201	1209	8	8	0	1226	1193	-18%	78%			-2%	-32%
Riser Top Tensions																			
Liquid Production #13	kN	1182	6			1204	1163	1210	0	0	0	1210	1210	69%	-100%			16%	115%
Water Injection #22	kN	1945	5			1959	1928	1976	1	1	0	1977	1974	99%	-86%			58%	149%
Gas Injection #24	kN	1286	6			1306	1268	1312	1	1	0	1314	1311	69%	-89%			20%	113%
Gas Export #25	kN	519	4			530	507	518	0	0	0	519	517	-5%	-87%			-50%	41%
Greenwater																			
Rel. wave elev. at bow	m	0.09	0.04			0.05	-0.23	0.00	0.00	0.00	0.00	NaN	NaN	-32%	-100%			#VALUE!	#VALUE!

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted										Figures of Merit (FM): Mean FM = simulation mean - measured mean /measured (Max-Min) :							
Loop Current Only		:All tests use API "net loads best estimate" algorithm unless otherwise noted										Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. /(measured Std. Dev.)							
Test 108010 (.5 hr)												MaxMin FM = simulation MaxMin - measured MaxMin /measured (Max-Min)							
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit					
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.		
Translations of FPSO (Earth fixed)																			
x - Turntable	m	65.93	2.55			71.37	60.54	58.91	4.37	4.37	0.00	67.97	49.63	-65%	71%			-31%	-101%
y - Turntable	m	-20.90	5.32			-9.87	-32.50	19.98	3.05	3.05	0.00	26.35	13.54	181%	-43%			160%	203%
xy - Turntable	m							62.20	5.33	5.33	0.00	72.90	51.44						
z - Turntable	m	-0.53	0.01			-0.45	-0.61	0.00	0.00	0.00	0.00	0.00	0.00	331%	-100%			281%	381%
Rotations of FPSO																			
Roll	deg	0.23	0.03			0.33	0.14	0.23	0.00	0.00	0.00	0.23	0.23	0%	-100%			-53%	47%
Pitch	deg	0.04	0.03			0.06	0.14	-0.04	0.00	0.00	0.00	-0.04	-0.04	100%	-100%			125%	225%
Yaw	deg	192.70	2.07			196.60	187.50	163.99	1.51	1.51	0.00	167.16	160.82	3641%	-27%			3633%	3663%
Forces and Moments acting on the turntable																			
Fx Turntab	kN	535	175			1010	69	466	321	321	0	1146	-162	-7%	84%			14%	-25%
Fy Turntab	kN	-1661	418			-570	-2676	1419	359	359	0	1967	729	146%	-14%			120%	162%
Fxy Turntable	kN							1493	482	482	0	2273	842						
Fz Turntab	kN	-711	146			-238	-1128	-662	123	123	0	-457	-921	5%	-16%			-25%	23%
Mx Turntable	kN m	13742	2673			20711	5317	-13699	1018	1018	0	-11657	-15847	-178%	-62%			-210%	-137%
My Turntable	kN m	53400	1887			58519	48161	30766	840	840	0	32553	29113	-219%	-55%			-251%	-184%
Mxy Turntable	kN m							33678	1320	1320	0	35722	31689						
Forces in mooring lines																			
F line 1(LTM)	kN	599	12			633	569	764	20	20	0	806	728	260%	59%			273%	249%
F line 2 (LTM)	kN	626	12			659	592	753	21	21	0	797	715	189%	76%			207%	185%
F line 3 (LTM)	kN	604	12			632	568	752	22	22	0	799	712	233%	90%			263%	226%
F line 4	kN	1344	57			1475	1222	991	25	25	0	1044	943	-140%	-57%			-171%	-110%
F line 5	kN	1402	67			1561	1267	994	22	22	0	1040	950	-139%	-68%			-177%	-108%
F line 6	kN	1524	72			1698	1378	1092	21	21	0	1138	1049	-135%	-70%			-175%	-103%
F line 7 (HTM)	kN	2270	57			2386	2143	2009	77	77	0	2172	1857	-108%	35%			-88%	-118%
F line 8 (HTM)	kN	2187	51			2301	2078	1945	79	79	0	2113	1790	-108%	54%			-84%	-129%
F line 9 (HTM)	kN	2178	47			2291	2087	2055	89	89	0	2244	1880	-60%	91%			-23%	-101%
F line 10	kN	1076	47			1181	970	1458	45	45	0	1553	1370	181%	-5%			176%	189%
F line 11	kN	1028	40			1126	938	1383	37	37	0	1463	1309	189%	-7%			179%	197%
F line 12	kN	942	39			1039	853	1316	31	31	0	1382	1254	201%	-20%			184%	216%
Riser Top Tensions																			
Liquid Production #13	kN	1017	33			1106	905	1108	6	6	0	1121	1096	45%	-81%			8%	95%
Water Injection #22	kN	1734	55			1886	1568	1881	4	4	0	1890	1872	46%	-92%			1%	95%
Gas Injection #24	kN	1393	57			1475	1300	1415	11	11	0	1438	1393	12%	-80%			-21%	53%
Gas Export #25	kN	419	21			472	367	507	0	0	0	508	507	84%	-98%			35%	133%
Greenwater																			
Rel. wave elev. at bow	m	0.21	0.02			0.27	-0.23	0.00	0.00	0.00	0.00	NaN	NaN	-42%	-100%			#VALUE!	#VALUE!

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted										Figures of Merit (FM): Mean FM = simulation mean - measured mean /measured (Max-Min) :							
Loop Wind & Current		:All tests use API "net loads best estimate" algorithm unless otherwise noted										Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. /(measured Std. Dev.)							
Test 108011 (.5 hr)												MaxMin FM = simulation MaxMin - measured MaxMin /measured (Max-Min)							
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit					
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.		
Translations of FPSO (Earth fixed)																			
x - Turntable	m	76.34	3.77			81.70	68.36	67.80	4.29	4.29	0.00	76.69	58.66	-64%	14%			-38%	-73%
y - Turntable	m	-30.60	3.38			-24.80	-36.60	-34.27	3.89	3.89	0.00	-26.06	-42.37	-31%	15%			-11%	-49%
xy - Turntable	m							75.97	5.79	5.79	0.00	87.61	64.18						
z - Turntable	m	-0.60	0.04			-0.50	-0.69	0.00	0.00	0.00	0.00	0.00	0.00	316%	-100%			263%	363%
Rotations of FPSO																			
Roll	deg	0.43	0.04			0.54	0.29	0.43	0.00	0.00	0.00	0.43	0.43	0%	-100%			-44%	56%
Pitch	deg	0.00	0.02			0.09	-0.07	0.00	0.00	0.00	0.00	0.00	0.00	0%	-100%			-56%	44%
Yaw	deg	207.70	1.64			210.60	204.40	-152.29	2.29	2.29	0.00	-147.49	-157.09	0%	40%			31%	-24%
Forces and Moments acting on the turntable																			
Fx Turntab	kN	596	167			1105	128	472	329	329	0	1185	-80	-13%	97%			8%	-21%
Fy Turntab	kN	-2812	384			-1933	-3696	-2836	589	589	0	-2179	-3969	-1%	53%			-14%	-15%
Fxy Turntable	kN							2875	674	674	0	3969	1994						
Fz Turntab	kN	-1000	172			-490	-1477	-956	150	150	0	-660	-1257	4%	-13%			-17%	22%
Mx Turntable	kN m	28922	2012			34318	23772	21265	1343	1343	0	24092	18488	-73%	-33%			-97%	-50%
My Turntable	kN m	50339	2025			55648	44685	28643	824	824	0	30410	27156	-198%	-59%			-230%	-160%
Mxy Turntable	kN m							35674	1576	1576	0	37803	33643						
Forces in mooring lines																			
F line 1(LTM)	kN	555	16			592	529	707	19	19	0	747	673	239%	21%			243%	227%
F line 2 (LTM)	kN	581	15			620	555	717	18	18	0	755	684	210%	16%			209%	198%
F line 3 (LTM)	kN	556	15			599	528	736	17	17	0	774	704	254%	13%			247%	248%
F line 4	kN	1452	36			1527	1383	1521	49	49	0	1624	1424	48%	33%			67%	29%
F line 5	kN	1536	48			1628	1453	1537	54	54	0	1652	1430	0%	13%			14%	-13%
F line 6	kN	1674	56			1784	1579	1718	68	68	0	1862	1586	22%	22%			38%	3%
F line 7 (HTM)	kN	2510	88			2646	2322	2277	101	101	0	2492	2079	-72%	15%			-47%	-75%
F line 8 (HTM)	kN	2409	82			2535	2229	2114	87	87	0	2297	1943	-97%	5%			-78%	-93%
F line 9 (HTM)	kN	2376	75			2490	2211	2142	81	81	0	2314	1981	-84%	7%			-63%	-82%
F line 10	kN	998	23			1045	945	962	24	24	0	1013	915	-37%	5%			-33%	-30%
F line 11	kN	942	24			991	891	912	25	25	0	965	864	-30%	3%			-26%	-27%
F line 12	kN	863	24			911	814	870	25	25	0	925	822	8%	6%			14%	9%
Riser Top Tensions																			
Liquid Production #13	kN	1014	34			1118	909	1097	6	6	0	1109	1085	39%	-83%			-4%	84%
Water Injection #22	kN	1709	57			1866	1507	1835	8	8	0	1851	1819	35%	-86%			-4%	87%
Gas Injection #24	kN	1411	55			1474	1361	1380	4	4	0	1389	1372	-27%	-93%			-76%	9%
Gas Export #25	kN	424	20			482	369	474	3	3	0	482	467	45%	-83%			0%	87%
Greenwater																			
Rel. wave elev. at bow	m	0.13	0.06			0.32	-0.23	0.00	0.00	0.00	0.00	NaN	NaN	-24%	-100%			#VALUE!	#VALUE!

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted						Figures of Merit (FM): :Mean FM = simulation mean - measured mean /[measured (Max-Min)] :													
Loop Current WWC		:All tests use API "net loads best estimate" algorithm" unless otherwise noted						Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. /[measured Std. Dev.]													
Test 108012								MaxMin FM = simulation MaxMin - measured MaxMin /[measured (Max-Min)]													
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit							
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min		
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.				
Translations of FPSO (Earth fixed)																					
x - Turntable	m	78.42	3.60	3.58	0.32	88.98	69.45	78.11	4.75	4.73	0.45	92.09	63.36	-2%	32%	32%	41%	16%	-31%		
y - Turntable	m	-18.81	5.83	5.80	0.57	-0.42	-32.69	-20.90	6.32	6.26	0.86	-2.90	-36.59	-6%	8%	8%	50%	-8%	-12%		
xy - Turntable	m							80.86	7.91	7.85	0.97	101.21	60.82								
z - Turntable	m	-0.61	0.95	0.05	0.95	2.90	-4.30	0.00	1.22	0.00	1.22	4.52	-4.52	8%	29%		29%	22%	-3%		
XYZ Average Abs(FM)														6%	23%	20%	40%	15%	15%		
Rotations of FPSO																					
Roll	deg	0.69	1.69	0.16	1.68	8.84	-6.60	0.00	3.66	0.00	3.66	13.60	-13.60	-4%	117%		118%	31%	-45%		
Pitch	deg	0.02	0.55	0.01	0.55	2.40	-2.28	0.00	0.77	0.00	0.77	2.87	-2.87	0%	39%		39%	10%	-13%		
Yaw	deg	211.45	2.26	2.23	0.37	219.79	202.64	-148.40	2.06	2.03	0.38	-142.37	-154.44	1%	-9%	-9%	2%	-13%	17%		
RPY Average Abs(FM)														2%	55%	9%	53%	18%	25%		
Forces and Moments acting on the turntable																					
Fx Turntab	kN	1042	432	315	297	2946	-354	955	499	255	429	2740	-587	-3%	15%	-19%	45%	-6%	-7%		
Fy Turntab	kN	-2299	1139	529	1008	3580	-6006	-2043	2079	629	1982	6935	-10392	3%	83%	19%	97%	35%	-46%		
Fxy Turntable	kN							2255	2138	679	2028	10392	0								
Fz Turntab	kN	-1028	2258	99	2255	9103	-11238	-1123	2634	187	2627	14386	-16965	0%	17%	89%	16%	26%	-28%		
Mx Turntable	kN m	29367	8747	2223	8459	67746	-3975	23656	10722	2631	10394	59467	-15970	-8%	23%	18%	23%	-12%	-17%		
My Turntable	kN m	49528	5796	2088	5407	77927	27705	34324	3057	1052	2870	47824	22452	-30%	-47%	-50%	-47%	-60%	-10%		
Mxy Turntable	kN m							41686	11149	2834	10783	65942	17520								
F-M Average Abs(FM)														9%	37%	39%	46%	28%	22%		
Forces in mooring lines																					
F line 1(LTM)	kN	544	52	14	51	835	262	673	80	18	79	1250	309	22%	53%	26%	55%	72%	8%		
F line 2 (LTM)	kN	566	52	14	50	850	293	677	79	17	77	1240	310	20%	51%	18%	53%	70%	3%		
F line 3 (LTM)	kN	536	49	15	47	810	273	689	77	18	75	1242	313	29%	58%	18%	61%	81%	7%		
F line 4	kN	1305	95	61	72	1669	778	1354	96	72	63	1836	890	5%	1%	19%	-13%	19%	13%		
F line 5	kN	1379	104	70	77	1788	813	1378	98	76	62	1857	918	0%	-6%	8%	-20%	7%	11%		
F line 6	kN	1507	112	77	82	1960	877	1549	111	90	65	2056	1065	4%	-1%	18%	-21%	9%	17%		
F line 7 (HTM)	kN	2535	127	84	95	3035	1974	2475	139	120	71	2984	1986	-6%	10%	43%	-25%	-5%	1%		
F line 8 (HTM)	kN	2459	123	79	94	2940	1935	2320	128	106	72	2810	1845	-14%	4%	34%	-24%	-13%	-9%		
F line 9 (HTM)	kN	2448	122	76	96	2911	1926	2376	128	104	74	2870	1896	-7%	4%	36%	-22%	-4%	-3%		
F line 10	kN	1103	97	51	83	1640	684	1072	114	51	101	1796	362	-3%	17%	1%	23%	16%	-34%		
F line 11	kN	1040	91	48	77	1533	666	1008	112	49	101	1735	337	-4%	23%	2%	31%	23%	-38%		
F line 12	kN	939	88	45	75	1432	576	953	110	46	100	1682	331	2%	26%	3%	34%	29%	-29%		
Tension Average Abs(FM)														10%	21%	19%	32%	29%	14%		
Riser Top Tensions																					
Liquid Production #13	kN	1016	86	11	85	1332	631	1082	152	6	152	1941	755	9%	78%	-43%	79%	87%	18%		
Water Injection #22	kN	1718	143	10	142	2306	1076	1829	162	8	162	2548	1422	9%	13%	-18%	13%	20%	28%		
Gas Injection #24	kN	1437	139	18	138	2309	795	1410	101	8	101	1971	935	-2%	-27%	-55%	-27%	-22%	9%		
Gas Export #25	kN	426	61	7	61	738	148	479	114	4	114	1220	326	9%	85%	-41%	86%	82%	30%		
Tension Average Abs(FM)														7%	51%	39%	51%	53%	21%		
Greenwater																					
Rel. wave elev. at bow	m	0.23	2.96	0.09	2.96	15.05	-10.24	0.08	2.90	0.00	2.90	12.72	-10.60	-1%	-2%		-2%	-9%	-1%		
														Average ABS(FM)		7%	32%	26%	40%	29%	18%
														Meta ABS(FM)		5%	28%	29%	32%	24%	15%

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted						Figures of Merit (FM): Mean FM = simulation mean - measured mean / measured (Max-Min)													
Hurricane WW&C		:All tests use API "net loads best estimate" algorithm" unless otherwise noted						Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. /(measured Std. Dev.)													
9 hour Composite								MaxMin FM = simulation MaxMin - measured MaxMin / measured (Max-Min)													
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit							
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min		
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.				
Translations of FPSO (Earth fixed)																					
x - Turntable	m	-50.61	8.03	7.99	0.83	-27.29	-83.99	-50.88	8.37	8.36	0.48	-32.09	-83.87	0%	4%	5%	-42%	-8%	0%		
y - Turntable	m	12.70	6.19	6.16	0.57	40.10	-6.94	20.92	3.84	3.83	0.26	34.41	12.22	17%	-38%	-38%	-54%	-12%	41%		
xy - Turntable	m							55.01	9.21	9.20	0.55	91.72	33.41								
z - Turntable	m	-0.45	2.19	0.07	2.18	7.96	-9.89	0.00	2.21	0.00	2.21	8.71	-8.71	3%	1%		1%	4%	7%		
XYZ Average Abs(FM)														7%	14%	21%	33%	8%	16%		
Rotations of FPSO																					
Roll	deg	0.44	1.10	0.12	1.09	5.45	-5.20	0.44	1.63	0.00	1.63	6.87	-5.99	0%	49%		50%	13%	-7%		
Pitch	deg	0.20	1.07	0.03	1.07	5.06	-4.05	0.20	1.32	0.00	1.32	5.39	-4.99	0%	23%		24%	4%	-10%		
Yaw	deg	8.35	2.78	2.77	0.21	23.17	0.78	7.21	1.42	1.41	0.12	11.83	2.60	-5%	-49%	-49%	-43%	-51%	8%		
RPY Average Abs(FM)														2%	40%	49%	39%	23%	9%		
Forces and Moments acting on the turntable																					
Fx Turntab	kN	2247	956	650	702	6830	-1503	2647	1033	604	838	7396	-1147	5%	8%	-7%	19%	7%	4%		
Fy Turntab	kN	-762	863	534	679	2063	-7610	-1499	1037	409	952	3694	-7814	-8%	20%	-23%	40%	17%	-2%		
Fxy Turntable	kN							3041	1463	729	1269	8197	0								
Fz Turntab	kN	-275	4002	235	3995	13953	-22268	-467	3924	183	3920	28517	-29701	-1%	-2%	-22%	-2%	40%	-21%		
Mx Turntable	kN m	9375	7191	2631	6693	62375	-20166	8120	5119	1043	5012	26772	-10335	-2%	-29%	-60%	-25%	-43%	12%		
My Turntable	kN m	13229	8872	2438	8530	64541	-27755	10346	4183	1370	3952	30738	-6917	-3%	-53%	-44%	-54%	-37%	23%		
Mxy Turntable	kN m							13152	6611	1721	6383	32047	0								
F-M Average Abs(FM)														4%	22%	31%	28%	29%	12%		
Forces in mooring lines																					
F line 1(LTM)	kN	1848	245	141	201	3507	1019	1783	195	139	137	2923	683	-3%	-20%	-1%	-32%	-23%	-13%		
F line 2 (LTM)	kN	1785	251	148	203	3367	920	1695	187	131	134	2815	614	-4%	-25%	-11%	-34%	-23%	-13%		
F line 3 (LTM)	kN	1749	217	126	177	3156	1007	1610	180	123	131	2708	549	-6%	-17%	-2%	-26%	-21%	-21%		
F line 4	kN	1105	146	50	138	2009	411	1041	115	32	110	1944	339	-4%	-22%	-36%	-20%	-4%	-4%		
F line 5	kN	997	143	48	134	1866	323	951	112	27	108	1843	330	-3%	-22%	-44%	-20%	-2%	0%		
F line 6	kN	1027	145	50	136	1876	359	979	114	29	110	1886	333	-3%	-22%	-43%	-19%	1%	-2%		
F line 7 (HTM)	kN	728	122	40	115	1272	263	781	129	44	122	1830	313	5%	6%	12%	5%	55%	5%		
F line 8 (HTM)	kN	737	118	36	112	1396	251	793	131	46	123	1855	314	5%	11%	29%	10%	40%	5%		
F line 9 (HTM)	kN	748	125	39	118	1319	266	808	133	47	125	1882	315	6%	7%	20%	5%	54%	5%		
F line 10	kN	1252	204	69	192	2639	365	1308	152	43	146	2444	354	2%	-25%	-38%	-24%	-9%	-1%		
F line 11	kN	1292	210	80	195	2749	426	1323	152	43	146	2449	356	1%	-28%	-46%	-25%	-13%	-3%		
F line 12	kN	1329	220	84	203	2861	373	1388	155	47	147	2521	362	2%	-30%	-44%	-27%	-14%	0%		
Tension Average Abs(FM)														4%	20%	27%	21%	21%	6%		
Riser Top Tensions																					
Liquid Production #13	kN	1241	218	20	217	2756	549	1275	289	21	288	3542	711	2%	33%	2%	33%	36%	7%		
Water Injection #22	kN	2072	315	25	314	4099	905	2141	316	25	315	4406	1334	2%	0%	-1%	0%	10%	13%		
Gas Injection #24	kN	1184	154	11	153	2074	502	1229	92	7	92	1771	912	3%	-40%	-39%	-40%	-19%	26%		
Gas Export #25	kN	516	160	26	157	1806	50	565	225	7	224	2428	308	3%	41%	-74%	42%	35%	15%		
Tension Average Abs(FM)														2%	28%	29%	29%	25%	15%		
Greenwater																					
Rel. wave elev. at bow	m	0.35	5.61	0.18	5.60	24.89	-20.42	0.19	5.24	0.00	5.24	24.94	-19.06	0%	-7%		-7%	0%	3%		
														Average ABS(FM)		4%	23%	29%	26%	21%	10%
														Meta ABS(FM)		4%	26%	27%	31%	25%	12%

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted						Figures of Merit (FM): Mean FM = simulation mean - measured mean / measured (Max-Min) :													
Hurricane Waves		:All tests use API "net loads best estimate" algorithm" unless otherwise noted						Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. / measured Std. Dev.													
9 hour Composite								MaxMin FM = simulation MaxMin - measured MaxMin / measured (Max-Min)													
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit							
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min		
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.				
Translations of FPSO (Earth fixed)																					
x - Turntable	m	-20.93	9.54	9.50	0.86	5.85	-72.53	-23.38	11.57	11.56	0.49	4.51	-71.36	-3%	21%	22%	-43%	-2%	1%		
y - Turntable	m	2.11	5.50	5.45	0.72	29.75	-14.04	4.94	5.43	5.41	0.42	24.70	-10.58	6%	-1%	-1%	-42%	-12%	8%		
xy - Turntable	m							23.90	12.78	12.76	0.64	73.11	0.00								
z - Turntable	m	-0.56	2.08	0.07	2.08	8.02	-9.11	0.00	2.22	0.00	2.22	8.74	-8.74	3%	7%		7%	4%	2%		
XYZ Average Abs(FM)														4%	10%	11%	30%	6%	4%		
Rotations of FPSO																					
Roll	deg	0.30	1.55	0.16	1.54	6.41	-6.93	0.30	3.02	0.00	3.02	12.19	-11.59	0%	95%		96%	43%	-35%		
Pitch	deg	0.20	1.02	0.04	1.02	4.53	-3.87	0.21	1.32	0.00	1.32	5.42	-5.00	0%	30%		30%	11%	-13%		
Yaw	deg	9.57	6.48	6.47	0.32	38.85	-6.56	8.73	4.41	4.41	0.15	22.73	-5.27	-2%	-32%	-32%	-53%	-36%	3%		
RPY Average Abs(FM)														1%	52%	32%	59%	30%	17%		
Forces and Moments acting on the turntable																					
Fx Turntab	kN	1079	916	618	677	5848	-3316	1463	1053	767	722	6496	-2726	4%	15%	24%	7%	7%	6%		
Fy Turntab	kN	-533	1024	557	860	3269	-8699	-659	1678	595	1569	4624	-6713	-1%	64%	7%	82%	11%	17%		
Fxy Turntable	kN							1605	1981	971	1727	8231	0								
Fz Turntab	kN	184	3643	163	3639	13755	-23156	-78	4056	116	4054	30796	-31323	-1%	11%	-29%	11%	46%	-22%		
Mx Turntable	kN m	1075	7668	1920	7424	74165	-36314	2485	11552	1355	11472	57486	-48649	1%	51%	-29%	55%	-15%	-11%		
My Turntable	kN m	713	6495	1331	6358	37759	-33281	2638	4426	1785	4050	21972	-14403	3%	-32%	34%	-36%	-22%	27%		
Mxy Turntable	kN m							3624	12371	2241	12166	59310	0								
F-M Average Abs(FM)														2%	35%	25%	38%	20%	17%		
Forces in mooring lines																					
F line 1(LTM)	kN	1404	203	124	161	3495	540	1392	191	139	131	2555	402	0%	-6%	13%	-19%	-32%	-5%		
F line 2 (LTM)	kN	1328	184	112	146	3321	651	1341	183	131	127	2475	398	0%	-1%	17%	-13%	-32%	-10%		
F line 3 (LTM)	kN	1336	181	111	143	3044	523	1293	174	122	124	2399	393	-2%	-4%	10%	-13%	-26%	-5%		
F line 4	kN	1173	138	45	130	1951	446	1150	117	27	113	2050	350	-1%	-15%	-39%	-13%	7%	-6%		
F line 5	kN	1074	125	43	117	1912	364	1067	115	29	112	1970	343	0%	-8%	-33%	-5%	4%	-1%		
F line 6	kN	1136	145	54	135	1944	413	1121	121	37	116	2058	348	-1%	-17%	-32%	-14%	7%	-4%		
F line 7 (HTM)	kN	903	147	68	131	1848	296	947	161	83	138	2164	332	3%	9%	22%	6%	20%	2%		
F line 8 (HTM)	kN	913	142	63	128	1817	325	955	163	83	140	2183	332	3%	14%	32%	9%	24%	0%		
F line 9 (HTM)	kN	927	150	65	135	1879	296	965	164	83	141	2201	332	2%	9%	26%	5%	20%	2%		
F line 10	kN	1161	176	53	168	2632	394	1168	145	29	143	2278	339	0%	-18%	-45%	-15%	-16%	-2%		
F line 11	kN	1185	182	66	169	3337	421	1159	145	34	141	2268	340	-1%	-20%	-49%	-17%	-37%	-3%		
F line 12	kN	1179	181	69	167	2884	400	1192	148	41	143	2317	345	1%	-18%	-40%	-15%	-23%	-2%		
Tension Average Abs(FM)														1%	12%	30%	12%	21%	4%		
Riser Top Tensions																					
Liquid Production #13	kN	1184	182	16	181	2720	565	1213	273	24	272	3340	713	1%	50%	49%	50%	29%	7%		
Water Injection #22	kN	1973	251	24	250	3874	987	2051	296	30	294	4133	1339	3%	18%	23%	18%	9%	12%		
Gas Injection #24	kN	1200	157	11	157	2216	530	1245	99	10	99	1860	908	3%	-37%	-8%	-37%	-21%	22%		
Gas Export #25	kN	534	132	17	131	1825	147	538	210	8	210	2277	309	0%	59%	-56%	61%	27%	10%		
Tension Average Abs(FM)														2%	41%	34%	41%	21%	13%		
Greenwater																					
Rel. wave elev. at bow	m	0.83	5.45	0.18	5.44	23.92	-19.24	0.19	5.25	0.00	5.25	24.96	-19.08	-1%	-4%		-4%	2%	0%		
														Average ABS(FM)		2%	25%	28%	29%	19%	9%
														Meta ABS(FM)		4%	26%	27%	31%	25%	12%

DeepStar FPSO		:All tests of 3 hour duration unless otherwise noted						Figures of Merit (FM): Mean FM = simulation mean - measured mean / measured (Max-Min) :													
Loop Current WWC		:All tests use API "net loads best estimate" algorithm" unless otherwise noted						Std. Dev. FM = simulation Std. Dev. - measured Std. Dev. / measured Std. Dev.													
9 hour Composite								MaxMin FM = simulation MaxMin - measured MaxMin / measured (Max-Min)													
Response	Unit	MARIN Model Tests						SeaSoft Version 6.80						Figures of Merit							
		Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min	Mean	St. Dev.	LF	WF	Max	Min		
				St. Dev.	St. Dev.					St. Dev.	St. Dev.					St. Dev.	St. Dev.				
Translations of FPSO (Earth fixed)																					
x - Turntable	m	78.58	3.77	3.76	0.32	88.98	65.41	78.11	4.76	4.74	0.45	93.75	61.46	-2%	26%	26%	40%	20%	-17%		
y - Turntable	m	-18.55	6.30	6.28	0.58	13.06	-34.36	-20.90	6.32	6.26	0.86	-0.02	-38.84	-5%	0%	0%	49%	-28%	-9%		
xy - Turntable	m							80.86	7.91	7.85	0.97	103.88	58.50								
z - Turntable	m	-0.62	0.96	0.05	0.96	2.97	-4.34	0.00	1.22	0.00	1.22	4.87	-4.87	8%	27%		27%	26%	-7%		
XYZ Average Abs(FM)														5%	18%	13%	39%	25%	11%		
Rotations of FPSO																					
Roll	deg	0.70	1.70	0.17	1.69	8.84	-6.60	0.00	3.66	0.00	3.66	14.64	-14.64	-5%	115%		116%	38%	-52%		
Pitch	deg	0.02	0.56	0.01	0.56	2.40	-2.42	0.00	0.77	0.00	0.77	3.09	-3.09	0%	36%		36%	14%	-14%		
Yaw	deg	211.43	2.36	2.33	0.38	220.47	202.64	-148.40	2.06	2.03	0.38	-141.57	-155.23	1%	-13%	-13%	0%	-11%	12%		
RPY Average Abs(FM)														2%	55%	13%	51%	21%	26%		
Forces and Moments acting on the turntable																					
Fx Turntab	kN	1044	456	340	304	3554	-652	955	500	255	429	2801	-647	-2%	10%	-25%	41%	-18%	0%		
Fy Turntab	kN	-2295	1168	563	1023	3580	-6127	-2043	2079	630	1982	7521	-10895	3%	78%	12%	94%	41%	-49%		
Fxy Turntable	kN							2255	2139	679	2028	10895	0								
Fz Turntab	kN	-1039	2291	97	2289	9103	-11238	-1123	2634	187	2628	16424	-19017	0%	15%	92%	15%	36%	-38%		
Mx Turntable	kN m	29545	8883	2309	8578	67746	-3975	23656	10722	2632	10394	61553	-18138	-8%	17%	14%	21%	-9%	-20%		
My Turntable	kN m	49671	5895	2013	5541	82075	26927	34324	3058	1053	2871	48711	21616	-28%	-48%	-48%	-48%	-60%	-10%		
Mxy Turntable	kN m							41686	11149	2835	10783	66314	17203								
F-M Average Abs(FM)														8%	34%	38%	44%	33%	23%		
Forces in mooring lines																					
F line 1(LTM)	kN	543	53	14	51	840	262	673	81	18	79	1325	303	22%	52%	22%	54%	84%	7%		
F line 2 (LTM)	kN	565	53	15	51	850	290	677	79	17	77	1314	305	20%	49%	16%	51%	83%	3%		
F line 3 (LTM)	kN	534	50	15	47	810	269	689	77	18	75	1314	307	29%	55%	15%	58%	93%	7%		
F line 4	kN	1301	99	66	73	1696	775	1354	96	72	63	1877	848	6%	-3%	10%	-14%	20%	8%		
F line 5	kN	1375	109	76	79	1821	792	1378	98	76	62	1897	878	0%	-10%	1%	-21%	7%	8%		
F line 6	kN	1505	118	83	84	1997	877	1549	111	90	65	2094	1027	4%	-6%	9%	-22%	9%	13%		
F line 7 (HTM)	kN	2539	131	89	96	3091	1920	2475	140	120	71	3011	1961	-5%	7%	35%	-26%	-7%	3%		
F line 8 (HTM)	kN	2464	127	83	96	2991	1870	2320	128	106	72	2837	1819	-13%	1%	28%	-26%	-14%	-5%		
F line 9 (HTM)	kN	2454	125	80	97	2956	1897	2376	128	104	74	2897	1869	-7%	2%	31%	-23%	-6%	-3%		
F line 10	kN	1106	101	56	85	1788	684	1072	114	51	101	1874	337	-3%	12%	-8%	20%	8%	-31%		
F line 11	kN	1038	95	52	79	1677	666	1008	112	49	101	1815	330	-3%	18%	-7%	27%	14%	-33%		
F line 12	kN	941	91	49	77	1579	576	953	110	46	100	1764	324	1%	22%	-5%	31%	18%	-25%		
Tension Average Abs(FM)														10%	20%	15%	31%	30%	12%		
Riser Top Tensions																					
Liquid Production #13	kN	1015	87	12	86	1332	631	1082	152	6	152	2057	744	10%	76%	-44%	77%	103%	16%		
Water Injection #22	kN	1718	144	11	144	2306	1076	1829	162	8	162	2624	1402	9%	12%	-22%	12%	26%	27%		
Gas Injection #24	kN	1437	140	17	139	2309	795	1410	101	8	101	2044	921	-2%	-28%	-55%	-27%	-18%	8%		
Gas Export #25	kN	425	62	8	62	738	148	479	114	4	114	1328	321	9%	83%	-42%	85%	100%	29%		
Tension Average Abs(FM)														7%	50%	41%	50%	62%	20%		
Greenwater																					
Rel. wave elev. at bow	m	0.25	2.97	0.09	2.97	15.25	-10.24	0.08	2.90	0.00	2.90	13.73	-11.26	-1%	-2%		-2%	-6%	-4%		
														Average ABS(FM)		7%	30%	24%	39%	33%	17%
														Meta ABS(FM)		4%	26%	27%	31%	25%	12%