Base Load Power Hub (BLPH)

BARGE INTACT AND DAMAGED STABILITY

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

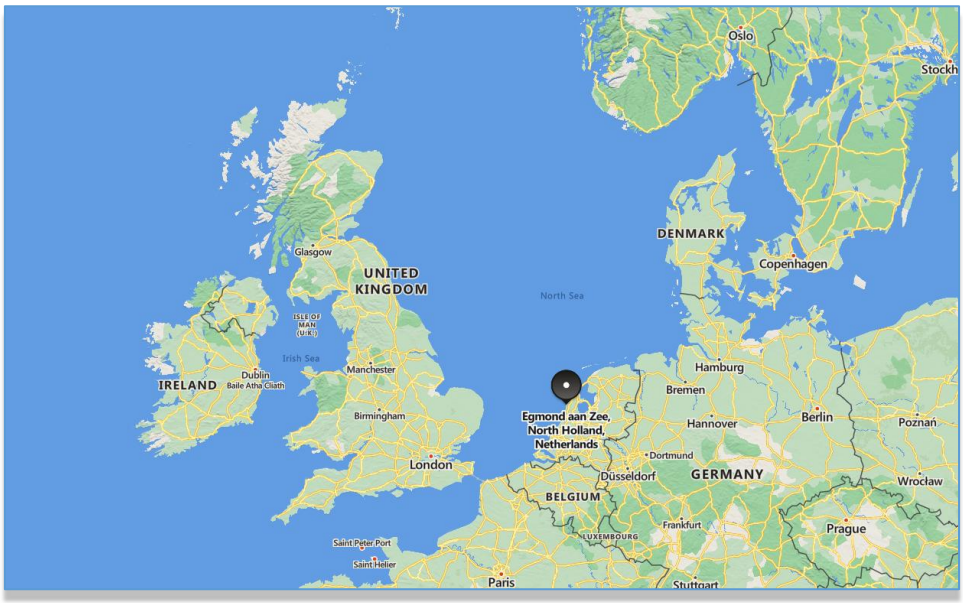


Figure 1.1 - HOLLANDSE KUST NOORD WIND PARK Location Map

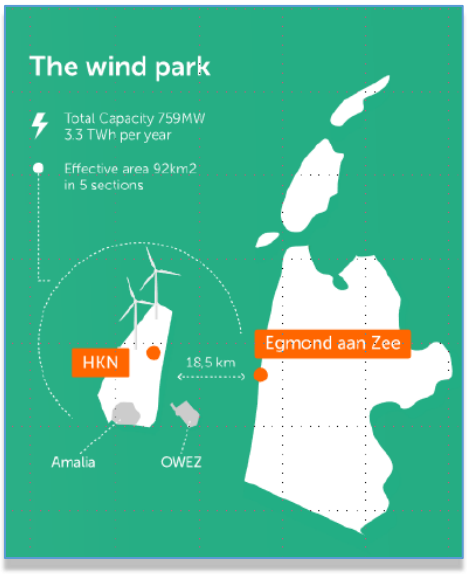


Figure 1.2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

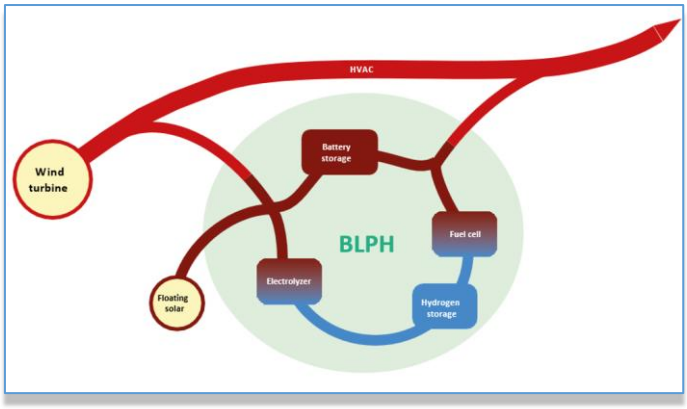


Figure 1.3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

This report deals with the naval analysis performed for the transportation from Rosetti Marino Piomboni yard (Italy) to Eemshaven Port (NL) of the Topside, TP and Caisson Frame, and other minor components, part of the BLPH project.

The cargo barge is the VERVECE having the following main characteristics:

- Barge Name: Vervece
- LOA: 91.44 m
- Breadth: 27.43 m
- Depth: 6.1 m
- Frame Spacing: 2.286 m

The scope of the document is to define the ballast pattern for towing and to check the loaded barge stability in intact and damaged conditions.

The report includes also the longitudinal strength of the loaded barge

Details of marine spread is presented in /27/.

Transportation is carried out in accordance with DNV-ST-N001, Ref./9/ and in compliance with the requirements, criteria and parameters reported in the Structural Design Premises, Ref./19/.

All naval analyses are performed using the MOSES program developed by Bentley, ref. /54/.

The International System of Units (SI) has been used in all engineering assessments and calculations.

3 REFERENCES

3.1 CODES AND STANDARDS

Doc. No.	Description
/1/ BS EN ISO 19900	General requirements for offshore structures - 2019
/2/ BS EN ISO 19901-1	Specific requirements for offshore structures - Part 1: Metocean design and operating considerations - 2015
/3/ BS EN ISO 19901-3	Specific requirements for offshore structures – Part 3: Topsides structure - 2014
/4/ BS EN ISO 19901-5	Specific requirements for offshore structures – Part 5: Weight Management - 2021
/5/ BS EN ISO 19901-6	Specific requirements for offshore structures – Part 6: Marine Operations – 2009
/6/ BS EN ISO 19902	Petroleum and natural gas industries - Fixed steel offshore structures – 2020
/7/ ISO 19906:2019	Petroleum and natural gas industries – Arctic offshore structures
/8/ UNI EN 1993-1-1	Design of steel structures - Part 1-1: General rules and rules for buildings
/9/ DNV-ST-N001	DNV - Marine operation and marine warranty - 2021
/10/ DNV-ST-0145	DNV, Offshore substations
/11/ DNV-RP-C201	DNV, Buckling Strength of Plated Structures, October 2010.
/12/ DNV-RP-C203	DNV, Fatigue design of offshore steel structures, September 2019 and Amendment January 2020
/13/ DNV-RP-C204	DNV-RP-C204 Design against accidental loads – 2019
/14/ DNV-RP-C205	DNV - Environmental conditions and environmental loads - September 2019, amended September 2021.
/15/ DNV-ST-0126	Support structures for wind turbine, 2018

3.2 COMPANY SPECIFICATIONS

Doc. No.	Description
/16/ DEP 37.19.00.12	Gen - Offshore Topsides Structures
/17/ DEP 37.19.00.30	Gen - Fixed Steel Offshore Structures (Adoption of IOGP S-631-11, Amendments / Supplements to ISO 19902:2020).

/18/ DEP 37.81.10.19	Gen - Marine Operations Requirements – Loadout, Transportation and Installation of Offshore Structures (Amendments / Supplements to ISO 19901-6)

3.3 PROJECT DOCUMENTS

Doc. No.	Description
/19/ 123A90-DDL-ST-SP-90017	Structural Design Basis
/20/ 123A90-DDL-MD-RE-01006	Monthly Weight Report – rev. July 24
/21/ 123A90-DDL-PP-DS-70070	BLPH Platform - Plot Plan Lower & Upper Deck
/22/ 123A90-DDL-ST-SP-90018	Structural Material Specification for Topside and TP
/23/ 123A90-DDL-ST-SP-90118	Structural Material Specification for Flange and Bolts
/24/ 123A90-DDL-TI-SP-99014	Specification for TP, Topside and Caissons Transportation and Installation
/25/ 123A90-DDL-TI-DD-99015	BLPH Platform – Barge Layout
/26/ 123A90-DDL-ST-TN-90119	Evaluating ISO and DNV Approaches
/27/ 123A90-DDL-TI-RE-99011	Transport Manual
/28/ 123A90-DDL-TI-DD-99021	BLPH – Topside – Grillage Assembly
/29/ 123A90-DDL-TI-DD-99023	BLPH – Topside – Grillage – Plan and Section
/30/ 123A90-DDL-TI-DD-99024	BLPH – Sea Fastening - Assembly
/31/ 123A90-DDL-TI-DD-99025	BLPH – Sea Fastening - Details
/32/ 123A90-DDL-ST-RE-90001	BLPH – Topside Loadout Analysis
/33/ 123A90-DDL-ST-RE-90002	BLPH – Topside Transportation Analysis
/34/ 123A90-DDL-ST-RE-90003	BLPH – Topside Fatigue Transportation Analysis
/35/ 123A90-DDL-TI-RE-99001	BLPH – Topside Grillage and Sea Fastening Design Report
/36/ 123A90-DDL-TI-RE-99003	Validation of TP Grillage and SF on barge Vervece
/37/ 123A90-DDL-TI-RE-99004	TP – Grillage and Sea Fastening Design Report
/38/ 123A90-DDL-TI-DD-99036	BLPH - TP - Upper Grillage - Plan View
/39/ 123A90-DDL-TI-DD-99037	BLPH - TP - Upper Grillage - Sections
/40/ 123A90-DDL-TI-DD-99038	BLPH - TP - Upper Grillage - Sections and Details
/41/ 123A90-DDL-TI-DD-99039	TP - Sea Fastening Drawing – Assembly
/42/ 123A90-DDL-TI-DD-99040	TP - Sea Fastening Drawing - Details
/43/ 123A90-DDL-ST-RE-90008	TP – Loadout Analysis

/44/ 123A90-DDL-ST-RE-90010	TP – Transportation Fatigue Analysis
/45/ 123A90-DDL-ST-RE-90015	Caisson Frame – In service, Lifting and transportation design report
/46/ 123A90-DDL-ST-RE-90014	Caisson Frame – Loadout Analysis
/47/ 123A90-DDL-ST-DD-90094	Caisson frame – Elevations
/48/ 123A90-DDL-ST-DD-90095	Caisson frame - Details
/49/ 123A90-DDL-ST-DD-90096	Caisson frame - Details
/50/ 123A90-DDL-TI-DD-99047	CF – Grillage drawing
/51/ 123A90-DDL-TI-DD-99007	Caisson – Grillage and Sea fastening Design report
/52/ 123A90-DDL-TI-DD-99048	CF – Sea fastening drawing
/53/	Vervece Stability booklet

3.4 SOFTWARE

Doc. No.	Description
/54/ MOSES	Hydrostatic and Hydrodynamic Analysis Software for Offshore Installation and Platform Design– BENTLEY Inc, v.12

4 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY)	Crosswind
CONTRACTOR (CTR)	ROSETTI MARINO S.p.A.
PROJECT	HOLLANDSE KUST NOORD WIND PARK Project
T&I CONTRACTOR	DEME
ALS	Accidental Limit State
BLPH	Base Load Power Hub
BESS	BATTERY ENERGY STORAGE SYSTEM
BLPH	Base Load Power Hub
Ce	Snow Exposure Coefficient
CF	Caisson Frame
CL	Concentrated Load
CoG	Centre of Gravity
CTV	Crew Transfer Vessel
CW	CrossWind
DAF	Dynamic Amplification Factor
DFF	Damage Fatigue Factors
DNV	Det Norske Veritas
DP	Dynamic Positioning
El.	Elevation
EPCI	Engineering Procurement Construction and Installation
FEED	Front End Engineering Design
HAT	Highest Astronomical Tide
HKN	Hollandse Kust Noord
LAT	Lowest Astronomical Tide
LRFD	Load and Resistance Factor Design
MSL	Mean Sea Level
NTE	Not-to-Exceed
OD	Outside Diameter
PAU	Pre-Assembled Unit (H2 Vessels)

PG	Plate Girder
SHL	Static Hook Load
T&I	Transport & Installation
ToS	Top of Steel
TP	Transition Piece
UC	Unity Check
UDL	Uniformly Distributed Load
VIV	Vortex Induced Vibration
VOOW	Van Oord Offshore Wind
WTG	Wind Turbine Generator
W2W	Walk to Work

Table 4.1 - Definitions and Abbreviations

5 SUMMARY AND CONCLUSIONS

The performed naval analyses lead to the following conclusions:

- The intact stability requirements are satisfied.
- As far as barge strength check concerns, the maximum usage factor, i.e. the ratio between calculated and allowable bending stress, is 0.20 in the sagging position.
- The maximum shear stress is 0.15.
- The maximum hull deflection is 0.8 cm in sagging condition

The ballast plan was selected to have a barge mean draft of 2.90m with trim 0.50deg. by stern. Draft Bow = 2.50m, stern =3.30m

The foreseen ballast plan is the following:

- Tank 2SW 61% ullage = 2.40m
- Tank 4PW 84% ullage = 1.00m
- Tank 5PC full
- Tank 5SW 80% ullage = 1.10m
- All remaining tanks empty, 3%

6 TRANSPORTATION ARRANGEMENT

An overview of the Transportation Layout is shown in the following figure:

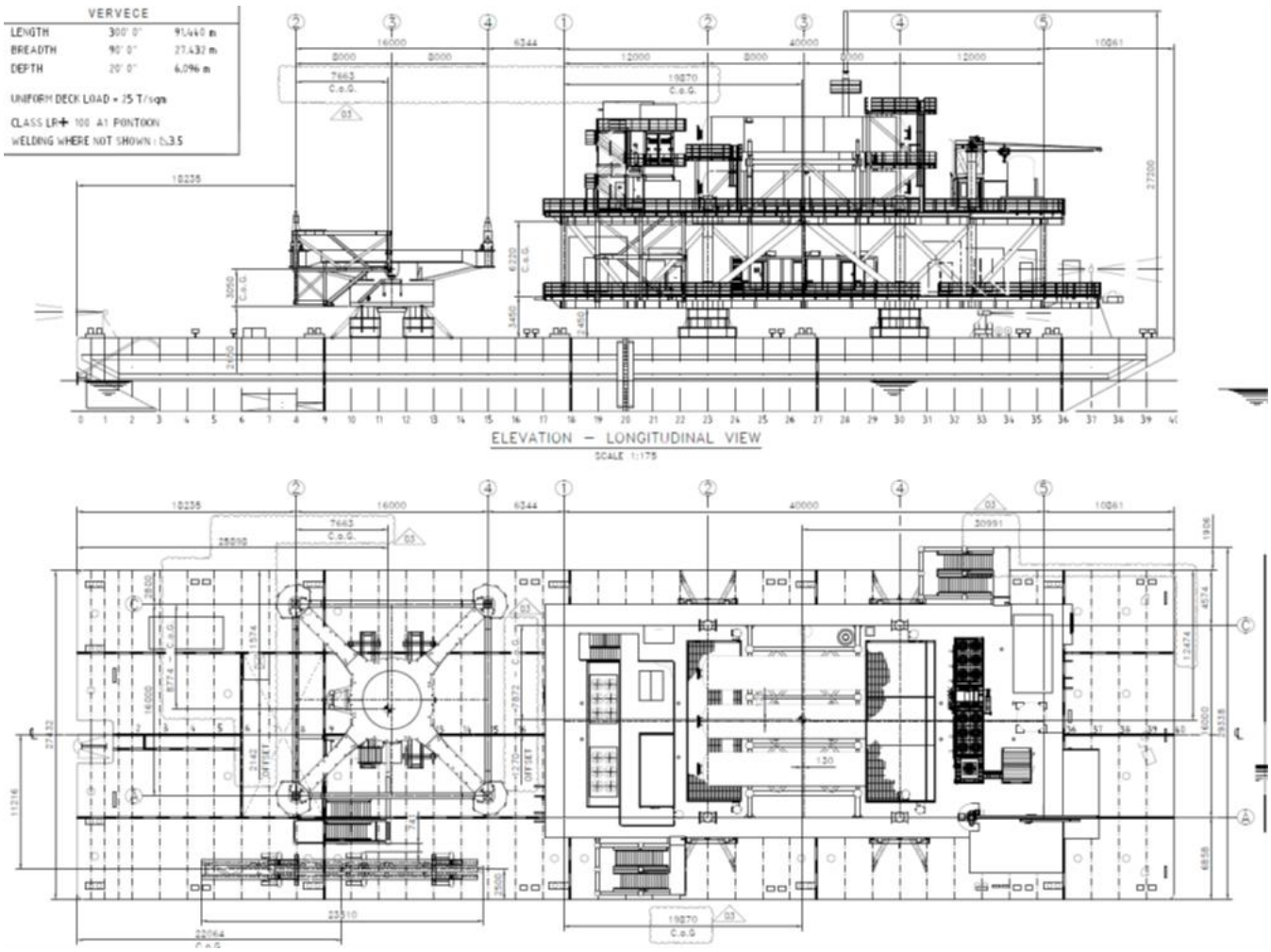


Figure 6.1 – Transportation Arrangement – plan and side view

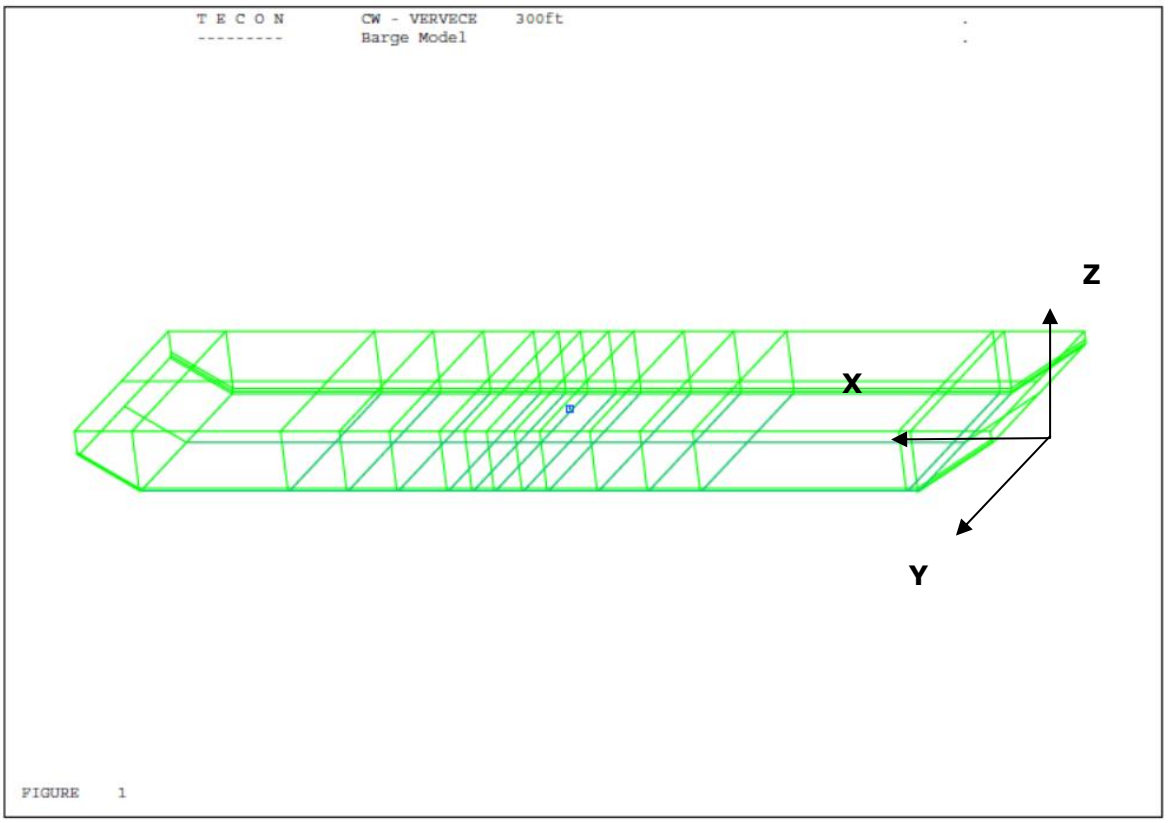
7 CARGO BARGE

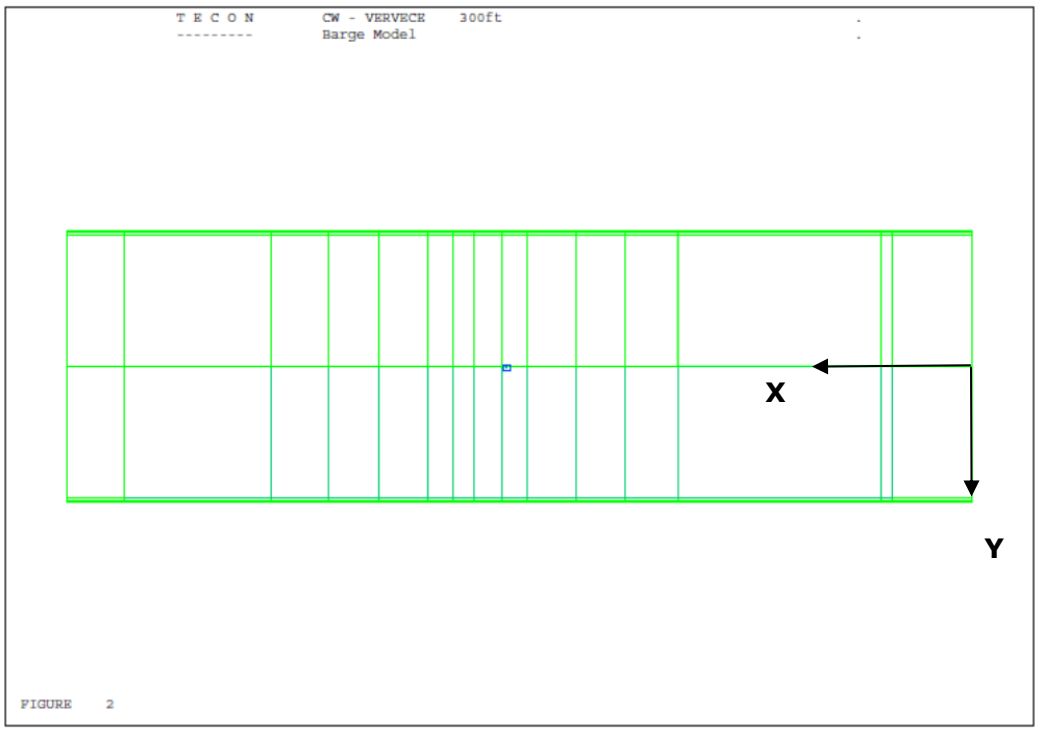
7.1 MOSES MODEL

Vervece barge model was set out in MOSES language based on the hull drawings and on the tanks capacities and weight distribution included in the barge documents.

The standard Moses reference system has the origin at the bow of the barge, on the centreline and at keel elevation, the X axis positive from bow to stern, the Y axis positive to starboard and the Z axis positive upwards.

The Moses barge hull model is shown in the following figures:





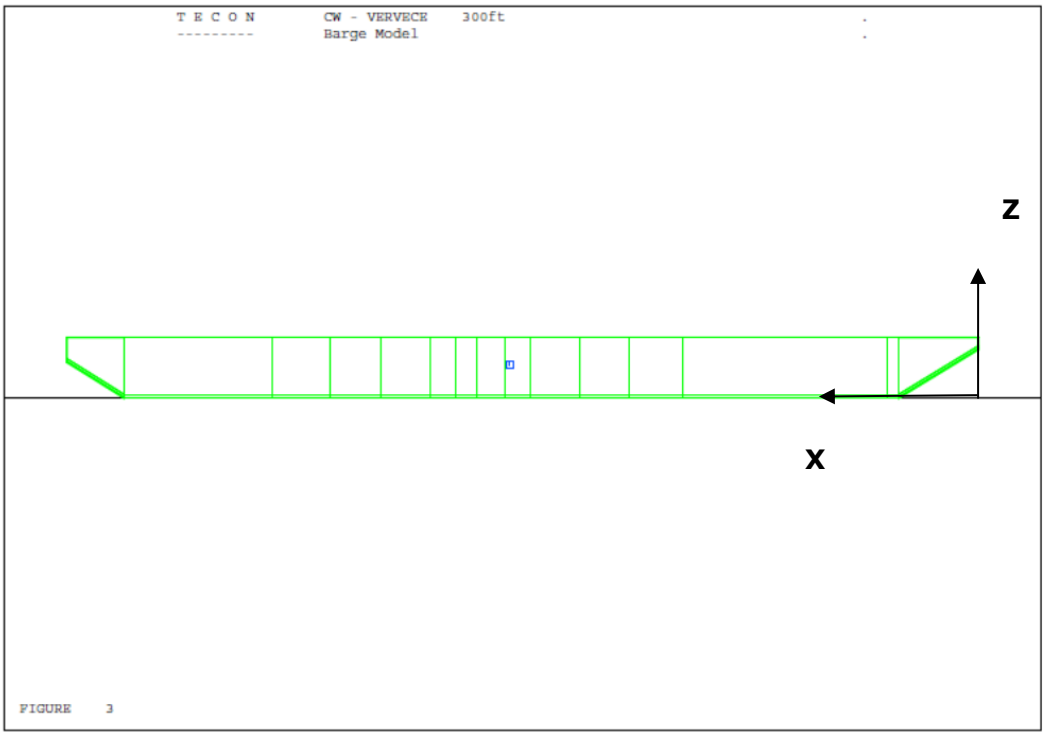


Figure 7.1 – Barge MOSES model and ref. system

The Barge hydrostatic properties are summarised in the following tables.

The density used for sea water is 1.025 t/m3.

```
**********************************************************************************************************
*                                          ***  MOSES   ***                                              *
*                                          ----------------                                              *
*          T E C O N       CW - VERVECE    300ft                                  25 March, 2025         *
*          ---------       Hydrostatic Curves                                     .                      *
*                                                                                 .                      *
*                                                                                                        *
**********************************************************************************************************

                              +++ H Y D R O S T A T I C   P R O P E R T I E S +++
                              ==================================================

                Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

                                    Results are in the Body System

                                          For Body VERVECE
```

Draft	Trim	Roll	M-Tons	X	Y	Z	Area	X	Y	KMT	KML	BMT	BML
0.10	0.00	0.00	211.04	46.85	0.00	0.05	2081.674	46.85	0.00	619.45	5128.82	619.40	5128.77
0.20	0.00	0.00	425.67	46.85	-0.00	0.10	2101.925	46.85	-0.00	313.63	2588.77	313.53	2588.67
0.30	0.00	0.00	641.89	46.85	0.00	0.15	2116.956	46.84	0.00	210.82	1743.33	210.67	1743.18
0.40	0.00	0.00	859.65	46.85	0.00	0.20	2132.015	46.84	0.00	159.57	1321.77	159.37	1321.57
0.50	0.00	0.00	1078.63	46.84	-0.00	0.25	2140.752	46.84	0.00	127.79	1066.52	127.54	1066.27
0.60	0.00	0.00	1298.50	46.84	0.00	0.30	2149.490	46.84	0.00	106.68	896.91	106.37	896.61
0.70	0.00	0.00	1519.27	46.84	-0.00	0.35	2158.227	46.83	0.00	91.64	776.06	91.29	775.70
0.80	0.00	0.00	1740.94	46.84	0.00	0.40	2166.965	46.83	0.00	80.39	685.59	79.99	685.19
0.90	0.00	0.00	1963.50	46.84	-0.00	0.45	2175.702	46.83	0.00	71.66	615.36	71.20	614.90
1.00	0.00	0.00	2186.96	46.84	0.00	0.50	2184.439	46.83	0.00	64.69	559.26	64.19	558.75
1.10	0.00	0.00	2411.31	46.84	-0.00	0.56	2193.177	46.83	0.00	59.00	513.42	58.45	512.87
1.20	0.00	0.00	2636.56	46.84	-0.00	0.61	2201.914	46.82	0.00	54.27	475.29	53.67	474.68
1.30	0.00	0.00	2862.70	46.84	-0.00	0.66	2210.652	46.82	0.00	50.28	443.07	49.62	442.41
1.40	0.00	0.00	3089.74	46.83	0.00	0.71	2219.389	46.82	0.00	46.87	415.49	46.16	414.78
1.50	0.00	0.00	3317.68	46.83	0.00	0.76	2228.126	46.82	0.00	43.92	391.62	43.16	390.86
1.60	0.00	0.00	3546.51	46.83	-0.00	0.81	2236.864	46.81	0.00	41.34	370.77	40.53	369.96
1.70	0.00	0.00	3776.23	46.83	-0.00	0.86	2245.601	46.81	0.00	39.07	352.40	38.21	351.54
1.80	0.00	0.00	4006.86	46.83	-0.00	0.91	2254.339	46.81	0.00	37.07	336.10	36.15	335.19
1.90	0.00	0.00	4238.37	46.83	-0.00	0.96	2263.076	46.81	0.00	35.28	321.54	34.31	320.58
2.00	0.00	0.00	4470.79	46.83	0.00	1.01	2271.813	46.81	0.00	33.67	308.46	32.65	307.45
2.10	0.00	0.00	4704.09	46.83	0.00	1.07	2280.551	46.80	0.00	32.22	296.65	31.15	295.58
2.20	0.00	0.00	4938.30	46.83	0.00	1.12	2289.288	46.80	0.00	30.91	285.93	29.79	284.81
2.30	0.00	0.00	5173.40	46.82	0.00	1.17	2298.026	46.80	0.00	29.71	276.17	28.54	275.00
2.40	0.00	0.00	5409.40	46.82	-0.00	1.22	2306.763	46.80	0.00	28.62	267.23	27.40	266.01
2.50	0.00	0.00	5646.29	46.82	-0.00	1.27	2315.500	46.79	0.00	27.63	259.03	26.35	257.76
2.60	0.00	0.00	5884.07	46.82	0.00	1.32	2324.238	46.79	0.00	26.71	251.48	25.38	250.15
2.70	0.00	0.00	6122.75	46.82	-0.00	1.38	2332.975	46.79	0.00	25.86	244.50	24.49	243.12
2.80	0.00	0.00	6362.33	46.82	0.00	1.43	2341.713	46.79	0.00	25.08	238.03	23.65	236.60
2.90	0.00	0.00	6602.80	46.82	0.00	1.48	2350.450	46.79	0.00	24.35	232.03	22.88	230.55
3.00	0.00	0.00	6844.17	46.82	0.00	1.53	2359.188	46.78	0.00	23.68	226.44	22.15	224.91
3.10	0.00	0.00	7086.44	46.81	0.00	1.58	2367.925	46.78	0.00	23.06	221.22	21.47	219.64
3.20	0.00	0.00	7329.60	46.81	0.00	1.63	2376.663	46.78	-0.00	22.47	216.35	20.84	214.71
3.30	0.00	0.00	7573.65	46.81	0.00	1.69	2385.400	46.78	0.00	21.93	211.78	20.24	210.10
3.40	0.00	0.00	7818.61	46.81	-0.00	1.74	2394.138	46.77	0.00	21.42	207.50	19.68	205.76
3.50	0.00	0.00	8064.45	46.81	0.00	1.79	2402.875	46.77	-0.00	20.94	203.47	19.15	201.68
3.60	0.00	0.00	8311.19	46.81	0.00	1.84	2411.444	46.77	-0.00	20.49	199.63	18.65	197.79
3.70	0.00	0.00	8558.60	46.81	0.00	1.90	2415.958	46.69	-0.00	20.04	195.05	18.14	193.15
3.80	0.00	0.00	8806.47	46.80	0.00	1.95	2420.419	46.61	-0.00	19.61	190.71	17.66	188.76
3.90	0.00	0.00	9054.78	46.80	0.00	2.00	2424.867	46.52	-0.00	19.21	186.60	17.21	184.60
4.00	0.00	0.00	9303.56	46.79	0.00	2.05	2429.302	46.44	-0.00	18.83	182.70	16.78	180.65
4.10	0.00	0.00	9552.79	46.78	-0.00	2.10	2433.730	46.36	0.00	18.48	179.00	16.37	176.90
4.20	0.00	0.00	9802.47	46.77	-0.00	2.16	2438.159	46.28	0.00	18.14	175.49	15.99	173.34
4.30	0.00	0.00	10052.61	46.75	0.00	2.21	2442.588	46.20	-0.00	17.82	172.15	15.62	169.95
4.40	0.00	0.00	10303.21	46.74	0.00	2.26	2447.017	46.11	0.00	17.52	168.98	15.26	166.72
4.50	0.00	0.00	10554.25	46.72	-0.00	2.31	2451.446	46.03	-0.00	17.24	165.95	14.93	163.64
4.60	0.00	0.00	10805.76	46.70	-0.00	2.36	2455.874	45.95	-0.00	16.97	163.06	14.61	160.69
4.70	0.00	0.00	11057.71	46.69	-0.00	2.42	2460.303	45.87	-0.00	16.72	160.30	14.30	157.88
4.80	0.00	0.00	11310.12	46.67	0.00	2.47	2464.732	45.79	-0.00	16.47	157.66	14.01	155.20
4.90	0.00	0.00	11562.96	46.65	0.00	2.52	2468.126	45.72	-0.00	16.24	154.95	13.72	152.43
5.00	0.00	0.00	11815.95	46.63	-0.00	2.57	2468.198	45.72	-0.00	16.00	151.75	13.43	149.18
5.10	0.00	0.00	12068.95	46.61	0.00	2.62	2468.228	45.72	-0.00	15.77	148.68	13.15	146.06
5.20	0.00	0.00	12321.94	46.59	-0.00	2.68	2468.245	45.72	0.00	15.55	145.74	12.88	143.06
5.30	0.00	0.00	12574.93	46.57	-0.00	2.73	2468.249	45.72	-0.00	15.34	142.91	12.62	140.18
5.40	0.00	0.00	12827.93	46.56	0.00	2.78	2468.249	45.72	-0.00	15.15	140.20	12.37	137.42
5.50	0.00	0.00	13080.93	46.54	0.00	2.83	2468.249	45.72	-0.00	14.96	137.59	12.13	134.76
5.60	0.00	0.00	13333.92	46.52	-0.00	2.88	2468.249	45.72	-0.00	14.78	135.09	11.90	132.20
5.70	0.00	0.00	13586.92	46.51	-0.00	2.93	2468.249	45.72	-0.00	14.61	132.68	11.68	129.74
5.80	0.00	0.00	13839.91	46.49	-0.00	2.99	2468.249	45.72	-0.00	14.45	130.36	11.46	127.37

5.90	0.00	0.00	14092.91	46.48	0.00	3.04	2468.249	45.72	-0.00	14.30	128.12	11.26	125.08
6.00	0.00	0.00	14345.91	46.47	-0.00	3.09	2468.249	45.72	-0.00	14.15	125.97	11.06	122.88

+++ H Y D R O S T A T I C C O E F F I C I E N T S +++

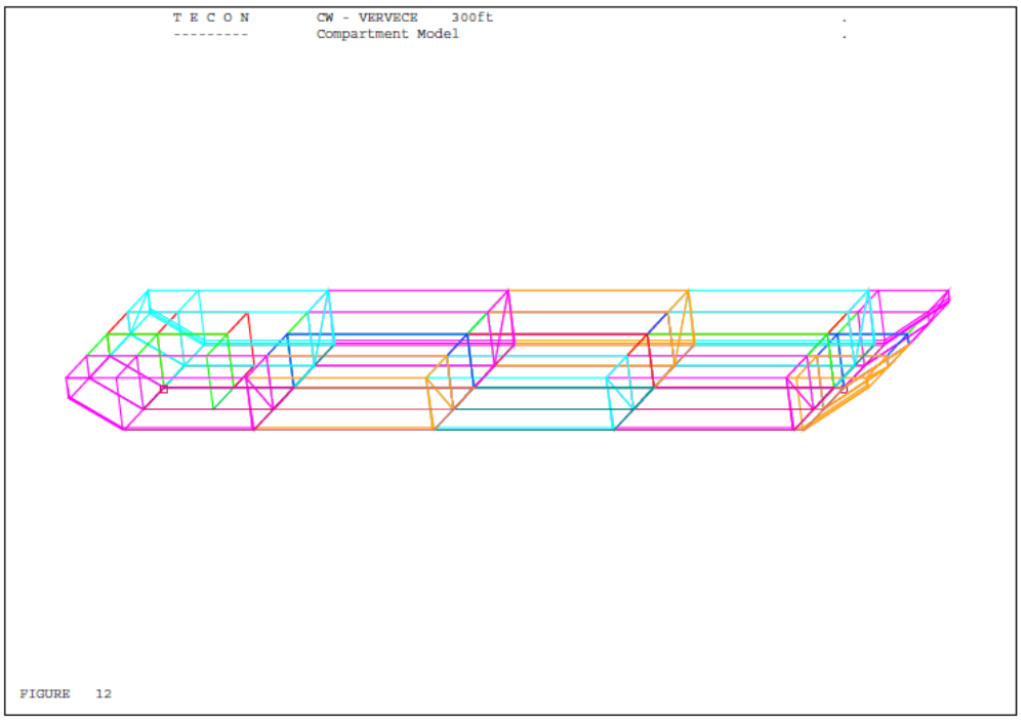
Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

Results are in the Body System

For Body VERVECE

/--- Condition ---/			Displacement	Wetted Surface	Load To Change Draft 1 MM	/--- For KG = KB ----/ Moment To Change .01 Deg	
Draft	Trim	Roll				--- Heel ---	--- Trim ---
0.10	0.00	0.00	211.04	2120.1	2.13	22.81	188.91
0.20	0.00	0.00	425.67	2151.4	2.15	23.29	192.32
0.30	0.00	0.00	641.89	2178.7	2.17	23.60	195.29
0.40	0.00	0.00	859.65	2206.1	2.19	23.91	198.28
0.50	0.00	0.00	1078.63	2232.2	2.19	24.01	200.73
0.60	0.00	0.00	1298.50	2258.4	2.20	24.11	203.20
0.70	0.00	0.00	1519.27	2284.7	2.21	24.21	205.69
0.80	0.00	0.00	1740.94	2311.0	2.22	24.30	208.20
0.90	0.00	0.00	1963.50	2337.4	2.23	24.40	210.72
1.00	0.00	0.00	2186.96	2363.9	2.24	24.50	213.27
1.10	0.00	0.00	2411.31	2390.4	2.25	24.60	215.84
1.20	0.00	0.00	2636.56	2417.0	2.26	24.70	218.43
1.30	0.00	0.00	2862.70	2443.6	2.27	24.79	221.04
1.40	0.00	0.00	3089.74	2470.3	2.27	24.89	223.67
1.50	0.00	0.00	3317.68	2497.1	2.28	24.99	226.33
1.60	0.00	0.00	3546.51	2524.0	2.29	25.09	229.00
1.70	0.00	0.00	3776.23	2550.9	2.30	25.19	231.69
1.80	0.00	0.00	4006.86	2577.9	2.31	25.28	234.41
1.90	0.00	0.00	4238.37	2604.9	2.32	25.38	237.15
2.00	0.00	0.00	4470.79	2632.0	2.33	25.48	239.90
2.10	0.00	0.00	4704.09	2659.2	2.34	25.58	242.68
2.20	0.00	0.00	4938.30	2686.4	2.35	25.68	245.48
2.30	0.00	0.00	5173.40	2713.7	2.36	25.77	248.30
2.40	0.00	0.00	5409.40	2741.1	2.36	25.87	251.15
2.50	0.00	0.00	5646.29	2768.5	2.37	25.97	254.01
2.60	0.00	0.00	5884.07	2796.0	2.38	26.07	256.90
2.70	0.00	0.00	6122.75	2823.6	2.39	26.17	259.80
2.80	0.00	0.00	6362.33	2851.2	2.40	26.26	262.73
2.90	0.00	0.00	6602.80	2878.9	2.41	26.36	265.69
3.00	0.00	0.00	6844.17	2906.7	2.42	26.46	268.66
3.10	0.00	0.00	7086.44	2934.5	2.43	26.56	271.66
3.20	0.00	0.00	7329.60	2962.4	2.44	26.66	274.67
3.30	0.00	0.00	7573.65	2990.3	2.45	26.75	277.71
3.40	0.00	0.00	7818.61	3018.4	2.45	26.85	280.78
3.50	0.00	0.00	8064.45	3046.4	2.46	26.95	283.86
3.60	0.00	0.00	8311.19	3074.5	2.47	27.05	286.91
3.70	0.00	0.00	8558.60	3100.3	2.48	27.10	288.53
3.80	0.00	0.00	8806.47	3126.2	2.48	27.15	290.13
3.90	0.00	0.00	9054.78	3152.1	2.49	27.20	291.73
4.00	0.00	0.00	9303.56	3178.0	2.49	27.25	293.33
4.10	0.00	0.00	9552.79	3204.0	2.49	27.30	294.94
4.20	0.00	0.00	9802.47	3230.0	2.50	27.35	296.55
4.30	0.00	0.00	10052.61	3256.0	2.50	27.40	298.17
4.40	0.00	0.00	10303.21	3282.0	2.51	27.45	299.80
4.50	0.00	0.00	10554.25	3308.1	2.51	27.50	301.43
4.60	0.00	0.00	10805.76	3334.3	2.52	27.55	303.06
4.70	0.00	0.00	11057.71	3360.4	2.52	27.60	304.71
4.80	0.00	0.00	11310.12	3386.6	2.53	27.65	306.35
4.90	0.00	0.00	11562.96	3412.3	2.53	27.69	307.62
5.00	0.00	0.00	11815.95	3436.0	2.53	27.69	307.65
5.10	0.00	0.00	12068.95	3459.8	2.53	27.69	307.66
5.20	0.00	0.00	12321.94	3483.6	2.53	27.69	307.67
5.30	0.00	0.00	12574.93	3507.3	2.53	27.69	307.67
5.40	0.00	0.00	12827.93	3531.1	2.53	27.69	307.67
5.50	0.00	0.00	13080.93	3554.9	2.53	27.69	307.67
5.60	0.00	0.00	13333.92	3578.7	2.53	27.69	307.67
5.70	0.00	0.00	13586.92	3602.4	2.53	27.69	307.67
5.80	0.00	0.00	13839.91	3626.2	2.53	27.69	307.67
5.90	0.00	0.00	14092.91	3650.0	2.53	27.69	307.67
6.00	0.00	0.00	14345.91	3673.8	2.53	27.69	307.67

The modelled compartment codes are shown in the following figure



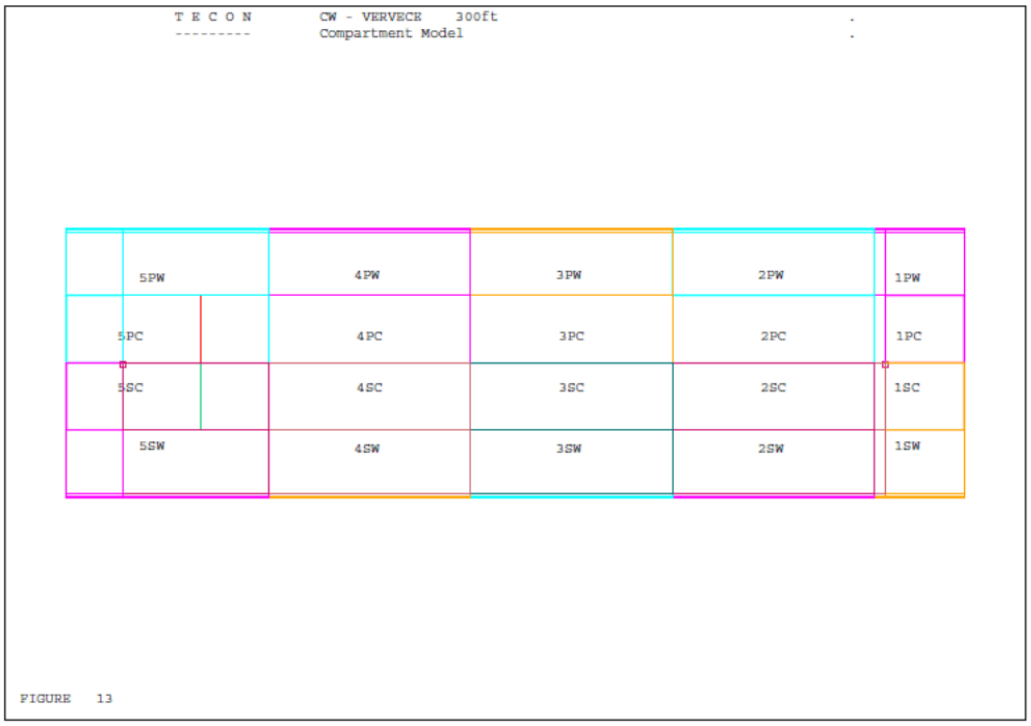


Figure 7.2 – Barge Compartments

The capacity plan for ballast compartments is presented in the Moses output.

The density used for ballast water is 1.025 t/m3 (same of sea water).

```
*****************************************************************************************************************
*                                        ***  MOSES   ***                                                       *
*          T E C O N       CW - VERVECE    300ft                                    .                          *
*          ---------       Capacity Plan                                            .                          *
*****************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================
                  Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

                                  Results Are Reported In Body System

                       Draft =     0.00 Roll Angle =     0.00 Pitch Angle =     0.00

                                     Wet Radii Of Gyration About CG

                              K-X =     7.95 K-Y =    24.53 K-Z =    25.56

                                          /-- Center of Gravity ---/  Sounding   % Full
                       Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                       ----------------  Part VERVECE    ------------
                       LOAD_GRO   1832.80    47.02     0.00     3.52
                       --- Contents ---
                       1PC         234.61     5.60    -3.43     3.81     6.10   100.00
                       1PW         234.98     5.60   -10.28     3.82     6.10   100.00
                       1SC         235.12     5.60     3.43     3.81     6.10   100.00
                       1SW         234.98     5.60    10.28     3.82     6.10   100.00
                       2PC         873.69    19.43    -3.43     3.05     6.10   100.00
                       2PW         873.63    19.43   -10.28     3.05     6.10   100.00
                       2SC         873.69    19.43     3.43     3.05     6.10   100.00
                       2SW         873.63    19.43    10.28     3.05     6.10   100.00
                       3PC         873.69    40.01    -3.43     3.05     6.10   100.00
                       3PW         873.63    40.00   -10.28     3.05     6.10   100.00
                       3SC         873.69    40.01     3.43     3.05     6.10   100.00
                       3SW         873.63    40.01    10.28     3.05     6.10   100.00
                       4PC         873.69    60.58    -3.43     3.05     6.10   100.00
                       4PW         873.63    60.58   -10.28     3.05     6.10   100.00
                       4SC         873.69    60.58     3.43     3.05     6.10   100.00
                       4SW         873.63    60.58    10.28     3.05     6.10   100.00
                       5PC         492.02    83.89    -3.43     3.31     6.10   100.00
                       5PW         793.58    80.40   -10.28     3.22     6.10   100.00
                       5SC         484.29    83.89     3.43     3.31     6.10   100.00
                       5SW         793.58    80.40    10.28     3.22     6.10   100.00
                       ========  ========  =======  =======  =======
                       Total     15819.89    45.53    -0.00     3.18
                       Buoyancy      0.00     0.00     0.00     0.00

                            +++ C O M P A R T M E N T   P R O P E R T I E S +++
                            ===================================================
                                     Results Are Reported In Body System

                          Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

                                    Fill   Specific /--- Ballast ---/ /------ % Full --------/ Sounding
                            Name    Type    Gravity  Maximum  Current   Max.    Min.    Curr.  --------

                          1PC     CORRECT     1.0250    234.6    234.6  100.00    0.00  100.00     6.096
                          1PW     CORRECT     1.0250    235.0    235.0  100.00    0.00  100.00     6.096
                          1SC     CORRECT     1.0250    235.1    235.1  100.00    0.00  100.00     6.096
                          1SW     CORRECT     1.0250    235.0    235.0  100.00    0.00  100.00     6.096
                          2PC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          2PW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          2SC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          2SW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          3PC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          3PW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          3SC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          3SW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          4PC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          4PW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          4SC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          4SW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          5PC     CORRECT     1.0250    492.0    492.0  100.00    0.00  100.00     6.096
                          5PW     CORRECT     1.0250    793.6    793.6  100.00    0.00  100.00     6.096
                          5SC     CORRECT     1.0250    484.3    484.3  100.00    0.00  100.00     6.096
                          5SW     CORRECT     1.0250    793.6    793.6  100.00    0.00  100.00     6.096
```

7.2 LIGHTSHIP

As indicated in barge Stability booklet the barge has the following properties:

- Lightweight = 1833 t
- LCG = 44.42 m
- VCG = 3.524 m
- TCG = 0.0 m

7.3 DOWNFLOODING POINTS

Down flooding points have been modelled at barge edges and at deck elevation+600mm, Ref. /53/.

Following FloodingPoints are included in the calculations:

No.	Type	Fr.AP(M)	Fr.CL(M)	Ab/BASE(M)	Description
1	3	90.000	-13.000	6.700	Ventilator, Tk. 1 PW
2	3	90.000	13.000	6.700	Ventilator, Tk. 1 SW
3	3	1.000	-13.000	6.700	Ventilator, Tk. 5 PW
4	3	1.000	13.000	6.700	Ventilator, TK. 5 SW

7.4 ALLOWABLE LONG. BENDING MOMENT AND SHEAR IN STILL WATER

Section 13 of Ref. /53/, indicates the following values of bending moment and shear in still water:

	Max B.M.	W
Hogging	26700 tm	3.24 m3
Sagging	26130 tm	3.24 m3
Max shear midship	6150 ton	

7.5 LOADS

The cargoes are presented in the next Table in Moses ref. system.

cargo ID	cargo description	W (ton)	(CoG coordinates from: bow / CL / deck)		
			x (m)	y (m)	z (m) excluded barge height (6.10m)
BLPH	BLPH topside	1700	31.16	-1.24	9.67
TP	Transition Piece	254.5	65.41	-2.142	5.70

GS1	Topside grillage and SF	75	30.86	-1.14	1.25
GS2	TP grillage and SF	45	65.20	-2.92	1.30
CF	Caisson Frame	30	69.38	11.22	1.45
GS3	Caisson Frame grillage and SF	0.5	67.44	11.22	1.00
		2105 t			

Table 7.1 -Transported loads

The cargo CoG positions on board are indicated by cubes in the following Moses figures and are listed in the next Moses table. Moses reference system is shown in section 7.

The loads include light ship, ballast water contents and cargo.

```
*****************************************************************************************************************
*                                              ***  MOSES   ***                                                 *
*          T E C O N                                                                    .                        *
*          ---------     Weights and Wind Exposed Areas                                 .                        *
*                                                                                                                *
*****************************************************************************************************************

                    Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  LOAD              CONT.            /---------- FACTOR ----------/ /----------- AREA -----------/ /---------- LOCATION ---------/
  GROUP     WEIGHT  NAME      DISPL     WIND   ADD. MASS    DRAG       X         Y         Z         X         Y         Z
--------- --------- -------- --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

CF           30.00                                                                                    69.38     11.22      7.55
                  #WEI|012 #Weight
                  #ARE|013      0.00      1.00      1.00      1.00      4.00      0.00      0.00     69.38     11.22      7.55
                  #ARE|014      0.00      1.00      1.00      1.00      0.00     25.00      0.00     69.38     11.22      7.55

TOPSIDE    1700.00                                                                                    30.99     -1.27     15.77
                  #WEI|004 #Weight
                  #ARE|005      0.00      1.00      1.00      1.00    500.00      0.00      0.00     30.99     -1.27     15.77
                  #ARE|006      0.00      1.00      1.00      1.00      0.00    800.00      0.00     30.99     -1.27     15.77

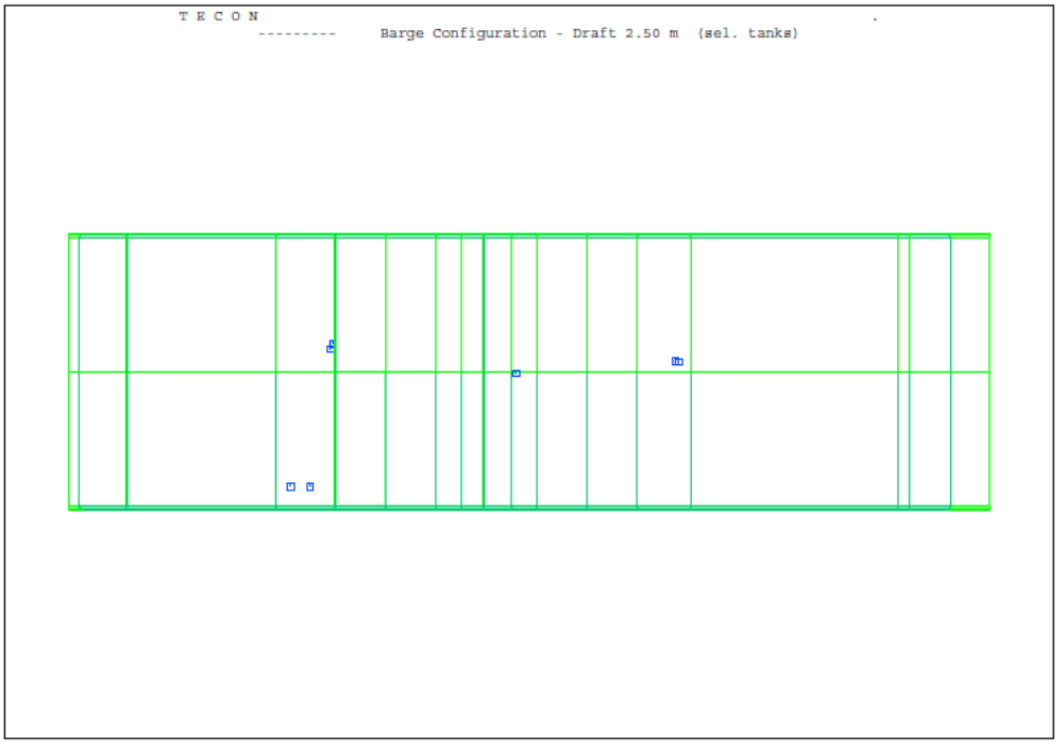
TP          254.50                                                                                    65.54     -2.14     11.80
                  #WEI|008 #Weight
                  #ARE|009      0.00      1.00      1.00      1.00    256.00      0.00      0.00     65.54     -2.14     11.80
                  #ARE|010      0.00      1.00      1.00      1.00      0.00    256.00      0.00     65.54     -2.14     11.80

GRI&SF-B     75.00                                                                                    30.86     -1.14      7.35
                  #WEI|016 #Weight

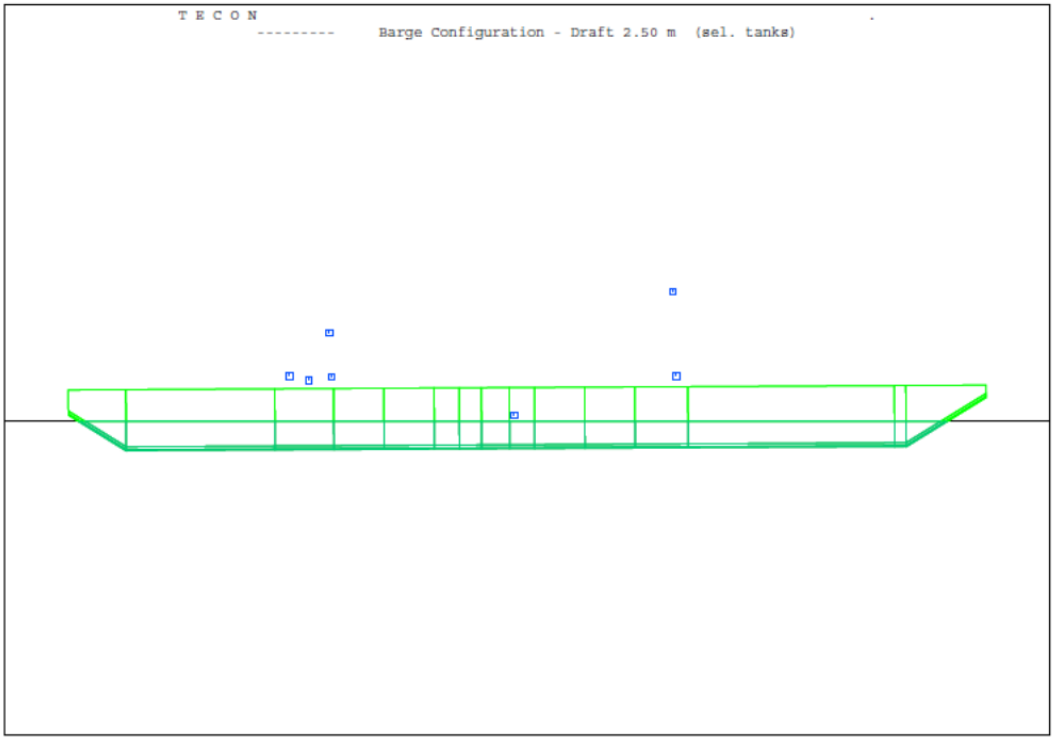
GRI&SF-C      0.50                                                                                    67.44     11.22      7.10
                  #WEI|020 #Weight

GRI&SF-T     45.00                                                                                    65.20     -2.92      7.40
                  #WEI|018 #Weight

VERVECE    1832.80                                                                                    47.02      0.00      3.52
                  #WEI|002 #Weight
```


T E C O N

Barge Configuration - Draft 2.50 m (sel. tanks)


T E C O N

Barge Configuration - Draft 2.50 m (sel. tanks)

8 BALLAST PLAN SELECTION

The ballast plan was selected to have a barge draft of 2.50m bow, no roll and trim 0.50deg. by stern. The resulting mid draft is 2.90m and 3.20m at stern.

The density used for the sea water and ballast water is 1.025 t/m3.

The foreseen ballast plan is the following:

- Tank 2SW 61% ullage = 2.40m
- Tank 4PW 84% ullage = 1.00m
- Tank 5PC full
- Tank 5SW 80% ullage = 1.10m
- All remaining tanks empty, 3%

VERVECE - BALLAST PLAN for TOWING - Draft 2.50 bow - 3.30m stern - trim 0.50deg

STERN						BOW
	5PW	84% **4PW** u=1.0m	**3PW**	**2PW**	**1PW**	
	98% **5PC** full	**4PC**	**3PC**	**2PC**	**1PC**	
	5SC	**4SC**	**3SC**	**2SC**	**1SC**	
	80.0% **5SW** u=1.10m	**4SW**	**3SW**	61% **2SW** u=2.40m	**1SW**	

Figure 8.1 – Barge Ballast Configuration

```
**********************************************************************************************************
*                                          ***  MOSES   ***                                              *
*                                          ----------------                                              *
*         T E C O N                                                                .                    *
*         ---------     Barge Configuration                                        .                    *
*                                                                                                       *
**********************************************************************************************************

                  +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                  ======================================================================

          Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

               Draft =     2.50 Roll Angle =     0.00 Pitch Angle =     0.50

                                   Wet Radii Of Gyration About CG

                           K-X =     9.49 K-Y =    25.06 K-Z =    25.09

                                  GMT =    16.39 GML =   210.93

                                     /-- Center of Gravity ---/  Sounding   % Full
               Name      Weight     ---X---  ---Y---  ---Z---  -------- --------

               ----------------  Part CF         ------------
               LOAD_GRO     30.00    69.38    11.22     7.55
               ----------------  Part GRI&SF-B   ------------
```

LOAD_GRO	75.00	30.86	-1.14	7.35		
---------- Part GRI&SF-C ----------						
LOAD_GRO	0.50	67.44	11.22	7.10		
---------- Part GRI&SF-T ----------						
LOAD_GRO	45.00	65.20	-2.92	7.40		
---------- Part TOPSIDE ----------						
LOAD_GRO	1700.00	30.99	-1.27	15.77		
---------- Part TP ----------						
LOAD_GRO	254.50	65.54	-2.14	11.80		
---------- Part VERVECE ----------						
LOAD_GRO	1832.80	47.02	0.00	3.52		
--- Contents ---						
1PC	2.35	8.46	-3.43	0.14	0.23	1.00
1PW	2.35	8.46	-10.19	0.14	0.24	1.00
1SC	2.35	8.46	3.43	0.14	0.23	1.00
1SW	2.35	8.46	10.19	0.14	0.24	1.00
2PC	26.21	21.12	-3.43	0.10	0.18	3.00
2PW	26.21	21.10	-10.18	0.10	0.19	3.00
2SC	26.21	21.12	3.43	0.10	0.18	3.00
2SW	528.60	19.51	10.28	1.85	3.69	60.51
3PC	26.21	41.69	-3.43	0.10	0.18	3.00
3PW	26.21	41.67	-10.18	0.10	0.19	3.00
3SC	26.21	41.69	3.43	0.10	0.18	3.00
3SW	26.21	41.67	10.18	0.10	0.19	3.00
4PC	26.21	62.26	-3.43	0.10	0.18	3.00
4PW	734.60	60.64	-10.28	2.57	5.13	84.09
4SC	26.21	62.26	3.43	0.10	0.18	3.00
4SW	26.21	62.25	10.18	0.10	0.19	3.00
5PC	482.18	83.90	-3.43	3.25	5.99	98.00
5PW	23.81	79.12	-10.19	0.12	0.26	3.00
5SC	14.53	82.02	3.43	0.14	0.29	3.00
5SW	636.49	80.28	10.28	2.64	4.99	80.21
Total	6629.51	48.78	-0.00	6.56		
Buoyancy	6629.44	48.83	-0.00	1.49		

+++ D R A F T M A R K R E A D I N G S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Name	Draft	Name	Draft	Name	Draft	Name	Draft	Name	Draft	Name	Draft
BOWPO	2.50	BOWST	2.50	MIDPO	2.90	MIDST	2.90	STEPO	3.30	STEST	3.30

The reductions in metacentric height (GM) due to the influence of free surface effect are included in the stability analysis.

9 BARGE INTACT STABILITY

All DNV intact stability criteria, ref. table 11-13 and sections 11.10.2 and 11.10.5 or Ref. /9/ are largely satisfied as follow

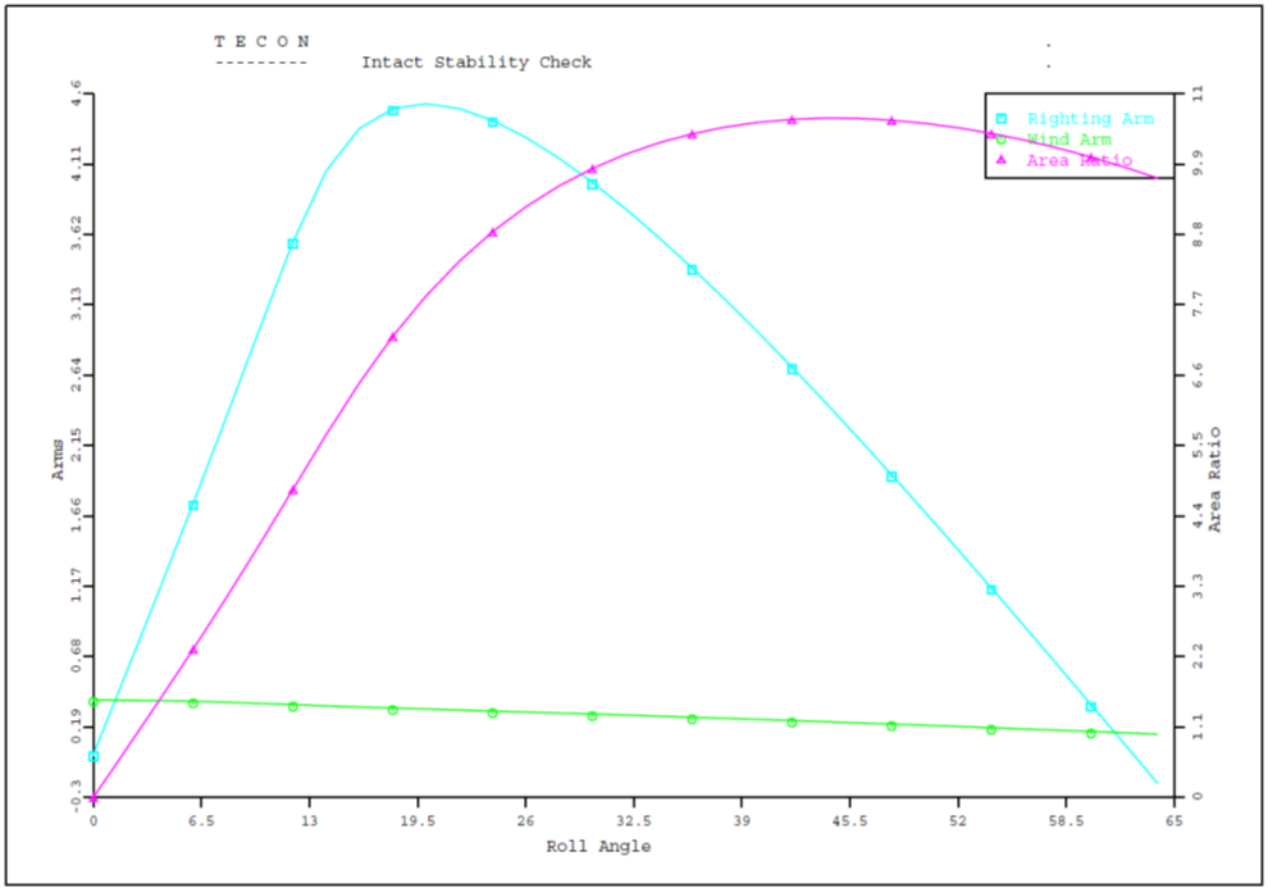
```
                    +++ S T A B I L I T Y   S U M M A R Y +++
                    ========================================

The Following Intact Condition
======================================
Draft                    =     2.50 M
Roll                     =     0.00 Deg
Pitch                    =     0.50 Deg
VCG                      =     6.56 M
Axis Angle               =     0.00 Deg
Wind Vel                 =   100.00 Knots
1st Intercept            =     1.31 Deg
2st Intercept            =    60.96 Deg
NWT Down-Flooding        =    14.78 Deg
WT Down-Flooding         = Not App. Deg
MIN (1st Int. NWT Down) =    14.78 Deg

Passes All of The Stability Requirements:
=========================================

GM                          >=    1.00       M    16.39 Passes
Range                       >=   36.00     DEG    62.13 Passes
Area Ratio                  >=    1.40            6.01 Passes
```

The following figure and table show the stability check results.



```
**********************************************************************************************************
*                                                                                                        *
*                                          ***  MOSES   ***                                              *
*                                          ----------------                          July, 2025          *
*          T E C O N                                                                                     *
*          ---------     Intact Stability Check                                                          *
*                                                                                                        *
**********************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 6629.51, KG = 6.56, and Wind Speed = 100 Knots

Initial: Roll = 0.00, Trim = 0.50 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
2.50	0.00	0.00	9999.00	3.41	-0.00	0.00	0.38	0.00	0.00	-0.378
2.50	2.00	0.00	9999.00	2.95	0.57	0.57	0.38	0.75	0.76	0.198
2.49	4.00	0.00	9999.00	2.50	1.16	2.30	0.37	1.51	1.53	0.781
2.47	6.00	0.00	9999.00	2.04	1.75	5.21	0.37	2.25	2.32	1.379
2.46	8.00	0.00	9999.00	1.58	2.35	9.31	0.36	2.98	3.12	1.989
2.43	10.00	0.00	9999.00	1.13	2.96	14.62	0.35	3.69	3.96	2.610
2.40	12.00	0.00	9999.00	0.67	3.57	21.15	0.35	4.39	4.82	3.224
2.35	14.00	0.00	9999.00	0.24	4.06	28.79	0.34	5.08	5.67	3.726
2.28	16.00	0.00	9999.00	-0.19	4.36	37.21	0.33	5.74	6.48	4.029
2.21	18.00	0.00	9999.00	-0.61	4.50	46.06	0.32	6.39	7.21	4.173
2.14	20.00	0.00	9999.00	-1.04	4.53	55.09	0.31	7.03	7.84	4.215
2.06	22.00	0.00	9999.00	-1.46	4.50	64.11	0.31	7.65	8.38	4.188
1.99	24.00	0.00	9999.00	-1.88	4.41	73.02	0.30	8.26	8.84	4.113
1.91	26.00	0.00	9999.00	-2.30	4.30	81.73	0.29	8.85	9.23	4.002
1.82	28.00	0.00	9999.00	-2.71	4.15	90.18	0.29	9.44	9.56	3.863
1.74	30.00	0.00	9999.00	-3.13	3.98	98.31	0.28	10.00	9.83	3.703
1.65	32.00	0.00	9999.00	-3.53	3.80	106.09	0.27	10.55	10.05	3.525
1.56	34.00	0.00	9999.00	-3.94	3.60	113.49	0.27	11.09	10.23	3.333
1.47	36.00	0.00	9999.00	-4.34	3.39	120.47	0.26	11.61	10.37	3.129
1.38	38.00	0.00	9999.00	-4.73	3.16	127.02	0.25	12.12	10.48	2.915
1.29	40.00	0.00	9999.00	-5.12	2.93	133.12	0.24	12.61	10.55	2.692
1.19	42.00	0.00	9999.00	-5.50	2.70	138.75	0.23	13.09	10.60	2.462
1.10	44.00	0.00	9999.00	-5.88	2.45	143.90	0.23	13.55	10.62	2.225
1.00	46.00	0.00	9999.00	-6.25	2.20	148.55	0.22	14.00	10.61	1.983
0.90	48.00	0.00	9999.00	-6.61	1.95	152.70	0.21	14.43	10.59	1.736
0.80	50.00	0.00	9999.00	-6.96	1.69	156.33	0.20	14.84	10.54	1.485
0.70	52.00	0.00	9999.00	-7.31	1.42	159.44	0.19	15.23	10.47	1.230
0.59	54.00	0.00	9999.00	-7.64	1.16	162.02	0.18	15.61	10.38	0.972
0.49	56.00	0.00	9999.00	-7.97	0.89	164.07	0.18	15.97	10.27	0.712
0.39	58.00	0.00	9999.00	-8.28	0.62	165.58	0.17	16.31	10.15	0.450
0.28	60.00	0.00	9999.00	-8.59	0.35	166.54	0.16	16.64	10.01	0.187
0.18	62.00	0.00	9999.00	-8.89	0.07	166.95	0.15	16.95	9.85	-0.078
0.07	64.00	0.00	9999.00	-9.17	-0.20	166.82	0.14	17.24	9.68	-0.343

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10 BARGE DAMAGED STABILITY

This section presents the barge min. requirements request in damaged conditions considering the port side tanks 1PW, 2PW, 3PW and 5PW at port side, and 1SW, 2SW, 3SW, 4SW and 5SW at starboard as critical ones.

Only the final equilibrium condition is analyzed as found the more onerous compared to the intermediate ones. Ref to section 11.10.5.7 and 11.10.7 of Ref /9/.

Refer to Appendix 1 for damaged cases stability.

11 BARGE LONGITUDINAL STRENGTH CHECK

The hull longitudinal strength check was carried out for the Still water condition. Being the barge classed, the longitudinal wave bending effect is not required (ref. 11.9.5.17 and 5.6.11.2 of Ref./9/).

The allowable stresses were assumed as follows: σ_{all} = 0.66*235 = 155 N/mm^2

τ_{all} = 0.40*235 = 94 N/mm^2

For normal stress, the maximum usage factor, i.e. the maximum bending / allowable stress ratio, is 0.20.

- UF = 5179/26130 = 0.20

For shear stress, the maximum usage factor is:

- UF_{shear} = 927/6150 = 0.15

The maximum deflection results 0.8 cm in damaged condition 4SW.

Values of BM and Shear along the longitudinal section of the cargo barge were compared with the admissible values shown in section 7.4. All the values are within allowable ones.

Note: In the following tables, the allowable deflection is conventionally set equal to unity, therefore the values indicated under the columns with heading "Deflection/Allowable" are the computed deflections.

11.1 INTACT CONDITION

```
*****************************************************************************************************
*                                        ***  MOSES   ***                                           *
*         T E C O N                                                                    .             *
*         ---------     Longitudinal Strength Analysis - Still Water                   .             *
*                                                                                                    *
*****************************************************************************************************

                  +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                  ================================================================

            Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

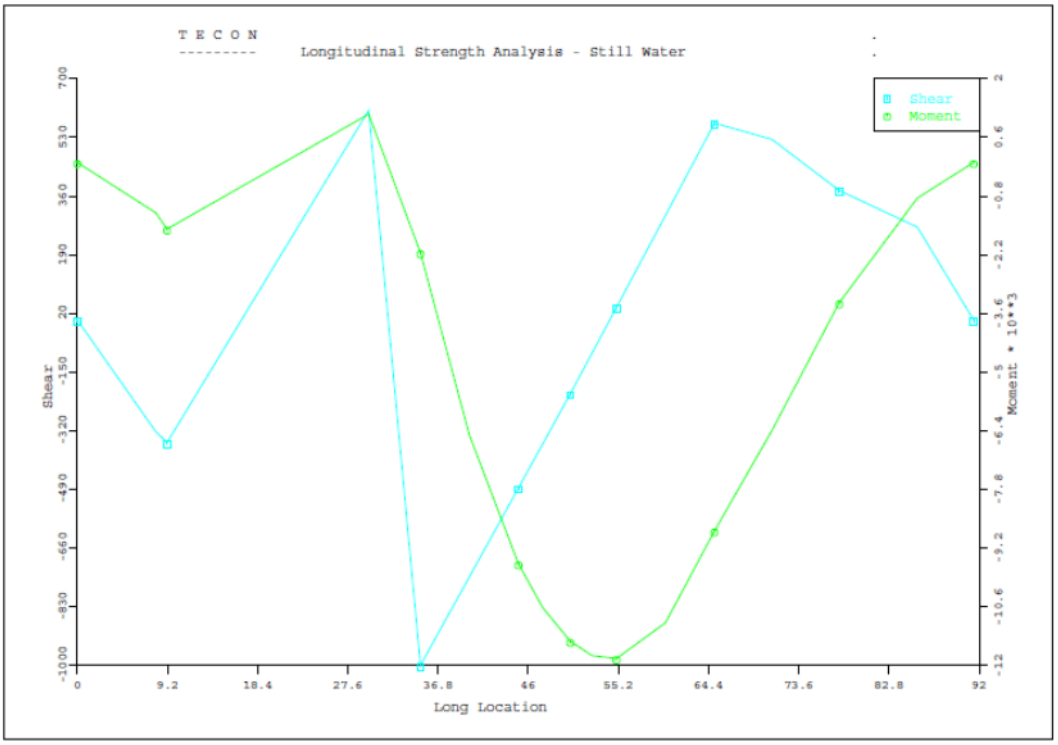
                                  Results are in the Body System

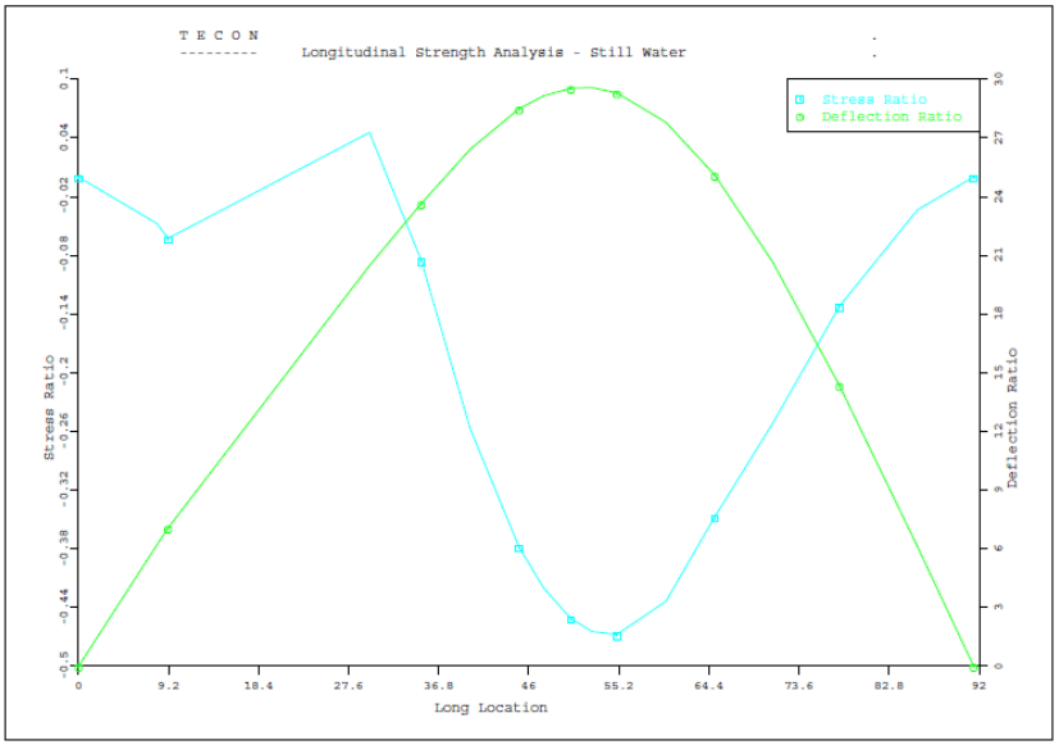
                                Allowable Stress =     155.00 MPa

                              Allowable Deflection =       1.00 MM

          Longitudinal       Shear          Bending         B. Stress/     Deflection/
            Location         Force           Moment         Allowable      Allowable
          --------------  --------------  --------------  --------------  --------------

                   0.00               1               0          0.0000          0.0000
                   8.00            -322           -1201         -0.0475          6.1948
                   9.14            -354           -1587         -0.0627          7.0651
                  29.72             608            1153          0.0456         20.4690
                  35.00            -999           -2151         -0.0850         23.6389
                  40.00            -743           -6503         -0.2570         26.4152
                  45.00            -486           -9573         -0.3783         28.4866
                  47.50            -357          -10625         -0.4199         29.1466
                  50.29            -213          -11420         -0.4513         29.5374
                  52.50             -95          -11760         -0.4647         29.5702
                  55.00              38          -11832         -0.4675         29.3027
                  60.00             304          -10977         -0.4337         27.7991
                  65.00             571           -8787         -0.3472         25.0976
                  70.87             524           -6390         -0.2525         20.6949
                  77.72             376           -3345         -0.1322         14.3532
                  85.70             270            -848         -0.0335          6.1199
                  91.44               1               0          0.0000          0.0001
```


T E C O N
Longitudinal Strength Analysis - Still Water
Shear
Moment
Shear
Moment * 10**3
Long Location


T E C O N
Longitudinal Strength Analysis - Still Water
Stress Ratio
Deflection Ratio
Stress Ratio
Deflection Ratio
Long Location

12 ATTACHMENT 1 – DAMAGED STABILITY CHECK

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025         *
*          T E C O N                                                                 .                       *
*          ---------     Barge Configuration                                         .                       *
*                                                                                                              *
*****************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                     Draft =     2.50 Roll Angle =     0.00 Pitch Angle =     0.50

                                    Wet Radii Of Gyration About CG

                             K-X =     9.49 K-Y =    25.06 K-Z =    25.09

                                    GMT =    16.39 GML =   210.93

                                       /-- Center of Gravity ---/  Sounding   % Full
                     Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                     ----------------  Part CF         ------------
                     LOAD_GRO     30.00    69.38    11.22     7.55
                     ----------------  Part GRI&SF-B   ------------
                     LOAD_GRO     75.00    30.86    -1.14     7.35
                     ----------------  Part GRI&SF-C   ------------
                     LOAD_GRO      0.50    67.44    11.22     7.10
                     ----------------  Part GRI&SF-T   ------------
                     LOAD_GRO     45.00    65.20    -2.92     7.40
                     ----------------  Part TOPSIDE    ------------
                     LOAD_GRO   1700.00    30.99    -1.27    15.77
                     ----------------  Part TP         ------------
                     LOAD_GRO    254.50    65.54    -2.14    11.80
                     ----------------  Part VERVECE    ------------
                     LOAD_GRO   1832.80    47.02     0.00     3.52
                     --- Contents ---
                     1PC           2.35     8.46    -3.43     0.14     0.23     1.00
                     1PW           2.35     8.46   -10.19     0.14     0.24     1.00
                     1SC           2.35     8.46     3.43     0.14     0.23     1.00
                     1SW           2.35     8.46    10.19     0.14     0.24     1.00
                     2PC          26.21    21.12    -3.43     0.10     0.18     3.00
                     2PW          26.21    21.10   -10.18     0.10     0.19     3.00
                     2SC          26.21    21.12     3.43     0.10     0.18     3.00
                     2SW         528.60    19.51    10.28     1.85     3.69    60.51
                     3PC          26.21    41.69    -3.43     0.10     0.18     3.00
                     3PW          26.21    41.67   -10.18     0.10     0.19     3.00
                     3SC          26.21    41.69     3.43     0.10     0.18     3.00
                     3SW          26.21    41.67    10.18     0.10     0.19     3.00
                     4PC          26.21    62.26    -3.43     0.10     0.18     3.00
                     4PW         734.60    60.64   -10.28     2.57     5.13    84.09
                     4SC          26.21    62.26     3.43     0.10     0.18     3.00
                     4SW          26.21    62.25    10.18     0.10     0.19     3.00
                     5PC         482.18    83.90    -3.43     3.25     5.99    98.00
                     5PW          23.81    79.12   -10.19     0.12     0.26     3.00
                     5SC          14.53    82.02     3.43     0.14     0.29     3.00
                     5SW         636.49    80.28    10.28     2.64     4.99    80.21
                     ========  ========  =======  =======  =======
                     Total      6629.51    48.78    -0.00     6.56
                     Buoyancy   6629.44    48.83    -0.00     1.49

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025         *
*          T E C O N                                                                 .                       *
*          ---------     Barge Configuration                                         .                       *
*                                                                                                              *
*****************************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        2.50 BOWST        2.50 MIDPO        2.90 MIDST        2.90 STEPO        3.30 STEST        3.30

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025         *
```

```
*          T E C O N                                                                                  .                *
*          ---------     Barge Configuration                                                          .                *
*                                                                                                                      *
************************************************************************************************************************

                                  +++ C O M P A R T M E N T   P R O P E R T I E S +++
                                  ===================================================

                                        Results Are Reported In Body System

                              Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                       Fill   Specific /--- Ballast ---/ /------ % Full --------/ Sounding
                                Name   Type    Gravity  Maximum  Current   Max.    Min.    Curr.  --------

                              1PC     CORRECT     1.0250    234.6      2.3    1.00    0.00    1.00     0.233
                              1PW     CORRECT     1.0250    235.0      2.3    1.00    0.00    1.00     0.238
                              1SC     CORRECT     1.0250    235.1      2.4    1.00    0.00    1.00     0.233
                              1SW     CORRECT     1.0250    235.0      2.3    1.00    0.00    1.00     0.238
                              2PC     CORRECT     1.0250    873.7     26.2    3.00    0.00    3.00     0.183
                              2PW     CORRECT     1.0250    873.6     26.2    3.00    0.00    3.00     0.188
                              2SC     CORRECT     1.0250    873.7     26.2    3.00    0.00    3.00     0.183
                              2SW     CORRECT     1.0250    873.6    528.6   60.51    0.00   60.51     3.691
                              3PC     CORRECT     1.0250    873.7     26.2    3.00    0.00    3.00     0.183
                              3PW     CORRECT     1.0250    873.6     26.2    3.00    0.00    3.00     0.188
                              3SC     CORRECT     1.0250    873.7     26.2    3.00    0.00    3.00     0.183
                              3SW     CORRECT     1.0250    873.6     26.2    3.00    0.00    3.00     0.188
                              4PC     CORRECT     1.0250    873.7     26.2    3.00    0.00    3.00     0.183
                              4PW     CORRECT     1.0250    873.6    734.6   84.09    0.00   84.09     5.127
                              4SC     CORRECT     1.0250    873.7     26.2    3.00    0.00    3.00     0.183
                              4SW     CORRECT     1.0250    873.6     26.2    3.00    0.00    3.00     0.188
                              5PC     CORRECT     1.0250    492.0    482.2   98.00    0.00   98.00     5.989
                              5PW     CORRECT     1.0250    793.6     23.8    3.00    0.00    3.00     0.259
                              5SC     CORRECT     1.0250    484.3     14.5    3.00    0.00    3.00     0.292
                              5SW     CORRECT     1.0250    793.6    636.5   80.21    0.00   80.21     4.990

************************************************************************************************************************
*                                                  ***  MOSES   ***                                                    *
*                                                  ----------------                                 21 July, 2025       *
*          T E C O N                                                                                  .                *
*          ---------     Weights and Wind Exposed Areas                                               .                *
*                                                                                                                      *
************************************************************************************************************************

                                  +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   C F +++
                                  ========================================================================

                                        Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  LOAD              CONT.           /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
  GROUP     WEIGHT  NAME      DISPL     WIND   ADD. MASS    DRAG        X         Y         Z         X         Y         Z
--------- --------- -------- --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

CF           30.00                                                                                    69.38     11.22      7.55
                  #WEI|012 #Weight
                  #ARE|013      0.00      1.00      1.00      1.00      4.00      0.00      0.00     69.38     11.22      7.55
                  #ARE|014      0.00      1.00      1.00      1.00      0.00     25.00      0.00     69.38     11.22      7.55


************************************************************************************************************************
*                                                  ***  MOSES   ***                                                    *
*                                                  ----------------                                 21 July, 2025       *
*          T E C O N                                                                                  .                *
*          ---------     Weights and Wind Exposed Areas                                               .                *
*                                                                                                                      *
************************************************************************************************************************

                                  +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   G R I & S F - B +++
                                  ====================================================================================

                                        Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  LOAD              CONT.           /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
  GROUP     WEIGHT  NAME      DISPL     WIND   ADD. MASS    DRAG        X         Y         Z         X         Y         Z
--------- --------- -------- --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

GRI&SF-B     75.00                                                                                    30.86     -1.14      7.35
                  #WEI|016 #Weight

************************************************************************************************************************
*                                                  ***  MOSES   ***                                                    *
*                                                  ----------------                                 21 July, 2025       *
*          T E C O N                                                                                  .                *
*          ---------     Weights and Wind Exposed Areas                                               .                *
*                                                                                                                      *
```

```
*****************************************************************************************************************

                +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   G R I & S F - C +++
                ===================================================================================

                     Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  LOAD              CONT.           /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
 GROUP     WEIGHT   NAME     DISPL    WIND   ADD. MASS    DRAG       X         Y         Z        X         Y         Z
-------- --------- -------- --------- ---------- ---------- ---------- --------- --------- --------- --------- ---------

GRI&SF-C      0.50                                                                                67.44     11.22      7.10
                #WEI|020 #Weight

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                    21 July, 2025                   *
*          T E C O N                                                           .                               *
*          ---------     Weights and Wind Exposed Areas                        .                               *
*                                                                                                              *
*****************************************************************************************************************

                +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   G R I & S F - T +++
                ===================================================================================

                     Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  LOAD              CONT.           /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
 GROUP     WEIGHT   NAME     DISPL    WIND   ADD. MASS    DRAG       X         Y         Z        X         Y         Z
-------- --------- -------- --------- ---------- ---------- ---------- --------- --------- --------- --------- ---------

GRI&SF-T     45.00                                                                                65.20     -2.92      7.40
                #WEI|018 #Weight

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                    21 July, 2025                   *
*          T E C O N                                                           .                               *
*          ---------     Weights and Wind Exposed Areas                        .                               *
*                                                                                                              *
*****************************************************************************************************************

                 +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   T O P S I D E +++
                 ===================================================================================

                     Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  LOAD              CONT.           /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
 GROUP     WEIGHT   NAME     DISPL    WIND   ADD. MASS    DRAG       X         Y         Z        X         Y         Z
-------- --------- -------- --------- ---------- ---------- ---------- --------- --------- --------- --------- ---------

TOPSIDE    1700.00                                                                               30.99     -1.27     15.77
                #WEI|004 #Weight
                #ARE|005      0.00      1.00       1.00       1.00     500.00      0.00      0.00     30.99     -1.27     15.77
                #ARE|006      0.00      1.00       1.00       1.00       0.00    800.00      0.00     30.99     -1.27     15.77

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                    21 July, 2025                   *
*          T E C O N                                                           .                               *
*          ---------     Weights and Wind Exposed Areas                        .                               *
*                                                                                                              *
*****************************************************************************************************************

                     +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   T P +++
                     ========================================================================

                     Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  LOAD              CONT.           /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
 GROUP     WEIGHT   NAME     DISPL    WIND   ADD. MASS    DRAG       X         Y         Z        X         Y         Z
-------- --------- -------- --------- ---------- ---------- ---------- --------- --------- --------- --------- ---------

TP          254.50                                                                               65.54     -2.14     11.80
                #WEI|008 #Weight
                #ARE|009      0.00      1.00       1.00       1.00     256.00      0.00      0.00     65.54     -2.14     11.80
                #ARE|010      0.00      1.00       1.00       1.00       0.00    256.00      0.00     65.54     -2.14     11.80

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                    21 July, 2025                   *
*          T E C O N                                                           .                               *
*          ---------     Weights and Wind Exposed Areas                        .                               *
*                                                                                                              *
*****************************************************************************************************************
```

+++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   V E R V E C E +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

LOAD GROUP	WEIGHT	CONT. NAME	DISPL	FACTOR WIND	FACTOR ADD. MASS	FACTOR DRAG	AREA X	AREA Y	AREA Z	LOCATION X	LOCATION Y	LOCATION Z
VERVECE	1832.80									47.02	0.00	3.52

#WEI|002 #Weight

*** MOSES ***

21 July, 2025

T E C O N

Intact Stability Check

+++ R I G H T I N G   A R M   R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 6629.51, KG = 6.56, and Wind Speed = 100 Knots

Initial: Roll = 0.00, Trim = 0.50 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

Condition Draft	Condition Roll	Condition Trim	Min. Height W Tight	Min. Height NW Tight	Righting Arm	Righting Area	Heeling Arm	Heeling Area	Area Ratio	Net Arm
2.50	0.00	0.00	9999.00	3.41	-0.00	0.00	0.38	0.00	0.00	-0.378
2.50	2.00	0.00	9999.00	2.95	0.57	0.57	0.38	0.75	0.76	0.198
2.49	4.00	0.00	9999.00	2.50	1.16	2.30	0.37	1.51	1.53	0.781
2.47	6.00	0.00	9999.00	2.04	1.75	5.21	0.37	2.25	2.32	1.379
2.46	8.00	0.00	9999.00	1.58	2.35	9.31	0.36	2.98	3.12	1.989
2.43	10.00	0.00	9999.00	1.13	2.96	14.62	0.35	3.69	3.96	2.610
2.40	12.00	0.00	9999.00	0.67	3.57	21.15	0.35	4.39	4.82	3.224
2.35	14.00	0.00	9999.00	0.24	4.06	28.79	0.34	5.08	5.67	3.726
2.28	16.00	0.00	9999.00	-0.19	4.36	37.21	0.33	5.74	6.48	4.029
2.21	18.00	0.00	9999.00	-0.61	4.50	46.06	0.32	6.39	7.21	4.173
2.14	20.00	0.00	9999.00	-1.04	4.53	55.09	0.31	7.03	7.84	4.215
2.06	22.00	0.00	9999.00	-1.46	4.50	64.11	0.31	7.65	8.38	4.188
1.99	24.00	0.00	9999.00	-1.88	4.41	73.02	0.30	8.26	8.84	4.113
1.91	26.00	0.00	9999.00	-2.30	4.30	81.73	0.29	8.85	9.23	4.002
1.82	28.00	0.00	9999.00	-2.71	4.15	90.18	0.29	9.44	9.56	3.863
1.74	30.00	0.00	9999.00	-3.13	3.98	98.31	0.28	10.00	9.83	3.703
1.65	32.00	0.00	9999.00	-3.53	3.80	106.09	0.27	10.55	10.05	3.525
1.56	34.00	0.00	9999.00	-3.94	3.60	113.49	0.27	11.09	10.23	3.333
1.47	36.00	0.00	9999.00	-4.34	3.39	120.47	0.26	11.61	10.37	3.129
1.38	38.00	0.00	9999.00	-4.73	3.16	127.02	0.25	12.12	10.48	2.915
1.29	40.00	0.00	9999.00	-5.12	2.93	133.12	0.24	12.61	10.55	2.692
1.19	42.00	0.00	9999.00	-5.50	2.70	138.75	0.23	13.09	10.60	2.462
1.10	44.00	0.00	9999.00	-5.88	2.45	143.90	0.23	13.55	10.62	2.225
1.00	46.00	0.00	9999.00	-6.25	2.20	148.55	0.22	14.00	10.61	1.983
0.90	48.00	0.00	9999.00	-6.61	1.95	152.70	0.21	14.43	10.59	1.736
0.80	50.00	0.00	9999.00	-6.96	1.69	156.33	0.20	14.84	10.54	1.485
0.70	52.00	0.00	9999.00	-7.31	1.42	159.44	0.19	15.23	10.47	1.230
0.59	54.00	0.00	9999.00	-7.64	1.16	162.02	0.18	15.61	10.38	0.972
0.49	56.00	0.00	9999.00	-7.97	0.89	164.07	0.18	15.97	10.27	0.712
0.39	58.00	0.00	9999.00	-8.28	0.62	165.58	0.17	16.31	10.15	0.450
0.28	60.00	0.00	9999.00	-8.59	0.35	166.54	0.16	16.64	10.01	0.187
0.18	62.00	0.00	9999.00	-8.89	0.07	166.95	0.15	16.95	9.85	-0.078
0.07	64.00	0.00	9999.00	-9.17	-0.20	166.82	0.14	17.24	9.68	-0.343

*** MOSES ***

21 July, 2025

T E C O N

VCG = 6.564 M Draft= 2.50 M Damage = NONE! Yaw = 0

+++ S T A B I L I T Y   S U M M A R Y +++

The Following Intact Condition

Draft = 2.50 M

```
Roll                    =     0.00 Deg
Pitch                   =     0.50 Deg
VCG                     =     6.56 M
Axis Angle              =     0.00 Deg
Wind Vel                =   100.00 Knots
1st Intercept           =     1.31 Deg
2st Intercept           =    60.96 Deg
NWT Down-Flooding       =    14.78 Deg
WT Down-Flooding        = Not App. Deg
MIN (1st Int. NWT Down) =    14.78 Deg

Passes All of The Stability Requirements:
=========================================

GM                          >=    1.00       M    16.39 Passes
Range                       >=   36.00     DEG    62.13 Passes
Area Ratio                  >=    1.40            6.01 Passes
```

```
*****************************************************************************************************
*                                        ***  MOSES   ***                                           *
*                                        ----------------                      21 July, 2025       *
*          T E C O N                                                           .                   *
*          ---------     Longitudinal Strength Analysis - Still Water - INTACT  .                   *
*                                                                                                   *
*****************************************************************************************************
```

+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	2	0	0.0000	0.0000
8.00	-3	-266	-0.0106	-0.0058
9.14	52	-239	-0.0095	-0.0111
29.72	570	6358	0.2512	0.8741
35.00	-918	2998	0.1185	2.2628
40.00	-649	-922	-0.0365	3.9379
45.00	-380	-3498	-0.1382	5.5235
47.50	-247	-4284	-0.1693	6.1885
50.29	-97	-4766	-0.1884	6.7916
52.50	-44	-4924	-0.1946	7.1536
55.00	14	-4963	-0.1962	7.4360
60.00	133	-4593	-0.1815	7.5941
65.00	250	-3633	-0.1436	7.2514
70.87	57	-3416	-0.1350	6.3227
77.72	257	-2362	-0.0934	4.5981
85.70	208	-617	-0.0244	2.0062
91.44	2	0	0.0000	0.0000

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*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                   *
*          ---------     Damaged Stability Check - Tank 1PW                    .                   *
*                                                                                                   *
*****************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                     Draft =     2.60 Roll Angle =     0.30 Pitch Angle =     0.41

                                    Wet Radii Of Gyration About CG

                             K-X =     9.50 K-Y =    25.18 K-Z =    25.23

                                    GMT =    15.70 GML =   200.89

                                       /-- Center of Gravity ---/  Sounding   % Full
                     Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                     ----------------  Part CF         ------------
                     LOAD_GRO     30.00    69.38    11.22     7.55
                     ----------------  Part GRI&SF-B   ------------
                     LOAD_GRO     75.00    30.86    -1.14     7.35
                     ----------------  Part GRI&SF-C   ------------
                     LOAD_GRO      0.50    67.44    11.22     7.10
                     ----------------  Part GRI&SF-T   ------------
                     LOAD_GRO     45.00    65.20    -2.92     7.40
                     ----------------  Part TOPSIDE    ------------
                     LOAD_GRO   1700.00    30.99    -1.27    15.77
                     ----------------  Part TP         ------------
                     LOAD_GRO    254.50    65.54    -2.14    11.80
                     ----------------  Part VERVECE    ------------
                     LOAD_GRO   1832.80    47.02     0.00     3.52
                     --- Contents ---
                     1PC           2.35     8.46    -3.52     0.14     0.24     1.00
                     1PW          58.66     7.24   -10.28     1.65     2.67    24.96
                     1SC           2.35     8.46     3.34     0.14     0.24     1.00
                     1SW           2.35     8.46    10.11     0.14     0.26     1.00
                     2PC          26.21    20.80    -3.54     0.10     0.18     3.00
                     2PW          26.21    20.79   -10.29     0.10     0.17     3.00
                     2SC          26.21    20.80     3.32     0.10     0.18     3.00
                     2SW         528.60    19.50    10.27     1.85     3.71    60.51
                     3PC          26.21    41.38    -3.54     0.10     0.18     3.00
                     3PW          26.21    41.36   -10.29     0.10     0.17     3.00
                     3SC          26.21    41.38     3.32     0.10     0.18     3.00
                     3SW          26.21    41.36    10.07     0.10     0.21     3.00
                     4PC          26.21    61.95    -3.54     0.10     0.18     3.00
                     4PW         734.60    60.63   -10.29     2.57     5.11    84.09
                     4SC          26.21    61.95     3.32     0.10     0.18     3.00
                     4SW          26.21    61.93    10.07     0.10     0.21     3.00
                     5PC         482.18    83.89    -3.43     3.25     5.99    98.00
                     5PW          23.81    78.98   -10.28     0.12     0.24     3.00
                     5SC          14.53    81.98     3.35     0.14     0.29     3.00
                     5SW         636.49    80.27    10.28     2.64     5.01    80.21
                     ========  ========  =======  =======  =======
                     Total      6685.82    48.41    -0.09     6.52
                     Buoyancy   6685.84    48.44    -0.12     1.50

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                   *
*          ---------     Damaged Stability Check - Tank 1PW                    .                   *
*                                                                                                   *
*****************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
  -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

   BOWPO        2.67 BOWST        2.53 MIDPO        3.00 MIDST        2.85 STEPO        3.32 STEST        3.18

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
```

```
*          T E C O N                                                                                    .          *
*          ---------     Damaged Stability Check - Tank 1PW                                              .          *
*                                                                                                                  *
********************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 1PW

Moment Scaled By 6685.82, KG = 6.52, and Wind Speed = 50 Knots

Initial: Roll = 0.30, Trim = 0.41 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
2.60	0.00	0.00	9999.00	3.38	0.00	0.00	0.09	0.00	0.00	-0.093
2.60	2.00	0.00	9999.00	2.92	0.55	0.55	0.09	0.19	2.95	0.457
2.60	4.00	0.00	9999.00	2.46	1.10	2.20	0.09	0.37	5.94	1.012
2.59	6.00	0.00	9999.00	2.00	1.67	4.98	0.09	0.55	9.00	1.579
2.58	8.00	0.00	9999.00	1.53	2.24	8.89	0.09	0.73	12.15	2.155
2.56	10.00	0.00	9999.00	1.07	2.82	13.96	0.09	0.91	15.41	2.738
2.53	12.00	0.00	9999.00	0.61	3.40	20.18	0.08	1.08	18.77	3.313
2.49	14.00	0.00	9999.00	0.16	3.84	27.42	0.08	1.24	22.11	3.762
2.45	16.00	0.00	9999.00	-0.29	4.08	35.34	0.08	1.40	25.23	4.003
2.40	18.00	0.00	9999.00	-0.73	4.18	43.61	0.08	1.56	28.01	4.106
2.34	20.00	0.00	9999.00	-1.18	4.20	51.99	0.08	1.71	30.40	4.121
2.28	22.00	0.00	9999.00	-1.62	4.15	60.33	0.07	1.86	32.45	4.076
2.22	24.00	0.00	9999.00	-2.06	4.06	68.54	0.07	2.01	34.19	3.988
2.15	26.00	0.00	9999.00	-2.49	3.94	76.54	0.07	2.15	35.64	3.869
2.08	28.00	0.00	9999.00	-2.92	3.79	84.28	0.07	2.29	36.86	3.725
2.01	30.00	0.00	9999.00	-3.35	3.63	91.70	0.07	2.42	37.86	3.562
1.94	32.00	0.00	9999.00	-3.77	3.45	98.78	0.07	2.55	38.68	3.383
1.86	34.00	0.00	9999.00	-4.19	3.25	105.48	0.06	2.68	39.33	3.189
1.78	36.00	0.00	9999.00	-4.60	3.05	111.77	0.06	2.81	39.82	2.985
1.70	38.00	0.00	9999.00	-5.01	2.83	117.65	0.06	2.93	40.19	2.771
1.61	40.00	0.00	9999.00	-5.41	2.61	123.09	0.06	3.04	40.42	2.549
1.53	42.00	0.00	9999.00	-5.80	2.38	128.07	0.06	3.16	40.55	2.320
1.44	44.00	0.00	9999.00	-6.19	2.14	132.58	0.05	3.27	40.58	2.085
1.35	46.00	0.00	9999.00	-6.57	1.90	136.62	0.05	3.37	40.50	1.845
1.26	48.00	0.00	9999.00	-6.94	1.65	140.17	0.05	3.47	40.34	1.600
1.17	50.00	0.00	9999.00	-7.31	1.40	143.22	0.05	3.57	40.10	1.352
1.07	52.00	0.00	9999.00	-7.66	1.15	145.76	0.05	3.66	39.77	1.100
0.98	54.00	0.00	9999.00	-8.01	0.89	147.80	0.04	3.75	39.37	0.846
0.88	56.00	0.00	9999.00	-8.34	0.63	149.32	0.04	3.84	38.90	0.590
0.78	58.00	0.00	9999.00	-8.67	0.37	150.32	0.04	3.92	38.36	0.332
0.68	60.00	0.00	9999.00	-8.98	0.11	150.80	0.04	4.00	37.75	0.073
0.58	62.00	0.00	9999.00	-9.28	-0.15	150.76	0.03	4.07	37.07	-0.188

```
********************************************************************************************************************
*                                              ***  MOSES   ***                                                    *
*                                              ----------------                    21 July, 2025                  *
*          T E C O N                                                               .                               *
*          VCG = 6.523 M Draft=    2.60 M Damage = 1PW Yaw = 0                                                     *
*                                                                                                                  *
********************************************************************************************************************
```

+++ S T A B I L I T Y S U M M A R Y +++

The Following Damaged Condition
==========
with 1PW Damaged

Draft	=	2.60 M
Roll	=	0.30 Deg
Pitch	=	0.41 Deg
VCG	=	6.52 M
Axis Angle	=	0.00 Deg
Wind Vel	=	50.00 Knots
1st Intercept	=	0.34 Deg
2st Intercept	=	60.51 Deg
NWT Down-Flooding	=	15.51 Deg
WT Down-Flooding	=	Not App. Deg
MIN (1st Int. NWT Down)	=	15.51 Deg

Passes All of The Stability Requirements:
==========

```
                GM                          >=    0.05       M    15.70 Passes
                Range                       >=   20.00     DEG    60.72 Passes
                Area Ratio                  >=    1.00            24.59 Passes
                RA at roll   >= 30 deg       >=    0.10       M     3.62 Passes

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                        21 July, 2025                *
*          T E C O N                                                               .                             *
*          ---------     Longitudinal Strength Analysis - Still Water - DAMAGED 1PW   .                          *
*                                                                                                               *
*****************************************************************************************************************

                    +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                    ================================================================

               Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                    Allowable Stress =     155.00 Mpa

                                  Allowable Deflection =       1.00 MM

          Longitudinal       Shear          Bending         B. Stress/     Deflection/
            Location         Force           Moment         Allowable      Allowable
          --------------  --------------  --------------  --------------  --------------

                  0.00               2               0          0.0000          0.0000
                  8.00              -2            -266         -0.0106         -0.0304
                  9.14              54            -237         -0.0094         -0.0392
                 29.72             570            6385          0.2523          0.7952
                 35.00            -918            3026          0.1196          2.1775
                 40.00            -649            -895         -0.0354          3.8497
                 45.00            -381           -3472         -0.1372          5.4356
                 47.50            -247           -4259         -0.1684          6.1015
                 50.29             -98           -4743         -0.1875          6.7067
                 52.50             -45           -4903         -0.1938          7.0709
                 55.00              13           -4944         -0.1954          7.3561
                 60.00             132           -4577         -0.1809          7.5219
                 65.00             250           -3621         -0.1431          7.1884
                 70.87              56           -3408         -0.1347          6.2724
                 77.72             256           -2359         -0.0932          4.5639
                 85.70             207            -616         -0.0244          1.9918
                 91.44               2               0          0.0000          0.0000
```

```
*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                   *
*          ---------     Damaged Stability Check - Tank 2PW                    .                   *
*                                                                                                   *
*****************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

                        Draft =     3.13 Roll Angle =     2.58 Pitch Angle =    -0.03

                                     Wet Radii Of Gyration About CG

                                K-X =     9.58 K-Y =    25.63 K-Z =    24.90

                                     GMT =    13.45 GML =   187.72

                                       /-- Center of Gravity ---/  Sounding   % Full
                        Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                        ----------------  Part CF         ------------
                        LOAD_GRO     30.00    69.38    11.22     7.55
                        ----------------  Part GRI&SF-B   ------------
                        LOAD_GRO     75.00    30.86    -1.14     7.35
                        ----------------  Part GRI&SF-C   ------------
                        LOAD_GRO      0.50    67.44    11.22     7.10
                        ----------------  Part GRI&SF-T   ------------
                        LOAD_GRO     45.00    65.20    -2.92     7.40
                        ----------------  Part TOPSIDE    ------------
                        LOAD_GRO   1700.00    30.99    -1.27    15.77
                        ----------------  Part TP         ------------
                        LOAD_GRO    254.50    65.54    -2.14    11.80
                        ----------------  Part VERVECE    ------------
                        LOAD_GRO   1832.80    47.02     0.00     3.52
                        --- Contents ---
                        1PC           2.35     8.44    -4.19     0.16     0.26     1.00
                        1SC           2.35     8.44     2.66     0.16     0.26     1.00
                        1SW           2.35     8.44     9.46     0.16     0.42     1.00
                        2PC          26.21    19.32    -4.39     0.11     0.18     3.00
                        2PW         513.75    19.43   -10.33     1.80     3.43    58.81
                        2SC          26.21    19.32     2.46     0.11     0.18     3.00
                        2SW         528.60    19.43    10.23     1.85     3.85    60.51
                        3PC          26.21    39.90    -4.39     0.11     0.18     3.00
                        3PW          26.21    39.90   -11.13     0.12     0.04     3.00
                        3SC          26.21    39.90     2.46     0.11     0.18     3.00
                        3SW          26.21    39.90     9.28     0.11     0.34     3.00
                        4PC          26.21    60.47    -4.39     0.11     0.18     3.00
                        4PW         734.60    60.58   -10.32     2.57     4.97    84.09
                        4SC          26.21    60.47     2.46     0.11     0.18     3.00
                        4SW          26.21    60.47     9.28     0.11     0.34     3.00
                        5PC         482.18    83.87    -3.46     3.25     5.99    98.00
                        5PW          23.81    78.34   -10.96     0.14     0.08     3.00
                        5SC          14.53    81.82     2.76     0.15     0.27     3.00
                        5SW         636.49    80.21    10.24     2.64     5.14    80.21
                        ========  ========  =======  =======  =======
                        Total      7114.70    46.69    -0.75     6.25
                        Buoyancy   7114.79    46.69    -0.96     1.61

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                   *
*          ---------     Damaged Stability Check - Tank 2PW                    .                   *
*                                                                                                   *
*****************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        3.75 BOWST        2.52 MIDPO        3.73 MIDST        2.49 STEPO        3.70 STEST        2.47

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                   *
```

```
*          ---------     Damaged Stability Check - Tank 2PW                              .                   *
*                                                                                                            *
**************************************************************************************************************
```

+++ R I G H T I N G   A R M   R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 2PW

Moment Scaled By 7114.70, KG = 6.25, and Wind Speed = 50 Knots

Initial: Roll = 2.58, Trim = -0.03 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

Condition			Min. Height		Righting		Heeling		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
3.13	0.00	0.00	9999.00	2.97	-0.00	0.00	0.09	0.00	0.00	-0.086
3.14	2.00	0.00	9999.00	2.49	0.48	0.48	0.08	0.17	2.78	0.391
3.15	4.00	0.00	9999.00	2.02	0.97	1.92	0.08	0.34	5.67	0.883
3.15	6.00	0.00	9999.00	1.54	1.47	4.35	0.08	0.50	8.68	1.386
3.14	8.00	0.00	9999.00	1.06	1.97	7.79	0.08	0.66	11.82	1.897
3.13	10.00	0.00	9999.00	0.58	2.48	12.24	0.08	0.81	15.09	2.407
3.12	12.00	0.00	9999.00	0.09	2.86	17.58	0.07	0.96	18.32	2.782
3.12	14.00	0.00	9999.00	-0.41	3.05	23.49	0.07	1.10	21.27	2.981
3.10	16.00	0.00	9999.00	-0.90	3.14	29.68	0.07	1.25	23.84	3.067
3.08	18.00	0.00	9999.00	-1.38	3.15	35.96	0.07	1.38	26.01	3.081
3.05	20.00	0.00	9999.00	-1.86	3.11	42.22	0.07	1.52	27.83	3.046
3.02	22.00	0.00	9999.00	-2.33	3.04	48.37	0.06	1.65	29.35	2.974
2.98	24.00	0.00	9999.00	-2.81	2.94	54.35	0.06	1.78	30.60	2.872
2.94	26.00	0.00	9999.00	-3.28	2.81	60.09	0.06	1.90	31.61	2.749
2.90	28.00	0.00	9999.00	-3.74	2.67	65.57	0.06	2.02	32.42	2.608
2.85	30.00	0.00	9999.00	-4.20	2.51	70.75	0.06	2.14	33.05	2.453
2.80	32.00	0.00	9999.00	-4.66	2.34	75.60	0.06	2.25	33.53	2.286
2.74	34.00	0.00	9999.00	-5.11	2.16	80.11	0.05	2.37	33.86	2.110
2.68	36.00	0.00	9999.00	-5.56	1.98	84.26	0.05	2.47	34.07	1.927
2.62	38.00	0.00	9999.00	-5.99	1.79	88.02	0.05	2.58	34.16	1.736
2.56	40.00	0.00	9999.00	-6.42	1.59	91.40	0.05	2.68	34.14	1.541
2.49	42.00	0.00	9999.00	-6.85	1.39	94.38	0.05	2.77	34.03	1.340
2.42	44.00	0.00	9999.00	-7.26	1.18	96.94	0.05	2.87	33.83	1.135
2.35	46.00	0.00	9999.00	-7.66	0.97	99.10	0.04	2.95	33.55	0.927
2.27	48.00	0.00	9999.00	-8.06	0.76	100.82	0.04	3.04	33.18	0.717
2.19	50.00	0.00	9999.00	-8.45	0.54	102.12	0.04	3.12	32.74	0.503
2.11	52.00	0.00	9999.00	-8.82	0.33	102.99	0.04	3.20	32.23	0.289
2.03	54.00	0.00	9999.00	-9.19	0.11	103.43	0.04	3.27	31.65	0.072
1.94	56.00	0.00	9999.00	-9.54	-0.11	103.42	0.03	3.34	30.99	-0.145

```
**************************************************************************************************************
*                                               ***  MOSES  ***                                              *
*                                               ----------------                        21 July, 2025        *
*          T E C O N                                                                      .                  *
*          VCG = 6.246 M Draft=    3.13 M Damage = 2PW Yaw = 0                                               *
*                                                                                                            *
**************************************************************************************************************
```

+++ S T A B I L I T Y   S U M M A R Y +++

```
The Following Damaged Condition
=======================================
with 2PW Damaged
Draft                    =     3.13 M
Roll                     =     2.58 Deg
Pitch                    =    -0.03 Deg
VCG                      =     6.25 M
Axis Angle               =     0.00 Deg
Wind Vel                 =    50.00 Knots
1st Intercept            =     0.36 Deg
2st Intercept            =    54.60 Deg
NWT Down-Flooding        =    11.26 Deg
WT Down-Flooding         = Not App. Deg
MIN (1st Int. NWT Down)  =    11.26 Deg

Passes All of The Stability Requirements:
=========================================

GM                           >=    0.05       M    13.45 Passes
Range                        >=   20.00     DEG    54.80 Passes
Area Ratio                   >=    1.00            17.18 Passes
RA at roll   >= 30 deg       >=    0.10       M     2.49 Passes
```

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025         *
*          T E C O N                                                                 .                       *
*          ---------     Longitudinal Strength Analysis - Still Water - DAMAGED 2PW   .                        *
*                                                                                                               *
*****************************************************************************************************************
```

+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	2	0	0.0000	0.0000
8.00	-6	-281	-0.0112	-0.0270
9.14	49	-257	-0.0102	-0.0355
29.72	578	6359	0.2513	0.7632
35.00	-913	3037	0.1200	2.1244
40.00	-645	-859	-0.0340	3.7777
45.00	-379	-3422	-0.1352	5.3484
47.50	-246	-4205	-0.1662	6.0088
50.29	-98	-4688	-0.1853	6.6095
52.50	-45	-4848	-0.1916	6.9715
55.00	13	-4890	-0.1933	7.2558
60.00	131	-4528	-0.1790	7.4240
65.00	248	-3579	-0.1415	7.0983
70.87	54	-3380	-0.1336	6.1971
77.72	254	-2345	-0.0927	4.5114
85.70	207	-612	-0.0242	1.9694
91.44	2	0	0.0000	0.0000

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*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025          *
*          T E C O N                                                                 .                        *
*          ---------     Damaged Stability Check - Tank 3PW                          .                        *
*                                                                                                               *
*****************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                    Results Are Reported In Body System

                          Draft =     2.77 Roll Angle =     2.34 Pitch Angle =     0.39

                                        Wet Radii Of Gyration About CG

                                  K-X =     9.58 K-Y =    24.53 K-Z =    24.04

                                        GMT =    13.37 GML =   202.83

                                          /-- Center of Gravity ---/  Sounding   % Full
                          Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                          ----------------  Part CF         ------------
                          LOAD_GRO     30.00    69.38    11.22     7.55
                          ----------------  Part GRI&SF-B   ------------
                          LOAD_GRO     75.00    30.86    -1.14     7.35
                          ----------------  Part GRI&SF-C   ------------
                          LOAD_GRO      0.50    67.44    11.22     7.10
                          ----------------  Part GRI&SF-T   ------------
                          LOAD_GRO     45.00    65.20    -2.92     7.40
                          ----------------  Part TOPSIDE    ------------
                          LOAD_GRO   1700.00    30.99    -1.27    15.77
                          ----------------  Part TP         ------------
                          LOAD_GRO    254.50    65.54    -2.14    11.80
                          ----------------  Part VERVECE    ------------
                          LOAD_GRO   1832.80    47.02     0.00     3.52
                          --- Contents ---
                          1PC           2.35     8.45    -4.12     0.15     0.24     1.00
                          1SC           2.35     8.45     2.74     0.15     0.24     1.00
                          1SW           2.35     8.45     9.53     0.16     0.38     1.00
                          2PC          26.21    20.76    -4.30     0.11     0.18     3.00
                          2SC          26.21    20.76     2.56     0.11     0.18     3.00
                          2SW         528.60    19.50    10.24     1.85     3.83    60.51
                          3PC          26.21    41.33    -4.30     0.11     0.18     3.00
                          3PW         495.91    40.08   -10.33     1.74     3.32    56.76
                          3SC          26.21    41.33     2.56     0.11     0.18     3.00
                          3SW          26.21    41.28     9.36     0.12     0.32     3.00
                          4PC          26.21    61.90    -4.30     0.11     0.18     3.00
                          4PW         734.60    60.63   -10.31     2.57     4.99    84.09
                          4SC          26.21    61.90     2.56     0.11     0.18     3.00
                          4SW          26.21    61.86     9.36     0.12     0.32     3.00
                          5PC         482.18    83.89    -3.46     3.25     5.99    98.00
                          5PW          23.81    78.98   -10.90     0.14     0.11     3.00
                          5SC          14.53    81.99     2.81     0.15     0.29     3.00
                          5SW         636.49    80.27    10.25     2.64     5.13    80.21
                          ========  ========  =======  =======  =======
                          Total      7070.65    48.30    -0.69     6.28
                          Buoyancy   7070.68    48.33    -0.88     1.60

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025          *
*          T E C O N                                                                 .                        *
*          ---------     Damaged Stability Check - Tank 3PW                          .                        *
*                                                                                                               *
*****************************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

  BOWPO        3.33 BOWST        2.21 MIDPO        3.64 MIDST        2.52 STEPO        3.96 STEST        2.84

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025          *
*          T E C O N                                                                 .                        *
*          ---------     Damaged Stability Check - Tank 3PW                          .                        *
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 3PW

Moment Scaled By 7070.65, KG = 6.28, and Wind Speed = 50 Knots

Initial: Roll = 2.34, Trim = 0.39 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
2.77	0.00	0.00	9999.00	2.77	0.00	0.00	0.09	0.00	0.00	-0.087
2.78	2.00	0.00	9999.00	2.29	0.48	0.48	0.09	0.17	2.76	0.391
2.78	4.00	0.00	9999.00	1.81	0.97	1.92	0.08	0.34	5.61	0.883
2.79	6.00	0.00	9999.00	1.34	1.47	4.35	0.08	0.51	8.57	1.385
2.78	8.00	0.00	9999.00	0.86	1.97	7.79	0.08	0.67	11.67	1.896
2.77	10.00	0.00	9999.00	0.38	2.48	12.25	0.08	0.82	14.88	2.402
2.77	12.00	0.00	9999.00	-0.11	2.87	17.59	0.07	0.97	18.08	2.795
2.76	14.00	0.00	9999.00	-0.60	3.09	23.55	0.07	1.12	21.03	3.014
2.75	16.00	0.00	9999.00	-1.09	3.18	29.82	0.07	1.26	23.62	3.113
2.74	18.00	0.00	9999.00	-1.57	3.20	36.21	0.07	1.40	25.82	3.134
2.71	20.00	0.00	9999.00	-2.04	3.17	42.58	0.07	1.54	27.68	3.104
2.68	22.00	0.00	9999.00	-2.51	3.10	48.85	0.07	1.67	29.23	3.037
2.65	24.00	0.00	9999.00	-2.98	3.00	54.96	0.06	1.80	30.51	2.938
2.61	26.00	0.00	9999.00	-3.45	2.88	60.84	0.06	1.93	31.56	2.817
2.57	28.00	0.00	9999.00	-3.91	2.74	66.46	0.06	2.05	32.40	2.677
2.53	30.00	0.00	9999.00	-4.36	2.58	71.78	0.06	2.17	33.06	2.522
2.48	32.00	0.00	9999.00	-4.81	2.41	76.77	0.06	2.29	33.56	2.356
2.43	34.00	0.00	9999.00	-5.26	2.23	81.42	0.06	2.40	33.91	2.179
2.38	36.00	0.00	9999.00	-5.70	2.05	85.70	0.05	2.51	34.14	1.995
2.33	38.00	0.00	9999.00	-6.13	1.86	89.61	0.05	2.62	34.25	1.803
2.27	40.00	0.00	9999.00	-6.55	1.66	93.12	0.05	2.72	34.26	1.606
2.21	42.00	0.00	9999.00	-6.97	1.45	96.23	0.05	2.82	34.17	1.404
2.14	44.00	0.00	9999.00	-7.37	1.24	98.92	0.05	2.91	33.99	1.198
2.08	46.00	0.00	9999.00	-7.77	1.03	101.20	0.04	3.00	33.72	0.988
2.01	48.00	0.00	9999.00	-8.16	0.82	103.05	0.04	3.09	33.37	0.775
1.94	50.00	0.00	9999.00	-8.54	0.60	104.47	0.04	3.17	32.95	0.560
1.87	52.00	0.00	9999.00	-8.91	0.38	105.45	0.04	3.25	32.45	0.343
1.79	54.00	0.00	9999.00	-9.27	0.16	105.99	0.04	3.32	31.89	0.124
1.71	56.00	0.00	9999.00	-9.61	-0.06	106.09	0.03	3.39	31.25	-0.095

*** MOSES ***

T E C O N 21 July, 2025

VCG = 6.276 M Draft= 2.77 M Damage = 3PW Yaw = 0

+++ S T A B I L I T Y S U M M A R Y +++

The Following Damaged Condition

with 3PW Damaged

Draft	=	2.77 M
Roll	=	2.34 Deg
Pitch	=	0.39 Deg
VCG	=	6.28 M
Axis Angle	=	0.00 Deg
Wind Vel	=	50.00 Knots
1st Intercept	=	0.36 Deg
2st Intercept	=	54.97 Deg
NWT Down-Flooding	=	11.50 Deg
WT Down-Flooding	=	Not App. Deg
MIN (1st Int. NWT Down)	=	11.50 Deg

Passes All of The Stability Requirements:

GM	>=	0.05	M	13.36 Passes
Range	>=	20.00	DEG	55.22 Passes
Area Ratio	>=	1.00		17.39 Passes
RA at roll >= 30 deg	>=	0.10	M	2.57 Passes

```
*****************************************************************************************************
*                                        ***  MOSES   ***                                           *
*                                        ----------------                    21 July, 2025         *
*          T E C O N                                                         .                       *
*          ---------     Longitudinal Strength Analysis - Still Water - DAMAGED 3PW   .              *
*                                                                                                   *
*****************************************************************************************************

                    +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                    ================================================================

 Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Allowable Stress =     155.00 Mpa

                                Allowable Deflection =       1.00 MM
```

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	2	0	0.0000	0.0000
8.00	-8	-286	-0.0113	0.1083
9.14	47	-264	-0.0105	0.1191
29.72	568	6229	0.2461	1.2326
35.00	-920	2859	0.1130	2.6474
40.00	-649	-1065	-0.0421	4.3317
45.00	-377	-3633	-0.1436	5.9111
47.50	-241	-4407	-0.1742	6.5669
50.29	-89	-4870	-0.1925	7.1562
52.50	-37	-5010	-0.1980	7.5047
55.00	21	-5030	-0.1988	7.7693
60.00	138	-4630	-0.1830	7.8874
65.00	253	-3649	-0.1442	7.5003
70.87	58	-3422	-0.1352	6.5173
77.72	257	-2364	-0.0934	4.7280
85.70	208	-616	-0.0244	2.0605
91.44	2	0	0.0000	0.0000

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*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 5PW                     .                    *
*                                                                                                   *
*****************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

                       Draft =     2.11 Roll Angle =     2.38 Pitch Angle =     1.19

                                     Wet Radii Of Gyration About CG

                              K-X =      9.59 K-Y =    25.99 K-Z =    25.74

                                     GMT =    13.42 GML =   177.97

                                        /-- Center of Gravity ---/  Sounding   % Full
                       Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                       ----------------  Part CF         ------------
                       LOAD_GRO     30.00    69.38    11.22     7.55
                       ----------------  Part GRI&SF-B   ------------
                       LOAD_GRO     75.00    30.86    -1.14     7.35
                       ----------------  Part GRI&SF-C   ------------
                       LOAD_GRO      0.50    67.44    11.22     7.10
                       ----------------  Part GRI&SF-T   ------------
                       LOAD_GRO     45.00    65.20    -2.92     7.40
                       ----------------  Part TOPSIDE    ------------
                       LOAD_GRO   1700.00    30.99    -1.27    15.77
                       ----------------  Part TP         ------------
                       LOAD_GRO    254.50    65.54    -2.14    11.80
                       ----------------  Part VERVECE    ------------
                       LOAD_GRO   1832.80    47.02     0.00     3.52
                       --- Contents ---
                       1PC           2.35     8.46    -4.13     0.15     0.18     1.00
                       1SC           2.35     8.46     2.73     0.15     0.18     1.00
                       1SW           2.35     8.46     9.52     0.16     0.33     1.00
                       2PC          26.21    23.08    -4.22     0.14     0.17     3.00
                       2SC          26.21    23.08     2.64     0.14     0.17     3.00
                       2SW         528.60    19.63    10.24     1.85     3.83    60.51
                       3PC          26.21    43.65    -4.22     0.14     0.17     3.00
                       3SC          26.21    43.65     2.64     0.14     0.17     3.00
                       3SW          26.21    43.60     9.44     0.14     0.32     3.00
                       4PC          26.21    64.23    -4.22     0.14     0.17     3.00
                       4PW         734.60    60.72   -10.31     2.57     4.98    84.09
                       4SC          26.21    64.23     2.64     0.14     0.17     3.00
                       4SW          26.21    64.17     9.44     0.14     0.32     3.00
                       5PC         482.18    83.92    -3.45     3.25     6.00    98.00
                       5PW         527.90    80.22   -10.32     2.24     4.08    66.52
                       5SC          14.53    82.31     2.79     0.15     0.32     3.00
                       5SW         636.49    80.38    10.25     2.65     5.13    80.21
                       ========  ========  =======  =======  =======
                       Total      7078.83    51.25    -0.69     6.32
                       Buoyancy   7079.07    51.35    -0.89     1.65

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 5PW                     .                    *
*                                                                                                   *
*****************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
  -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

  BOWPO        2.68 BOWST        1.54 MIDPO        3.63 MIDST        2.49 STEPO        4.58 STEST        3.44

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 5PW                     .                    *
*                                                                                                   *
```

****

+++ R I G H T I N G A R M R E S U L T S +++
==========

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 5PW

Moment Scaled By 7078.83, KG = 6.32, and Wind Speed = 50 Knots

Initial: Roll = 2.38, Trim = 1.19 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
2.11	0.00	0.00	9999.00	2.16	-0.00	0.00	0.09	0.00	0.00	-0.088
2.12	2.00	0.00	9999.00	1.68	0.48	0.48	0.09	0.17	2.73	0.390
2.13	4.00	0.00	9999.00	1.20	0.96	1.91	0.08	0.35	5.53	0.876
2.13	6.00	0.00	9999.00	0.73	1.46	4.33	0.08	0.51	8.44	1.373
2.13	8.00	0.00	9999.00	0.25	1.96	7.74	0.08	0.68	11.47	1.878
2.13	10.00	0.00	9999.00	-0.23	2.44	12.14	0.08	0.83	14.57	2.360
2.11	12.00	0.00	9999.00	-0.70	2.83	17.41	0.08	0.99	17.64	2.755
2.10	14.00	0.00	9999.00	-1.17	3.10	23.34	0.07	1.14	20.53	3.025
2.08	16.00	0.00	9999.00	-1.63	3.24	29.68	0.07	1.28	23.12	3.167
2.05	18.00	0.00	9999.00	-2.09	3.29	36.20	0.07	1.43	25.37	3.217
2.03	20.00	0.00	9999.00	-2.55	3.27	42.77	0.07	1.57	27.28	3.205
2.00	22.00	0.00	9999.00	-3.01	3.21	49.26	0.07	1.70	28.89	3.147
1.97	24.00	0.00	9999.00	-3.47	3.12	55.59	0.07	1.84	30.23	3.057
1.94	26.00	0.00	9999.00	-3.92	3.01	61.72	0.06	1.97	31.34	2.941
1.90	28.00	0.00	9999.00	-4.36	2.87	67.60	0.06	2.10	32.23	2.807
1.86	30.00	0.00	9999.00	-4.80	2.72	73.19	0.06	2.22	32.94	2.656
1.82	32.00	0.00	9999.00	-5.23	2.55	78.45	0.06	2.34	33.49	2.493
1.78	34.00	0.00	9999.00	-5.66	2.38	83.38	0.06	2.46	33.90	2.319
1.74	36.00	0.00	9999.00	-6.08	2.19	87.95	0.06	2.57	34.18	2.136
1.69	38.00	0.00	9999.00	-6.49	2.00	92.14	0.05	2.68	34.34	1.946
1.64	40.00	0.00	9999.00	-6.90	1.80	95.94	0.05	2.79	34.40	1.749
1.59	42.00	0.00	9999.00	-7.29	1.60	99.34	0.05	2.89	34.35	1.548
1.54	44.00	0.00	9999.00	-7.68	1.39	102.33	0.05	2.99	34.22	1.341
1.48	46.00	0.00	9999.00	-8.06	1.18	104.90	0.05	3.08	34.00	1.131
1.43	48.00	0.00	9999.00	-8.43	0.96	107.04	0.04	3.18	33.71	0.918
1.37	50.00	0.00	9999.00	-8.79	0.74	108.75	0.04	3.26	33.34	0.702
1.31	52.00	0.00	9999.00	-9.13	0.52	110.01	0.04	3.34	32.89	0.484
1.25	54.00	0.00	9999.00	-9.47	0.30	110.84	0.04	3.42	32.38	0.264
1.18	56.00	0.00	9999.00	-9.80	0.08	111.22	0.04	3.50	31.80	0.042
1.12	58.00	0.00	9999.00	-10.11	-0.15	111.15	0.03	3.57	31.16	-0.180

****

* *** MOSES *** *

* ---------- *

* T E C O N 21 July, 2025 *

* VCG = 6.315 M Draft= 2.11 M Damage = 5PW Yaw = 0 . *

* *

****

+++ S T A B I L I T Y S U M M A R Y +++
==========

The Following Damaged Condition
==========
with 5PW Damaged

Draft	=	2.11 M
Roll	=	2.38 Deg
Pitch	=	1.19 Deg
VCG	=	6.32 M
Axis Angle	=	0.00 Deg
Wind Vel	=	50.00 Knots
1st Intercept	=	0.37 Deg
2st Intercept	=	52.82 Deg
NWT Down-Flooding	=	8.20 Deg
WT Down-Flooding	=	Not App. Deg
MIN (1st Int. NWT Down)	=	8.20 Deg

Passes All of The Stability Requirements:
==========

GM	>=	0.05	M	13.42 Passes
Range	>=	20.00	DEG	53.13 Passes
Area Ratio	>=	1.00		11.57 Passes
RA at roll >= 30 deg	>=	0.10	M	2.33 Passes

```
**********************************************************************************************************
*                                        ***  MOSES   ***                                                *
*                                        ----------------                        21 July, 2025       *
*          T E C O N                                                             .                     *
*          ---------     Longitudinal Strength Analysis - Still Water - DAMAGED 5PW   .                 *
*                                                                                                        *
**********************************************************************************************************
```

+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	3	0	0.0000	0.0000
8.00	-5	-272	-0.0108	0.0060
9.14	50	-247	-0.0098	0.0024
29.72	572	6312	0.2494	0.8916
35.00	-917	2963	0.1171	2.2685
40.00	-646	-946	-0.0374	3.9283
45.00	-375	-3504	-0.1385	5.4962
47.50	-240	-4275	-0.1690	6.1517
50.29	-88	-4735	-0.1871	6.7447
52.50	-37	-4875	-0.1927	7.0996
55.00	19	-4898	-0.1936	7.3748
60.00	134	-4513	-0.1784	7.5248
65.00	247	-3559	-0.1407	7.1824
70.87	48	-3377	-0.1335	6.2641
77.72	254	-2360	-0.0933	4.5586
85.70	208	-622	-0.0246	1.9901
91.44	2	0	0.0000	0.0000

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                        21 July, 2025                *
*          T E C O N                                                               .                             *
*          ---------     Damaged Stability Check - Tank 1SW                         .                             *
*                                                                                                                *
*****************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ======================================================================

                  Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                    Results Are Reported In Body System

                         Draft =     2.56 Roll Angle =    -0.72 Pitch Angle =     0.41

                                       Wet Radii Of Gyration About CG

                                 K-X =     9.45 K-Y =    25.18 K-Z =    25.18

                                       GMT =    16.20 GML =   204.87

                                          /-- Center of Gravity ---/  Sounding   % Full
                         Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                         ----------------  Part CF         ------------
                         LOAD_GRO     30.00    69.38    11.22     7.55
                         ----------------  Part GRI&SF-B   ------------
                         LOAD_GRO     75.00    30.86    -1.14     7.35
                         ----------------  Part GRI&SF-C   ------------
                         LOAD_GRO      0.50    67.44    11.22     7.10
                         ----------------  Part GRI&SF-T   ------------
                         LOAD_GRO     45.00    65.20    -2.92     7.40
                         ----------------  Part TOPSIDE    ------------
                         LOAD_GRO   1700.00    30.99    -1.27    15.77
                         ----------------  Part TP         ------------
                         LOAD_GRO    254.50    65.54    -2.14    11.80
                         ----------------  Part VERVECE    ------------
                         LOAD_GRO   1832.80    47.02     0.00     3.52
                         --- Contents ---
                         1PC           2.35     8.46    -3.21     0.14     0.24     1.00
                         1SC           2.35     8.46     3.64     0.14     0.24     1.00
                         1SW          60.07     7.22    10.30     1.67     2.68    25.56
                         2PC          26.21    20.82    -3.16     0.10     0.18     3.00
                         2SC          26.21    20.82     3.70     0.10     0.18     3.00
                         2SW         528.60    19.50    10.29     1.85     3.65    60.51
                         3PC          26.21    41.40    -3.16     0.10     0.18     3.00
                         3SC          26.21    41.40     3.70     0.10     0.18     3.00
                         3SW          26.21    41.38    10.44     0.10     0.15     3.00
                         4PC          26.21    61.97    -3.16     0.10     0.18     3.00
                         4PW         734.60    60.63   -10.27     2.57     5.17    84.09
                         4SC          26.21    61.97     3.70     0.10     0.18     3.00
                         4SW          26.21    61.96    10.44     0.10     0.15     3.00
                         5PC         482.18    83.89    -3.42     3.25     5.99    98.00
                         5SC          14.53    81.98     3.62     0.14     0.29     3.00
                         5SW         636.49    80.27    10.29     2.64     4.95    80.21
                         ========  ========  =======  =======  =======
                         Total      6608.66    48.45     0.22     6.60
                         Buoyancy   6608.65    48.48     0.29     1.49

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                        21 July, 2025                *
*          T E C O N                                                               .                             *
*          ---------     Damaged Stability Check - Tank 1SW                         .                             *
*                                                                                                                *
*****************************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
  -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

  BOWPO        2.39 BOWST        2.74 MIDPO        2.72 MIDST        3.07 STEPO        3.05 STEST        3.40

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                        21 July, 2025                *
*          T E C O N                                                               .                             *
*          ---------     Damaged Stability Check - Tank 1SW                         .                             *
*                                                                                                                *
*****************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 1SW

Moment Scaled By 6608.66, KG = 6.60, and Wind Speed = 50 Knots

Initial: Roll = -0.72, Trim = 0.41 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
2.56	0.00	0.00	9999.00	3.32	-0.00	0.00	0.09	0.00	0.00	-0.095
2.56	2.00	0.00	9999.00	3.20	0.56	0.56	0.09	0.19	2.97	0.469
2.55	4.00	0.00	9999.00	2.75	1.13	2.26	0.09	0.38	5.96	1.037
2.53	6.00	0.00	9999.00	2.29	1.71	5.10	0.09	0.57	9.00	1.616
2.51	8.00	0.00	9999.00	1.84	2.30	9.11	0.09	0.75	12.11	2.208
2.48	10.00	0.00	9999.00	1.39	2.90	14.31	0.09	0.93	15.31	2.811
2.45	12.00	0.00	9999.00	0.93	3.51	20.72	0.09	1.11	18.62	3.419
2.40	14.00	0.00	9999.00	0.49	4.05	28.28	0.09	1.29	21.98	3.967
2.33	16.00	0.00	9999.00	0.07	4.42	36.75	0.08	1.46	25.22	4.331
2.26	18.00	0.00	9999.00	-0.35	4.60	45.76	0.08	1.62	28.20	4.515
2.18	20.00	0.00	9999.00	-0.77	4.66	55.02	0.08	1.78	30.82	4.580
2.10	22.00	0.00	9999.00	-1.19	4.65	64.32	0.08	1.94	33.09	4.567
2.02	24.00	0.00	9999.00	-1.60	4.58	73.54	0.08	2.10	35.04	4.499
1.94	26.00	0.00	9999.00	-2.02	4.47	82.58	0.07	2.25	36.69	4.391
1.85	28.00	0.00	9999.00	-2.43	4.33	91.38	0.07	2.40	38.09	4.252
1.76	30.00	0.00	9999.00	-2.84	4.16	99.86	0.07	2.54	39.26	4.090
1.67	32.00	0.00	9999.00	-3.25	3.98	108.00	0.07	2.68	40.23	3.909
1.58	34.00	0.00	9999.00	-3.65	3.78	115.76	0.07	2.82	41.02	3.713
1.48	36.00	0.00	9999.00	-4.05	3.57	123.11	0.07	2.96	41.65	3.503
1.38	38.00	0.00	9999.00	-4.44	3.35	130.03	0.06	3.09	42.14	3.282
1.28	40.00	0.00	9999.00	-4.83	3.11	136.49	0.06	3.21	42.50	3.052
1.18	42.00	0.00	9999.00	-5.21	2.87	142.47	0.06	3.33	42.74	2.814
1.08	44.00	0.00	9999.00	-5.59	2.63	147.97	0.06	3.45	42.87	2.569
0.98	46.00	0.00	9999.00	-5.96	2.37	152.97	0.06	3.57	42.90	2.318
0.87	48.00	0.00	9999.00	-6.32	2.12	157.46	0.05	3.68	42.83	2.061
0.77	50.00	0.00	9999.00	-6.67	1.85	161.43	0.05	3.78	42.68	1.800
0.66	52.00	0.00	9999.00	-7.02	1.59	164.87	0.05	3.88	42.45	1.535
0.56	54.00	0.00	9999.00	-7.35	1.31	167.77	0.05	3.98	42.14	1.267
0.45	56.00	0.00	9999.00	-7.68	1.04	170.13	0.05	4.07	41.75	0.996
0.34	58.00	0.00	9999.00	-8.00	0.77	171.93	0.04	4.16	41.30	0.723
0.23	60.00	0.00	9999.00	-8.31	0.49	173.19	0.04	4.25	40.77	0.448
0.12	62.00	0.00	9999.00	-8.61	0.21	173.89	0.04	4.33	40.18	0.172
0.01	64.00	0.00	9999.00	-8.90	-0.07	174.03	0.04	4.40	39.53	-0.105

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                    21 July, 2025                   *
*          T E C O N                                                           .                                *
*          VCG = 6.598 M Draft=    2.56 M Damage = 1SW Yaw = 0                                                  *
*                                                                                                               *
*****************************************************************************************************************
```

+++ S T A B I L I T Y S U M M A R Y +++

The Following Damaged Condition
=====
with 1SW Damaged

Draft	=	2.56 M
Roll	=	-0.72 Deg
Pitch	=	0.42 Deg
VCG	=	6.60 M
Axis Angle	=	0.00 Deg
Wind Vel	=	50.00 Knots
1st Intercept	=	0.34 Deg
2st Intercept	=	62.82 Deg
NWT Down-Flooding	=	15.84 Deg
WT Down-Flooding	=	Not App. Deg
MIN (1st Int. NWT Down)	=	15.84 Deg

Passes All of The Stability Requirements:
=====

GM	>=	0.05	M	16.20 Passes
Range	>=	20.00	DEG	63.06 Passes
Area Ratio	>=	1.00		24.96 Passes

RA at roll >= 30 deg >= 0.10 M 4.10 Passes

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025          *
*          T E C O N                                                                 .                         *
*          ---------     Longitudinal Strength Analysis - Still Water - DAMAGED 1SW   .                         *
*                                                                                                               *
*****************************************************************************************************************
```

+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	1	0	0.0000	0.0000
8.00	-6	-285	-0.0113	0.0121
9.14	50	-260	-0.0103	0.0091
29.72	573	6309	0.2493	0.9008
35.00	-916	2962	0.1170	2.2768
40.00	-646	-947	-0.0375	3.9357
45.00	-375	-3503	-0.1385	5.5027
47.50	-240	-4274	-0.1689	6.1577
50.29	-88	-4734	-0.1871	6.7502
52.50	-37	-4875	-0.1927	7.1045
55.00	19	-4898	-0.1936	7.3794
60.00	134	-4512	-0.1783	7.5286
65.00	247	-3558	-0.1407	7.1854
70.87	48	-3377	-0.1335	6.2663
77.72	254	-2360	-0.0933	4.5600
85.70	208	-622	-0.0246	1.9907
91.44	2	0	0.0000	0.0000

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*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025        *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 2SW                     .                    *
*                                                                                                    *
*****************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                     Draft =     2.19 Roll Angle =     0.65 Pitch Angle =     0.73

                                    Wet Radii Of Gyration About CG

                             K-X =     9.42 K-Y =    25.09 K-Z =    24.95

                                    GMT =    14.59 GML =   199.42

                                      /-- Center of Gravity ---/  Sounding   % Full
                     Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                     ----------------  Part CF         ------------
                     LOAD_GRO     30.00    69.38    11.22     7.55
                     ----------------  Part GRI&SF-B   ------------
                     LOAD_GRO     75.00    30.86    -1.14     7.35
                     ----------------  Part GRI&SF-C   ------------
                     LOAD_GRO      0.50    67.44    11.22     7.10
                     ----------------  Part GRI&SF-T   ------------
                     LOAD_GRO     45.00    65.20    -2.92     7.40
                     ----------------  Part TOPSIDE    ------------
                     LOAD_GRO   1700.00    30.99    -1.27    15.77
                     ----------------  Part TP         ------------
                     LOAD_GRO    254.50    65.54    -2.14    11.80
                     ----------------  Part VERVECE    ------------
                     LOAD_GRO   1832.80    47.02     0.00     3.52
                     --- Contents ---
                     1PC           2.35     8.47    -3.62     0.14     0.22     1.00
                     1SC           2.35     8.47     3.24     0.14     0.22     1.00
                     2PC          26.21    21.90    -3.67     0.11     0.18     3.00
                     2SC          26.21    21.90     3.19     0.11     0.18     3.00
                     2SW         332.28    19.63    10.26     1.17     2.36    38.03
                     3PC          26.21    42.48    -3.67     0.11     0.18     3.00
                     3SC          26.21    42.48     3.19     0.11     0.18     3.00
                     3SW          26.21    42.44     9.95     0.11     0.23     3.00
                     4PC          26.21    63.05    -3.67     0.11     0.18     3.00
                     4PW         734.60    60.67   -10.29     2.57     5.09    84.09
                     4SC          26.21    63.05     3.19     0.11     0.18     3.00
                     4SW          26.21    63.01     9.95     0.11     0.23     3.00
                     5PC         482.18    83.91    -3.44     3.25     5.99    98.00
                     5SC          14.53    82.11     3.26     0.14     0.30     3.00
                     5SW         636.49    80.32    10.27     2.64     5.03    80.21
                     ========  ========  =======  =======  =======
                     Total      6352.26    49.79    -0.21     6.76
                     Buoyancy   6351.90    49.85    -0.27     1.45

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025        *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 2SW                     .                    *
*                                                                                                    *
*****************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        2.34 BOWST        2.03 MIDPO        2.93 MIDST        2.62 STEPO        3.52 STEST        3.21

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025        *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 2SW                     .                    *
*                                                                                                    *
*****************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 2SW

Moment Scaled By 6352.26, KG = 6.76, and Wind Speed = 50 Knots

Initial: Roll = 0.65, Trim = 0.73 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
2.19	0.00	0.00	9999.00	3.20	0.00	0.00	0.10	0.00	0.00	-0.099
2.16	2.00	0.00	9999.00	2.77	0.52	0.52	0.10	0.20	2.59	0.416
2.13	4.00	0.00	9999.00	2.33	1.04	2.07	0.10	0.40	5.17	0.936
2.09	6.00	0.00	9999.00	1.90	1.56	4.67	0.10	0.60	7.79	1.464
2.05	8.00	0.00	9999.00	1.47	2.10	8.33	0.10	0.80	10.45	2.000
2.00	10.00	0.00	9999.00	1.04	2.63	13.06	0.10	0.99	13.15	2.538
1.94	12.00	0.00	9999.00	0.62	3.13	18.83	0.10	1.19	15.87	3.034
1.85	14.00	0.00	9999.00	0.22	3.50	25.46	0.09	1.38	18.50	3.405
1.75	16.00	0.00	9999.00	-0.17	3.73	32.69	0.09	1.56	20.95	3.643
1.64	18.00	0.00	9999.00	-0.56	3.85	40.28	0.09	1.74	23.14	3.764
1.53	20.00	0.00	9999.00	-0.94	3.88	48.01	0.09	1.92	25.04	3.792
1.42	22.00	0.00	9999.00	-1.32	3.84	55.73	0.09	2.09	26.67	3.756
1.31	24.00	0.00	9999.00	-1.70	3.76	63.33	0.08	2.26	28.04	3.674
1.19	26.00	0.00	9999.00	-2.08	3.64	70.73	0.08	2.42	29.18	3.559
1.08	28.00	0.00	9999.00	-2.46	3.50	77.87	0.08	2.58	30.13	3.418
0.96	30.00	0.00	9999.00	-2.83	3.34	84.70	0.08	2.74	30.89	3.257
0.84	32.00	0.00	9999.00	-3.20	3.16	91.19	0.08	2.90	31.49	3.080
0.73	34.00	0.00	9999.00	-3.57	2.96	97.31	0.07	3.05	31.95	2.889
0.61	36.00	0.00	9999.00	-3.93	2.76	103.03	0.07	3.19	32.28	2.688
0.48	38.00	0.00	9999.00	-4.29	2.55	108.34	0.07	3.33	32.50	2.477
0.36	40.00	0.00	9999.00	-4.64	2.33	113.21	0.07	3.47	32.61	2.257
0.24	42.00	0.00	9999.00	-4.99	2.10	117.63	0.07	3.60	32.63	2.032
0.12	44.00	0.00	9999.00	-5.33	1.86	121.59	0.06	3.73	32.56	1.800
-0.00	46.00	0.00	9999.00	-5.66	1.62	125.08	0.06	3.86	32.41	1.563
-0.12	48.00	0.00	9999.00	-5.99	1.38	128.09	0.06	3.98	32.18	1.322
-0.25	50.00	0.00	9999.00	-6.31	1.13	130.60	0.06	4.10	31.87	1.077
-0.37	52.00	0.00	9999.00	-6.62	0.88	132.62	0.05	4.21	31.50	0.828
-0.49	54.00	0.00	9999.00	-6.92	0.63	134.13	0.05	4.32	31.07	0.578
-0.61	56.00	0.00	9999.00	-7.22	0.38	135.14	0.05	4.42	30.57	0.325
-0.73	58.00	0.00	9999.00	-7.50	0.12	135.63	0.05	4.52	30.02	0.070
-0.85	60.00	0.00	9999.00	-7.78	-0.14	135.61	0.05	4.61	29.41	-0.186

```
**********************************************************************************************************
*                                          ***  MOSES   ***                                              *
*                                          ----------------                    21 July, 2025             *
*          T E C O N                                                           .                         *
*          VCG = 6.757 M Draft=    2.19 M Damage = 2SW Yaw = 0                                           *
*                                                                                                        *
**********************************************************************************************************
```

+++ S T A B I L I T Y S U M M A R Y +++

The Following Damaged Condition
==========
with 2SW Damaged

Draft	=	2.19 M
Roll	=	0.65 Deg
Pitch	=	0.73 Deg
VCG	=	6.76 M
Axis Angle	=	0.00 Deg
Wind Vel	=	50.00 Knots
1st Intercept	=	0.39 Deg
2st Intercept	=	56.77 Deg
NWT Down-Flooding	=	13.15 Deg
WT Down-Flooding	=	Not App. Deg
MIN (1st Int. NWT Down)	=	13.15 Deg

Passes All of The Stability Requirements:
==========

GM	>=	0.05	M	14.59 Passes
Range	>=	20.00	DEG	57.19 Passes
Area Ratio	>=	1.00		17.09 Passes
RA at roll >= 30 deg	>=	0.10	M	3.15 Passes

```
**********************************************************************************************************
*                                          ***  MOSES   ***                                              *
*                                          ----------------                        21 July, 2025        *
*          T E C O N                                                               .                     *
*          ---------     Longitudinal Strength Analysis - Still Water - DAMAGED 2SW   .                   *
*                                                                                                        *
**********************************************************************************************************
```

+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 2SW

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	3	0	0.0000	0.0000
8.00	-32	-353	-0.0140	-0.1591
9.14	15	-363	-0.0144	-0.1873
29.72	620	6396	0.2528	0.0758
35.00	-886	3254	0.1286	1.2729
40.00	-629	-533	-0.0211	2.7947
45.00	-368	-3026	-0.1196	4.2694
47.50	-236	-3783	-0.1495	4.8976
50.29	-88	-4236	-0.1674	5.4763
52.50	-39	-4378	-0.1730	5.8318
55.00	14	-4410	-0.1743	6.1207
60.00	123	-4063	-0.1606	6.3381
65.00	230	-3177	-0.1256	6.1122
70.87	25	-3111	-0.1230	5.3834
77.72	238	-2229	-0.0881	3.9493
85.70	199	-586	-0.0232	1.7306
91.44	2	0	0.0000	0.0000

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*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025          *
*          T E C O N                                                                 .                        *
*          ---------     Damaged Stability Check - Tank 3SW                          .                        *
*                                                                                                              *
*****************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ======================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                    Results Are Reported In Body System

                          Draft =     2.69 Roll Angle =    -2.57 Pitch Angle =     0.44

                                        Wet Radii Of Gyration About CG

                                  K-X =     9.54 K-Y =    24.47 K-Z =    24.00

                                        GMT =    11.58 GML =   188.10

                                          /-- Center of Gravity ---/  Sounding   % Full
                          Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                          ----------------  Part CF         ------------
                          LOAD_GRO     30.00    69.38    11.22     7.55
                          ----------------  Part GRI&SF-B   ------------
                          LOAD_GRO     75.00    30.86    -1.14     7.35
                          ----------------  Part GRI&SF-C   ------------
                          LOAD_GRO      0.50    67.44    11.22     7.10
                          ----------------  Part GRI&SF-T   ------------
                          LOAD_GRO     45.00    65.20    -2.92     7.40
                          ----------------  Part TOPSIDE    ------------
                          LOAD_GRO   1700.00    30.99    -1.27    15.77
                          ----------------  Part TP         ------------
                          LOAD_GRO    254.50    65.54    -2.14    11.80
                          ----------------  Part VERVECE    ------------
                          LOAD_GRO   1832.80    47.02     0.00     3.52
                          --- Contents ---
                          1PC           2.35     8.45    -2.67     0.16     0.23     1.00
                          1SC           2.35     8.45     4.19     0.16     0.23     1.00
                          2PC          26.21    20.88    -2.48     0.12     0.18     3.00
                          2SC          26.21    20.88     4.38     0.12     0.18     3.00
                          2SW         472.00    19.51    10.33     1.65     3.14    54.03
                          3PC          26.21    41.45    -2.48     0.12     0.18     3.00
                          3SC          26.21    41.45     4.38     0.12     0.18     3.00
                          3SW         494.44    40.08    10.33     1.73     3.30    56.60
                          4PC          26.21    62.03    -2.48     0.12     0.18     3.00
                          4PW         734.60    60.63   -10.25     2.57     5.28    84.09
                          4SC          26.21    62.03     4.38     0.12     0.18     3.00
                          4SW          26.21    62.03    11.12     0.12     0.04     3.00
                          5PC         482.18    83.89    -3.40     3.25     6.00    98.00
                          5SC          14.53    82.00     4.10     0.15     0.29     3.00
                          5SW         636.49    80.28    10.32     2.64     4.84    80.21
                          ========  ========  =======  =======  =======
                          Total      6960.23    48.47     0.76     6.35
                          Buoyancy   6960.05    48.50     0.98     1.58

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025          *
*          T E C O N                                                                 .                        *
*          ---------     Damaged Stability Check - Tank 3SW                          .                        *
*                                                                                                              *
*****************************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        2.07 BOWST        3.30 MIDPO        2.42 MIDST        3.65 STEPO        2.77 STEST        4.00

*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025          *
*          T E C O N                                                                 .                        *
*          ---------     Damaged Stability Check - Tank 3SW                          .                        *
*                                                                                                              *
*****************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 2SW, 3SW

Moment Scaled By 6960.23, KG = 6.35, and Wind Speed = 50 Knots

Initial: Roll = -2.57, Trim = 0.44 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
2.69	0.00	0.00	9999.00	2.74	-0.00	0.00	0.09	0.00	0.00	-0.089
2.64	2.00	0.00	9999.00	3.24	0.39	0.39	0.09	0.18	2.17	0.299
2.59	4.00	0.00	9999.00	3.09	0.78	1.56	0.09	0.36	4.28	0.683
2.54	6.00	0.00	9999.00	2.68	1.16	3.49	0.09	0.55	6.34	1.064
2.48	8.00	0.00	9999.00	2.28	1.54	6.19	0.09	0.74	8.38	1.450
2.41	10.00	0.00	9999.00	1.87	1.93	9.67	0.10	0.93	10.41	1.839
2.34	12.00	0.00	9999.00	1.47	2.32	13.93	0.10	1.12	12.44	2.229
2.26	14.00	0.00	9999.00	1.06	2.71	18.97	0.10	1.31	14.48	2.618
2.16	16.00	0.00	9999.00	0.67	3.05	24.73	0.09	1.50	16.50	2.961
2.05	18.00	0.00	9999.00	0.30	3.30	31.09	0.09	1.68	18.45	3.211
1.93	20.00	0.00	9999.00	-0.08	3.45	37.85	0.09	1.87	20.27	3.362
1.82	22.00	0.00	9999.00	-0.47	3.52	44.82	0.09	2.05	21.90	3.428
1.70	24.00	0.00	9999.00	-0.85	3.51	51.84	0.09	2.22	23.34	3.423
1.59	26.00	0.00	9999.00	-1.23	3.45	58.80	0.08	2.39	24.59	3.368
1.47	28.00	0.00	9999.00	-1.61	3.36	65.62	0.08	2.56	25.64	3.278
1.35	30.00	0.00	9999.00	-1.99	3.24	72.22	0.08	2.72	26.53	3.161
1.23	32.00	0.00	9999.00	-2.37	3.10	78.56	0.08	2.88	27.26	3.023
1.11	34.00	0.00	9999.00	-2.75	2.95	84.61	0.08	3.04	27.86	2.868
0.99	36.00	0.00	9999.00	-3.12	2.78	90.33	0.07	3.19	28.33	2.700
0.86	38.00	0.00	9999.00	-3.48	2.59	95.70	0.07	3.34	28.68	2.521
0.73	40.00	0.00	9999.00	-3.85	2.40	100.70	0.07	3.48	28.93	2.333
0.61	42.00	0.00	9999.00	-4.20	2.21	105.31	0.07	3.62	29.08	2.137
0.48	44.00	0.00	9999.00	-4.56	2.00	109.51	0.07	3.76	29.15	1.934
0.35	46.00	0.00	9999.00	-4.91	1.79	113.30	0.06	3.89	29.14	1.725
0.22	48.00	0.00	9999.00	-5.25	1.57	116.67	0.06	4.02	29.05	1.511
0.09	50.00	0.00	9999.00	-5.58	1.35	119.59	0.06	4.14	28.90	1.294
-0.03	52.00	0.00	9999.00	-5.91	1.13	122.08	0.06	4.26	28.67	1.072
-0.16	54.00	0.00	9999.00	-6.23	0.90	124.11	0.06	4.37	28.39	0.847
-0.29	56.00	0.00	9999.00	-6.54	0.67	125.69	0.05	4.48	28.04	0.620
-0.42	58.00	0.00	9999.00	-6.85	0.44	126.81	0.05	4.59	27.64	0.391
-0.55	60.00	0.00	9999.00	-7.15	0.21	127.46	0.05	4.69	27.19	0.160
-0.68	62.00	0.00	9999.00	-7.44	-0.03	127.64	0.05	4.78	26.68	-0.073

```
*****************************************************************************************************************
*                                                                                                               *
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025        *
*          T E C O N                                                                 .                     *
*          VCG = 6.346 M Draft=    2.77 M Damage = 3SW Yaw = 0                                                  *
*                                                                                                               *
*****************************************************************************************************************
```

+++ S T A B I L I T Y S U M M A R Y +++

The Following Damaged Condition
==========
with 3SW Damaged

Draft	=	2.77 M
Roll	=	-2.94 Deg
Pitch	=	0.37 Deg
VCG	=	6.35 M
Axis Angle	=	0.00 Deg
Wind Vel	=	50.00 Knots
1st Intercept	=	0.37 Deg
2st Intercept	=	64.79 Deg
NWT Down-Flooding	=	17.71 Deg
WT Down-Flooding	=	Not App. Deg
MIN (1st Int. NWT Down)	=	17.71 Deg

Passes All of The Stability Requirements:
==========

GM	>=	0.05	M	14.00 Passes
Range	>=	20.00	DEG	65.04 Passes
Area Ratio	>=	1.00		23.85 Passes
RA at roll >= 30 deg	>=	0.10	M	3.99 Passes

```
**********************************************************************************************************
*                                        ***  MOSES   ***                                                *
*                                        ----------------                        21 July, 2025       *
*          T E C O N                                                             .                     *
*          ---------     Longitudinal Strength Analysis - Still Water - DAMAGED 3SW   .                 *
*                                                                                                        *
**********************************************************************************************************

                    +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                    ================================================================

 Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Allowable Stress =     155.00 Mpa

                                Allowable Deflection =       1.00 MM
```

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	2	0	0.0000	0.0000
8.00	-7	-289	-0.0115	0.1477
9.14	48	-266	-0.0106	0.1640
29.72	562	6179	0.2442	1.3712
35.00	-924	2784	0.1100	2.8010
40.00	-650	-1153	-0.0456	4.4910
45.00	-373	-3715	-0.1468	6.0665
47.50	-234	-4477	-0.1769	6.7171
50.29	-79	-4916	-0.1943	7.2981
52.50	-28	-5036	-0.1991	7.6389
55.00	28	-5038	-0.1991	7.8943
60.00	140	-4615	-0.1824	7.9933
65.00	252	-3629	-0.1435	7.5886
70.87	52	-3419	-0.1351	6.5876
77.72	257	-2379	-0.0940	4.7774
85.70	209	-626	-0.0248	2.0822
91.44	2	0	0.0000	0.0000

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*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 4SW                     .                    *
*                                                                                                   *
*****************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                     Draft =     2.43 Roll Angle =    -2.97 Pitch Angle =     0.78

                                    Wet Radii Of Gyration About CG

                             K-X =     9.54 K-Y =    24.58 K-Z =    24.23

                                    GMT =    13.85 GML =   200.94

                                       /-- Center of Gravity ---/  Sounding   % Full
                     Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                     ----------------  Part CF         ------------
                     LOAD_GRO     30.00    69.38    11.22     7.55
                     ----------------  Part GRI&SF-B   ------------
                     LOAD_GRO     75.00    30.86    -1.14     7.35
                     ----------------  Part GRI&SF-C   ------------
                     LOAD_GRO      0.50    67.44    11.22     7.10
                     ----------------  Part GRI&SF-T   ------------
                     LOAD_GRO     45.00    65.20    -2.92     7.40
                     ----------------  Part TOPSIDE    ------------
                     LOAD_GRO   1700.00    30.99    -1.27    15.77
                     ----------------  Part TP         ------------
                     LOAD_GRO    254.50    65.54    -2.14    11.80
                     ----------------  Part VERVECE    ------------
                     LOAD_GRO   1832.80    47.02     0.00     3.52
                     --- Contents ---
                     1PC           2.35     8.45    -2.56     0.16     0.21     1.00
                     1SC           2.35     8.45     4.30     0.16     0.21     1.00
                     2PC          26.21    21.87    -2.39     0.13     0.18     3.00
                     2SC          26.21    21.87     4.47     0.13     0.18     3.00
                     2SW         528.60    19.56    10.34     1.85     3.51    60.51
                     3PC          26.21    42.45    -2.39     0.13     0.18     3.00
                     3SC          26.21    42.45     4.47     0.13     0.18     3.00
                     4PC          26.21    63.02    -2.39     0.13     0.18     3.00
                     4PW         734.60    60.67   -10.24     2.57     5.31    84.09
                     4SC          26.21    63.02     4.47     0.13     0.18     3.00
                     4SW         543.40    60.71    10.33     1.90     3.62    62.20
                     5PC         482.18    83.90    -3.40     3.25     6.00    98.00
                     5SC          14.53    82.15     4.21     0.16     0.30     3.00
                     5SW         636.49    80.32    10.33     2.64     4.81    80.21
                     ========  ========  =======  =======  =======
                     Total      7039.56    49.76     0.87     6.33
                     Buoyancy   7039.83    49.82     1.12     1.62

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 4SW                     .                    *
*                                                                                                   *
*****************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
  -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

  BOWPO        1.72 BOWST        3.14 MIDPO        2.35 MIDST        3.77 STEPO        2.97 STEST        4.39

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 4SW                     .                    *
*                                                                                                   *
*****************************************************************************************************

                                    +++ R I G H T I N G   A R M   R E S U L T S +++
```

==========

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 4SW

Moment Scaled By 7039.56, KG = 6.33, and Wind Speed = 50 Knots

Initial: Roll = -2.97, Trim = 0.78 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
2.43	0.00	0.00	9999.00	2.35	0.00	0.00	0.09	0.00	0.00	-0.088
2.41	2.00	0.00	9999.00	2.83	0.48	0.48	0.09	0.18	2.70	0.390
2.39	4.00	0.00	9999.00	2.84	0.95	1.91	0.09	0.36	5.37	0.865
2.36	6.00	0.00	9999.00	2.41	1.43	4.30	0.09	0.54	8.01	1.339
2.33	8.00	0.00	9999.00	1.97	1.91	7.63	0.09	0.72	10.64	1.816
2.29	10.00	0.00	9999.00	1.54	2.39	11.92	0.09	0.90	13.29	2.298
2.25	12.00	0.00	9999.00	1.11	2.87	17.18	0.09	1.08	15.98	2.784
2.20	14.00	0.00	9999.00	0.68	3.35	23.41	0.09	1.25	18.70	3.267
2.14	16.00	0.00	9999.00	0.27	3.77	30.54	0.09	1.43	21.42	3.685
2.06	18.00	0.00	9999.00	-0.14	4.06	38.37	0.08	1.60	24.03	3.977
1.98	20.00	0.00	9999.00	-0.54	4.22	46.65	0.08	1.76	26.44	4.138
1.89	22.00	0.00	9999.00	-0.95	4.28	55.16	0.08	1.93	28.58	4.199
1.81	24.00	0.00	9999.00	-1.35	4.27	63.71	0.08	2.09	30.46	4.193
1.73	26.00	0.00	9999.00	-1.76	4.22	72.20	0.08	2.25	32.10	4.140
1.65	28.00	0.00	9999.00	-2.17	4.12	80.54	0.08	2.40	33.50	4.047
1.56	30.00	0.00	9999.00	-2.58	4.00	88.66	0.07	2.56	34.70	3.924
1.48	32.00	0.00	9999.00	-2.98	3.85	96.51	0.07	2.70	35.71	3.778
1.39	34.00	0.00	9999.00	-3.38	3.68	104.05	0.07	2.85	36.55	3.613
1.30	36.00	0.00	9999.00	-3.77	3.50	111.23	0.07	2.99	37.24	3.432
1.21	38.00	0.00	9999.00	-4.16	3.31	118.04	0.07	3.12	37.79	3.239
1.11	40.00	0.00	9999.00	-4.54	3.10	124.45	0.07	3.26	38.22	3.036
1.02	42.00	0.00	9999.00	-4.92	2.89	130.44	0.06	3.39	38.53	2.823
0.93	44.00	0.00	9999.00	-5.30	2.66	135.99	0.06	3.51	38.74	2.603
0.83	46.00	0.00	9999.00	-5.66	2.44	141.09	0.06	3.63	38.85	2.376
0.73	48.00	0.00	9999.00	-6.02	2.20	145.73	0.06	3.75	38.88	2.144
0.63	50.00	0.00	9999.00	-6.38	1.96	149.89	0.06	3.86	38.82	1.906
0.53	52.00	0.00	9999.00	-6.72	1.72	153.57	0.05	3.97	38.68	1.664
0.43	54.00	0.00	9999.00	-7.06	1.47	156.75	0.05	4.07	38.48	1.418
0.33	56.00	0.00	9999.00	-7.38	1.22	159.44	0.05	4.17	38.20	1.169
0.23	58.00	0.00	9999.00	-7.70	0.96	161.62	0.05	4.27	37.85	0.918
0.13	60.00	0.00	9999.00	-8.01	0.71	163.30	0.04	4.36	37.44	0.664
0.03	62.00	0.00	9999.00	-8.31	0.45	164.46	0.04	4.45	36.97	0.409
-0.07	64.00	0.00	9999.00	-8.60	0.19	165.10	0.04	4.53	36.44	0.152
-0.17	66.00	0.00	9999.00	-8.88	-0.07	165.22	0.04	4.61	35.86	-0.106

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025          *
*          T E C O N                                                                 .                        *
*          VCG = 6.328 M Draft=    2.43 M Damage = 4SW Yaw = 0                                                  *
*                                                                                                               *
*****************************************************************************************************************
```

+++ S T A B I L I T Y S U M M A R Y +++

The Following Damaged Condition
with 4SW Damaged

Draft	=	2.43 M
Roll	=	-2.97 Deg
Pitch	=	0.78 Deg
VCG	=	6.33 M
Axis Angle	=	0.00 Deg
Wind Vel	=	50.00 Knots
1st Intercept	=	0.37 Deg
2st Intercept	=	64.67 Deg
NWT Down-Flooding	=	17.71 Deg
WT Down-Flooding	=	Not App. Deg
MIN (1st Int. NWT Down)	=	17.71 Deg

Passes All of The Stability Requirements:

GM	>=	0.05	M	13.85 Passes
Range	>=	20.00	DEG	64.94 Passes
Area Ratio	>=	1.00		23.71 Passes
RA at roll >= 30 deg	>=	0.10	M	3.95 Passes

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          21 July, 2025         *
*          T E C O N                                                                 .                       *
*          ---------     Longitudinal Strength Analysis - Still Water - DAMAGED 4SW   .                        *
*                                                                                                               *
*****************************************************************************************************************
```

+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	2	0	0.0000	0.0000
8.00	-7	-289	-0.0114	0.2140
9.14	48	-266	-0.0105	0.2398
29.72	561	6157	0.2433	1.6145
35.00	-927	2748	0.1086	3.0830
40.00	-654	-1207	-0.0477	4.8056
45.00	-379	-3793	-0.1499	6.4078
47.50	-241	-4570	-0.1806	7.0684
50.29	-86	-5028	-0.1987	7.6579
52.50	-34	-5163	-0.2040	8.0026
55.00	22	-5179	-0.2047	8.2591
60.00	139	-4773	-0.1887	8.3485
65.00	256	-3785	-0.1496	7.9169
70.87	63	-3534	-0.1397	6.8630
77.72	264	-2431	-0.0961	4.9697
85.70	212	-638	-0.0252	2.1643
91.44	2	0	0.0000	0.0000

```
*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 5SW                     .                    *
*                                                                                                   *
*****************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                     Draft =     2.70 Roll Angle =     1.80 Pitch Angle =     0.01

                                    Wet Radii Of Gyration About CG

                             K-X =     9.30 K-Y =    24.52 K-Z =    24.10

                                    GMT =    15.59 GML =   204.57

                                       /-- Center of Gravity ---/  Sounding   % Full
                     Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                     ----------------  Part CF         ------------
                     LOAD_GRO     30.00    69.38    11.22     7.55
                     ----------------  Part GRI&SF-B   ------------
                     LOAD_GRO     75.00    30.86    -1.14     7.35
                     ----------------  Part GRI&SF-C   ------------
                     LOAD_GRO      0.50    67.44    11.22     7.10
                     ----------------  Part GRI&SF-T   ------------
                     LOAD_GRO     45.00    65.20    -2.92     7.40
                     ----------------  Part TOPSIDE    ------------
                     LOAD_GRO   1700.00    30.99    -1.27    15.77
                     ----------------  Part TP         ------------
                     LOAD_GRO    254.50    65.54    -2.14    11.80
                     ----------------  Part VERVECE    ------------
                     LOAD_GRO   1832.80    47.02     0.00     3.52
                     --- Contents ---
                     1PC           2.35     8.45    -3.96     0.15     0.26     1.00
                     1SC           2.35     8.45     2.89     0.15     0.26     1.00
                     2PC          26.21    19.46    -4.10     0.10     0.18     3.00
                     2SC          26.21    19.46     2.76     0.10     0.18     3.00
                     2SW         528.60    19.43    10.25     1.85     3.80    60.51
                     3PC          26.21    40.03    -4.10     0.10     0.18     3.00
                     3SC          26.21    40.03     2.76     0.10     0.18     3.00
                     4PC          26.21    60.61    -4.10     0.10     0.18     3.00
                     4PW         734.60    60.58   -10.31     2.57     5.02    84.09
                     4SC          26.21    60.61     2.76     0.10     0.18     3.00
                     5PC         482.18    83.87    -3.45     3.25     5.99    98.00
                     5SC          14.53    81.83     2.96     0.14     0.27     3.00
                     5SW         274.77    79.27    10.22     1.24     2.49    34.62
                     ========  ========  =======  =======  =======
                     Total      6134.45    46.85    -0.60     6.87
                     Buoyancy   6134.68    46.85    -0.77     1.39

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 5SW                     .                    *
*                                                                                                   *
*****************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 --------- -------- --------- -------- --------- -------- --------- -------- --------- -------- --------- --------

  BOWPO        3.13 BOWST        2.27 MIDPO        3.13 MIDST        2.27 STEPO        3.14 STEST        2.28

*****************************************************************************************************
*                                          ***  MOSES   ***                                         *
*                                          ----------------                    21 July, 2025       *
*          T E C O N                                                           .                    *
*          ---------     Damaged Stability Check - Tank 5SW                     .                    *
*                                                                                                   *
*****************************************************************************************************

                              +++ R I G H T I N G   A R M   R E S U L T S +++
                              ============================================
```

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Compartments Flooded Are: 5SW

Moment Scaled By 6134.45, KG = 6.87, and Wind Speed = 50 Knots

Initial: Roll = 1.80, Trim = 0.01 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
2.70	0.00	0.00	9999.00	3.58	-0.00	0.00	0.10	0.00	0.00	-0.102
2.67	2.00	0.00	9999.00	3.14	0.55	0.55	0.10	0.21	2.69	0.449
2.63	4.00	0.00	9999.00	2.70	1.12	2.22	0.10	0.41	5.42	1.015
2.59	6.00	0.00	9999.00	2.26	1.69	5.03	0.10	0.61	8.21	1.593
2.55	8.00	0.00	9999.00	1.82	2.28	9.01	0.10	0.81	11.07	2.179
2.49	10.00	0.00	9999.00	1.39	2.83	14.12	0.10	1.01	13.95	2.736
2.40	12.00	0.00	9999.00	0.99	3.25	20.20	0.10	1.21	16.75	3.152
2.28	14.00	0.00	9999.00	0.61	3.54	26.99	0.09	1.40	19.34	3.451
2.16	16.00	0.00	9999.00	0.23	3.70	34.24	0.09	1.58	21.66	3.612
2.03	18.00	0.00	9999.00	-0.15	3.76	41.71	0.09	1.76	23.66	3.669
1.91	20.00	0.00	9999.00	-0.53	3.74	49.20	0.09	1.94	25.37	3.652
1.78	22.00	0.00	9999.00	-0.91	3.67	56.61	0.09	2.11	26.79	3.582
1.64	24.00	0.00	9999.00	-1.29	3.56	63.83	0.08	2.28	27.97	3.474
1.51	26.00	0.00	9999.00	-1.66	3.42	70.81	0.08	2.45	28.93	3.337
1.38	28.00	0.00	9999.00	-2.04	3.26	77.49	0.08	2.61	29.70	3.178
1.24	30.00	0.00	9999.00	-2.41	3.08	83.82	0.08	2.77	30.30	3.000
1.10	32.00	0.00	9999.00	-2.78	2.88	89.79	0.08	2.92	30.74	2.808
0.96	34.00	0.00	9999.00	-3.15	2.68	95.35	0.07	3.07	31.06	2.604
0.82	36.00	0.00	9999.00	-3.51	2.46	100.49	0.07	3.22	31.25	2.390
0.68	38.00	0.00	9999.00	-3.87	2.24	105.19	0.07	3.36	31.33	2.168
0.54	40.00	0.00	9999.00	-4.22	2.01	109.43	0.07	3.49	31.31	1.939
0.39	42.00	0.00	9999.00	-4.57	1.77	113.21	0.07	3.63	31.21	1.704
0.25	44.00	0.00	9999.00	-4.91	1.53	116.50	0.06	3.76	31.01	1.463
0.11	46.00	0.00	9999.00	-5.25	1.28	119.31	0.06	3.88	30.74	1.219
-0.04	48.00	0.00	9999.00	-5.58	1.03	121.62	0.06	4.00	30.39	0.970
-0.18	50.00	0.00	9999.00	-5.90	0.78	123.43	0.06	4.12	29.98	0.719
-0.33	52.00	0.00	9999.00	-6.22	0.52	124.72	0.05	4.23	29.50	0.466
-0.47	54.00	0.00	9999.00	-6.53	0.26	125.51	0.05	4.34	28.95	0.211
-0.61	56.00	0.00	9999.00	-6.83	0.00	125.77	0.05	4.44	28.35	-0.045
-0.76	58.00	0.00	9999.00	-7.12	-0.25	125.52	0.05	4.53	27.68	-0.302

```
*********************************************************************************************************************
*                                          ***  MOSES   ***                                                         *
*                                          ----------------                      21 July, 2025                    *
*          T E C O N                                                             .                                  *
*          VCG = 6.873 M Draft=    2.70 M Damage = 5SW Yaw = 0                                                      *
*                                                                                                                   *
*********************************************************************************************************************
```

+++ S T A B I L I T Y S U M M A R Y +++

The Following Damaged Condition

with 5SW Damaged

Draft	=	2.70 M
Roll	=	1.80 Deg
Pitch	=	0.01 Deg
VCG	=	6.87 M
Axis Angle	=	0.00 Deg
Wind Vel	=	50.00 Knots
1st Intercept	=	0.39 Deg
2st Intercept	=	55.59 Deg
NWT Down-Flooding	=	15.19 Deg
WT Down-Flooding	=	Not App. Deg
MIN (1st Int. NWT Down)	=	15.19 Deg

Passes All of The Stability Requirements:

GM		>=	0.05	M	15.59 Passes
Range		>=	20.00	DEG	55.88 Passes
Area Ratio		>=	1.00		20.53 Passes
RA at roll	>= 30 deg	>=	0.10	M	3.06 Passes

```
*********************************************************************************************************************
*                                          ***  MOSES   ***                                                         *
*                                          ----------------                      21 July, 2025                    *
*          T E C O N                                                             .                                  *
```

```
*          ---------     Longitudinal Strength Analysis - Still Water - DAMAGED 5SW   .                       *
*                                                                                                             *
***************************************************************************************************************
```

+++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	35	-142	-0.0056	-2.4247
9.14	101	-63	-0.0025	-2.7744
29.72	694	8050	0.3181	-7.5505
35.00	-807	5311	0.2099	-7.2468
40.00	-555	1900	0.0751	-6.3385
45.00	-306	-257	-0.0102	-5.2092
47.50	-183	-871	-0.0344	-4.6416
50.29	-46	-1192	-0.0472	-4.0356
52.50	-22	-1269	-0.0502	-3.5847
55.00	4	-1292	-0.0511	-3.1070
60.00	56	-1142	-0.0452	-2.2571
65.00	106	-736	-0.0291	-1.5307
70.87	-166	-1604	-0.0634	-0.8088
77.72	140	-1696	-0.0670	-0.2657
85.70	165	-554	-0.0219	-0.0428
91.44	0	0	0.0000	0.0000

13 ATTACHMENT 2 – BALLAST SURVEY REPORT dated 23/07/2025