STATIC MOORING ANALYSIS FOR KHK VISION

Static Mooring Analysis Report

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1 Objective

The objective of this report is to conduct static mooring analysis of KHK Vision alongside a suitable VLCC Tanker Berth under the standard environmental conditions as defined in OCIMF Mooring Equipment Guideline Fourth Edition 2018 (OCIMF MEG 4) using OPTIMOOR. This report presents the results of static mooring assessments carried out. The purpose of the assessments is to

- Determine mooring line tension under the standard environmental conditions.
- Determine vessel movements for the mooring arrangements considered.
- To verify compliance of the vessels mooring line loads to the constrains as specified in OCIMF MEG 4

Vessel data is provided by Tai Chong Cheang Steamship Co. (H.K.) Ltd (Herewith referred as “TCC”).

2 Description of Mooring Arrangement

Figure 2.1 shows the mooring layout of KHK Vision at VLCC Tanker Berth. Ten lines forward and ten lines aft has been used in 4/4/2 configuration as shown below.

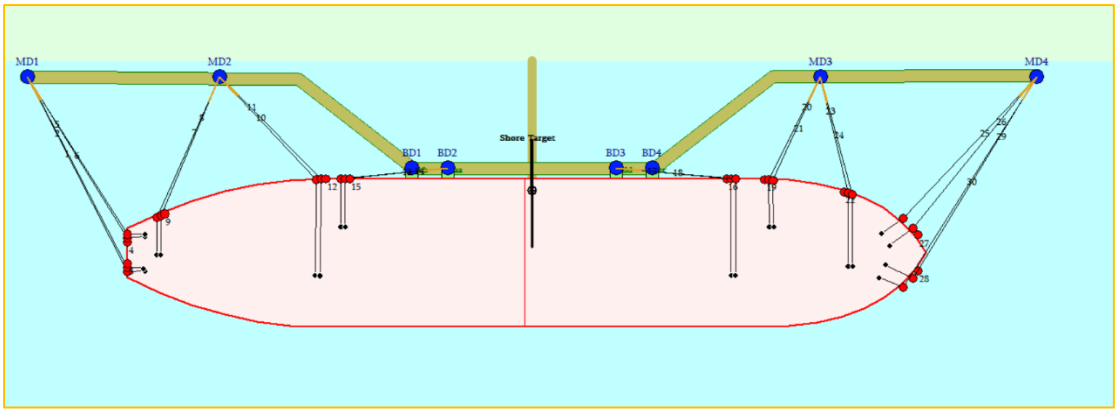


Figure 2-1 Mooring Layout of KHK Vision

Details of the VLCC tanker berth is presented in Appendix 1. Fender properties are generally not a major concern when running static mooring analysis. Fender compliance usually has only a minor influence on mooring line tensions, they are more of importance while carrying out berth design. This influence is greater with wires and high-modulus fiber ropes than it is with conventional fiber ropes. Also it is observed that OPTIMOOR over states fender pressures in cases of partial contact (i.e. where the fender contact is less than 100%), fender reaction for those cases to be ignored.

3 Vessel Data

Particulars of KHK Vision are presented in Table 3.1.

Table 3-1 Main Particulars of KHK Vision

Vessel Type	LBP (m)	B (m)	D (m)	T_L (m)	T_B (m)	DWT (tons)
Tanker	320.0	58.0	31.20	22.422	F: 8.70 A: 11.00	306,000

T_L = Loaded Draft, T_B = Ballast Draft,

The vessel details are shown in Appendix 2.

4 Mooring Analysis

4.1 General

The analysis has been carried out using OPTIMOOR (Version 6.7.7) mooring analysis program by Tension Technology International Ltd.

The OPTIMOOR output includes individual line loads for given wind directions and speed, vessel movements and a summation of the loads on the bollards.

Pretension was applied on each of the mooring lines to simulate the vessels being winched tight against the berth to minimize movement along the berth. Winch brake limit is set at 54 ton.

For the vessels, the mooring lines adopted are presented in Table 4.1.

Table 4-1 Mooring Line Properties

Parameter	Type	Diameter (mm)	MBL (T)	Pre-tension
Mooring Wire	6X37WS+IWRC	42	115	10
Tail Rope	Magnaro Megacore 8 strand plated rope	90	163	10

MBL = Minimum Breaking Load

All calculations were carried out based on the design environmental conditions listed in Section 4.2.

4.2 Environmental Condition

As stated in OCIMF MEG 4, section 3.2.2, for all ships above 16,000DWT intended for general worldwide trading, the mooring restraint available on board the ships as as fixed equipment should be sufficient to satisfy the following conditions:

a) 60 knots wind from any direction simultaneously with

b) 3 knots current at 0 degrees or 180 degrees or

c) 2 knots current 10 degrees or 170 degrees or

d) 0.75 knots current from the direction of maximum beam loading

Water depth to draft ratios (W_d/T) for these conditions are to be taken as 1.05 when loaded and 3.0 when in ballast.

4.3 Analysis Criteria

The following criteria, as recommended by OCIMF, is applied to determine whether mooring arrangement is effective:

a) Maximum load (tension) on the mooring lines not to exceed 55% of MBL (for wire mooring line)

b) The vessel excursion related to surge and sway has been restricted to the envelope, as below:

- Surge: +/-2.0 meters
- Sway: - 2.0 meters

4.4 Mooring Analysis

The mooring analysis was carried out for the run cases presented in Table 4.2.

Table 4-2 Mooring Analysis Run Cases

Run Case	Vessel Loading Condition	Vessel Draft (m)	Water Depth/ Vessel Draft (W_d/T)	Current		Wind	
				Speed (knots)	Direction	Speed (knots)	Direction
1	Ballast	F: 8.70 A: 11.0	3.0	3.0	From Ahead	60	Omni
2				3.0	From Astern	60	Omni
3				2.0	10º on Bow pushing off berth	60	Omni
4				2.0	10º on Stern pushing off berth	60	Omni
5				0.75	90º pushing off berth	60	Omni
6	Loaded	22.422	1.05	3.0	From Ahead	60	Omni
7				3.0	From Astern	60	Omni
8				2.0	10º on Bow pushing off berth	60	Omni
9				2.0	10º on Stern pushing off berth	60	Omni
10				0.75	90º pushing off berth	60	Omni

4.5 Mooring Analysis Result Summary

The mooring analysis results are summarized in Table 4.3 & Table 4.4.

Line	Highest Loading	Wind Speed	True Direction	Current Speed	Screen Direction	Water Level	Draft	Trim	Offset	Batch Run no
1	40%	60	250°	0.75	-90°	6.0	9.9	2.3	0.0	5
2	40%	60	250°	0.75	-90°	6.0	9.9	2.3	0.0	5
5	40%	60	250°	0.75	-90°	6.0	9.9	2.3	0.0	5
6	39%	60	250°	0.75	-90°	6.0	9.9	2.3	0.0	5
7	45%	60	250°	2.0	-170°	0.0	22.4	0.0	0.0	9
8	45%	60	250°	2.0	-170°	0.0	22.4	0.0	0.0	9
10	29%	60	270°	0.75	-90°	6.0	9.9	2.3	0.0	5
11	28%	60	270°	0.75	-90°	6.0	9.9	2.3	0.0	5
13	28%	60	0°	2.0	-170°	0.0	22.4	0.0	0.0	9
14	28%	60	0°	2.0	-170°	0.0	22.4	0.0	0.0	9
17	36%	60	160°	2.0	-10°	0.0	22.4	0.0	0.0	8
18	35%	60	160°	2.0	-10°	0.0	22.4	0.0	0.0	8
20	37%	60	290°	2.0	-10°	0.0	22.4	0.0	0.0	8
21	38%	60	290°	2.0	-10°	0.0	22.4	0.0	0.0	8
23	46%	60	280°	2.0	-10°	0.0	22.4	0.0	0.0	8
24	47%	60	150°	2.0	-10°	0.0	22.4	0.0	0.0	8
25	30%	60	290°	0.75	-90°	6.0	9.9	2.3	0.0	5
26	32%	60	300°	2.0	-10°	0.0	22.4	0.0	0.0	8
29	34%	60	300°	2.0	-10°	0.0	22.4	0.0	0.0	8
30	33%	60	300°	2.0	-10°	0.0	22.4	0.0	0.0	8

Table 4-3 Summary of Highest Line Tensions of all Run Cases

	Highest Excursion	Wind Speed	True Direction	Current Speed	Screen Direction	Water Level	Draft	Trim	Offset	Batch Run no
Long	0.68	60	160°	2.0	-10°	0.0	22.4	0.0	0.0	8
Long	-0.46	60	0°	3.0	0°	6.0	9.9	2.3	0.0	1
Trans	0.10	60	90°	3.0	0°	6.0	9.9	2.3	0.0	1
Trans	-0.84	60	270°	0.75	-90°	6.0	9.9	2.3	0.0	5

Table 4-4 Summary of Highest Vessel Excursions of all Run Cases

5 Conclusion and Recommendations

5.1 Conclusion

Static Mooring analysis has been carried out for KHK Vision at VLCC tanker berth. Section 4.5 provides the summary of results from all the cases.

Results obtained were studied with criteria listed in section 4.3. Based on results of the mooring analyses, it can be seen that all the criteria are fulfilled for all the load cases.

The maximum mooring line tension was recorded on Line No. 24 (forward breast lines) which is 47 % of MBL for Run Case 8.

The maximum surge 0.68 was recorded for Run Case 8 and sway is outward (0.84) for Run Case 5.

The static mooring analysis results for KHK Vision are in compliance with the criteria set by OCIMF MEG 4.

Based on the static mooring analysis carried out as per the environmental criteria described in Section 4.2 of this report, the **Ship Design MBL for this vessel is 115 MT.**

5.2 Recommendation

In view of the conclusions, please find below the recommendations to maintain safe mooring conditions for the ship & the berth:

- The Static mooring analysis has been carried out to confirm the validity of the specific mooring arrangement with OCIMF MEG 4. However every port layout is different, the Master of the vessel should ensure proper mooring layout for homogeneous load sharing between the lines.
- In this analysis pretension has been applied on each of the mooring lines to simulate the vessels being winched tight against the berth to minimize movement along the berth. Master should ensure proper line tending at all time during the vessel being moored.
- The wind rise analysis has been carried out for each of the load cases. The wind rise shows the line tensions at different wind speed acting omnidirectional. This gives a generic guidance. However Master should follow the guidelines as laid out in the company's SMS procedure or specific terminal guideline regarding casting off at severe weather conditions.

6 Codes and Standards

The analysis has been carried out with reference to the following codes and guidelines:

- OCIMF Mooring Equipment Guidelines (4rd Edition 2018)
- BS 6349-1-1:2013 Maritime works. General. Code of practice for planning and design for operations

Appendix A

Berth Details

Berth Data for VLCC Berth

(file C:\Local Files\Project\New folder\OPTIMOOR VLCC\VLCC BERTH.bth)
Units in m & tonnes

Left to Right of Screen Site Plan Points:	0°
Width of Channel (for Current):	5000
Pier Height (Fixed) above Datum:	8.0
Seabed Depth in way of Ship below Datum:	23.5
Dist of Berth Target to Right of Origin:	0.0
Wind Speed Specified at Height:	10.0
Current Specified at Depth:	mean

Hook/ Bollard	X-Dist to Origin	Dist to Fender Line	Ht above Pier	Allowable Load
MD1	-210.0	40.0	0.3	
MD2	-130.0	40.0	0.3	
BD2	-35.0	4.3	0.3	
BD3	35.0	4.3	0.3	
MD3	120.0	40.0	0.3	
MD4	210.0	40.0	0.3	
BD1	-50.0	4.3	0.3	
BD4	50.0	4.3	0.3	

Fender	X-Dist to Origin	Ht above Datum	Width Along Side	Face Contact Area (m²)
aa	-35.0	4.5	5.0	30.0
bb	-50.0	4.5	5.0	30.0
cc	50.0	4.5	5.0	30.0
dd	35.0	4.5	5.0	30.0

Fender Load-Compression Data

aa	189	340	427	466	485	480	471	461	471	485	tonnes
	0.13	0.25	0.38	0.50	0.63	0.75	0.88	1.13	1.25	1.38	m
bb	189	340	427	466	485	480	471	461	471	485	tonnes
	0.13	0.25	0.38	0.50	0.63	0.75	0.88	1.13	1.25	1.38	m
cc	189	340	427	466	485	480	471	461	471	485	tonnes
	0.13	0.25	0.38	0.50	0.63	0.75	0.88	1.13	1.25	1.38	m
dd	189	340	427	466	485	480	471	461	471	485	tonnes
	0.13	0.25	0.38	0.50	0.63	0.75	0.88	1.13	1.25	1.38	m

Appendix B

Vessel Details

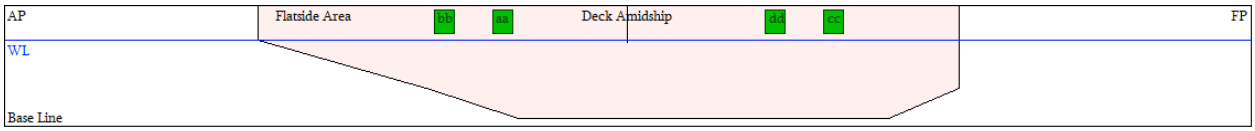
Vessel Data for KHK Vision

(file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.vsl)
Units in m, mm, & tonnes
Longitudinal datum at AP

LBP: 320.0
Breadth: 58.0
Depth: 31.2
Port Target: 2.9 fwd from midship -24.4 from CL and 2.0 above deck
Stbd Target: 2.9 fwd from midship 24.4 from CL and 2.0 above deck
End-on projected windage area: 800 above deck level
Side projected windage area: 1021 above deck level
Fendering possible from: 0.297 LBP aft of midship
to: 0.266 LBP fwd of midship
Current drag data based on: OCIMF MEG-4 Tanker
Wind drag data based on: OCIMF Tanker (V-shaped Bow)
Hull Pressure Limit (t/m²): 20

Flatside Contour — Longitudinal datum at AP

X-dist	65.0	65.0	109.2	131.9	227.0	245.0	245.0	245.0
Depth	0.0	8.8	21.4	29.0	29.0	21.3	8.8	0.0



Line No.	Fair-Lead X	Fair-Lead Y	Ht on Deck	Dist to Winch	Brake Limit	Pre-Tension	Line Size-Type-BL	Tail Segment-1 Lgth-Size-Type-BL
1	-5.6	-7.3	-2.7	7.3	69	10	42 SW 115	11.0 90 Tx 163
2	-5.6	-5.8	-2.7	7.3	69	10	42 SW 115	11.0 90 Tx 163
3	-5.6	-4.2	-2.7	4.0	69	10	42 SW 115	11.0 90 Tx 163
4	-5.6	4.2	-2.7	4.0	69	10	42 SW 115	11.0 90 Tx 163
5	-5.6	5.8	-2.7	7.3	69	10	42 SW 115	11.0 90 Tx 163
6	-5.6	7.3	-2.7	7.3	69	10	42 SW 115	11.0 90 Tx 163
7	6.8	13.8	-2.7	14.5	69	10	42 SW 115	11.0 90 Tx 163
8	8.5	14.7	-2.7	15.3	69	10	42 SW 115	11.0 90 Tx 163
9	10.0	15.3	-2.7	4.4	69	10	42 SW 115	11.0 90 Tx 163
10	73.1	28.8	0.3	37.7	69	10	42 SW 115	11.0 90 Tx 163
11	75.0	28.9	0.3	37.8	69	10	42 SW 115	11.0 90 Tx 163
12	77.0	28.9	0.3	5.7	69	10	42 SW 115	11.0 90 Tx 163
13	83.4	29.0	0.3	18.7	69	10	42 SW 115	11.0 90 Tx 163
14	85.2	29.0	0.3	18.7	69	10	42 SW 115	11.0 90 Tx 163
15	87.1	29.0	0.3	5.7	69	10	42 SW 115	11.0 90 Tx 163
16	244.0	29.0	0.3	5.8	69	10	42 SW 115	11.0 90 Tx 163
17	245.8	29.0	0.3	37.9	69	10	42 SW 115	11.0 90 Tx 163
18	247.6	29.0	0.3	37.9	69	10	42 SW 115	11.0 90 Tx 163
19	259.8	28.7	0.3	5.3	69	10	42 SW 115	11.0 90 Tx 163
20	261.4	28.6	0.3	18.4	69	10	42 SW 115	11.0 90 Tx 163
21	263.2	28.5	0.3	18.3	69	10	42 SW 115	11.0 90 Tx 163
22	292.7	24.0	0.3	7.0	69	10	42 SW 115	11.0 90 Tx 163
23	294.4	23.4	0.3	28.6	69	10	42 SW 115	11.0 90 Tx 163
24	296.2	22.8	0.3	28.2	69	10	42 SW 115	11.0 90 Tx 163
25	317.3	13.5	0.4	10.6	69	10	42 SW 115	11.0 90 Tx 163
26	321.4	9.8	0.5	12.6	69	10	42 SW 115	11.0 90 Tx 163
27	323.6	7.0	0.6	4.0	69	10	42 SW 115	11.0 90 Tx 163
28	323.6	-7.0	0.6	4.0	69	10	42 SW 115	11.0 90 Tx 163
29	321.4	-9.8	0.5	12.6	69	10	42 SW 115	11.0 90 Tx 163
30	317.3	-13.5	0.4	10.6	69	10	42 SW 115	11.0 90 Tx 163

Codes for Types of Line:
SW: Steel Wire (steel core)
Tx: Polyester and Polyolefin.

Appendix C

OPTIMOOR Run Results

Batch File: Ballast OCIMF.env
Pull-In initialised at the water levels, drafts, trims, and offsets specified for each particular batch case

Batch Run 1:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level:	6.00 above Datum (initialised at this water level)
Draft:	9.85 (initialised at this draft))
Trim:	2.30 (initialised at this trim)
Bottom Clearance:	18.5
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Port Target:	2.7 above Pier
Current:	3.0 knots
Current Direction from:	0° True 0° Screen Right
Wind Speed:	60 knots
Wind Direction from:	All°
Total End-on Windage Area:	2092
Total Side Windage Area:	7853

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	5.9	0.0	0.0

0.44 (fwd)	0.10 (inw)	0.1° (port)	0.00 (up)
-0.46 (aft)	-0.78 (out)	-0.1° (stbd)	0.00 (up)

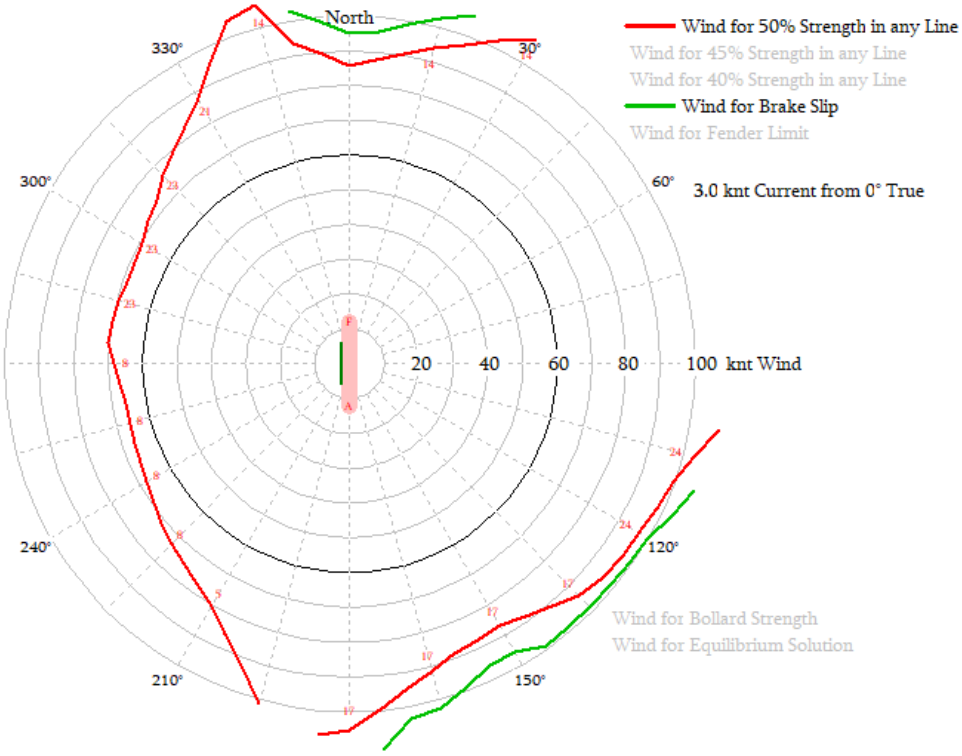
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	True	Line Tension	Percent Strength
1-MD1	0.31	95.2			-110°	250°	43.5	38%
2-MD1	0.31	93.9			-110°	250°	43.5	38%
5-MD1	0.30	84.1			-110°	250°	43.2	38%
6-MD1	0.30	82.9			-110°	250°	43.1	37%
7-MD2	0.30	77.1			-100°	260°	47.2	41%
8-MD2	0.29	76.5			-100°	260°	47.5	41%
10-MD2	0.31	97.3			-90°	270°	31.1	27%
11-MD2	0.31	98.6			-90°	270°	30.4	26%
13-BD2	0.27	66.9			0°	0°	29.1	25%
14-BD2	0.27	65.3			0°	0°	29.1	25%
17-BD3	0.29	89.7			150°	150°	26.2	23%
18-BD3	0.29	91.4			150°	150°	26.2	23%
20-MD3	0.28	68.1			-70°	290°	40.5	35%
21-MD3	0.28	67.4			-70°	290°	41.3	36%
23-MD3	0.30	79.5			-70°	290°	43.7	38%
24-MD3	0.30	80.1			-70°	290°	43.5	38%
25-MD4	0.31	91.5			-70°	290°	33.4	29%
26-MD4	0.31	93.4			-70°	290°	35.0	30%
29-MD4	0.34	108.7			-70°	290°	36.5	32%
30-MD4	0.34	111.8			-70°	290°	35.9	31%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	199	0.13	6.6	100%
bb	225	0.15	13.8	54%
cc	163	0.11	5.4	100%
dd	155	0.10	5.2	100%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	87.2	146.1			173.1		31°	31.9
	22.7	125.0			131.8		2°	41.8
	-53.3	5.2			58.2		-84°	22.7
	48.4	4.4			52.4		85°	19.6
	-13.8	144.8			159.8		-5°	66.4
	-83.6	108.0			140.3		-38°	32.3

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 1
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 6.00 above datum
Draft: 9.9
Trim: 2.3



Batch Run 2:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level:	6.00 above Datum (initialised at this water level)
Draft:	9.85 (initialised at this draft))
Trim:	2.30 (initialised at this trim)
Bottom Clearance:	18.5
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Port Target:	2.7 above Pier
Current:	3.0 knots
Current Direction from:	180° True 180° Screen Right
Wind Speed:	60 knots
Wind Direction from:	All°
Total End-on Windage Area:	2092
Total Side Windage Area:	7853

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	-8.6	0.0	0.0

0.52 (fwd)	0.10 (inw)	0.1° (port)	0.00 (up)
-0.39 (aft)	-0.78 (out)	-0.1° (stbd)	0.00 (up)

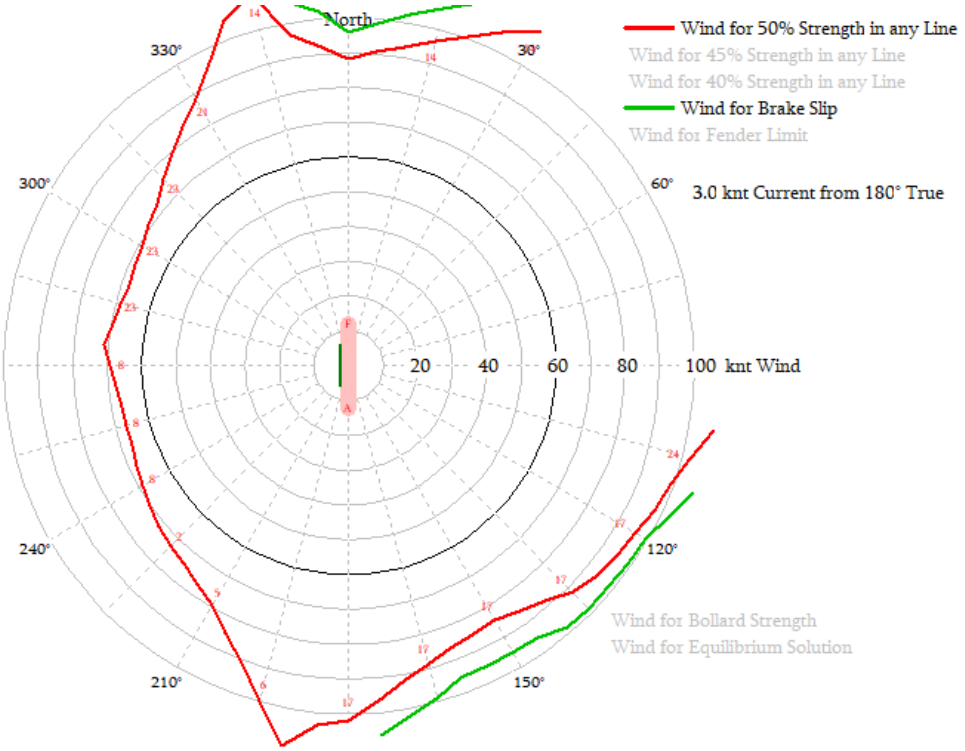
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Direction True	Line Tension	Percent Strength
1-MD1	0.31	95.2			-110°	250°	44.1	38%
2-MD1	0.31	93.9			-110°	250°	44.1	38%
5-MD1	0.30	84.1			-110°	250°	44.0	38%
6-MD1	0.30	82.9			-110°	250°	43.9	38%
7-MD2	0.30	77.1			-100°	260°	45.8	40%
8-MD2	0.29	76.5			-100°	260°	46.2	40%
10-MD2	0.31	97.3			-90°	270°	32.4	28%
11-MD2	0.31	98.6			-90°	270°	31.8	28%
13-BD2	0.27	66.9			0°	0°	26.2	23%
14-BD2	0.27	65.3			0°	0°	26.2	23%
17-BD3	0.29	89.7			150°	150°	29.7	26%
18-BD3	0.29	91.4			150°	150°	29.6	26%
20-MD3	0.28	68.1			-70°	290°	39.8	35%
21-MD3	0.28	67.4			-70°	290°	40.7	35%
23-MD3	0.30	79.5			-70°	290°	44.7	39%
24-MD3	0.30	80.1			-70°	290°	44.6	39%
25-MD4	0.31	91.5			-70°	290°	32.3	28%
26-MD4	0.31	93.4			-70°	290°	34.1	30%
29-MD4	0.34	108.7			-70°	290°	36.0	31%
30-MD4	0.34	111.8			-70°	290°	35.3	31%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	202	0.14	6.7	100%
bb	230	0.16	14.2	54%
cc	161	0.11	5.4	100%
dd	153	0.10	5.1	100%

Hook/ Bollard	X-Force	Y-Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	88.8	148.5			176.0		31°	32.4
	25.5	124.3			131.4		3°	41.9
	-48.0	4.7			52.4		-84°	20.5
	54.8	4.9			59.3		85°	22.2
	-12.6	145.6			160.6		-5°	66.7
	-81.6	105.6			137.2		-38°	31.5

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 2
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 6.00 above datum
Draft: 9.9
Trim: 2.3



Batch Run 3:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level:	6.00 above Datum (initialised at this water level)
Draft:	9.85 (initialised at this draft))
Trim:	2.30 (initialised at this trim)
Bottom Clearance:	18.5
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Port Target:	2.7 above Pier
Current:	2.0 knots
Current Direction from:	350° True -10° Screen Right
Wind Speed:	60 knots
Wind Direction from:	All°
Total End-on Windage Area:	2092
Total Side Windage Area:	7853

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	2.6	-11.1	-5.2

0.49 (fwd)	0.10 (inw)	0.1° (port)	0.00 (up)
-0.44 (aft)	-0.81 (out)	-0.1° (stbd)	0.00 (up)

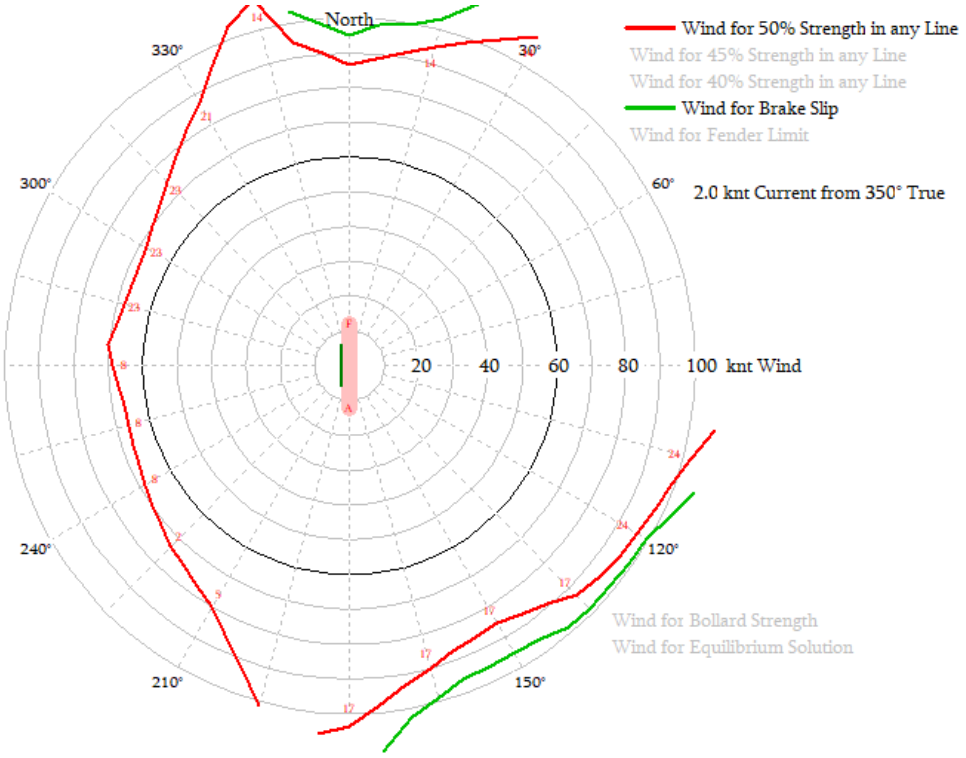
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	True	Line Tension	Percent Strength
1-MD1	0.31	95.2			-110°	250°	43.6	38%
2-MD1	0.31	93.9			-110°	250°	43.6	38%
5-MD1	0.30	84.1			-110°	250°	43.4	38%
6-MD1	0.30	82.9			-110°	250°	43.3	38%
7-MD2	0.30	77.1			-100°	260°	46.4	40%
8-MD2	0.29	76.5			-100°	260°	46.8	41%
10-MD2	0.31	97.3			-90°	270°	32.1	28%
11-MD2	0.31	98.6			-90°	270°	31.4	27%
13-BD2	0.27	66.9			0°	0°	28.0	24%
14-BD2	0.27	65.3			0°	0°	28.1	24%
17-BD3	0.29	89.7			150°	150°	28.4	25%
18-BD3	0.29	91.4			150°	150°	28.3	25%
20-MD3	0.28	68.1			-70°	290°	41.8	36%
21-MD3	0.28	67.4			-70°	290°	42.7	37%
23-MD3	0.30	79.5			-70°	290°	46.1	40%
24-MD3	0.30	80.1			-70°	290°	45.9	40%
25-MD4	0.31	91.5			-70°	290°	34.4	30%
26-MD4	0.31	93.4			-70°	290°	36.2	32%
29-MD4	0.34	108.7			-70°	290°	38.0	33%
30-MD4	0.34	111.8			-70°	290°	37.3	32%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	202	0.14	6.7	100%
bb	230	0.16	14.2	54%
cc	153	0.10	5.1	100%
dd	147	0.10	4.9	100%

Hook/ Bollard	X-Force	Y-Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	87.6	146.5			173.7		31°	32.0
	24.0	125.0			132.0		2°	42.0
	-51.4	5.0			56.1		-84°	22.0
	52.4	4.8			56.7		85°	21.2
	-13.6	151.4			167.0		-5°	69.3
	-86.5	112.0			145.4		-38°	33.4

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 3
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 6.00 above datum
Draft: 9.9
Trim: 2.3



Batch Run 4:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level:	6.00 above Datum (initialised at this water level)
Draft:	9.85 (initialised at this draft))
Trim:	2.30 (initialised at this trim)
Bottom Clearance:	18.5
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Port Target:	2.7 above Pier
Current:	2.0 knots
Current Direction from:	190° True 190° Screen Right
Wind Speed:	60 knots
Wind Direction from:	All°
Total End-on Windage Area:	2092
Total Side Windage Area:	7853

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	-4.0	-7.0	6.1

0.47 (fwd)	0.10 (inw)	0.2° (port)	0.00 (up)
-0.42 (aft)	-0.80 (out)	-0.1° (stbd)	0.00 (up)

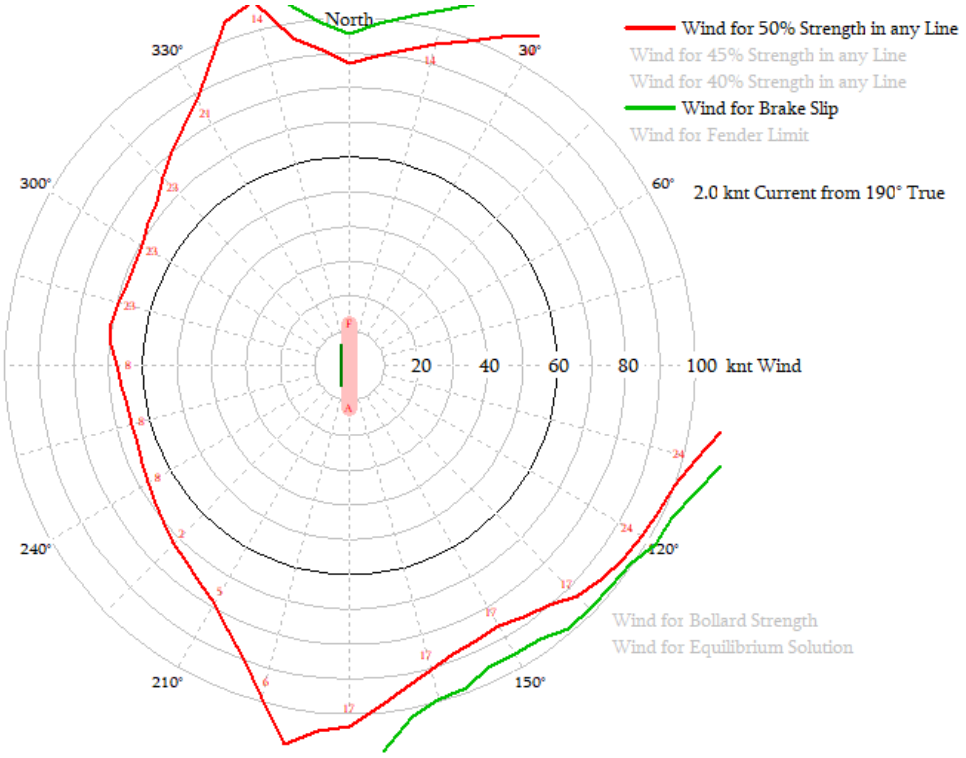
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Direction True	Line Tension	Percent Strength
1-MD1	0.31	95.2			-110°	250°	45.5	40%
2-MD1	0.31	93.9			-110°	250°	45.5	40%
5-MD1	0.30	84.1			-110°	250°	45.2	39%
6-MD1	0.30	82.9			-110°	250°	45.1	39%
7-MD2	0.30	77.1			-100°	260°	48.3	42%
8-MD2	0.29	76.5			-100°	260°	48.7	42%
10-MD2	0.31	97.3			-95°	265°	32.5	28%
11-MD2	0.31	98.6			-90°	270°	31.8	28%
13-BD2	0.27	66.9			0°	0°	27.5	24%
14-BD2	0.27	65.3			0°	0°	27.6	24%
17-BD3	0.29	89.7			150°	150°	27.4	24%
18-BD3	0.29	91.4			150°	150°	27.3	24%
20-MD3	0.28	68.1			-70°	290°	40.1	35%
21-MD3	0.28	67.4			-70°	290°	40.8	36%
23-MD3	0.30	79.5			-70°	290°	43.6	38%
24-MD3	0.30	80.1			-70°	290°	43.5	38%
25-MD4	0.31	91.5			-70°	290°	32.4	28%
26-MD4	0.31	93.4			-70°	290°	34.1	30%
29-MD4	0.34	108.7			-70°	290°	35.7	31%
30-MD4	0.34	111.8			-70°	290°	35.0	30%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	193	0.13	6.4	100%
bb	218	0.15	13.4	54%
cc	168	0.11	5.6	100%
dd	158	0.10	5.3	100%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	91.3	152.9			181.1		31°	33.3
	24.0	128.8			135.9		2°	43.1
	-50.5	4.9			55.1		-84°	21.6
	50.5	4.5			54.6		85°	20.5
	-13.4	144.0			158.9		-5°	66.0
	-81.4	105.2			136.7		-38°	31.5

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 4
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 6.00 above datum
Draft: 9.9
Trim: 2.3



Batch Run 5:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level:	6.00 above Datum (initialised at this water level)
Draft:	9.85 (initialised at this draft))
Trim:	2.30 (initialised at this trim)
Bottom Clearance:	18.5
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Port Target:	2.7 above Pier
Current:	0.75 knots
Current Direction from:	270° True -90° Screen Right
Wind Speed:	60 knots
Wind Direction from:	All°
Total End-on Windage Area:	2092
Total Side Windage Area:	7853

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	-0.5	-26.1	0.0

0.49 (fwd)	0.09 (inw)	0.1° (port)	0.00 (up)
-0.43 (aft)	-0.84 (out)	-0.1° (stbd)	0.00 (up)

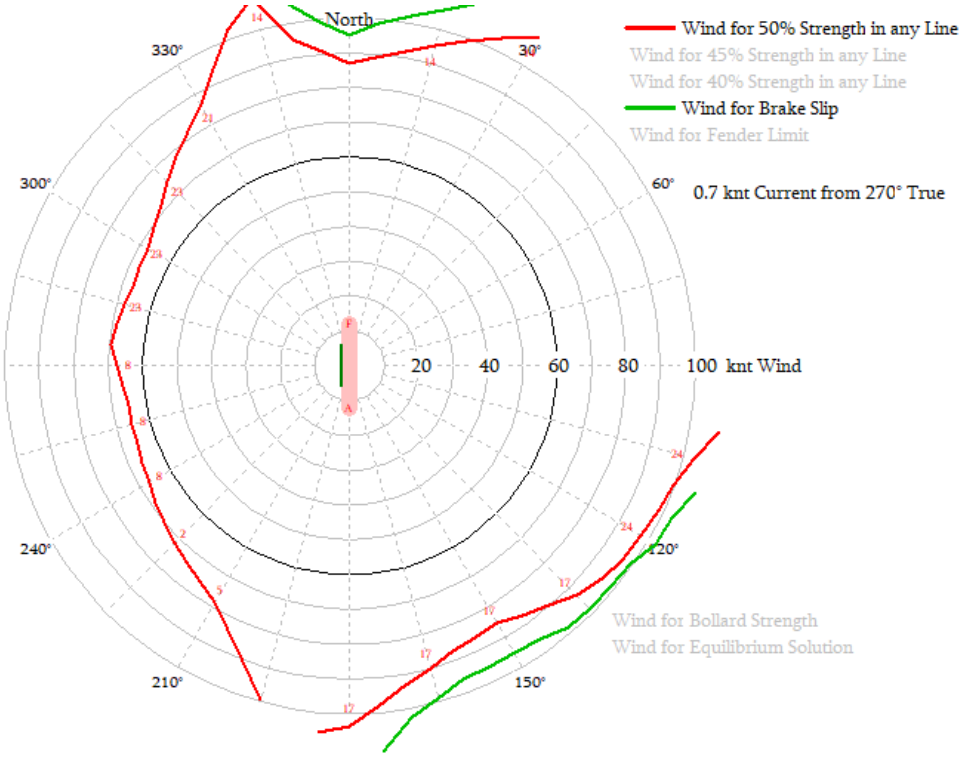
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Direction True	Line Tension	Percent Strength
1-MD1	0.31	95.2			-110°	250°	45.7	40%
2-MD1	0.31	93.9			-110°	250°	45.7	40%
5-MD1	0.30	84.1			-110°	250°	45.5	40%
6-MD1	0.30	82.9			-110°	250°	45.4	39%
7-MD2	0.30	77.1			-100°	260°	48.6	42%
8-MD2	0.29	76.5			-100°	260°	49.0	43%
10-MD2	0.31	97.3			-90°	270°	33.3	29%
11-MD2	0.31	98.6			-90°	270°	32.6	28%
13-BD2	0.27	66.9			0°	0°	27.8	24%
14-BD2	0.27	65.3			0°	0°	27.8	24%
17-BD3	0.29	89.7			150°	150°	28.3	25%
18-BD3	0.29	91.4			150°	150°	28.2	25%
20-MD3	0.28	68.1			-70°	290°	42.4	37%
21-MD3	0.28	67.4			-70°	290°	43.3	38%
23-MD3	0.30	79.5			-70°	290°	46.5	40%
24-MD3	0.30	80.1			-70°	290°	46.3	40%
25-MD4	0.31	91.5			-70°	290°	34.5	30%
26-MD4	0.31	93.4			-70°	290°	36.4	32%
29-MD4	0.34	108.7			-70°	290°	38.1	33%
30-MD4	0.34	111.8			-70°	290°	37.4	33%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	194	0.13	6.5	100%
bb	220	0.15	13.6	54%
cc	156	0.10	5.2	100%
dd	148	0.10	4.9	100%

Hook/ Bollard	X-Force	Y-Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	91.8	153.7			182.2		31°	33.5
	24.3	130.6			137.8		2°	43.8
	-50.9	5.0			55.6		-84°	21.8
	52.1	4.7			56.5		85°	21.1
	-13.9	153.2			168.9		-5°	70.1
	-86.8	112.4			145.9		-38°	33.5

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 5
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 6.00 above datum
Draft: 9.9
Trim: 2.3



Batch File: Laden OCIMF.env
Pull-In initialised at the water levels, drafts, trims, and offsets specified for each particular batch case

Batch Run 6:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level: 0.00 above Datum (initialised at this water level)
Draft: 22.40 (initialised at this draft))
Trim: 0.00 (initialised at this trim)
Bottom Clearance: 1.10
Fwd Offset of Vessel Target: 0.0 from Berth Target
Vessel Port Target: 2.7 above Pier
Current: 3.0 knots
Current Direction from: 0° True 0° Screen Right
Wind Speed: 60 knots
Wind Direction from: All°

Total End-on Windage Area: 1310
Total Side Windage Area: 3837

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	32.6	23.7	0.2

0.13 (fwd)	0.05 (inw)	0.1° (port)	0.00 (up)
-0.36 (aft)	-0.05 (out)	0.0° (stbd)	0.00 (up)

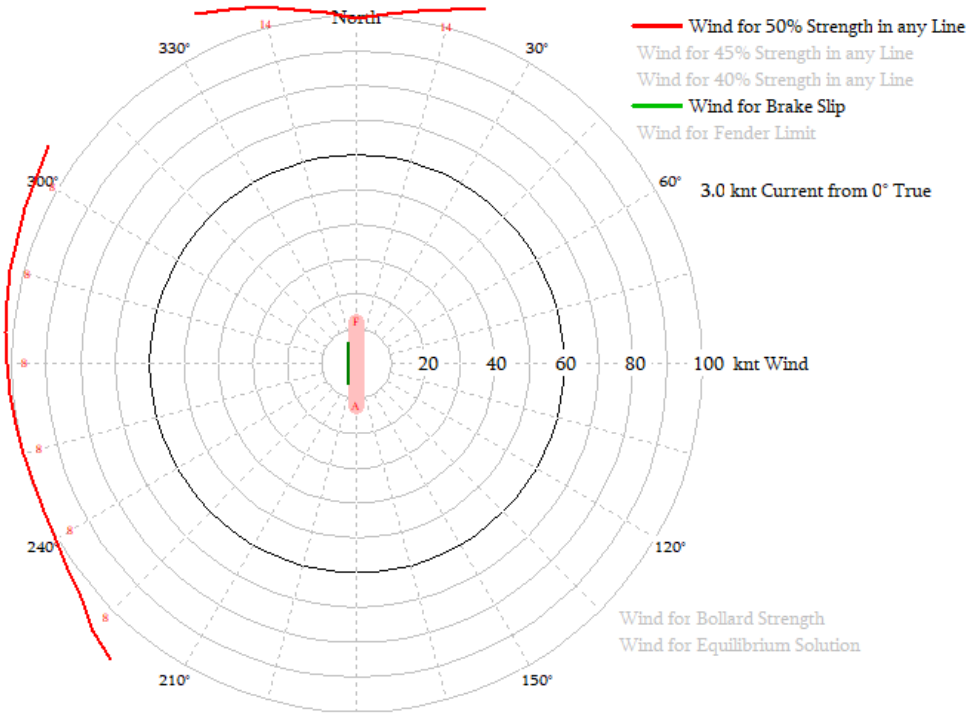
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Worst Direction True	Line Tension	Percent Strength
1-MD1	0.31	93.9			-130°	230°	18.1	16%
2-MD1	0.31	92.6			-130°	230°	18.0	16%
5-MD1	0.30	82.6			-130°	230°	17.6	15%
6-MD1	0.30	81.4			-130°	230°	17.5	15%
7-MD2	0.30	75.3			-120°	240°	21.6	19%
8-MD2	0.29	74.6			-120°	240°	21.6	19%
10-MD2	0.31	94.3			-150°	210°	12.9	11%
11-MD2	0.31	95.7			-150°	210°	12.8	11%
13-BD2	0.26	63.2			0°	0°	26.4	23%
14-BD2	0.26	61.4			0°	0°	26.6	23%
17-BD3	0.28	85.7			160°	160°	14.5	13%
18-BD3	0.28	87.5			160°	160°	14.5	13%
20-MD3	0.28	63.9			0°	0°	16.1	14%
21-MD3	0.28	63.1			0°	0°	15.7	14%
23-MD3	0.29	75.4			150°	150°	13.7	12%
24-MD3	0.29	75.9			150°	150°	13.9	12%
25-MD4	0.31	88.9			0°	0°	18.5	16%
26-MD4	0.31	90.7			0°	0°	17.5	15%
29-MD4	0.33	106.4			0°	0°	15.5	14%
30-MD4	0.34	109.7			0°	0°	15.6	14%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	103	0.07	3.4	100%
bb	119	0.08	4.0	100%
cc	69	0.05	2.3	100%
dd	69	0.05	2.3	100%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	36.7	60.9			71.1		31°	-1.9
	12.4	55.7			55.8		-1°	-1.3
	-52.7	5.1			52.9		-84°	1.0
	28.9	2.5			29.0		85°	0.5
	-11.8	44.9			44.9		-3°	0.8
	-42.0	52.1			66.9		-39°	0.7

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 6
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 0.00 above datum
Draft: 22.4
Trim: 0.0



Batch Run 7:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level:	0.00 above Datum (initialised at this water level)
Draft:	22.40 (initialised at this draft))
Trim:	0.00 (initialised at this trim)
Bottom Clearance:	1.10
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Port Target:	2.7 above Pier
Current:	3.0 knots
Current Direction from:	180° True 180° Screen Right
Wind Speed:	60 knots
Wind Direction from:	All°
Total End-on Windage Area:	1310
Total Side Windage Area:	3837

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	-41.6	-12.3	0.0

0.41 (fwd)	0.05 (inw)	0.1° (port)	0.00 (up)
-0.10 (aft)	-0.12 (out)	-0.1° (stbd)	0.00 (up)

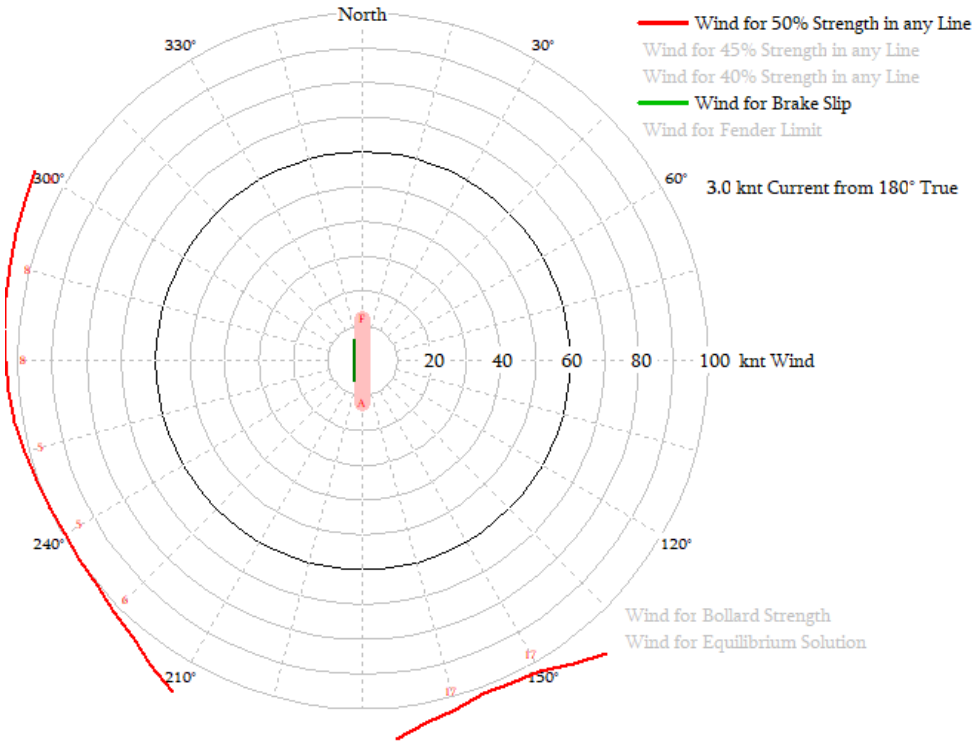
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Direction True	Line Tension	Percent Strength
1-MD1	0.31	93.9			-120°	240°	22.5	20%
2-MD1	0.31	92.6			-120°	240°	22.6	20%
5-MD1	0.30	82.6			-120°	240°	23.0	20%
6-MD1	0.30	81.4			-120°	240°	23.0	20%
7-MD2	0.30	75.3			-110°	250°	17.3	15%
8-MD2	0.29	74.6			-110°	250°	17.5	15%
10-MD2	0.31	94.3			-170°	190°	19.0	17%
11-MD2	0.31	95.7			-170°	190°	19.2	17%
13-BD2	0.26	63.2			0°	0°	14.4	12%
14-BD2	0.26	61.4			0°	0°	14.4	13%
17-BD3	0.28	85.7			160°	160°	26.1	23%
18-BD3	0.28	87.5			160°	160°	25.9	23%
20-MD3	0.28	63.9			0°	0°	11.9	10%
21-MD3	0.28	63.1			0°	0°	11.8	10%
23-MD3	0.29	75.4			150°	150°	17.3	15%
24-MD3	0.29	75.9			150°	150°	17.9	16%
25-MD4	0.31	88.9			0°	0°	12.6	11%
26-MD4	0.31	90.7			0°	0°	12.3	11%
29-MD4	0.33	106.4			0°	0°	11.8	10%
30-MD4	0.34	109.7			0°	0°	11.8	10%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	120	0.08	4.0	100%
bb	140	0.09	4.7	100%
cc	55	0.04	1.8	100%
dd	61	0.04	2.0	100%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	47.2	77.8			91.0		31°	-2.5
	26.4	57.2			58.4		12°	-0.8
	-28.6	2.8			28.8		-84°	0.5
	51.8	4.6			52.0		85°	0.8
	-6.2	46.2			46.3		-4°	0.9
	-30.1	37.8			48.3		-39°	0.5

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 7
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 0.00 above datum
Draft: 22.4
Trim: 0.0



Batch Run 8:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level: 0.00 above Datum (initialised at this water level)
Draft: 22.40 (initialised at this draft))
Trim: 0.00 (initialised at this trim)
Bottom Clearance: 1.10
Fwd Offset of Vessel Target: 0.0 from Berth Target
Vessel Port Target: 2.7 above Pier
Current: 2.0 knots
Current Direction from: 350° True -10° Screen Right
Wind Speed: 60 knots
Wind Direction from: All°

Total End-on Windage Area: 1310
Total Side Windage Area: 3837

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	-18.7	-285.4	-76.1

0.68 (fwd) -0.10 (out) -0.1° (stbd) 0.00 (up)
0.01 (fwd) -0.68 (out) -0.3° (stbd) 0.00 (up)

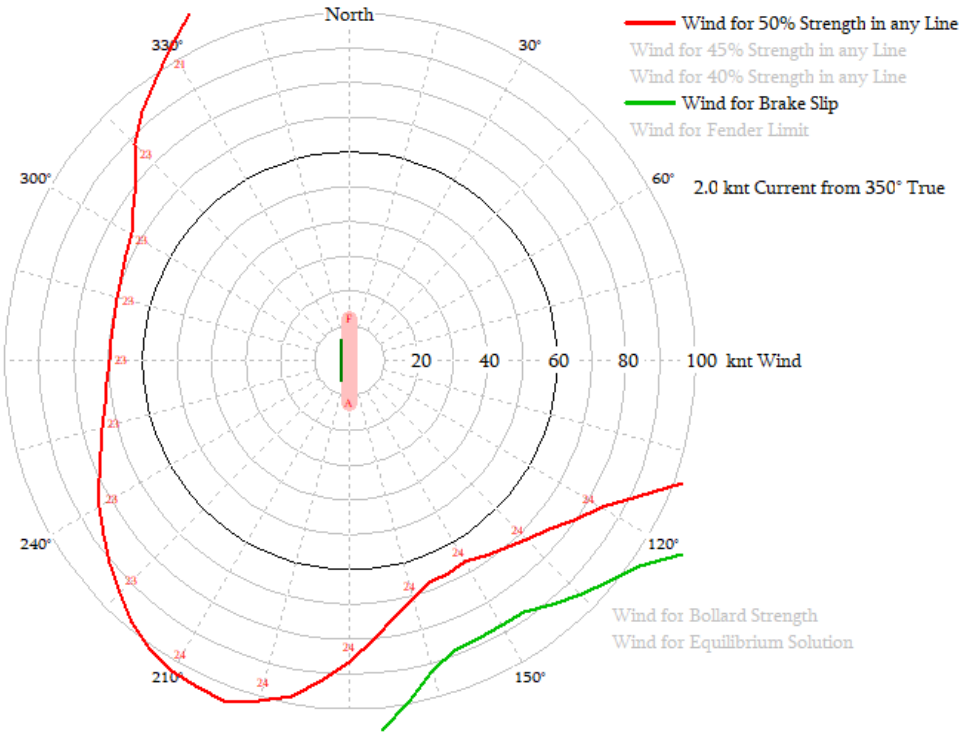
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Direction True	Line Tension	Percent Strength
1-MD1	0.31	93.9			-120°	240°	27.9	24%
2-MD1	0.31	92.6			-120°	240°	28.0	24%
5-MD1	0.30	82.6			-120°	240°	29.3	25%
6-MD1	0.30	81.4			-120°	240°	29.5	26%
7-MD2	0.30	75.3			-110°	250°	22.5	20%
8-MD2	0.29	74.6			-110°	250°	23.0	20%
10-MD2	0.31	94.3			-110°	250°	31.8	28%
11-MD2	0.31	95.7			-110°	250°	31.5	27%
13-BD2	0.26	63.2			0°	0°	9.7	8%
14-BD2	0.26	61.4			0°	0°	9.7	8%
17-BD3	0.28	85.7			160°	160°	41.0	36%
18-BD3	0.28	87.5			160°	160°	40.7	35%
20-MD3	0.28	63.9			-70°	290°	42.7	37%
21-MD3	0.28	63.1			-70°	290°	44.0	38%
23-MD3	0.29	75.4			-80°	280°	53.5	46%
24-MD3	0.29	75.9			150°	150°	54.2	47%
25-MD4	0.31	88.9			-60°	300°	34.4	30%
26-MD4	0.31	90.7			-60°	300°	36.9	32%
29-MD4	0.33	106.4			-60°	300°	39.4	34%
30-MD4	0.34	109.7			-60°	300°	38.5	33%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	21	0.01	0.7	100%
bb	117	0.08	3.9	100%
cc		0.00		
dd		0.00		

Hook/ Bollard	X-Force	Y-Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	59.4	97.9			114.6		31°	-3.1
	37.9	85.7			89.7		17°	-0.8
	-19.3	1.9			19.4		-84°	0.4
	81.3	8.0			81.7		84°	1.3
	-11.3	180.7			181.0		-3°	3.3
	-90.8	117.8			148.7		-38°	1.6

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 8
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 0.00 above datum
Draft: 22.4
Trim: 0.0



Batch Run 9:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level:	0.00 above Datum (initialised at this water level)
Draft:	22.40 (initialised at this draft))
Trim:	0.00 (initialised at this trim)
Bottom Clearance:	1.10
Fwd Offset of Vessel Target:	0.0 from Berth Target
Vessel Port Target:	2.7 above Pier
Current:	2.0 knots
Current Direction from:	190° True 190° Screen Right
Wind Speed:	60 knots
Wind Direction from:	All°
Total End-on Windage Area:	1310
Total Side Windage Area:	3837

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	0.6	-180.6	71.9

0.12 (fwd)	0.02 (inw)	0.2° (port)	0.00 (up)
-0.43 (aft)	-0.44 (out)	0.0° (port)	0.00 (up)

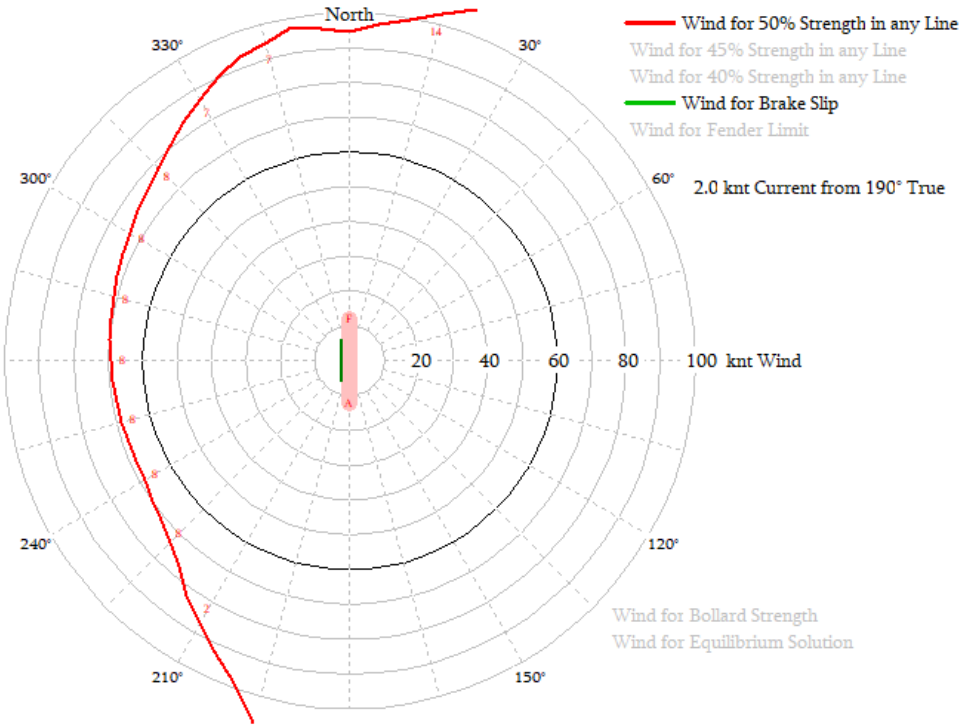
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Direction True	Line Tension	Percent Strength
1-MD1	0.31	93.9			-120°	240°	44.9	39%
2-MD1	0.31	92.6			-120°	240°	44.8	39%
5-MD1	0.30	82.6			-120°	240°	44.0	38%
6-MD1	0.30	81.4			-120°	240°	43.8	38%
7-MD2	0.29	75.3			-110°	250°	51.3	45%
8-MD2	0.29	74.6			-110°	250°	51.5	45%
10-MD2	0.31	94.3			-110°	250°	25.6	22%
11-MD2	0.31	95.7			-110°	250°	24.6	21%
13-BD2	0.26	63.2			0°	0°	32.0	28%
14-BD2	0.26	61.4			0°	0°	32.3	28%
17-BD3	0.28	85.7			150°	150°	14.1	12%
18-BD3	0.29	87.5			150°	150°	14.0	12%
20-MD3	0.28	63.9			-70°	290°	20.3	18%
21-MD3	0.28	63.1			-70°	290°	19.9	17%
23-MD3	0.29	75.4			-80°	280°	10.6	9%
24-MD3	0.29	75.9			-80°	280°	10.2	9%
25-MD4	0.31	88.9			-60°	300°	14.7	13%
26-MD4	0.31	90.7			-60°	300°	13.7	12%
29-MD4	0.33	106.4			-60°	300°	11.6	10%
30-MD4	0.34	109.7			-60°	300°	11.8	10%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	4	0.00	0.1	100%
bb		0.00		
cc	92	0.06	3.1	100%
dd	66	0.04	2.2	100%

Hook/ Bollard	X-Force	Y-Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	90.8	152.4			177.4		31°	-4.8
	-21.8	128.9			129.2		-3°	-3.0
	-64.0	6.7			64.3		-84°	1.2
	28.0	2.4			28.1		85°	0.5
	-13.4	55.6			57.0		-13°	1.0
	-32.4	40.2			51.6		-39°	0.6

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 9
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 0.00 above datum
Draft: 22.4
Trim: 0.0



Batch Run 10:

Static Mooring Response for KHK Vision at VLCC Berth

Units in m & tonnes (file C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt)

Remarks: OCIMF Evrionement Cases

Water Level: 0.00 above Datum (initialised at this water level)
Draft: 22.40 (initialised at this draft))
Trim: 0.00 (initialised at this trim)
Bottom Clearance: 1.10
Fwd Offset of Vessel Target: 0.0 from Berth Target
Vessel Port Target: 2.7 above Pier
Current: 0.75 knots
Current Direction from: 270° True -90° Screen Right
Wind Speed: 60 knots
Wind Direction from: All°

Total End-on Windage Area: 1310
Total Side Windage Area: 3837

	Longitudinal	Transverse	Yaw Moment/LBP
Current Drag Force:	-4.8	-146.7	0.7

0.28 (fwd)	0.03 (inw)	0.1° (port)	0.00 (up)
-0.23 (aft)	-0.40 (out)	-0.1° (stbd)	0.00 (up)

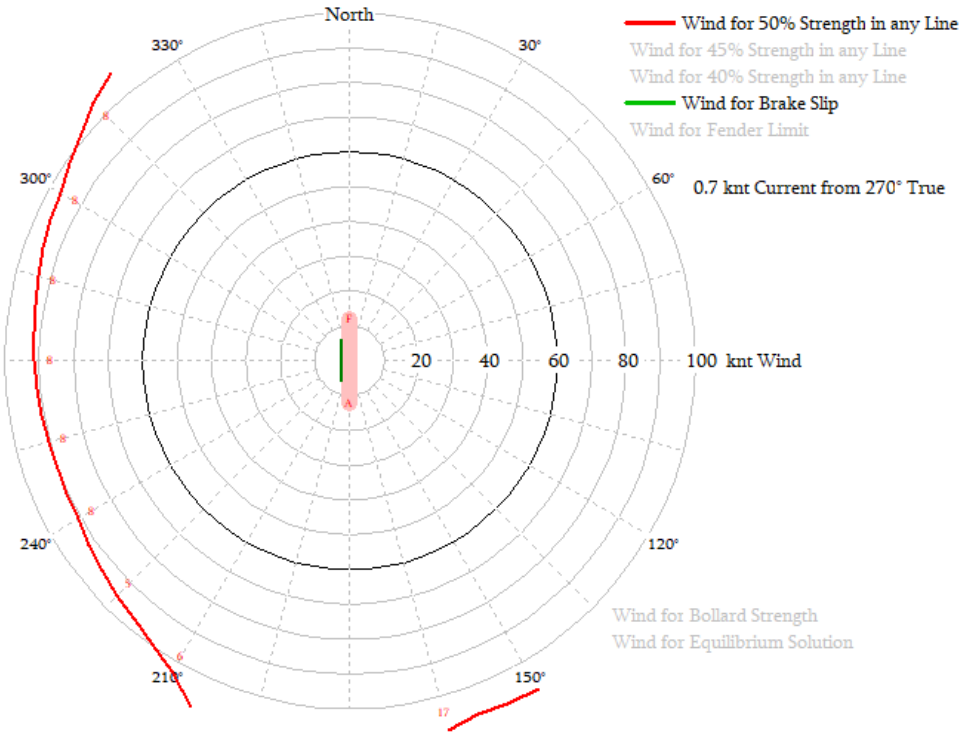
Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slip	Worst Direction to Screen	Direction True	Line Tension	Percent Strength
1-MD1	0.31	93.9			-120°	240°	30.5	27%
2-MD1	0.31	92.6			-120°	240°	30.5	27%
5-MD1	0.30	82.6			-120°	240°	30.6	27%
6-MD1	0.29	81.4			-120°	240°	30.6	27%
7-MD2	0.30	75.3			-110°	250°	31.1	27%
8-MD2	0.30	74.6			-110°	250°	31.3	27%
10-MD2	0.31	94.3			-110°	250°	23.4	20%
11-MD2	0.31	95.7			-110°	250°	22.9	20%
13-BD2	0.27	63.2			0°	0°	20.4	18%
14-BD2	0.26	61.4			0°	0°	20.5	18%
17-BD3	0.28	85.7			160°	160°	20.7	18%
18-BD3	0.28	87.5			160°	160°	20.6	18%
20-MD3	0.28	63.9			-70°	290°	24.6	21%
21-MD3	0.28	63.1			-70°	290°	24.8	22%
23-MD3	0.29	75.4			-80°	280°	23.2	20%
24-MD3	0.29	75.9			-80°	280°	23.0	20%
25-MD4	0.31	88.9			-60°	300°	19.7	17%
26-MD4	0.31	90.7			-60°	300°	20.0	17%
29-MD4	0.34	106.4			-60°	300°	19.8	17%
30-MD4	0.34	109.7			-60°	300°	19.6	17%

Fender	Thrust	Compression	Pressure	Flatside Area
aa	74	0.05	2.5	100%
bb	90	0.06	3.0	100%
cc	26	0.02	0.9	100%
dd	30	0.02	1.0	100%

Hook/ Bollard	X-Force	Y-Force	Other X-Load	Other Y-Load	Total Force	%Bollard Strength	Direction in Plan	Bollard Uplift
	62.9	104.6			122.1		31°	-3.3
	20.5	89.2			89.5		5°	-1.6
	-40.6	4.0			40.8		-84°	0.7
	41.2	3.7			41.4		85°	0.7
	-11.0	88.5			89.1		-7°	1.6
	-48.8	61.9			78.9		-38°	0.9

Wind Capability Rose for KHK Vision at VLCC Berth

Ref: Batch Run 10
Remarks: Remarks: OCIMF Evrionement Cases
Water Level: 0.00 above datum
Draft: 22.4
Trim: 0.0



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*** All Batch Files for C:\Local Files\Project\New folder\OPTIMOOR VLCC\KHK Vision.opt ***

Greatest Excursions for all Batch Files in this Case at Target:

	Highest Excursion	Wind Speed	True Direction	Current Speed	Screen Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
Long	0.68	60	160°	2.0	-10°				0.0	22.4	0.0	0.0	8
Long	-0.46	60	0°	3.0	0°				6.0	9.9	2.3	0.0	1
Trans	0.10	60	90°	3.0	0°				6.0	9.9	2.3	0.0	1
Trans	-0.84	60	270°	0.75	-90°				6.0	9.9	2.3	0.0	5

Greatest Line Tensions as % of Strength for all Batch Files in this Case:

Line	Highest Loading	Wind Speed	True Direction	Current Speed	Screen Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
1	40%	60	250°	0.75	-90°				6.0	9.9	2.3	0.0	5
2	40%	60	250°	0.75	-90°				6.0	9.9	2.3	0.0	5
5	40%	60	250°	0.75	-90°				6.0	9.9	2.3	0.0	5
6	39%	60	250°	0.75	-90°				6.0	9.9	2.3	0.0	5
7	45%	60	250°	2.0	-170°				0.0	22.4	0.0	0.0	9
8	45%	60	250°	2.0	-170°				0.0	22.4	0.0	0.0	9
10	29%	60	270°	0.75	-90°				6.0	9.9	2.3	0.0	5
11	28%	60	270°	0.75	-90°				6.0	9.9	2.3	0.0	5
13	28%	60	0°	2.0	-170°				0.0	22.4	0.0	0.0	9
14	28%	60	0°	2.0	-170°				0.0	22.4	0.0	0.0	9
17	36%	60	160°	2.0	-10°				0.0	22.4	0.0	0.0	8
18	35%	60	160°	2.0	-10°				0.0	22.4	0.0	0.0	8
20	37%	60	290°	2.0	-10°				0.0	22.4	0.0	0.0	8
21	38%	60	290°	2.0	-10°				0.0	22.4	0.0	0.0	8
23	46%	60	280°	2.0	-10°				0.0	22.4	0.0	0.0	8
24	47%	60	150°	2.0	-10°				0.0	22.4	0.0	0.0	8
25	30%	60	290°	0.75	-90°				6.0	9.9	2.3	0.0	5
26	32%	60	300°	2.0	-10°				0.0	22.4	0.0	0.0	8
29	34%	60	300°	2.0	-10°				0.0	22.4	0.0	0.0	8
30	33%	60	300°	2.0	-10°				0.0	22.4	0.0	0.0	8

Greatest Berth Fender Thrusts for all Batch Files in this Case:

Fender	Highest Thrust	Wind Speed	True Direction	Current Speed	Screen Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
aa	202	60	0°	3.0	-180°				6.0	9.9	2.3	0.0	2
bb	230	60	0°	3.0	-180°				6.0	9.9	2.3	0.0	2
cc	168	60	0°	2.0	-170°				6.0	9.9	2.3	0.0	4
dd	158	60	0°	2.0	-170°				6.0	9.9	2.3	0.0	4

Greatest Horizontal Bollard Forces for all Batch Files in this Case:

Bollard	Highest Force	Wind Speed	True Direction	Current Speed	Screen Direction	Wave Ht	True Direction	Wave Period	Water Level	Draft	Trim	Offset	Batch Run no
MD1	182	60	250°	0.75	-90°				6.0	9.9	2.3	0.0	5
MD2	138	60	260°	0.75	-90°				6.0	9.9	2.3	0.0	5
BD2	64	60	0°	2.0	-170°				0.0	22.4	0.0	0.0	9
BD3	82	60	160°	2.0	-10°				0.0	22.4	0.0	0.0	8

MD3	181	60	280°	2.0	-10°		0.0	22.4	0.0	0.0	8
MD4	149	60	300°	2.0	-10°		0.0	22.4	0.0	0.0	8

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