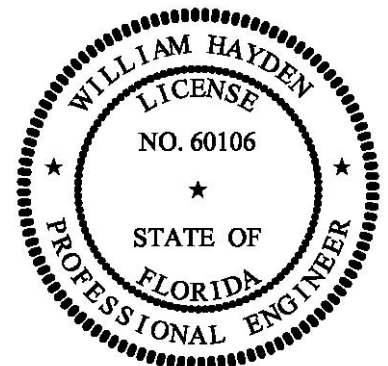


Vessel: Owner: Condition: 2 Passengers and Crew Date: D & L Job #:		NCDOT 45' Pushboat Departure Condition-Light Load Partially Protected Waters December 18, 2018 17-1392 Rev. P By: MJC						Per Person Weight for Calculations: 275 pounds # of Crew: 2																																																
Item	Weight	VCG	LCG	TCG	VM	LM	TM																																																	
	(lt)	(ft, abl)	(-aft/+ fwd)	(+s/-p)																																																				
Lightship from Weight Estimate:	49.71	4.94	23.16	0.00	245.57	1,151.40	0.00																																																	
2 Crew + Affects:	0.25	9.00	15.00	0.00	2.21	3.68	0																																																	
A Frame Pick	3.50	20.00	1.00	0.00	70.00	3.50	0																																																	
ER Spares and Outfit	1.50	4.00	25.00	0.00	6.00	37.50	0																																																	
65% Fwd Ballast P & S (1450 gal per)	7.28	3.36	9.00	0.00	24.46	65.52	0																																																	
0% Mid Ballast P & S (1500 gal per)	0.00	3.13	15.00	0.00	0.00	0.00	0																																																	
0% Aft Ballast P & S (2100 gal per)	0.00	3.25	36.70	0.00	0.00	0.00	0																																																	
100% FO Tank P & S (500 gal per)	3.30	3.90	19.00	0.00	12.87	62.70	0																																																	
Total	65.54	5.51	20.21	0.00	361.11	1,324.30	0																																																	
Trim & Draft Calculations		<table border="1"> <tr><th colspan="2">Stability</th></tr> <tr><td>KM(t), ft</td><td>14.56</td></tr> <tr><td>KG, ft</td><td>5.51</td></tr> <tr><td>GM</td><td>9.05</td></tr> <tr><td>FSM, ft-t</td><td>37.460</td></tr> <tr><td>FS Corr, ft</td><td>0.570</td></tr> <tr><td>GM corr, ft</td><td>8.48</td></tr> </table>						Stability		KM(t), ft	14.56	KG, ft	5.51	GM	9.05	FSM, ft-t	37.460	FS Corr, ft	0.570	GM corr, ft	8.48																																			
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		<table border="1"> <tr><th colspan="2">VCG w/ FSC</th></tr> <tr><td></td><td>6.08 ft</td></tr> </table>						VCG w/ FSC			6.08 ft																																													
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NCDOT 45' Pushboat	
Departure Condition-Light Load	
46 CFR 173.097 Towline Pull Criteria	
N	2
P	300
D	3
S	1
h	9
K	38
Disp	65.54
f (freeboard)	2.92
B beam	20

GM Rq'd: **4.61 ft**
 GM Actual: **8.48 ft**



D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA STABILITY ANALYSIS-DEPARTURE CONDITION LIGHT LOAD

ALT 0-MJC

LCG reference is Frame 0

Hydrostatic Properties

Draft is from Baseline.

Trim: fwd 1.05/45.50, No heel, VCG = 6.08

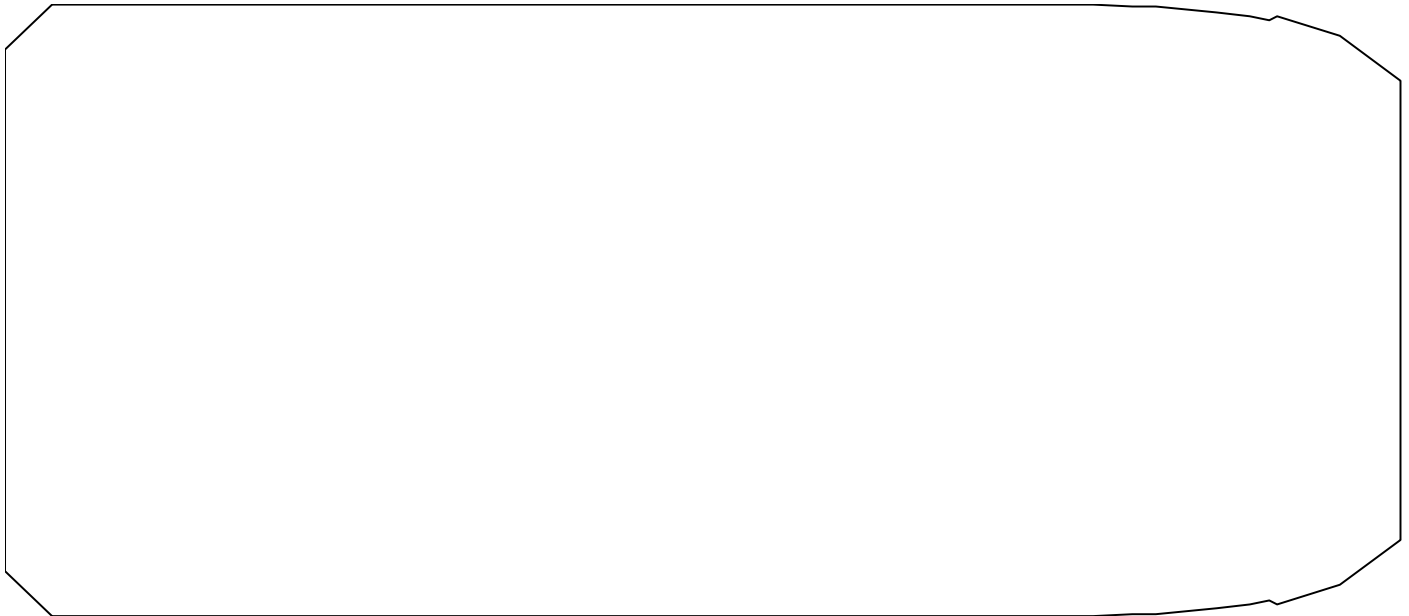
LCF Draft (ft)	Displ (LT)	LCB (ft)	VCB (ft)	LCF (ft)	TPI (LT/inch)	MTI (LT-ft /inch)	GML (ft)	GM(Solid) (ft)
3.582	65.546	20.115a	1.944	20.652a	1.90	5.13	42.738	6.733

Water Specific Gravity = 1.025.

Trim is per 45.50ft

Floating Status

Draft FP	5.106 ft	Heel	zero	GM(Solid)	6.733 ft
Draft MS	4.582 ft	Equil	No	F/S Corr.	0.000 ft
Draft AP	4.058 ft	Wind	0.0 kn	GM(Fluid)	6.733 ft
Trim	fwd 1.05/45.50	Wave	No	KMT	12.812 ft
LCG	20.210a ft	VCG	6.080 ft	TPIIn	1.90



D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA STABILITY ANALYSIS-DEPARTURE CONDITION LIGHT LOAD

ALT 0-MJC

Intact Stability Criteria CFR 170.173 (c)

Righting Arms vs Heel Angle

Heel Angle (deg)	Trim Angle (deg)	Origin Depth (ft)	Righting Arm (ft)	Area (ft-Deg)	Flood Pt Height (ft)
0.00	1.32f	4.06	0.00	0.000	4.92 (1)
5.00s	1.46f	4.07	0.61	1.537	4.47 (1)
10.00s	1.72f	4.07	1.18	6.051	4.02 (1)
15.00s	1.98f	4.03	1.76	13.417	3.55 (1)
20.00s	2.44f	4.05	2.24	23.479	3.03 (1)
25.00s	3.16f	4.15	2.39	35.192	2.48 (1)
30.00s	3.92f	4.25	2.28	46.962	1.91 (1)
35.00s	4.71f	4.34	2.04	57.804	1.33 (1)
40.00s	5.52f	4.41	1.71	67.208	0.73 (1)
45.00s	6.33f	4.47	1.34	74.864	0.13 (1)
46.06s	6.49f	4.48	1.26	76.243	0.00 (1)
50.00s	7.12f	4.51	0.94	80.575	-0.48 (1)
55.00s	7.90f	4.53	0.51	84.213	-1.07 (1)
60.00s	8.60f	4.51	0.08	85.700	-1.66 (1)

Unprotected Flood Point

Name	L,T,V (ft)	Height (ft)
(1) Engine Room Stacks	21.000a, 5.250s, 8.500	4.925

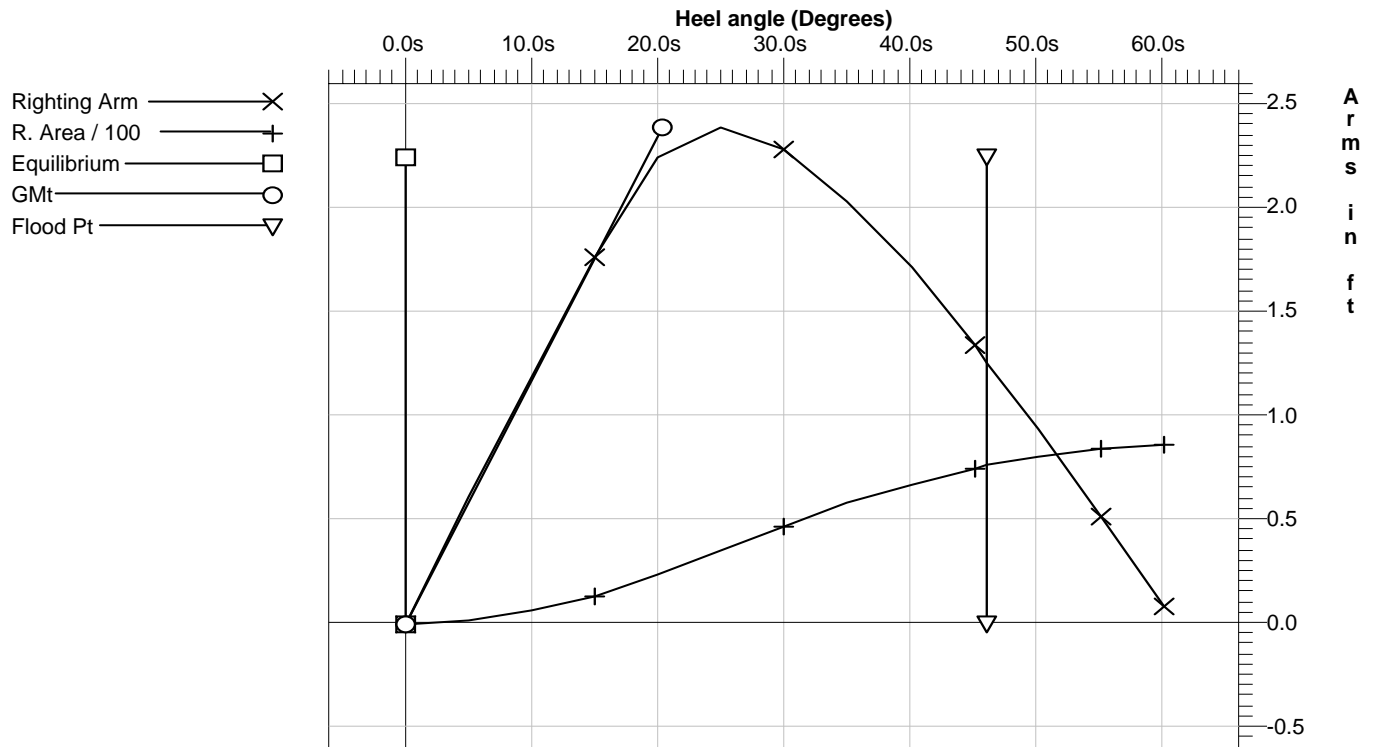
CFR 170.173 (C) CRITERIA EXPOSED WATERS

Limit	Min/Max	Actual	Margin	Pass
(1) GM at Equilibrium	>0.49 ft	6.73	6.24	Yes
(2) Area at MaxRA	>12.480 ft-D	35.192	22.712	Yes
(3) Absolute Angle at MaxRA	>15.00 deg	25.00	10.00	Yes
(4) Area from 0.00 deg to 40.00 or Flood	>16.900 ft-D	67.208	50.308	Yes
(5) Area from 30.00 deg to 40.00 or Flood	>5.600 ft-D	20.246	14.646	Yes

**D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA
STABILITY ANALYSIS-DEPARTURE CONDITION LIGHT LOAD**

ALT 0-MJC

Righting Arms vs. Heel



Vessel: Owner: Condition: 2 Passengers and Crew Date: D & L Job #:		NCDOT 45' Pushboat Arrival Condition-Light Load Partially Protected Waters October 24, 2017 16-1356 Rev. P By: MJC						Per Person Weight for Calculations: 275 pounds # of Crew: 2																																																
Item	Weight	VCG	LCG	TCG	VM	LM	TM																																																	
	(lt)	(ft, abl)	(-aft/+ fwd)	(+s/-p)																																																				
Lightship from Weight Estimate:	49.71	4.94	23.16	0.00	245.57	1,151.40	0.00																																																	
2 Crew + Affects:	0.25	9.00	15.00	0.00	2.21	3.68	0																																																	
A Frame Pick	3.50	20.00	1.00	0.00	0.00	0.00	0																																																	
ER Spares and Outfit	1.50	4.00	25.00	0.00	70.00	3.50	0																																																	
55% Fwd Ballast P & S (1450 gal per)	6.16	3.36	9.00	0.00	0.00	0.00	0																																																	
0% Mid Ballast P & S (1500 gal per)	0.00	3.13	15.00	0.00	6.00	37.50	0																																																	
0% Aft Ballast P & S (2100 gal per)	0.00	3.25	36.70	0.00	0.00	0.00	0																																																	
10% FO Tank P & S (500 gal per)	0.33	3.90	19.00	0.00	0.00	0.00	0																																																	
Total	61.45	5.63	20.47	0.00	345.76	1,257.79	0																																																	
Trim & Draft Calculations		<table border="1"> <tr><th colspan="2">Stability</th></tr> <tr><td>KM(t), ft</td><td>13.27</td></tr> <tr><td>KG, ft</td><td>5.63</td></tr> <tr><td>GM</td><td>7.64</td></tr> <tr><td>FSM, ft-t</td><td>37.460</td></tr> <tr><td>FS Corr, ft</td><td>0.610</td></tr> <tr><td>GM corr, ft</td><td>7.03</td></tr> </table>						Stability		KM(t), ft	13.27	KG, ft	5.63	GM	7.64	FSM, ft-t	37.460	FS Corr, ft	0.610	GM corr, ft	7.03																																			
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20.47 LCG from FP (ft, +a/-f)		<table border="1"> <tr><th colspan="7">Calculation Data, Fresh Water</th></tr> <tr><th>Draft</th><th>Displ (lt)</th><th>TPI</th><th>Lcb (ft)</th><th>Lcf (ft)</th><th>MT1"</th><th>KM(t), ft</th></tr> <tr><td>3.00</td><td>52.66</td><td>1.81</td><td>21.21</td><td>20.80</td><td>5.02</td><td>14.64</td></tr> <tr><td>3.40</td><td>61.45</td><td></td><td>21.25</td><td>22.47</td><td>6.65</td><td>13.27</td></tr> <tr><td>3.25</td><td>58.27</td><td>1.91</td><td>21.24</td><td>21.87</td><td>6.06</td><td>13.76</td></tr> <tr><td>diff</td><td>5.616</td><td></td><td>0.023</td><td>1.068</td><td>1.040</td><td>-0.871</td></tr> <tr><td>slope</td><td></td><td></td><td>0.004</td><td>0.190</td><td>0.185</td><td>-0.155</td></tr> </table>						Calculation Data, Fresh Water							Draft	Displ (lt)	TPI	Lcb (ft)	Lcf (ft)	MT1"	KM(t), ft	3.00	52.66	1.81	21.21	20.80	5.02	14.64	3.40	61.45		21.25	22.47	6.65	13.27	3.25	58.27	1.91	21.24	21.87	6.06	13.76	diff	5.616		0.023	1.068	1.040	-0.871	slope			0.004	0.190	0.185	-0.155
Calculation Data, Fresh Water																																																								
Draft	Displ (lt)							TPI	Lcb (ft)	Lcf (ft)	MT1"	KM(t), ft																																												
3.00	52.66							1.81	21.21	20.80	5.02	14.64																																												
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21.25 LCB from FP (ft, +a/-f)																																																								
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37.46 Total Free Surface Moment																																																								

NCDOT 45' Pushboat	
Arrival Condition-Light Load	
46 CFR 173.097 Towline Pull Criteria	
N	2
P	300
D	3
S	1
h	9
K	38
Disp	61.45
f (freeboard)	3.10
B beam	20

GM Rq'd: **4.64 ft**
 GM Actual: **7.03 ft**

VCG w/ FSC 6.24 ft

LCG Reference is FP @ frame 0

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA
STABILITY ANALYSIS-ARRIVAL CONDITION LIGHT LOAD

ALT 0 -MJC

LCG reference is Frame 0

Hydrostatic Properties

Draft is from Baseline.

Trim: fwd 0.75/45.50, No heel, VCG = 6.24

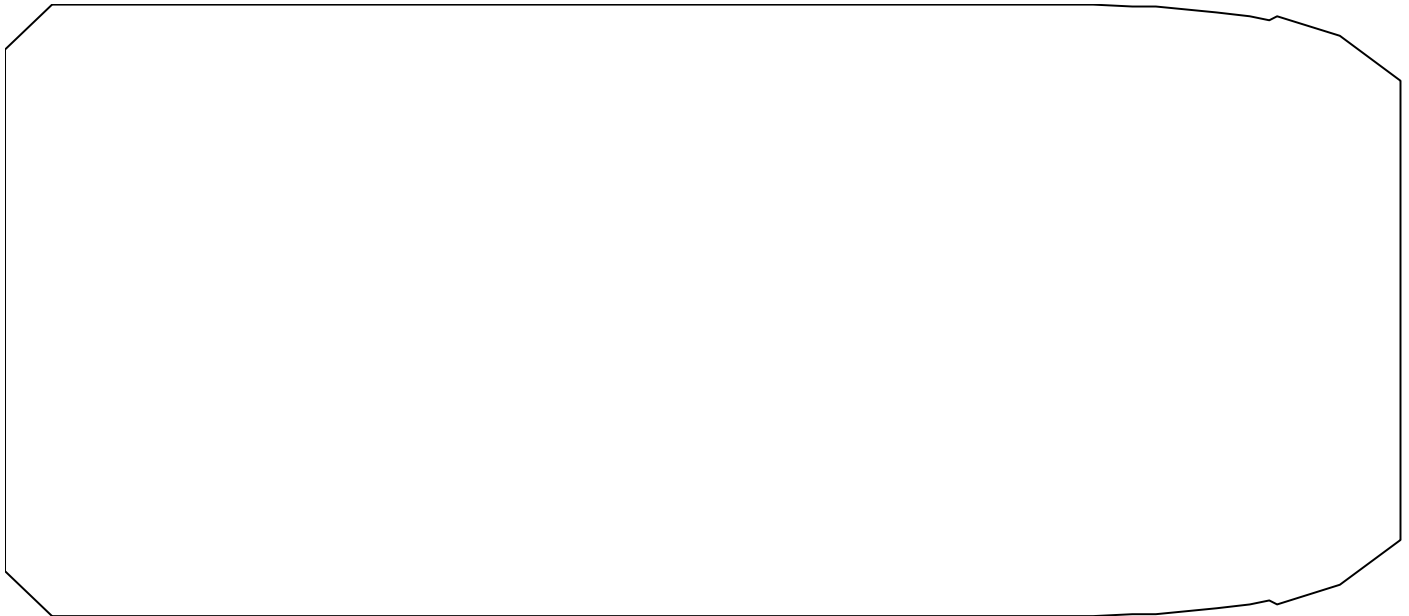
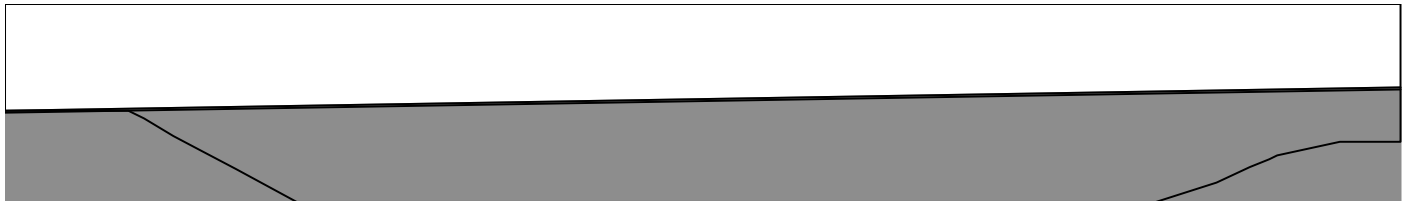
LCF Draft (ft)	Displ (LT)	LCB (ft)	VCB (ft)	LCF (ft)	TPI (LT/inch)	MTI (LT-ft /inch)	GML (ft)	GM(Solid) (ft)
3.403	61.459	20.398a	1.835	20.544a	1.87	4.87	43.252	7.119

Water Specific Gravity = 1.025.

Trim is per 45.50ft

Floating Status

Draft FP	4.497 ft	Heel	zero	GM(Solid)	7.119 ft
Draft MS	4.120 ft	Equil	No	F/S Corr.	0.000 ft
Draft AP	3.743 ft	Wind	0.0 kn	GM(Fluid)	7.119 ft
Trim	fwd 0.75/45.50	Wave	No	KMT	13.358 ft
LCG	20.470a ft	VCG	6.240 ft	TPIIn	1.87



D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA STABILITY ANALYSIS-ARRIVAL CONDITION LIGHT LOAD

ALT 0 -MJC

Intact Stability Criteria CFR 170.173 (c)

Righting Arms vs Heel Angle

Heel Angle (deg)	Trim Angle (deg)	Origin Depth (ft)	Righting Arm (ft)	Area (ft-Deg)	Flood Pt Height (ft)
0.00	0.95f	3.74	0.00	0.000	26.92 (1)
5.00s	1.07f	3.75	0.64	1.592	26.36 (1)
10.00s	1.32f	3.74	1.22	6.267	25.69 (1)
15.00s	1.57f	3.70	1.84	13.919	24.83 (1)
20.00s	1.93f	3.66	2.38	24.505	23.83 (1)
25.00s	2.49f	3.66	2.54	36.968	22.73 (1)
30.00s	3.10f	3.65	2.43	49.507	21.48 (1)
35.00s	3.75f	3.65	2.18	61.083	20.09 (1)
40.00s	4.41f	3.63	1.84	71.152	18.55 (1)
45.00s	5.07f	3.60	1.45	79.382	16.89 (1)
50.00s	5.72f	3.55	1.02	85.555	15.10 (1)
55.00s	6.35f	3.49	0.57	89.528	13.21 (1)
60.00s	6.94f	3.40	0.10	91.214	11.23 (1)

Unprotected Flood Point

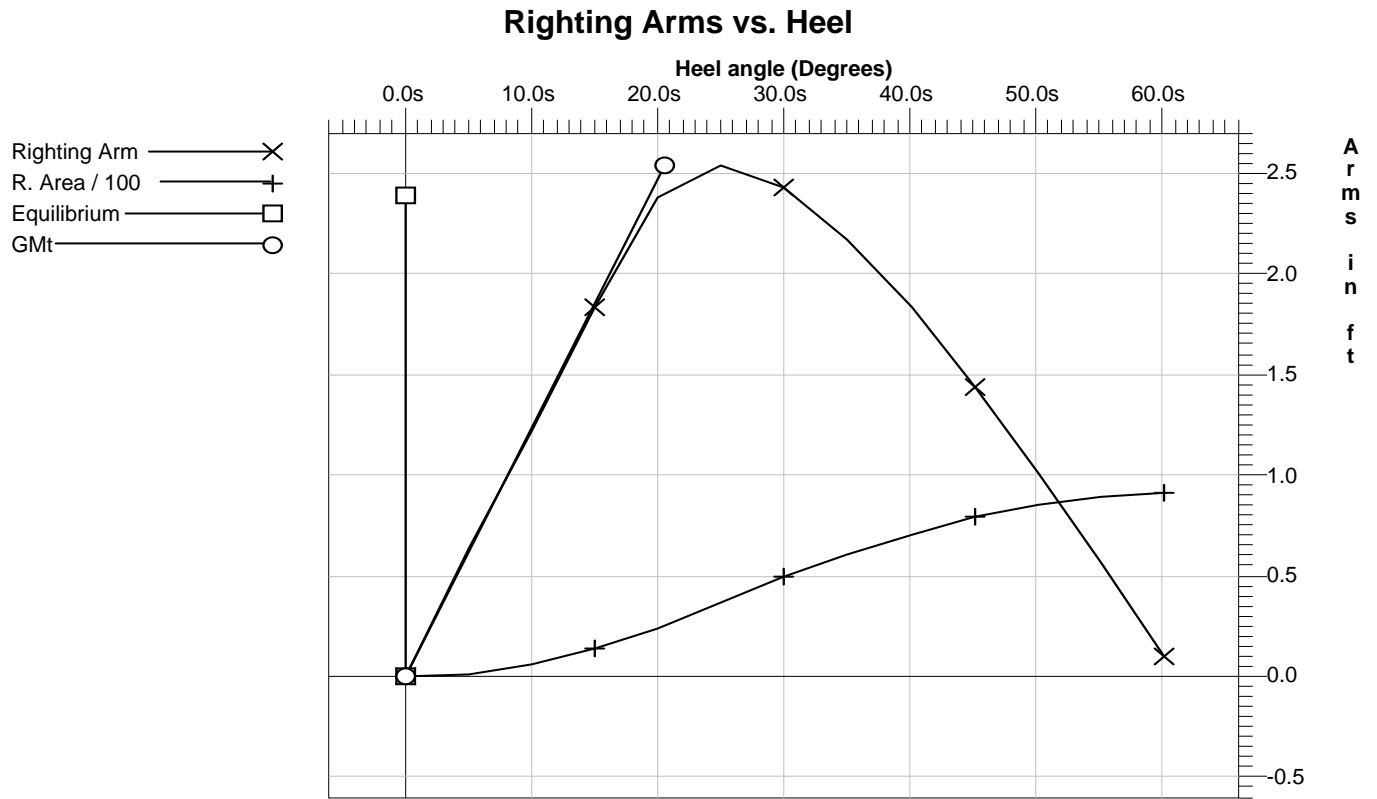
Name	L,T,V (ft)	Height (ft)
(1) Engine Room Stacks	40.500a, 6.000s, 30.000	26.924

CFR 170.173 (C) CRITERIA EXPOSED WATERS

Limit	Min/Max	Actual	Margin	Pass
(1) GM at Equilibrium	>0.49 ft	7.12	6.63	Yes
(2) Area at MaxRA	>12.480 ft-D	36.968	24.488	Yes
(3) Absolute Angle at MaxRA	>15.00 deg	25.00	10.00	Yes
(4) Area from 0.00 deg to 40.00 or Flood	>16.900 ft-D	71.152	54.252	Yes
(5) Area from 30.00 deg to 40.00 or Flood	>5.600 ft-D	21.645	16.045	Yes

**D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA
STABILITY ANALYSIS-ARRIVAL CONDITION LIGHT LOAD**

ALT 0 -MJC



Vessel: NCDOT 45' Pushboat Owner: Condition: Departure Condition-Heavy Load 2 Passengers and Crew Date: December 18, 2018 D & L Job #: 17-1392		Rev. P By: MJC		Per Person Weight for Calculations: 275 pounds # of Crew: 2																	
Item	Weight (lt)	VCG (ft, abl)	LCG (-aft/+ fwd)	TCG (+s/-p)	VM	LM	TM														
<u>Lightship from Weight Estimate:</u>	49.71	4.94	23.16	0.00	245.57	1,151.40	0.00														
2 Crew + Affects:	0.25	9.00	15.00	0.00	2.21	3.68	0														
A Frame Pick	3.50	20.00	1.00	0.00	0.00	0.00	0														
ER Spares and Outfit	1.50	4.00	25.00	0.00	70.00	3.50	0														
					6.00	37.50	0														
					0.00	0.00	0														
11.2 100% Fwd Ballast P & S (1450 gal per)	11.20	3.36	9.00	0.00	37.63	100.80	0														
11.64 55% Mid Ballast P & S (1500 gal per)	6.40	3.13	15.00	0.00	20.04	96.03	0														
16.32 50% Aft Ballast P & S (2100 gal per)	8.16	3.25	36.70	0.00	26.52	299.47	0														
3.3 100% FO Tank P & S (500 gal per)	3.30	3.90	19.00	0.00	12.87	62.70	0														
Total	84.02	5.01	20.89	0.00	420.84	1,755.08	0														
Trim & Draft Calculations		<table border="1"> <tr><th colspan="2">Stability</th></tr> <tr><td>KM(t), ft</td><td>12.20</td></tr> <tr><td>KG, ft</td><td>5.01</td></tr> <tr><td>GM</td><td>7.19</td></tr> <tr><td>FSM, ft-t</td><td>37.460</td></tr> <tr><td>FS Corr, ft</td><td>0.450</td></tr> <tr><td>GM corr, ft</td><td>6.74</td></tr> </table>						Stability		KM(t), ft	12.20	KG, ft	5.01	GM	7.19	FSM, ft-t	37.460	FS Corr, ft	0.450	GM corr, ft	6.74
Stability																					
KM(t), ft	12.20																				
KG, ft	5.01																				
GM	7.19																				
FSM, ft-t	37.460																				
FS Corr, ft	0.450																				
GM corr, ft	6.74																				
20.89 LCG from FP (ft, +a/-f)					<table border="1"> <tr><td colspan="2">VCG w/ FSC</td><td>5.46 ft</td></tr> </table>			VCG w/ FSC		5.46 ft											
VCG w/ FSC		5.46 ft																			
21.74 LCB from FP (ft, +a/-f)					LCG Reference is FP @ frame 0																
-0.86 Trim Lever, ft																					
8.19 Moment to Trim 1"																					
-0.73 Trim (ft, + stern trim/- bow trim)																					
23.03 LCF from FP (ft, +f/-a)																					
45.50 Length Between Perpendiculars, ft																					
0.00 Difference Btw LCF & Midships Draft																					
4.28 Draft at LCF, ft																					
4.29 Draft Amidships																					
4.65 Draft at Fr 0																					
3.92 Draft at Fr 30																					
4.588 Draft at Fwd Draft Mark @ fr 2:																					
5.296 Draft at Aft Draft Mark @ fr 20:																					
(Ft-Lt) Free Surface Moments					Calculation Data, Fresh Water																
4.52 Fwd Ballast P & S (1450 gal per)					(+/-a)	(+/-a)															
4.52 Mid Ballast P & S (1500 gal per)					Lcb (ft)	Lcf (ft)	MT1"														
27.14 Aft Ballast P & S (2100 gal per)	Draft	Displ (lt)	TPI				KM(t), ft														
1.28 FO Tank P & S (500 gal per)	4.00	76.85	2.12	21.62	23.05	8.11	12.95														
	4.28	84.02		21.74	23.03	8.19	12.20														
	4.25	83.22	2.13	21.73	23.03	8.18	12.28														
	diff	6.378		0.107	-0.021	0.070	-0.669														
37.46 Total Free Surface Moment	slope			0.017	-0.003	0.011	-0.105														

NCDOT 45' Pushboat
 Departure Condition-Heavy Load
 46 CFR 173.097 Towline Pull Criteria

N	2
P	300
D	3
S	1
h	9
K	38
Disp	84.02
f (freeboard)	2.21
B beam	20

GM Rq'd: **4.75 ft**
 GM Actual: **6.74 ft**

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA
STABILITY ANALYSIS-DEPARTURE CONDITION HEAVY LOAD

ALT 0 -MJC

LCG reference is Frame 0

Hydrostatic Properties

Draft is from Baseline.

Trim: fwd 0.81/45.50, No heel, VCG = 5.46

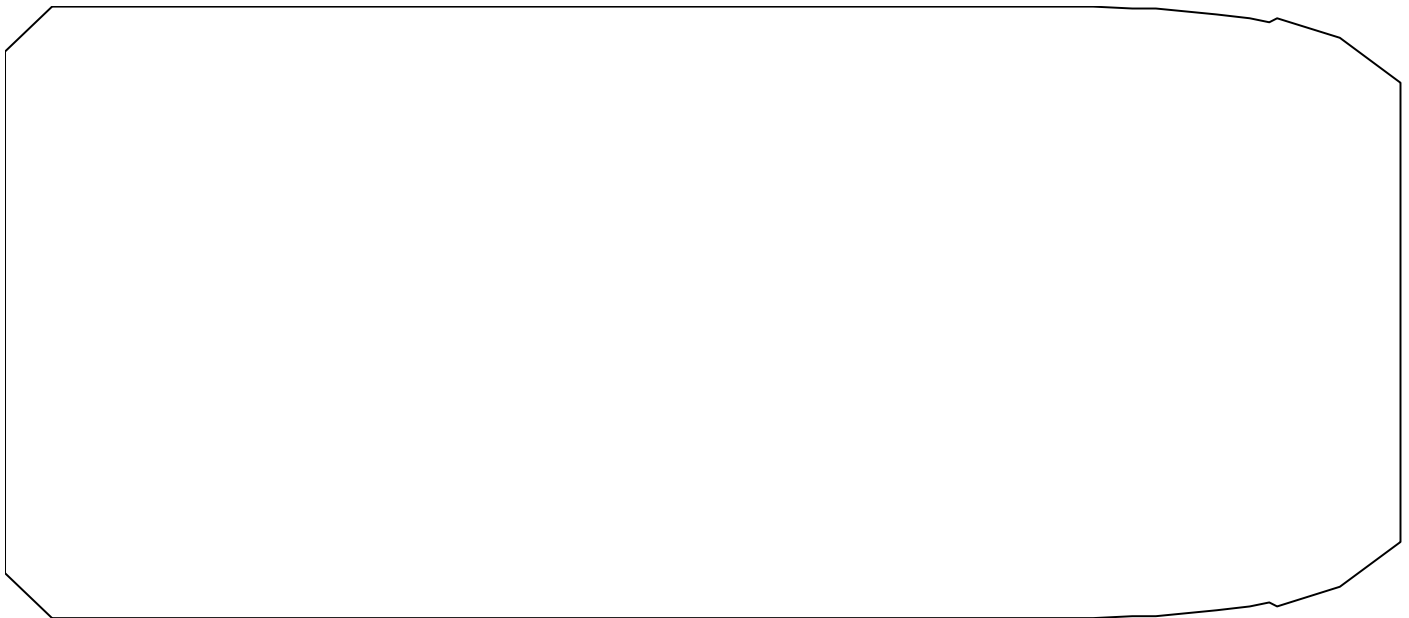
LCF Draft (ft)	Displ (LT)	LCB (ft)	VCB (ft)	LCF (ft)	TPI (LT/inch)	MTI (LT-ft /inch)	GML (ft)	GM(Solid) (ft)
4.282	84.022	20.835a	2.377	22.975a	2.13	7.41	48.148	6.796

Water Specific Gravity = 1.025.

Trim is per 45.50ft

Floating Status

Draft FP	5.502 ft	Heel	zero	GM(Solid)	6.796 ft
Draft MS	5.097 ft	Equil	No	F/S Corr.	0.000 ft
Draft AP	4.691 ft	Wind	0.0 kn	GM(Fluid)	6.796 ft
Trim	fwd 0.81/45.50	Wave	No	KMT	12.255 ft
LCG	20.890a ft	VCG	5.460 ft	TPIIn	2.13



D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA STABILITY ANALYSIS-DEPARTURE CONDITION HEAVY LOAD

ALT 0 -MJC

Intact Stability Criteria CFR 170.173 (c)

Righting Arms vs Heel Angle

Heel Angle (deg)	Trim Angle (deg)	Origin Depth (ft)	Righting Arm (ft)	Area (ft-Deg)	Flood Pt Height (ft)
0.00	1.02f	4.69	0.00	0.000	4.18 (1)
5.00s	1.06f	4.68	0.59	1.463	3.71 (1)
10.00s	1.25f	4.67	1.12	5.737	3.24 (1)
15.00s	1.56f	4.68	1.53	12.406	2.74 (1)
20.00s	2.07f	4.82	1.76	20.724	2.13 (1)
24.29s	2.56f	5.00	1.83	28.456	1.52 (1)
25.00s	2.66f	5.03	1.82	29.754	1.42 (1)
30.00s	3.32f	5.28	1.74	38.724	0.66 (1)
34.36s	3.91f	5.48	1.58	46.003	0.00 (1)
35.00s	4.00f	5.51	1.56	47.002	-0.10 (1)
40.00s	4.70f	5.71	1.31	54.208	-0.86 (1)
45.00s	5.39f	5.88	1.03	60.091	-1.62 (1)
50.00s	6.07f	6.02	0.73	64.503	-2.36 (1)
55.00s	6.72f	6.12	0.41	67.346	-3.09 (1)
60.00s	7.30f	6.17	0.08	68.557	-3.79 (1)

Unprotected Flood Point

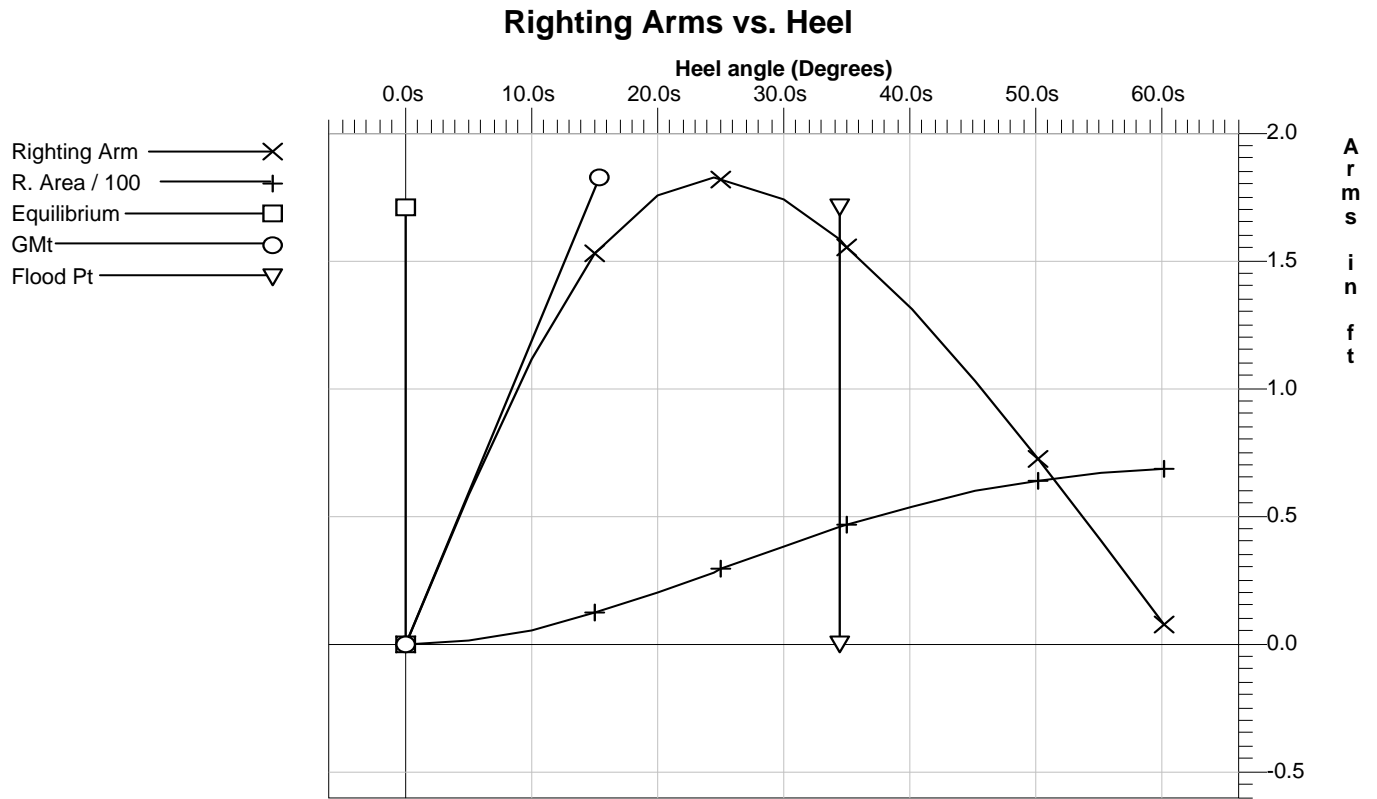
Name	L,T,V (ft)	Height (ft)
(1) Engine Room Stacks	21.000a, 5.250s, 8.500	4.182

CFR 170.173 (C) CRITERIA EXPOSED WATERS

Limit	Min/Max	Actual	Margin	Pass
(1) GM at Equilibrium	>0.49 ft	6.80	6.31	Yes
(2) Area at MaxRA	>12.480 ft-D	28.456	15.976	Yes
(3) Absolute Angle at MaxRA	>15.00 deg	24.29	9.29	Yes
(4) Area from 0.00 deg to 40.00 or Flood	>16.900 ft-D	46.003	29.103	Yes
(5) Area from 30.00 deg to 40.00 or Flood	>5.600 ft-D	7.279	1.679	Yes

**D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA
STABILITY ANALYSIS-DEPARTURE CONDITION HEAVY LOAD**

ALT 0 -MJC



Vessel: Owner: Condition: 2 Passengers and Crew Date: D & L Job #:		NCDOT 45' Pushboat Arrival Condition-Heavy Load Partially Protected Waters October 24, 2017 16-1356 Rev. P By: MJC																			
		Per Person Weight for Calculations: 275 pounds # of Crew: 2																			
Item	Weight	VCG	LCG	TCG	VM	LM	TM														
	(lt)	(ft, abl)	(-aft/+ fwd)	(+s/-p)																	
<u>Lightship from Weight Estimate:</u>	49.71	4.94	23.16	0.00	245.57	1,151.40	0.00														
2 Pax & Crew:	0.25	9.00	15.00	0.00	2.21	3.68	0														
A Frame Pick	3.50	20.00	1.00	0.00	0.00	0.00	0														
ER Spares and Outfit	1.50	4.00	25.00	0.00	70.00	3.50	0														
					6.00	37.50	0														
					0.00	0.00	0														
100% Fwd Ballast P & S (1450 gal per)	11.20	3.36	9.00	0.00	0.00	0.00	0														
55% Mid Ballast P & S (1500 gal per)	6.40	3.13	15.00	0.00	37.63	100.80	0														
50% Aft Ballast P & S (2100 gal per)	8.16	3.25	36.70	0.00	20.04	96.03	0														
10% FO Tank P & S (500 gal per)	0.33	3.90	19.00	0.00	26.52	299.47	0														
Total	81.05	5.05	20.96	0.00	1.29	6.27	0														
Trim & Draft Calculations		<table border="1"> <tr><td colspan="2">Stability</td></tr> <tr><td>KM(t), ft</td><td>12.51</td></tr> <tr><td>KG, ft</td><td>5.05</td></tr> <tr><td>GM</td><td>7.46</td></tr> <tr><td>FSM, ft-t</td><td>37.460</td></tr> <tr><td>FS Corr, ft</td><td>0.460</td></tr> <tr><td>GM corr, ft</td><td>7.00</td></tr> </table>						Stability		KM(t), ft	12.51	KG, ft	5.05	GM	7.46	FSM, ft-t	37.460	FS Corr, ft	0.460	GM corr, ft	7.00
Stability																					
KM(t), ft	12.51																				
KG, ft	5.05																				
GM	7.46																				
FSM, ft-t	37.460																				
FS Corr, ft	0.460																				
GM corr, ft	7.00																				
20.96 LCG from FP (ft, +a/-f)		<table border="1"> <tr><td colspan="2">VCG w/ FSC</td><td>5.51 ft</td></tr> </table>						VCG w/ FSC		5.51 ft											
VCG w/ FSC		5.51 ft																			
21.69 LCB from FP (ft, +a/-f)		LCG Reference is FP @ frame 0																			
-0.74 Trim Lever, ft																					
8.16 Moment to Trim 1"																					
-0.61 Trim (ft, + stern trim/- bow trim)																					
23.04 LCF from FP (ft, +f/-a)																					
45.50 Length Between Perpendiculars, ft																					
0.00 Difference Btw LCF & Midships Draft																					
4.17 Draft at LCF, ft																					
4.17 Draft Amidships																					
4.47 Draft at Fr 0																					
3.86 Draft at Fr 30																					
4.420 Draft at Fwd Draft Mark @ fr 4:																					
5.010 Draft at Aft Draft Mark @ fr 20:																					
(Ft-Lt) Free Surface Moments		Calculation Data, Fresh Water																			
4.52 Fwd Ballast P & S (1450 gal per)				(+f/-a)	(+f/-a)																
4.52 Mid Ballast P & S (1500 gal per)	Draft	Displ (lt)	TPI	Lcb (ft)	Lcf (ft)	MT1"	KM(t), ft														
27.14 Aft Ballast P & S (2100 gal per)	4.00	76.85	2.12	21.62	23.05	8.11	12.95														
1.28 FO Tank P & S (500 gal per)	4.17	81.05		21.69	23.04	8.16	12.51														
	4.25	83.22	2.13	21.73	23.03	8.18	12.28														
	diff	6.378		0.107	-0.021	0.070	-0.669														
37.46 Total Free Surface Moment	slope			0.017	-0.003	0.011	-0.105														

NCDOT 45' Pushboat
 Arrival Condition-Heavy Load
 46 CFR 173.097 Towline Pull Criteria

N	2
P	300
D	3
S	1
h	9
K	38
Disp	81.05
f (freeboard)	2.33
B beam	20

GM Rq'd: **4.67 ft**
 GM Actual: **7.00 ft**

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA
STABILITY ANALYSIS-ARRIVAL CONDITION HEAVY LOAD

ALT 0 -MJC

LCG reference is Frame 0

Hydrostatic Properties

Draft is from Baseline.

Trim: fwd 0.68/45.50, No heel, VCG = 5.51

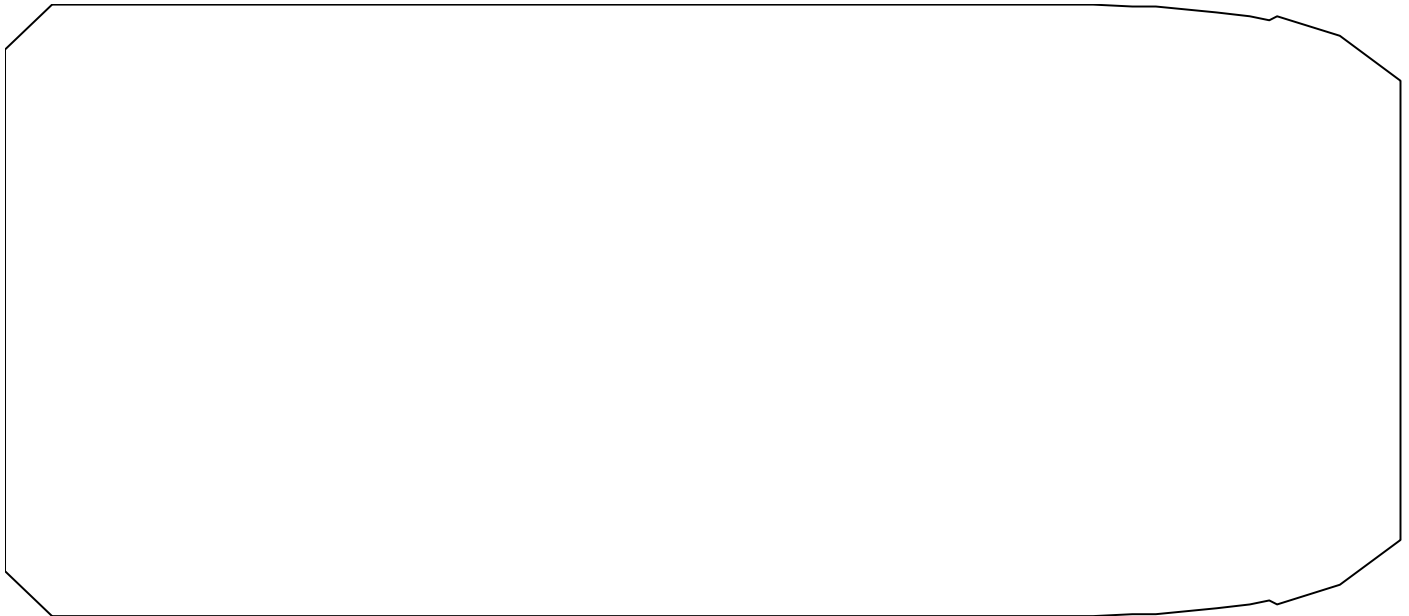
LCF Draft (ft)	Displ (LT)	LCB (ft)	VCB (ft)	LCF (ft)	TPI (LT/inch)	MTI (LT-ft /inch)	GML (ft)	GM(Solid) (ft)
4.166	81.062	20.912a	2.307	22.987a	2.13	7.39	49.809	7.026

Water Specific Gravity = 1.025.

Trim is per 45.50ft

Floating Status

Draft FP	5.186 ft	Heel	zero	GM(Solid)	7.026 ft
Draft MS	4.847 ft	Equil	No	F/S Corr.	0.000 ft
Draft AP	4.508 ft	Wind	0.0 kn	GM(Fluid)	7.026 ft
Trim	fwd 0.68/45.50	Wave	No	KMT	12.536 ft
LCG	20.960a ft	VCG	5.510 ft	TPIIn	2.13



D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA STABILITY ANALYSIS-ARRIVAL CONDITION HEAVY LOAD

ALT 0 -MJC

Intact Stability Criteria CFR 170.173 (c)

Righting Arms vs Heel Angle

Heel Angle (deg)	Trim Angle (deg)	Origin Depth (ft)	Righting Arm (ft)	Area (ft-Deg)	Flood Pt Height (ft)
0.00	0.85f	4.51	0.00	0.000	26.09 (1)
5.00s	0.91f	4.50	0.60	1.501	25.50 (1)
10.00s	1.10f	4.49	1.14	5.877	24.78 (1)
15.00s	1.36f	4.47	1.59	12.744	23.91 (1)
20.00s	1.83f	4.57	1.87	21.481	22.85 (1)
25.00s	2.39f	4.75	1.96	31.144	21.56 (1)
30.00s	3.00f	4.95	1.88	40.806	20.12 (1)
35.00s	3.64f	5.14	1.69	49.760	18.53 (1)
40.00s	4.29f	5.29	1.43	57.589	16.81 (1)
45.00s	4.94f	5.42	1.14	64.043	14.97 (1)
50.00s	5.57f	5.52	0.82	68.960	13.03 (1)
55.00s	6.17f	5.59	0.48	72.231	10.99 (1)
60.00s	6.73f	5.61	0.14	73.790	8.88 (1)

Unprotected Flood Point

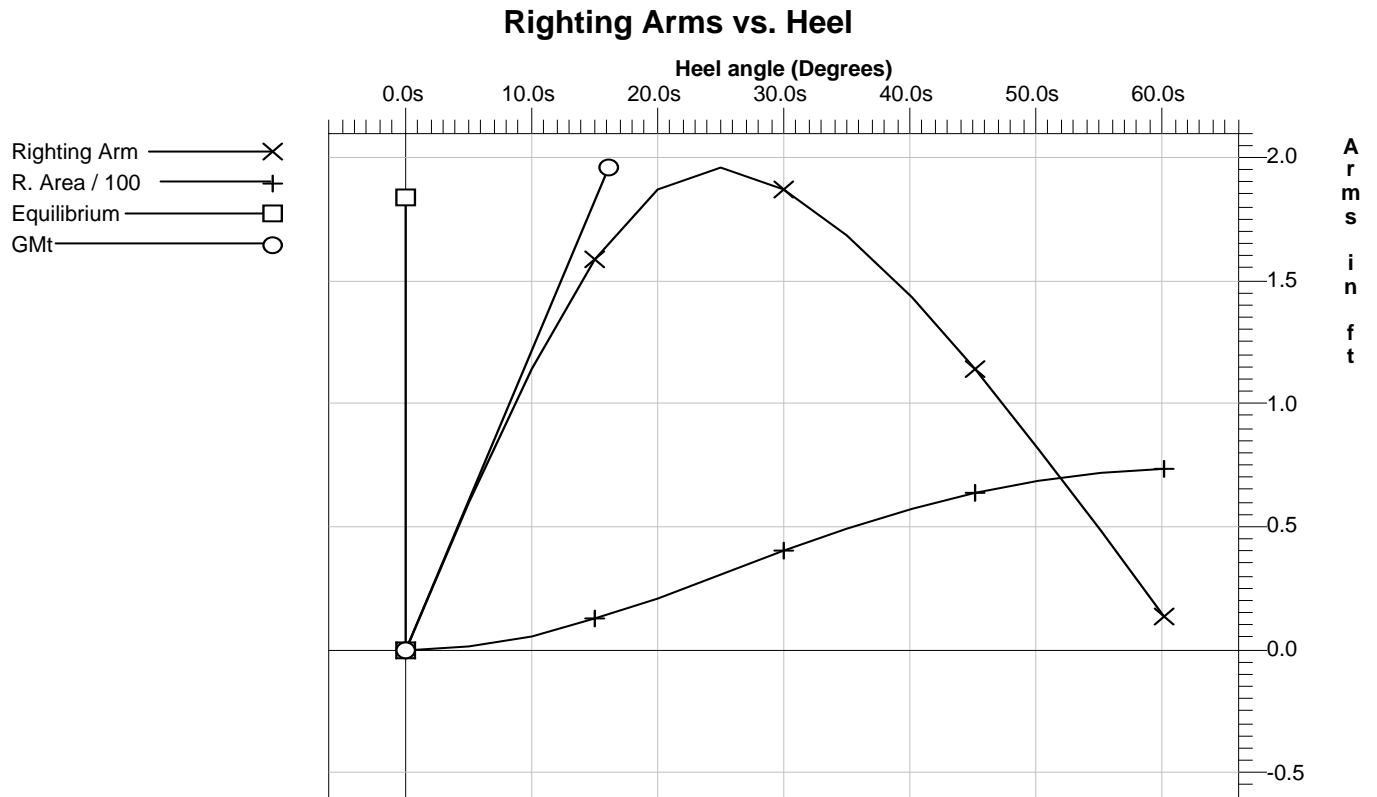
Name	L,T,V (ft)	Height (ft)
(1) Engine Room Stacks	40.500a, 6.000s, 30.000	26.092

CFR 170.173 (C) CRITERIA EXPOSED WATERS

Limit	Min/Max	Actual	Margin	Pass
(1) GM at Equilibrium	>0.49 ft	7.03	6.54	Yes
(2) Area at MaxRA	>12.480 ft-D	31.144	18.664	Yes
(3) Absolute Angle at MaxRA	>15.00 deg	25.00	10.00	Yes
(4) Area from 0.00 deg to 40.00 or Flood	>16.900 ft-D	57.589	40.689	Yes
(5) Area from 30.00 deg to 40.00 or Flood	>5.600 ft-D	16.783	11.183	Yes

**D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT EXPOSED WATERS & TOWLINE PULL CIRITERIA
STABILITY ANALYSIS-ARRIVAL CONDITION HEAVY LOAD**

ALT 0 -MJC



D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT SALTWATER HYDROSTATICS

Hydrostatic Properties

Draft is from Baseline.

No Trim, No heel, VCG = 0.00

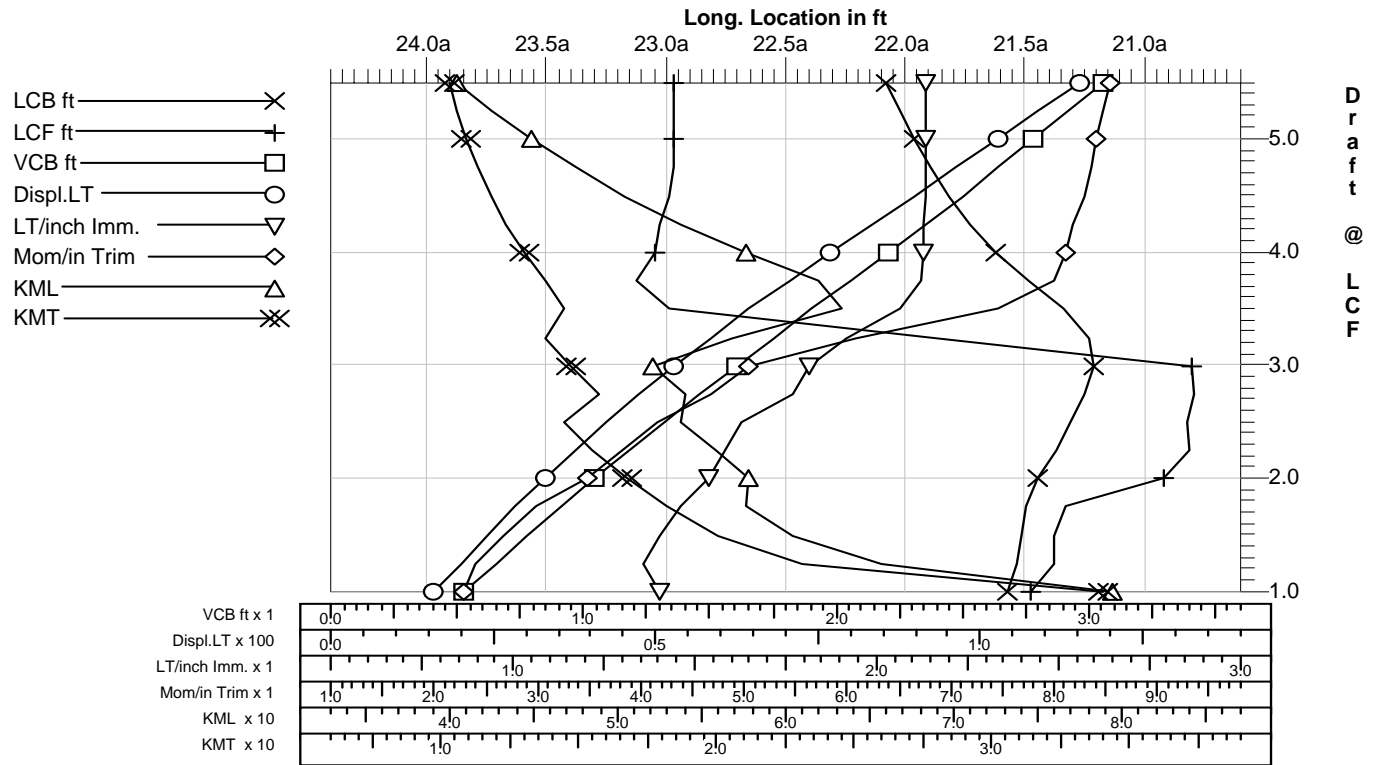
LCF Draft (ft)	Displ (LT)	LCB (ft)	VCB (ft)	LCF (ft)	TPI (LT/inch)	MTI (LT-ft /inch)	KML (ft)	KMT (ft)
1.000	15.699	21.573a	0.518	21.476a	1.40	2.28	79.313	33.990
1.250	19.803	21.540a	0.645	21.383a	1.35	2.38	65.690	23.056
1.500	23.938	21.514a	0.773	21.380a	1.40	2.65	60.357	20.011
1.750	28.237	21.495a	0.905	21.330a	1.46	2.98	57.531	18.104
2.000	32.716	21.453a	1.039	20.924a	1.53	3.46	57.738	16.689
2.250	37.416	21.368a	1.176	20.816a	1.58	3.82	55.716	15.439
2.500	42.222	21.310a	1.314	20.830a	1.63	4.15	53.632	14.416
2.750	47.281	21.259a	1.455	20.798a	1.77	4.67	53.970	15.684
3.000	52.658	21.212a	1.600	20.803a	1.81	5.02	52.054	14.635
3.250	58.274	21.235a	1.748	21.871a	1.91	6.06	56.783	13.764
3.500	64.203	21.339a	1.898	22.991a	2.06	7.44	63.255	14.414
3.750	70.483	21.492a	2.053	23.126a	2.12	7.99	61.873	13.745
4.000	76.846	21.624a	2.204	23.051a	2.12	8.11	57.630	12.949
4.250	83.224	21.732a	2.351	23.030a	2.13	8.18	53.672	12.280
4.500	89.607	21.824a	2.496	22.989a	2.13	8.27	50.421	11.747
4.750	96.002	21.901a	2.638	22.976a	2.13	8.34	47.453	11.283
5.000	102.397	21.968a	2.777	22.976a	2.13	8.40	44.791	10.882
5.250	108.791	22.027a	2.916	22.977a	2.13	8.46	42.457	10.543
5.500	115.186	22.080a	3.052	22.977a	2.13	8.52	40.396	10.256

Water Specific Gravity = 1.025.

Trim is per 45.50ft

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT SALTWATER HYDROSTATICS

Hydrostatic Properties at zero, Heel = 0.00



D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT TANK SOUNDINGS TABLE

ALT 0 -MJC

Tank Soundings for FWD BALLAST.P containing SEA WATER (1.025)

No Trim, No Heel

Sounding (ft)	Volume (ft³)	Weight (LT)	LCG (ft)	TCG (ft)	VCG (ft)	FSM (LT-ft)	Ullage (ft)
0.00	0.00	0.00	0.000	0.000	0.000	0.00	6.50
0.08	1.24	0.04	10.477a	2.327p	0.044	1.11	6.42
0.17	2.65	0.08	10.347a	2.315p	0.090	1.16	6.33
0.25	4.29	0.12	10.216a	2.324p	0.138	1.28	6.25
0.33	6.09	0.17	10.096a	2.351p	0.186	1.52	6.17
0.42	8.01	0.23	10.011a	2.406p	0.232	1.64	6.08
0.50	10.05	0.29	9.931a	2.440p	0.279	1.76	6.00
0.58	12.20	0.35	9.852a	2.461p	0.327	1.84	5.92
0.67	14.45	0.41	9.779a	2.471p	0.374	1.91	5.83
0.75	16.78	0.48	9.721a	2.489p	0.422	1.95	5.75
0.83	19.09	0.55	9.667a	2.505p	0.468	1.99	5.67
0.92	21.49	0.61	9.615a	2.522p	0.514	2.06	5.58
1.00	23.97	0.68	9.566a	2.540p	0.561	2.10	5.50
1.08	26.47	0.76	9.523a	2.556p	0.607	2.11	5.42
1.17	29.01	0.83	9.484a	2.570p	0.652	2.14	5.33
1.25	31.60	0.90	9.449a	2.584p	0.698	2.17	5.25
1.33	34.16	0.98	9.417a	2.598p	0.743	2.22	5.17
1.42	36.76	1.05	9.388a	2.611p	0.788	2.26	5.08
1.50	39.37	1.12	9.362a	2.622p	0.833	2.26	5.00
1.58	41.98	1.20	9.340a	2.631p	0.877	2.26	4.92
1.67	44.60	1.27	9.320a	2.639p	0.921	2.26	4.83
1.75	47.21	1.35	9.302a	2.646p	0.964	2.26	4.75
1.83	49.82	1.42	9.286a	2.652p	1.008	2.26	4.67
1.92	52.43	1.50	9.272a	2.657p	1.051	2.26	4.58
2.00	55.05	1.57	9.259a	2.662p	1.094	2.26	4.50
2.08	57.66	1.65	9.247a	2.666p	1.137	2.26	4.42
2.17	60.27	1.72	9.237a	2.670p	1.180	2.26	4.33
2.25	62.88	1.80	9.227a	2.673p	1.223	2.26	4.25
2.33	65.50	1.87	9.218a	2.676p	1.265	2.26	4.17
2.42	68.11	1.95	9.209a	2.679p	1.308	2.26	4.08
2.50	70.72	2.02	9.202a	2.682p	1.350	2.26	4.00
2.58	73.33	2.09	9.194a	2.684p	1.393	2.26	3.92
2.67	75.95	2.17	9.188a	2.687p	1.435	2.26	3.83
2.75	78.56	2.24	9.182a	2.689p	1.478	2.26	3.75
2.83	81.17	2.32	9.176a	2.691p	1.520	2.26	3.67
2.92	83.78	2.39	9.170a	2.693p	1.562	2.26	3.58
3.00	86.40	2.47	9.165a	2.694p	1.604	2.26	3.50
3.08	89.01	2.54	9.160a	2.696p	1.647	2.26	3.42
3.17	91.64	2.62	9.156a	2.698p	1.689	2.26	3.33
3.25	94.23	2.69	9.151a	2.699p	1.731	2.26	3.25
3.33	96.83	2.77	9.147a	2.701p	1.773	2.26	3.17
3.42	99.46	2.84	9.143a	2.702p	1.815	2.26	3.08
3.50	102.07	2.92	9.140a	2.703p	1.857	2.26	3.00
3.58	104.68	2.99	9.136a	2.704p	1.899	2.26	2.92
3.67	107.30	3.07	9.133a	2.705p	1.941	2.26	2.83
3.75	109.91	3.14	9.130a	2.707p	1.983	2.26	2.75
3.83	112.52	3.21	9.127a	2.708p	2.025	2.26	2.67
3.92	115.13	3.29	9.124a	2.709p	2.067	2.26	2.58

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT TANK SOUNDINGS TABLE

ALT 0 -MJC

4.00	117.75	3.36	9.121a	2.709p	2.109	2.26	2.50
4.08	120.36	3.44	9.118a	2.710p	2.151	2.26	2.42
4.17	122.97	3.51	9.116a	2.711p	2.193	2.26	2.33
4.25	125.58	3.59	9.114a	2.712p	2.235	2.26	2.25
4.33	128.20	3.66	9.111a	2.713p	2.277	2.26	2.17
4.42	130.81	3.74	9.109a	2.714p	2.319	2.26	2.08
4.50	133.42	3.81	9.107a	2.714p	2.361	2.26	2.00
4.58	136.03	3.89	9.105a	2.715p	2.402	2.26	1.92
4.67	138.65	3.96	9.103a	2.716p	2.444	2.26	1.83
4.75	141.26	4.04	9.101a	2.716p	2.486	2.26	1.75
4.83	143.87	4.11	9.099a	2.717p	2.528	2.26	1.67
4.92	146.48	4.18	9.097a	2.717p	2.570	2.26	1.58
5.00	149.10	4.26	9.096a	2.718p	2.612	2.26	1.50
5.08	151.71	4.33	9.094a	2.719p	2.654	2.26	1.42
5.17	154.32	4.41	9.092a	2.719p	2.695	2.26	1.33
5.25	156.93	4.48	9.091a	2.720p	2.737	2.26	1.25
5.33	159.55	4.56	9.089a	2.720p	2.779	2.26	1.17
5.42	162.16	4.63	9.088a	2.721p	2.821	2.26	1.08
5.50	164.77	4.71	9.087a	2.721p	2.863	2.26	1.00
5.58	167.38	4.78	9.085a	2.722p	2.905	2.26	0.92
5.67	170.00	4.86	9.084a	2.722p	2.946	2.26	0.83
5.75	172.61	4.93	9.083a	2.722p	2.988	2.26	0.75
5.83	175.22	5.01	9.081a	2.723p	3.030	2.26	0.67
5.92	177.83	5.08	9.080a	2.723p	3.072	2.26	0.58
6.00	180.45	5.15	9.079a	2.724p	3.114	2.26	0.50
6.08	183.06	5.23	9.078a	2.724p	3.155	2.26	0.42
6.17	185.67	5.30	9.077a	2.724p	3.197	2.26	0.33
6.25	188.28	5.38	9.076a	2.725p	3.239	2.26	0.25
6.33	190.90	5.45	9.075a	2.725p	3.281	2.26	0.17
6.42	193.51	5.53	9.074a	2.725p	3.322	2.26	0.08
FULL	196.12	5.60	9.073a	2.726p	3.364	0.00	0.00

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT TANK SOUNDINGS TABLE

ALT 0 -MJC

Tank Soundings for MID BALLAST.P containing SEA WATER (1.025)

No Trim, No Heel

Sounding (ft)	Volume (ft ³)	Weight (LT)	LCG (ft)	TCG (ft)	VCG (ft)	FSM (LT-ft)	Ullage (ft)
0.00	0.00	0.00	0.000	0.000	0.000	0.00	6.50
0.08	2.61	0.07	15.000a	2.750p	0.042	2.26	6.42
0.17	5.23	0.15	15.000a	2.750p	0.083	2.26	6.33
0.25	7.84	0.22	15.000a	2.750p	0.125	2.26	6.25
0.33	10.45	0.30	15.000a	2.750p	0.167	2.26	6.17
0.42	13.06	0.37	15.000a	2.750p	0.208	2.26	6.08
0.50	15.67	0.45	15.000a	2.750p	0.250	2.26	6.00
0.58	18.29	0.52	15.000a	2.750p	0.292	2.26	5.92
0.67	20.90	0.60	15.000a	2.750p	0.333	2.26	5.83
0.75	23.51	0.67	15.000a	2.750p	0.375	2.26	5.75
0.83	26.13	0.75	15.000a	2.750p	0.417	2.26	5.67
0.92	28.74	0.82	15.000a	2.750p	0.458	2.26	5.58
1.00	31.35	0.90	15.000a	2.750p	0.500	2.26	5.50
1.08	33.96	0.97	15.000a	2.750p	0.542	2.26	5.42
1.17	36.58	1.04	15.000a	2.750p	0.583	2.26	5.33
1.25	39.19	1.12	15.000a	2.750p	0.625	2.26	5.25
1.33	41.80	1.19	15.000a	2.750p	0.667	2.26	5.17
1.42	44.41	1.27	15.000a	2.750p	0.708	2.26	5.08
1.50	47.02	1.34	15.000a	2.750p	0.750	2.26	5.00
1.58	49.64	1.42	15.000a	2.750p	0.792	2.26	4.92
1.67	52.25	1.49	15.000a	2.750p	0.833	2.26	4.83
1.75	54.86	1.57	15.000a	2.750p	0.875	2.26	4.75
1.83	57.48	1.64	15.000a	2.750p	0.917	2.26	4.67
1.92	60.09	1.72	15.000a	2.750p	0.958	2.26	4.58
2.00	62.70	1.79	15.000a	2.750p	1.000	2.26	4.50
2.08	65.31	1.87	15.000a	2.750p	1.042	2.26	4.42
2.17	67.93	1.94	15.000a	2.750p	1.083	2.26	4.33
2.25	70.54	2.01	15.000a	2.750p	1.125	2.26	4.25
2.33	73.15	2.09	15.000a	2.750p	1.167	2.26	4.17
2.42	75.76	2.16	15.000a	2.750p	1.208	2.26	4.08
2.50	78.38	2.24	15.000a	2.750p	1.250	2.26	4.00
2.58	80.99	2.31	15.000a	2.750p	1.292	2.26	3.92
2.67	83.60	2.39	15.000a	2.750p	1.333	2.26	3.83
2.75	86.21	2.46	15.000a	2.750p	1.375	2.26	3.75
2.83	88.83	2.54	15.000a	2.750p	1.417	2.26	3.67
2.92	91.44	2.61	15.000a	2.750p	1.458	2.26	3.58
3.00	94.05	2.69	15.000a	2.750p	1.500	2.26	3.50
3.08	96.66	2.76	15.000a	2.750p	1.542	2.26	3.42
3.17	99.29	2.84	15.000a	2.750p	1.584	2.26	3.33
3.25	101.89	2.91	15.000a	2.750p	1.625	2.26	3.25
3.33	104.49	2.98	15.000a	2.750p	1.666	2.26	3.17
3.42	107.11	3.06	15.000a	2.750p	1.708	2.26	3.08
3.50	109.73	3.13	15.000a	2.750p	1.750	2.26	3.00
3.58	112.34	3.21	15.000a	2.750p	1.792	2.26	2.92
3.67	114.95	3.28	15.000a	2.750p	1.833	2.26	2.83
3.75	117.56	3.36	15.000a	2.750p	1.875	2.26	2.75
3.83	120.18	3.43	15.000a	2.750p	1.917	2.26	2.67
3.92	122.79	3.51	15.000a	2.750p	1.958	2.26	2.58
4.00	125.40	3.58	15.000a	2.750p	2.000	2.26	2.50
4.08	128.01	3.66	15.000a	2.750p	2.042	2.26	2.42

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT TANK SOUNDINGS TABLE

ALT 0 -MJC

4.17	130.63	3.73	15.000a	2.750p	2.083	2.26	2.33
4.25	133.24	3.81	15.000a	2.750p	2.125	2.26	2.25
4.33	135.85	3.88	15.000a	2.750p	2.167	2.26	2.17
4.42	138.46	3.96	15.000a	2.750p	2.208	2.26	2.08
4.50	141.08	4.03	15.000a	2.750p	2.250	2.26	2.00
4.58	143.69	4.10	15.000a	2.750p	2.292	2.26	1.92
4.67	146.30	4.18	15.000a	2.750p	2.333	2.26	1.83
4.75	148.91	4.25	15.000a	2.750p	2.375	2.26	1.75
4.83	151.53	4.33	15.000a	2.750p	2.417	2.26	1.67
4.92	154.14	4.40	15.000a	2.750p	2.458	2.26	1.58
5.00	156.75	4.48	15.000a	2.750p	2.500	2.26	1.50
5.08	159.36	4.55	15.000a	2.750p	2.542	2.26	1.42
5.17	161.98	4.63	15.000a	2.750p	2.583	2.26	1.33
5.25	164.59	4.70	15.000a	2.750p	2.625	2.26	1.25
5.33	167.20	4.78	15.000a	2.750p	2.667	2.26	1.17
5.42	169.81	4.85	15.000a	2.750p	2.708	2.26	1.08
5.50	172.43	4.93	15.000a	2.750p	2.750	2.26	1.00
5.58	175.04	5.00	15.000a	2.750p	2.792	2.26	0.92
5.67	177.65	5.07	15.000a	2.750p	2.833	2.26	0.83
5.75	180.26	5.15	15.000a	2.750p	2.875	2.26	0.75
5.83	182.88	5.22	15.000a	2.750p	2.917	2.26	0.67
5.92	185.49	5.30	15.000a	2.750p	2.958	2.26	0.58
6.00	188.10	5.37	15.000a	2.750p	3.000	2.26	0.50
6.08	190.71	5.45	15.000a	2.750p	3.042	2.26	0.42
6.17	193.33	5.52	15.000a	2.750p	3.083	2.26	0.33
6.25	195.94	5.60	15.000a	2.750p	3.125	2.26	0.25
6.33	198.55	5.67	15.000a	2.750p	3.167	2.26	0.17
6.42	201.16	5.75	15.000a	2.750p	3.208	2.26	0.08
FULL	203.78	5.82	15.000a	2.750p	3.250	0.00	0.00

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT TANK SOUNDINGS TABLE

ALT 0 -MJC

Tank Soundings for FO.P containing DIESEL OIL (0.870)

No Trim, No Heel

Sounding (ft)	Volume (ft ³)	Weight (LT)	LCG (ft)	TCG (ft)	VCG (ft)	FSM (LT-ft)	Ullage (ft)
0.00	0.00	0.00	0.000	0.000	0.000	0.00	6.50
0.08	0.87	0.02	19.000a	2.750p	0.042	0.64	6.42
0.17	1.74	0.04	19.000a	2.750p	0.083	0.64	6.33
0.25	2.61	0.06	19.000a	2.750p	0.125	0.64	6.25
0.33	3.48	0.08	19.000a	2.750p	0.167	0.64	6.17
0.42	4.35	0.11	19.000a	2.750p	0.208	0.64	6.08
0.50	5.22	0.13	19.000a	2.750p	0.250	0.64	6.00
0.58	6.10	0.15	19.000a	2.750p	0.292	0.64	5.92
0.67	6.97	0.17	19.000a	2.750p	0.333	0.64	5.83
0.75	7.84	0.19	19.000a	2.750p	0.375	0.64	5.75
0.83	8.71	0.21	19.000a	2.750p	0.417	0.64	5.67
0.92	9.58	0.23	19.000a	2.750p	0.458	0.64	5.58
1.00	10.45	0.25	19.000a	2.750p	0.500	0.64	5.50
1.08	11.32	0.27	19.000a	2.750p	0.542	0.64	5.42
1.17	12.19	0.30	19.000a	2.750p	0.583	0.64	5.33
1.25	13.06	0.32	19.000a	2.750p	0.625	0.64	5.25
1.33	13.93	0.34	19.000a	2.750p	0.667	0.64	5.17
1.42	14.80	0.36	19.000a	2.750p	0.708	0.64	5.08
1.50	15.68	0.38	19.000a	2.750p	0.750	0.64	5.00
1.58	16.55	0.40	19.000a	2.750p	0.792	0.64	4.92
1.67	17.42	0.42	19.000a	2.750p	0.833	0.64	4.83
1.75	18.29	0.44	19.000a	2.750p	0.875	0.64	4.75
1.83	19.16	0.46	19.000a	2.750p	0.917	0.64	4.67
1.92	20.03	0.49	19.000a	2.750p	0.958	0.64	4.58
2.00	20.90	0.51	19.000a	2.750p	1.000	0.64	4.50
2.08	21.77	0.53	19.000a	2.750p	1.042	0.64	4.42
2.17	22.64	0.55	19.000a	2.750p	1.083	0.64	4.33
2.25	23.51	0.57	19.000a	2.750p	1.125	0.64	4.25
2.33	24.38	0.59	19.000a	2.750p	1.167	0.64	4.17
2.42	25.25	0.61	19.000a	2.750p	1.208	0.64	4.08
2.50	26.13	0.63	19.000a	2.750p	1.250	0.64	4.00
2.58	27.00	0.65	19.000a	2.750p	1.292	0.64	3.92
2.67	27.87	0.68	19.000a	2.750p	1.333	0.64	3.83
2.75	28.74	0.70	19.000a	2.750p	1.375	0.64	3.75
2.83	29.61	0.72	19.000a	2.750p	1.417	0.64	3.67
2.92	30.48	0.74	19.000a	2.750p	1.458	0.64	3.58
3.00	31.35	0.76	19.000a	2.750p	1.500	0.64	3.50
3.08	32.22	0.78	19.000a	2.750p	1.542	0.64	3.42
3.17	33.12	0.80	19.000a	2.750p	1.585	0.64	3.33
3.25	33.96	0.82	19.000a	2.750p	1.625	0.64	3.25
3.33	34.81	0.84	19.000a	2.750p	1.665	0.64	3.17
3.42	35.70	0.87	19.000a	2.750p	1.708	0.64	3.08
3.50	36.58	0.89	19.000a	2.750p	1.750	0.64	3.00
3.58	37.45	0.91	19.000a	2.750p	1.792	0.64	2.92
3.67	38.32	0.93	19.000a	2.750p	1.833	0.64	2.83
3.75	39.19	0.95	19.000a	2.750p	1.875	0.64	2.75
3.83	40.06	0.97	19.000a	2.750p	1.917	0.64	2.67
3.92	40.93	0.99	19.000a	2.750p	1.958	0.64	2.58
4.00	41.80	1.01	19.000a	2.750p	2.000	0.64	2.50
4.08	42.67	1.03	19.000a	2.750p	2.042	0.64	2.42

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT TANK SOUNDINGS TABLE

ALT 0 -MJC

4.17	43.54	1.06	19.000a	2.750p	2.083	0.64	2.33
4.25	44.41	1.08	19.000a	2.750p	2.125	0.64	2.25
4.33	45.28	1.10	19.000a	2.750p	2.167	0.64	2.17
4.42	46.15	1.12	19.000a	2.750p	2.208	0.64	2.08
4.50	47.02	1.14	19.000a	2.750p	2.250	0.64	2.00
4.58	47.90	1.16	19.000a	2.750p	2.292	0.64	1.92
4.67	48.77	1.18	19.000a	2.750p	2.333	0.64	1.83
4.75	49.64	1.20	19.000a	2.750p	2.375	0.64	1.75
4.83	50.51	1.22	19.000a	2.750p	2.417	0.64	1.67
4.92	51.38	1.25	19.000a	2.750p	2.458	0.64	1.58
5.00	52.25	1.27	19.000a	2.750p	2.500	0.64	1.50
5.08	53.12	1.29	19.000a	2.750p	2.542	0.64	1.42
5.17	53.99	1.31	19.000a	2.750p	2.583	0.64	1.33
5.25	54.86	1.33	19.000a	2.750p	2.625	0.64	1.25
5.33	55.73	1.35	19.000a	2.750p	2.667	0.64	1.17
5.42	56.60	1.37	19.000a	2.750p	2.708	0.64	1.08
5.50	57.47	1.39	19.000a	2.750p	2.750	0.64	1.00
5.58	58.35	1.41	19.000a	2.750p	2.792	0.64	0.92
5.67	59.22	1.44	19.000a	2.750p	2.833	0.64	0.83
5.75	60.09	1.46	19.000a	2.750p	2.875	0.64	0.75
5.83	60.96	1.48	19.000a	2.750p	2.917	0.64	0.67
5.92	61.83	1.50	19.000a	2.750p	2.958	0.64	0.58
6.00	62.70	1.52	19.000a	2.750p	3.000	0.64	0.50
6.08	63.57	1.54	19.000a	2.750p	3.042	0.64	0.42
6.17	64.44	1.56	19.000a	2.750p	3.083	0.64	0.33
6.25	65.31	1.58	19.000a	2.750p	3.125	0.64	0.25
6.33	66.18	1.60	19.000a	2.750p	3.167	0.64	0.17
6.42	67.05	1.63	19.000a	2.750p	3.208	0.64	0.08
FULL	67.93	1.65	19.000a	2.750p	3.250	0.00	0.00

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT TANK SOUNDINGS TABLE

ALT 0 -MJC

Tank Soundings for AFT BALLAST.P containing SEA WATER (1.025)

No Trim, No Heel

Sounding (ft)	Volume (ft ³)	Weight (LT)	LCG (ft)	TCG (ft)	VCG (ft)	FSM (LT-ft)	Ullage (ft)
0.00	0.00	0.00	0.000	0.000	0.000	0.00	6.50
0.08	0.34	0.01	34.463a	1.600p	0.056	0.24	6.42
0.17	0.71	0.02	34.551a	1.677p	0.103	0.34	6.33
0.25	1.31	0.04	34.644a	1.792p	0.163	0.51	6.25
0.33	1.90	0.05	34.710a	1.893p	0.212	0.68	6.17
0.42	2.63	0.08	34.773a	2.003p	0.264	0.91	6.08
0.50	3.50	0.10	34.833a	2.116p	0.319	1.20	6.00
0.58	4.52	0.13	34.880a	2.249p	0.374	1.56	5.92
0.67	5.63	0.16	34.914a	2.401p	0.428	1.99	5.83
0.75	6.98	0.20	34.953a	2.558p	0.487	2.39	5.75
0.83	8.35	0.24	34.992a	2.689p	0.541	2.79	5.67
0.92	9.86	0.28	35.033a	2.814p	0.595	3.25	5.58
1.00	11.52	0.33	35.076a	2.925p	0.651	3.66	5.50
1.08	13.33	0.38	35.122a	3.023p	0.706	4.15	5.42
1.17	15.23	0.44	35.158a	3.126p	0.761	4.66	5.33
1.25	17.26	0.49	35.195a	3.225p	0.816	5.21	5.25
1.33	19.42	0.55	35.234a	3.312p	0.870	5.45	5.17
1.42	21.70	0.62	35.275a	3.385p	0.925	5.73	5.08
1.50	24.19	0.69	35.320a	3.451p	0.982	6.07	5.00
1.58	26.70	0.76	35.365a	3.506p	1.036	6.47	4.92
1.67	29.36	0.84	35.409a	3.560p	1.091	6.93	4.83
1.75	32.11	0.92	35.450a	3.617p	1.145	7.42	4.75
1.83	35.00	1.00	35.493a	3.671p	1.200	7.86	4.67
1.92	38.02	1.09	35.536a	3.720p	1.255	8.12	4.58
2.00	41.17	1.18	35.581a	3.764p	1.310	8.42	4.50
2.08	44.44	1.27	35.627a	3.804p	1.365	8.79	4.42
2.17	47.86	1.37	35.675a	3.840p	1.420	9.24	4.33
2.25	51.38	1.47	35.720a	3.878p	1.475	9.71	4.25
2.33	55.11	1.57	35.765a	3.918p	1.531	10.11	4.17
2.42	58.82	1.68	35.808a	3.954p	1.585	10.29	4.08
2.50	62.63	1.79	35.851a	3.988p	1.639	10.49	4.00
2.58	66.53	1.90	35.892a	4.020p	1.693	10.71	3.92
2.67	70.54	2.02	35.933a	4.051p	1.747	10.97	3.83
2.75	74.65	2.13	35.973a	4.083p	1.800	11.28	3.75
2.83	78.85	2.25	36.012a	4.115p	1.853	11.56	3.67
2.92	83.12	2.37	36.049a	4.145p	1.906	11.66	3.58
3.00	87.55	2.50	36.086a	4.175p	1.960	11.78	3.50
3.08	91.88	2.62	36.119a	4.202p	2.012	11.92	3.42
3.17	96.29	2.75	36.152a	4.229p	2.063	12.10	3.33
3.25	100.77	2.88	36.184a	4.256p	2.114	12.32	3.25
3.33	105.34	3.01	36.215a	4.283p	2.166	12.61	3.17
3.42	110.04	3.14	36.245a	4.312p	2.217	13.11	3.08
3.50	114.68	3.28	36.275a	4.342p	2.268	13.57	3.00
3.58	119.43	3.41	36.304a	4.371p	2.319	13.57	2.92
3.67	124.18	3.55	36.331a	4.397p	2.369	13.57	2.83
3.75	128.93	3.68	36.355a	4.421p	2.419	13.57	2.75
3.83	133.68	3.82	36.378a	4.443p	2.467	13.57	2.67
3.92	138.43	3.95	36.400a	4.463p	2.516	13.57	2.58
4.00	143.18	4.09	36.420a	4.482p	2.564	13.57	2.50
4.08	147.93	4.23	36.438a	4.499p	2.611	13.57	2.42

D&L#1393 45.5'x20'x6.5' ASSIST PUSHBOAT TANK SOUNDINGS TABLE

ALT 0 -MJC

4.17	152.68	4.36	36.456a	4.515p	2.658	13.57	2.33
4.25	157.43	4.50	36.472a	4.530p	2.705	13.57	2.25
4.33	162.18	4.63	36.488a	4.544p	2.752	13.57	2.17
4.42	166.93	4.77	36.502a	4.558p	2.798	13.57	2.08
4.50	171.68	4.90	36.516a	4.570p	2.844	13.57	2.00
4.58	176.43	5.04	36.529a	4.582p	2.890	13.57	1.92
4.67	181.18	5.18	36.541a	4.593p	2.935	13.57	1.83
4.75	185.93	5.31	36.553a	4.604p	2.980	13.57	1.75
4.83	190.68	5.45	36.564a	4.614p	3.026	13.57	1.67
4.92	195.43	5.58	36.575a	4.623p	3.070	13.57	1.58
5.00	200.18	5.72	36.585a	4.633p	3.115	13.57	1.50
5.08	204.93	5.85	36.594a	4.641p	3.160	13.57	1.42
5.17	209.68	5.99	36.604a	4.649p	3.204	13.57	1.33
5.25	214.43	6.13	36.612a	4.657p	3.249	13.57	1.25
5.33	219.18	6.26	36.621a	4.665p	3.293	13.57	1.17
5.42	223.93	6.40	36.629a	4.672p	3.337	13.57	1.08
5.50	228.68	6.53	36.637a	4.679p	3.381	13.57	1.00
5.58	233.43	6.67	36.644a	4.685p	3.425	13.57	0.92
5.67	238.18	6.80	36.651a	4.692p	3.469	13.57	0.83
5.75	242.93	6.94	36.658a	4.698p	3.513	13.57	0.75
5.83	247.68	7.08	36.664a	4.704p	3.557	13.57	0.67
5.92	252.43	7.21	36.671a	4.709p	3.600	13.57	0.58
6.00	257.18	7.35	36.677a	4.715p	3.644	13.57	0.50
6.08	261.93	7.48	36.683a	4.720p	3.687	13.57	0.42
6.17	266.68	7.62	36.688a	4.725p	3.731	13.57	0.33
6.25	271.43	7.75	36.694a	4.730p	3.774	13.57	0.25
6.33	276.18	7.89	36.699a	4.735p	3.817	13.57	0.17
6.42	280.93	8.03	36.704a	4.739p	3.861	13.57	0.08
FULL	285.68	8.16	36.709a	4.743p	3.904	0.00	0.00