

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Bid Receiving - PWGSC / Réception des soumissions
- TPSGC
11 Laurier St. / 11, rue Laurier
Place du Portage, Phase III
Core 0B2 / Noyau 0B2
Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

SOLICITATION AMENDMENT MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Ship Refits and Conversions / Radoubss et
modifications de navires and / et
11 Laurier St. / 11, rue Laurier
6C2, Place du Portage
Gatineau, Québec K1A 0S5

Title - Sujet CCGS Earl Grey VLE Refit	
Solicitation No. - N° de l'invitation F7049-140284/A	Amendment No. - N° modif. 002
Client Reference No. - N° de référence du client F7049-140284	Date 2015-01-05
GETS Reference No. - N° de référence de SEAG PW-\$\$MD-031-24859	
File No. - N° de dossier 031md.F7049-140284	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-02-03	Time Zone Fuseau horaire Eastern Standard Time EST
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Bilodeau, Allen	Buyer Id - Id de l'acheteur 031md
Telephone No. - N° de téléphone (819) 956-5950 ()	FAX No. - N° de FAX () -
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Solicitation No. - N° de l'invitation

F7049-140284/A

Amd. No. - N° de la modif.

002

Buyer ID - Id de l'acheteur

031md

Client Ref. No. - N° de réf. du client

F7049-140284

File No. - N° du dossier

031mdF7049-140284

CCC No./N° CCC - FMS No/ N° VME

**Please refer to the following Question and Answer #2 and attached
CCGS Earl Grey Stability Booklets**

C.C.G.S. EARL GREY
STABILITY IN FLOODED CONDITIONS

APPROVALS:

Transport Canada	Transports Canada
<p>APPROVED APPROUVÉ</p> <p>ON THE AUTHORITY OF THE CANADA SHIPPING ACT AND REGULATIONS MADE THEREUNDER. EN VERTU DE LA LOI SUR LA MARINE MARCHANDE DU CANADA ET DES RÈGLEMENTS CONNEXES.</p>	
<p>ON BEHALF OF THE BOARD OF STEAMSHIP INSPECTION, DEPARTMENT OF TRANSPORT. POUR LE COMPTE DU BUREAU D'INSPECTION DES NAVIRES À VAPEUR, MINISTÈRE DES TRANSPORTS.</p>	
<p>14 JUL 1987 DATE</p>	

"SUBJECT TO THE OWNER, HIS SHIPBUILDER OR NAVAL ARCHITECT BEING RESPONSIBLE FOR THE ACCURACY OF THE DESIGN OPERATING CONDITIONS PRESENTED HEREIN AND OF THE BASIC DATA FROM WHICH SUCH CONDITIONS WERE DEVELOPED. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND MASTER TO ENSURE THAT A PROPER MEASURE OF STABILITY IS MAINTAINED FOR ALL CONDITIONS OF LOADING AND BALLASTING."

"SOUS RÉSERVE QUE LE PROPRIÉTAIRE, SONT ARCHITECTE NAVAL OU LE CONSTRUCTEUR DE NAVIRES SON RESPONSABLES DE L'EXACTITUDE DES CONDITIONS D'EXPLOITATION SOUMISES ET DES DONNÉES DE BASES D'APRÈS LESQUELLES LES CONDITIONS SONT ÉLABORÉES IL INCOMBE AU PROPRIÉTAIRE ET AU CAPITAINE DE MAINTENIR UN DEGRÉ APPROPRIÉ DE STABILITÉ DANS TOUTES LES CONDITIONS DE CHARGEMENT ET DE LESTAGE."

SUBJECT TO THE ANGLE OF DOWN-FLOODING BEING IN EXCESS OF 40°

SOUS RÉSERVE QUE L'ANGLE CRITIQUE D'ENVAHISSEMENT SOIT SUPÉRIEUR À 40°

ALL OPENINGS IN THAT PART OF THE SUPERSTRUCTURE, THE VOLUME OF WHICH IS INCLUDED IN THE COMPUTATION OF THE CROSS CURVES OF STABILITY, ARE TO BE FITTED WITH WEATHERTIGHT CLOSING APPLIANCES.

TOUTES LES OUVERTURES DE CETTE PARTIE DE LA SUPERSTRUCTURE, DONT LE VOLUME EST COMPRIS DANS LE CALCUL DES ABQUES DE STABILITÉ, DOIVENT ÊTRE MUNIES DE DISPOSITIFS DE FERMETURE ÉTANCHE.

C.C.G.S. EARL GREY

HULL NO.
218

DATE:
APR. 1987

PAGE:
1 OF 10

STABILITY IN FLOODED
CONDITIONS



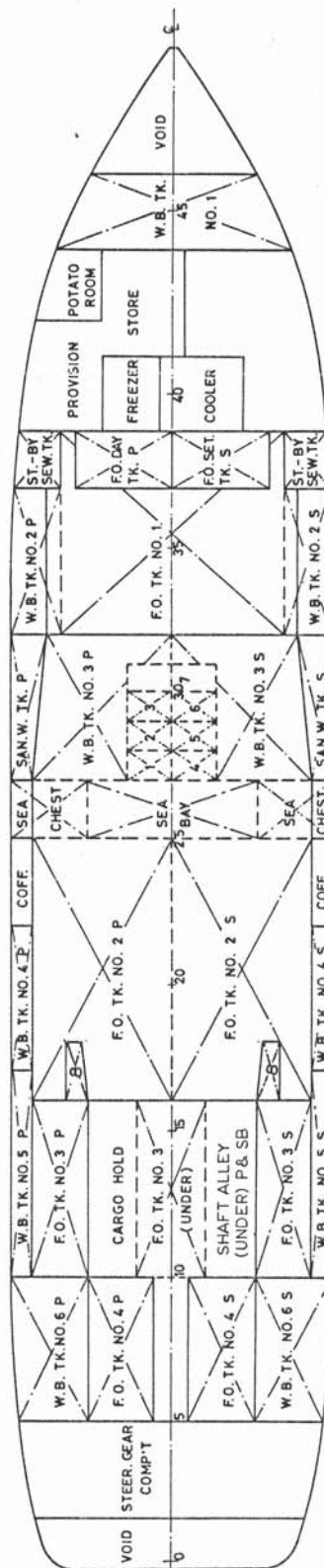
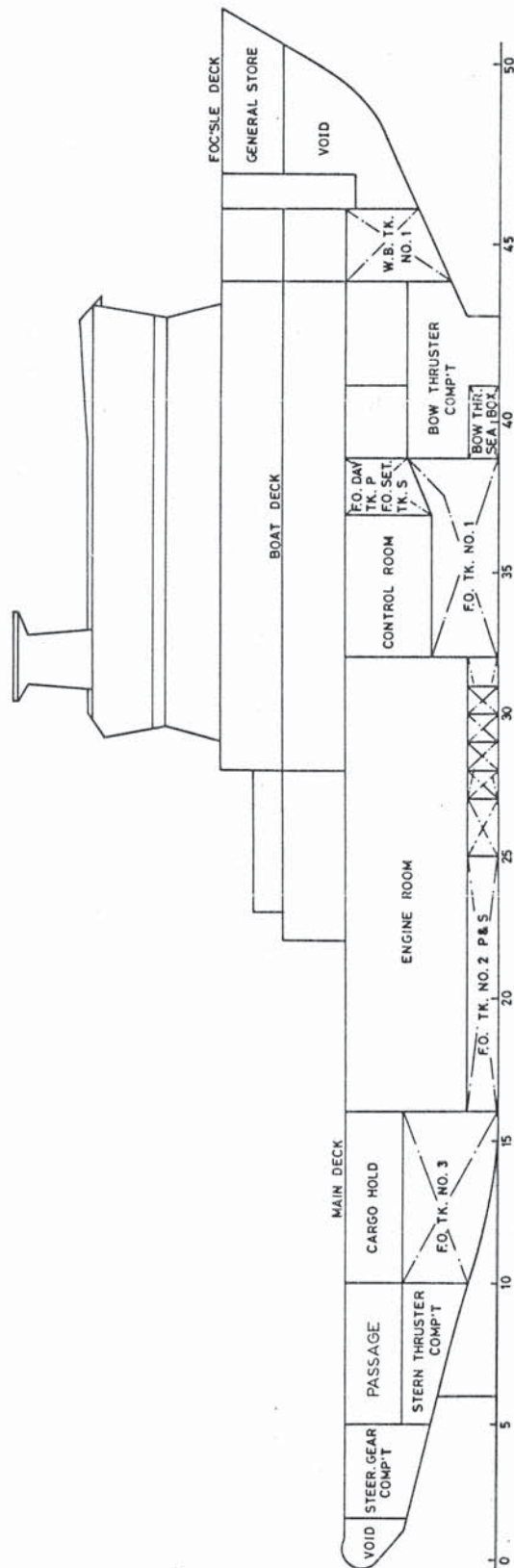
PORT WELLER DRY DOCKS
A DIVISION OF ULS
INTERNATIONAL INC.
ST. CATHARINES ONTARIO

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY HULL NO. 218 STABILITY IN FLOODED CONDITIONS	PAGE: 2 OF 10
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Appendix 'A; - Capacity Tables



- 1 - WASTE OIL TK.
- 2 - USED L.O. TK.
- 3 - F.W. DRAIN TK.
- 4 - DIRTY OIL TK.
- 5 - FUEL OVERFLOW TK.
- 6 - OILY WATER WASTE TK.
- 7 - TRANSDUCER COMP.

8 - FIRE PUMP SEA CHEST
P & SB

C.C.G.S. EARL GREY	HULL NO. 218	PAGE: 3 OF 10
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GENERAL ARRANGEMENT

PORT WELLS DRY DOCKS
A DIVISION OF ULS
INTERNATIONAL INC.

ST. CATHARINES

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY HULL NO. 218 STABILITY IN FLOODED CONDITIONS	PAGE: 4 OF 10
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2. Flooding Calculations

Flooding calculations were performed for loading conditions presented in 'Stability Information Booklet', which, in our opinion, can be engaged in towing.

There are two main watertight compartments aft of engine room which can be flooded when the towing is underway:

1. Steering gear compartment FR. 1-5, which can be flooded through access hatch.
2. Cargo hold, stern thruster compartment, shaft alley P & SB, which can be flooded through cargo hatch.

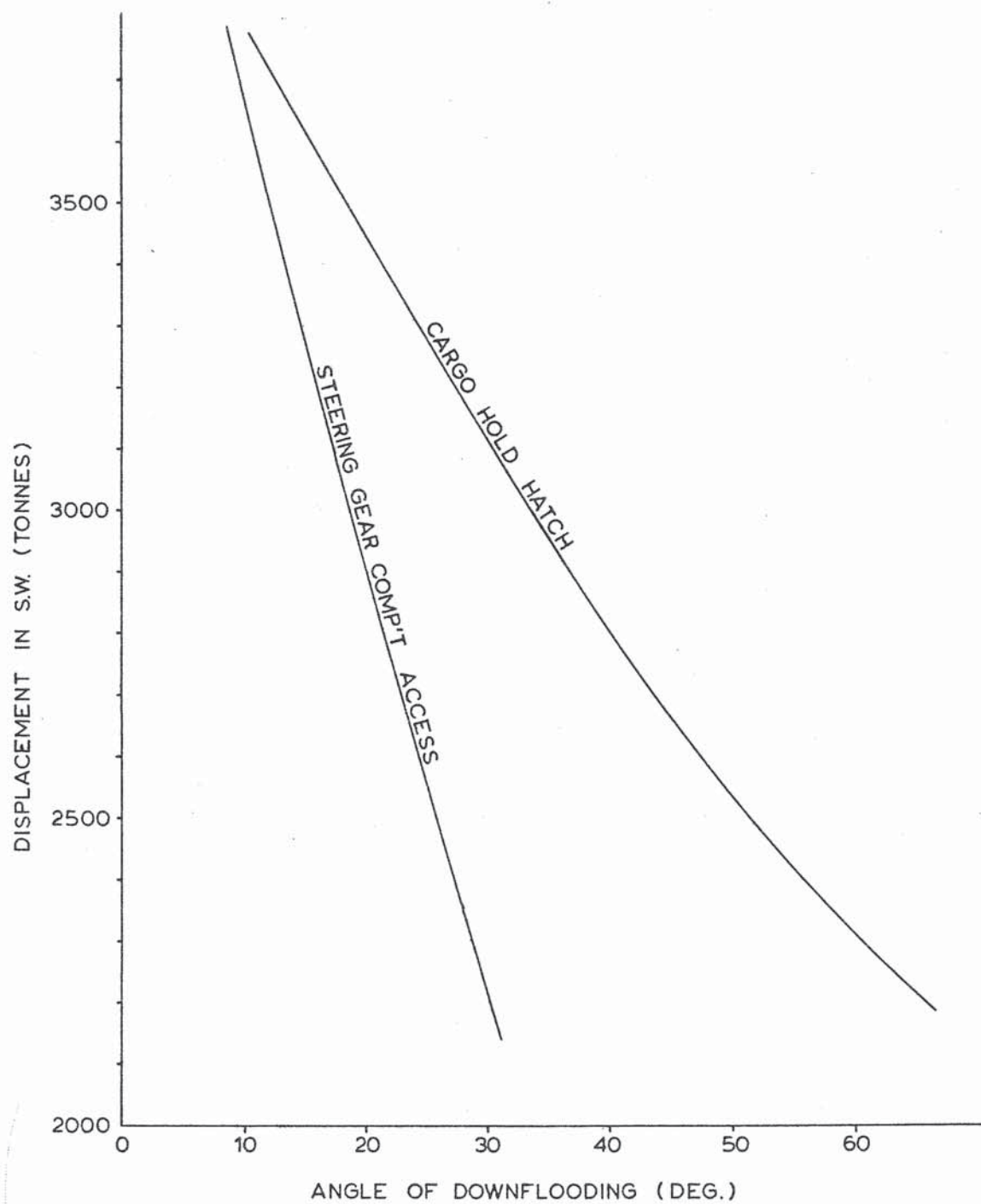
Both of these compartments were completely flooded and free surface effect were taken into account.

All loading conditions which can be engaged in towing were investigated for freeboard and metacentric height in final stage of flooding.

All cases of flooding were found to meet the survival criteria as follows:

- a) The vessel has positive stability and,
- b) The deck edge of any part of the vessel is not submerged.

3. ANGLE OF DOWNFLOODING CURVES.



4. Flooding Cases

Flooding Case	Flooded Compartments	Permability
1	Steering Gear Comp't. FR. 1-5	0.98
2.	Cargo Hold & Passage FR. 5-16	0.98
	Stern Thruster Comp't. FR. 5-10	1.00
	Shaft Alley P FR. 10-16	1.00
	Shaft Alley S FR. 10-16	1.00

5. Summary of Flooded Conditions

Flooded Case No. 1

Cond. No.*	Angle of Heel	Reduct. in Freebd.	Reduct. in GM Fluid	GZ at 30°	Cond. No.	Angle of Heel	Reduct. in Freebd.	Reduct. in GM Fluid	GZ at 30°
	Deg.	m	m	m		Deg.	m	m	m
1001	0	0.115	0.203	0.472	1011	0	0.127	0.210	0.556
1002	0	0.120	0.207	0.468	1012	0	0.120	0.209	0.540
1007	0	0.116	0.211	0.465	1013	0	0.125	0.211	0.522
1008	0	0.114	0.210	0.427	1014	0	0.120	0.212	0.482

* Condition No. correspond to number of conditions in "Stability Information Booklet".

► Indicates flooded conditions presented in this book.

Flooded Case No. 2

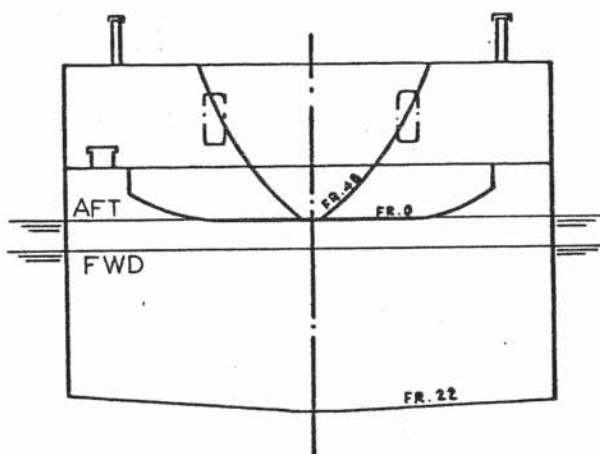
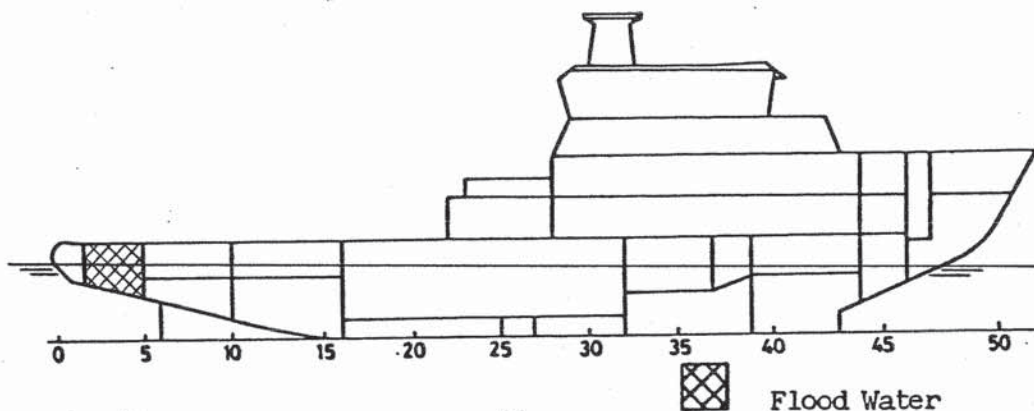
Cond. No.	Angle of Heel	Reduct. in Freebd.	Reduct. in GM Fluid	GZ at 30°	Cond. No.	Angle of Heel	Reduct. in Freebd.	Reduct. in GM Fluid	GZ at 30°
	Deg.	m	m	m		Deg.	m	m	m
1001	0	0.297	-0.096	0.444	1011	0	0.309	-0.120	0.537
1002	0	0.306	-0.134	0.451	1012	0	0.306	-0.122	0.519
1007	0	0.297	-0.143	0.435	1013	0	0.307	-0.119	0.504
1008	0	0.296	-0.093	0.401	1014	0	0.307	-0.124	0.463

STABILITY IN FLOODED CONDITIONS

CONDITION NO. 1014 Max. Deck Cargo, Arrival, 10% Consum.
+ 30 Days (Arctic)

FLOODED CASE NO. 1 (Greatest reduction in Metacentric Height)

NOTE: For Description of Tanks See "General Arrangement" Page 3.



INTACT CONDITION NO. 1014

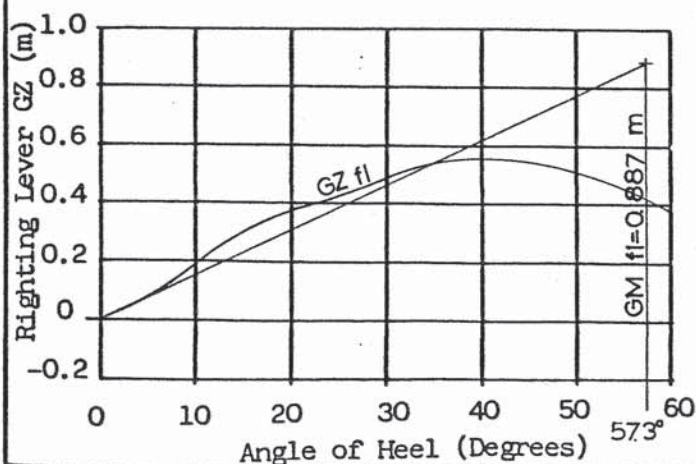
Deadweight	383.1 t
Displacement	2604.9 t
Mean Draft at L.C.F.	4.835 m
Trim By Bow	0.143 m

Flooded CONDITION CASE 1

Flood Water	120.0 t
Apparent Displ. Flooded	2724.9 t
Draft Aft at A.P. Ext.	5.357 m
Draft Fwd at F.P. Ext.	4.542 m
Trim By Stern	0.815 m
Angle of Heel	0

Distance of Flooded Waterline

To Deck Edge	1.382 m
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Area Under GZ Curve:

Up to 30°	-0.145 MR
Up to 40°	-0.237 MR
Between 30°-40°	-0.092 MR
GZ at 30°	-0.482 m

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY HULL NO. 218 STABILITY IN FLOODED CONDITIONS	PAGE: 8 OF 10						
<p>6. <u>Flooded Conditions</u></p> <table><thead><tr><th></th><th><u>PAGE</u></th></tr></thead><tbody><tr><td>1. Flooded Condition, Case No. 1</td><td>9</td></tr><tr><td>2. Flooded Condition, Case No. 2</td><td>10</td></tr></tbody></table>				<u>PAGE</u>	1. Flooded Condition, Case No. 1	9	2. Flooded Condition, Case No. 2	10
	<u>PAGE</u>							
1. Flooded Condition, Case No. 1	9							
2. Flooded Condition, Case No. 2	10							

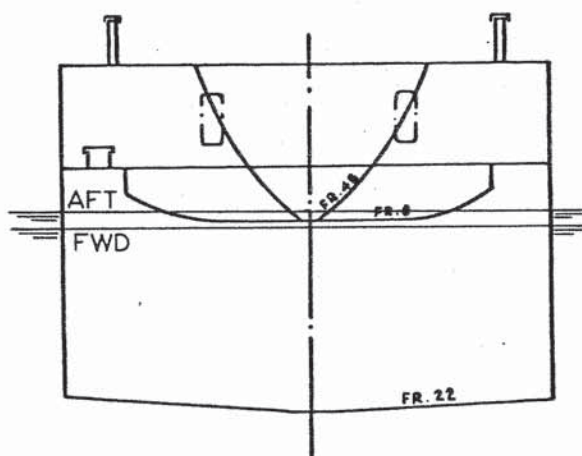
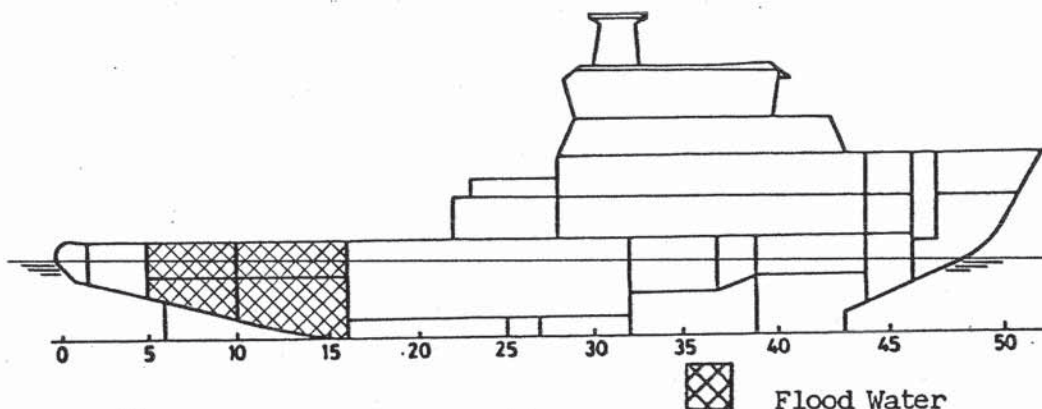
APPENDIX 'A'

C.C.G.S. EARL GREY	HULL NO. 218	DATE: APR 1987	PAGE: 1 OF 7
CAPACITY TABLES	 PORT WELLER DRY DOCKS A DIVISION OF ULS INTERNATIONAL INC. ST. CATHARINES ONTARIO		

CONDITION NO. 1011 Ballast Departure, 70% Consum. (Arctic)

FLOODED CASE NO. 2 (Greatest reduction in Freeboard)

NOTE: For Description of Tanks See "General Arrangement" Page 3.



INTACT CONDITION NO. 1011

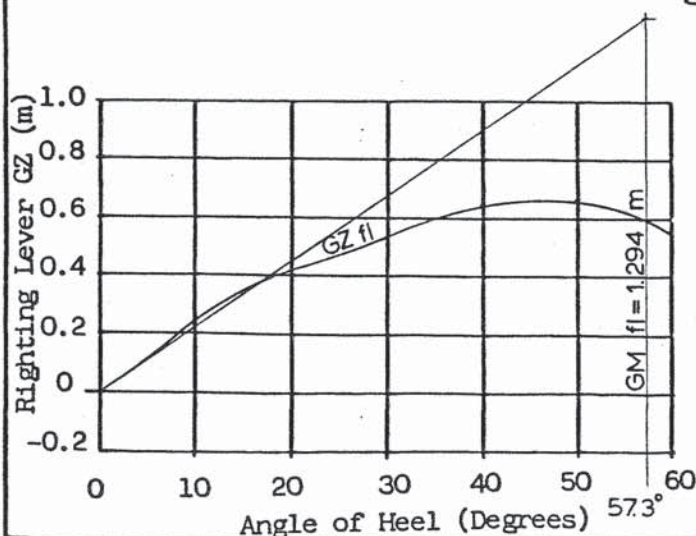
Deadweight	538.8 t
Displacement	2760.6 t
Mean Draft at L.C.F.	5.030 m
Trim By	0.696 m

Flooded CONDITION CASE 2

Flood Water	270.8 t
Apparent Displ. Flooded	3031.4 t
Draft Aft at A.P. Ext.	5.594 m
Draft Fwd at F.P. Ext.	5.127 m
Trim By Stern	0.467 m
Angle of Heel	0

Distance of Flooded Waterline

To Deck Edge	1.147 m
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Area Under GZ Curve:

Up to 30°	-0.165 MR
Up to 40°	-0.269 MR
Between 30° - 40°	-0.104 MR
GZ at 30°	-0.537 m

PORT WELLER DRY DOCKS	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
ST. CATH. ONTARIO	CAPACITY TABLES		3 OF 7

C. C. G. S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
STEERING GEAR COMP'T FR. 1-5
COMP. NO 203
PERMEABILITY 0.9700

, LEVEL FROM		VOLUME	CENTRE OF GRAVITY FROM			INERTIA
BL	BOTTOM	CUBM	LPP/2	BL	CL	MOMENT
3.287	0.000	0.0				
3.387	0.100	0.031	-25.501	3.342	-0.000	0.098
3.487	0.200	0.142	-25.813	3.427	-0.000	0.498
3.587	0.300	0.379	-25.960	3.499	-0.000	1.421
3.687	0.400	0.770	-26.096	3.571	-0.000	3.271
3.787	0.500	1.405	-26.295	3.648	-0.000	6.565
3.887	0.600	2.337	-26.518	3.725	-0.000	12.051
3.987	0.700	3.603	-26.723	3.800	-0.000	20.361
4.087	0.800	5.155	-26.862	3.872	-0.000	32.250
4.187	0.900	6.993	-26.962	3.942	-0.000	48.427
4.287	1.000	9.118	-27.038	4.011	-0.000	69.622
4.387	1.100	11.530	-27.096	4.079	-0.000	96.564
4.487	1.200	14.229	-27.143	4.147	-0.000	129.982
4.587	1.300	17.216	-27.182	4.215	-0.000	170.591
4.687	1.400	20.489	-27.214	4.283	-0.000	219.131
4.787	1.500	24.050	-27.241	4.350	-0.000	276.071
4.887	1.600	27.897	-27.264	4.417	-0.000	342.204
4.987	1.700	32.024	-27.284	4.484	-0.000	412.493
5.087	1.800	36.407	-27.303	4.551	-0.000	475.086
5.187	1.900	41.002	-27.321	4.617	-0.000	533.047
5.287	2.000	45.771	-27.340	4.681	-0.000	576.887
5.387	2.100	50.654	-27.357	4.745	-0.000	605.752
5.487	2.200	55.612	-27.372	4.806	-0.000	630.947
5.587	2.300	60.639	-27.386	4.867	-0.000	656.136
5.687	2.400	65.734	-27.398	4.927	-0.000	681.198
5.787	2.500	70.893	-27.409	4.986	-0.000	706.710
5.887	2.600	76.118	-27.418	5.044	-0.000	733.432
5.987	2.700	81.410	-27.427	5.102	-0.000	760.911
6.087	2.800	86.743	-27.435	5.160	-0.000	764.495
6.187	2.900	92.077	-27.443	5.216	-0.000	764.484
6.287	3.000	97.410	-27.449	5.272	-0.000	764.493
6.387	3.100	102.744	-27.455	5.327	-0.000	764.505
6.487	3.200	108.077	-27.460	5.382	-0.000	764.516
6.587	3.300	113.411	-27.464	5.437	-0.000	764.513
6.687	3.400	118.745	-27.469	5.490	-0.000	764.508
6.700	3.413	119.432	-27.469	5.497	-0.000	

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
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CAPACITY TABLES

C. C. G. S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
STERN THRUSTER COMP'T FR. 5-10
COMP. NO 143
PERMEABILITY 0.9700

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM		INERTIA MOMENT
BL	BOTTOM		LPP/2	BL CL	
1.377	0.000	0.0			
1.477	0.100	0.034	-19.251	1.431 0.000	0.075
1.577	0.200	0.073	-19.251	1.492 0.000	0.075
1.677	0.300	0.156	-19.473	1.568 0.000	0.268
1.777	0.400	0.346	-19.693	1.656 0.000	0.377
1.877	0.500	0.540	-19.758	1.717 0.000	0.377
1.977	0.600	0.779	-19.849	1.783 -0.000	0.528
2.077	0.700	1.049	-19.925	1.846 -0.000	0.528
2.177	0.800	1.321	-19.971	1.904 -0.000	0.614
2.277	0.900	1.729	-20.127	1.980 -0.000	0.829
2.377	1.000	2.154	-20.234	2.049 -0.000	0.829
2.477	1.100	2.604	-20.326	2.115 -0.000	0.927
2.577	1.200	3.105	-20.423	2.181 -0.000	0.980
2.677	1.300	3.608	-20.494	2.243 -0.000	0.980
2.777	1.400	4.241	-20.629	2.316 -0.000	1.282
2.877	1.500	4.898	-20.740	2.384 -0.000	1.282
2.977	1.600	5.602	-20.850	2.453 -0.000	1.432
3.077	1.700	6.336	-20.951	2.519 -0.000	1.432
3.177	1.800	7.162	-21.077	2.590 -0.000	1.725
3.277	1.900	8.051	-21.206	2.660 -0.000	1.734
3.377	2.000	8.970	-21.322	2.728 -0.000	1.809
3.477	2.100	9.898	-21.421	2.794 -0.000	1.809
3.577	2.200	10.825	-21.503	2.857 -0.000	1.809
3.677	2.300	11.753	-21.572	2.917 -0.000	1.809
3.777	2.400	12.680	-21.630	2.977 -0.000	1.809
3.877	2.500	13.608	-21.681	3.035 -0.000	1.809
3.977	2.600	14.535	-21.725	3.092 -0.000	1.809
4.077	2.700	15.463	-21.764	3.148 -0.000	1.809
4.150	2.773	16.138	-21.790	3.188 -0.000	

C. C. G. S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
 CARCO HOLD & PASSAGE FR. 5-16
 COMP. NO 211
 PERMEABILITY 0.9700

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM			INERTIA MOMENT
BL	BOTTOM		LPP/2	BL	CL	
4.158	0.000	0.0				
4.258	0.100	6.073	-16.557	4.208	0.000	215.545
4.358	0.200	12.145	-16.557	4.258	0.000	215.545
4.458	0.300	18.218	-16.557	4.308	0.000	215.545
4.558	0.400	24.291	-16.557	4.358	0.000	215.545
4.658	0.500	30.363	-16.557	4.408	0.000	215.545
4.758	0.600	36.436	-16.557	4.458	0.000	215.545
4.858	0.700	42.509	-16.557	4.508	0.000	215.545
4.958	0.800	48.581	-16.557	4.558	0.000	215.545
5.058	0.900	54.654	-16.557	4.608	0.000	215.545
5.158	1.000	60.727	-16.557	4.658	0.000	215.545
5.258	1.100	66.799	-16.557	4.708	0.000	215.545
5.358	1.200	72.872	-16.557	4.758	0.000	215.545
5.458	1.300	78.945	-16.557	4.808	0.000	215.545
5.558	1.400	85.017	-16.557	4.858	0.000	215.545
5.658	1.500	91.090	-16.557	4.908	0.000	215.545
5.758	1.600	97.163	-16.557	4.958	0.000	215.545
5.858	1.700	103.235	-16.557	5.008	0.000	215.545
5.958	1.800	109.308	-16.557	5.058	0.000	215.545
6.058	1.900	115.381	-16.557	5.108	0.000	215.545
6.158	2.000	121.453	-16.557	5.158	0.000	215.545
6.258	2.100	127.526	-16.557	5.208	0.000	215.545
6.358	2.200	133.599	-16.557	5.258	0.000	215.545
6.458	2.300	139.671	-16.557	5.308	0.000	215.545
6.558	2.400	145.744	-16.557	5.358	0.000	215.545
6.658	2.500	151.817	-16.557	5.408	0.000	215.545
6.700	2.542	154.368	-16.557	5.429	-0.000	

CAPACITY TABLES

C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
SHAFT ALLEY FR. 10-16 P
COMP. NO 127
PERMEABILITY 0.9700

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM		INERTIA MOMENT
BL	BOTTOM		LPP/2	BL CL	
0.188	0.000	0.0			
0.288	0.100	0.014	-12.020	0.261 -1.622	0.013
0.388	0.200	0.102	-12.353	0.335 -1.766	0.130
0.488	0.300	0.304	-12.511	0.407 -1.930	0.549
0.588	0.400	0.656	-12.705	0.479 -2.066	1.303
0.688	0.500	1.154	-12.881	0.548 -2.168	1.828
0.788	0.600	1.765	-13.046	0.614 -2.228	2.177
0.888	0.700	2.474	-13.198	0.679 -2.272	2.726
0.988	0.800	3.301	-13.363	0.744 -2.303	3.096
1.088	0.900	4.210	-13.512	0.807 -2.325	3.354
1.188	1.000	5.208	-13.657	0.871 -2.341	3.584
1.288	1.100	6.283	-13.792	0.934 -2.357	3.911
1.388	1.200	7.434	-13.920	0.996 -2.371	4.327
1.488	1.300	8.659	-14.048	1.059 -2.380	4.549
1.588	1.400	9.959	-14.173	1.121 -2.387	4.714
1.688	1.500	11.319	-14.290	1.183 -2.394	4.842
1.788	1.600	12.740	-14.402	1.245 -2.401	5.142
1.888	1.700	14.213	-14.506	1.307 -2.409	5.309
1.988	1.800	15.700	-14.595	1.367 -2.416	5.323
2.088	1.900	17.201	-14.671	1.425 -2.422	5.387
2.188	2.000	18.710	-14.738	1.483 -2.427	5.424
2.288	2.100	20.221	-14.795	1.539 -2.432	5.424
2.388	2.200	21.731	-14.844	1.595 -2.436	5.424
2.488	2.300	23.241	-14.887	1.649 -2.439	5.424
2.588	2.400	24.752	-14.924	1.704 -2.443	5.424
2.688	2.500	26.262	-14.957	1.757 -2.445	5.424
2.788	2.600	27.772	-14.987	1.811 -2.448	5.424
2.888	2.700	29.282	-15.013	1.864 -2.450	5.424
2.988	2.800	30.793	-15.037	1.916 -2.452	5.424
3.088	2.900	32.303	-15.059	1.969 -2.454	5.424
3.188	3.000	33.813	-15.078	2.021 -2.455	5.424
3.288	3.100	35.324	-15.096	2.073 -2.457	5.424
3.388	3.200	36.834	-15.113	2.125 -2.458	5.424
3.488	3.300	38.344	-15.128	2.176 -2.459	5.424
3.588	3.400	39.854	-15.142	2.228 -2.461	5.424
3.688	3.500	41.365	-15.155	2.280 -2.462	5.424
3.788	3.600	42.875	-15.169	2.331 -2.463	5.424
3.888	3.700	44.385	-15.179	2.382 -2.464	5.424
3.988	3.800	45.896	-15.189	2.433 -2.464	5.424
4.088	3.900	47.406	-15.199	2.484 -2.465	5.424
4.150	3.962	48.347	-15.205	2.516 -2.466	

PORT WELLER DRY DOCKS	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
ST. CATH. ONTARIO	CAPACITY TABLES		7 OF 7

C. C. G. S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
 SHAFT ALLEY FR. 10-16 S
 COMP. NO 128
 PERMEABILITY 0.9700

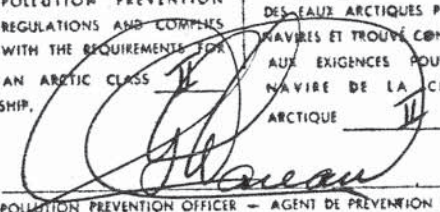
, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM		INERTIA MOMENT
BL	BOTTOM		LPP/2	BL CL	
0.188	0.000	0.0			
0.288	0.100	0.014	-12.020	0.261 1.622	0.013
0.388	0.200	0.102	-12.353	0.335 1.766	0.130
0.488	0.300	0.304	-12.511	0.407 1.930	0.549
0.588	0.400	0.656	-12.705	0.479 2.066	1.303
0.688	0.500	1.154	-12.881	0.548 2.168	1.828
0.788	0.600	1.765	-13.046	0.614 2.228	2.177
0.888	0.700	2.474	-13.198	0.679 2.272	2.726
0.988	0.800	3.301	-13.363	0.744 2.303	3.096
1.088	0.900	4.210	-13.512	0.807 2.325	3.354
1.188	1.000	5.208	-13.657	0.871 2.341	3.584
1.288	1.100	6.283	-13.792	0.934 2.357	3.911
1.388	1.200	7.434	-13.920	0.996 2.371	4.327
1.488	1.300	8.659	-14.048	1.059 2.380	4.549
1.588	1.400	9.959	-14.173	1.121 2.387	4.715
1.688	1.500	11.319	-14.290	1.183 2.394	4.843
1.788	1.600	12.740	-14.402	1.245 2.401	5.142
1.888	1.700	14.213	-14.506	1.307 2.409	5.309
1.988	1.800	15.700	-14.595	1.367 2.416	5.323
2.088	1.900	17.201	-14.671	1.425 2.422	5.388
2.188	2.000	18.710	-14.738	1.483 2.427	5.424
2.288	2.100	20.221	-14.795	1.539 2.432	5.424
2.388	2.200	21.731	-14.844	1.595 2.436	5.424
2.488	2.300	23.241	-14.887	1.649 2.439	5.424
2.588	2.400	24.752	-14.924	1.704 2.443	5.424
2.688	2.500	26.262	-14.957	1.757 2.445	5.424
2.788	2.600	27.772	-14.987	1.811 2.448	5.424
2.888	2.700	29.282	-15.013	1.864 2.450	5.424
2.988	2.800	30.793	-15.037	1.916 2.452	5.424
3.088	2.900	32.303	-15.059	1.969 2.454	5.424
3.188	3.000	33.813	-15.078	2.021 2.455	5.424
3.288	3.100	35.324	-15.096	2.073 2.457	5.424
3.388	3.200	36.834	-15.113	2.125 2.458	5.424
3.488	3.300	38.344	-15.128	2.176 2.459	5.424
3.588	3.400	39.854	-15.142	2.228 2.461	5.424
3.688	3.500	41.365	-15.155	2.280 2.462	5.424
3.788	3.600	42.875	-15.168	2.331 2.463	5.424
3.888	3.700	44.385	-15.179	2.382 2.464	5.424
3.988	3.800	45.896	-15.189	2.433 2.464	5.424
4.088	3.900	47.406	-15.199	2.484 2.465	5.424
4.150	3.962	48.347	-15.205	2.516 2.466	

C.C.G.S. Earl Grey

Intact and Damaged

Stability Booklet

APPROVALS

EXAMINED IN ACCORDANCE WITH SCHEDULE <u>VI</u> TO THE ARCTIC SHIPPING POLLUTION PREVENTION REGULATIONS AND COMPIES WITH THE REQUIREMENTS FOR AN ARCTIC CLASS <u>II</u> SHIP.	EXAMINÉ CONFORMÉMENT L'ANNÉE <u>VI</u> DU RÈGLEMENT SUR LA PRE- VENTION DE LA POLLUTION DES EAUX ARCTIQUES PAR LES NAVIRES ET TROUVÉ CONFORME AUX EXIGENCES POUR UN NAVIRE DE LA CLASSE ARCTIQUE <u>II</u>
 POLLUTION PREVENTION OFFICER — AGENT DE PREVENTION DE LA POLLUTION <u>14 JUL 1987</u> DATE	

SUBJECT TO THE ACCURACY
OF THE BASIC DATA BEING
THE RESPONSIBILITY OF THE
OWNER, HIS NAVAL
ARCHITECT OR THE SHIP-
BUILDER.

SOUS RÉSERVE QU'IL
INCOMBE AU PROPRIÉ-
TAIRE, À SON ARCHITECTE
NAVAL OU AU CON-
STRUCTEUR DE NAVIRES
DE S'ASSURER QUE LES
DONNÉES DE BASES SONT
PRÉCISES.

ALL OPENINGS IN THAT PART OF
THE SUPERSTRUCTURE, THE
VOLUME OF WHICH IS INCLUDED
IN THE COMPUTATION OF THE
CROSS CURVES OF STABILITY,
ARE TO BE FITTED WITH
WEATHERTIGHT CLOSING
APPLIANCES.

TOUTES LES OUVERTURES DE
CETTE PARTIE DE LA SUPER-
STRUCTURE, DONT LE VOLUME
EST COMPRIS DANS LE
CALCUL DES ABAQUES DE
STABILITÉ, DOIVENT ÊTRE
MUNIES DE DISPOSITIFS DE
FERMETURE ÉTANCHE.

C.C.G.S. EARL GREY

HULL NO.
218

DATE:
APR 1987

PAGE:
1 OF 41

INTACT AND DAMAGED STABILITY BOOKLET

AS PER CANADIAN COAST GUARD
ARCTIC SHIPPING POLLUTION
PREVENTION REGULATIONS



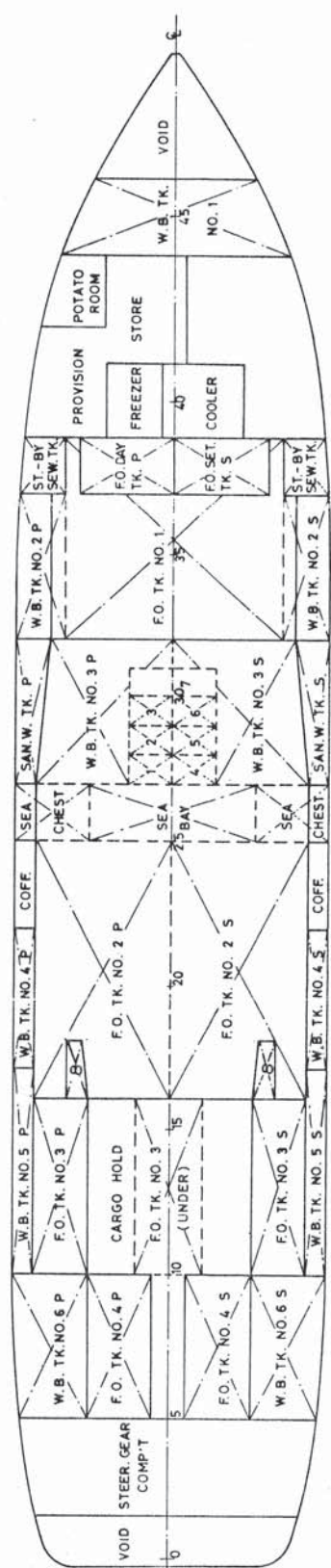
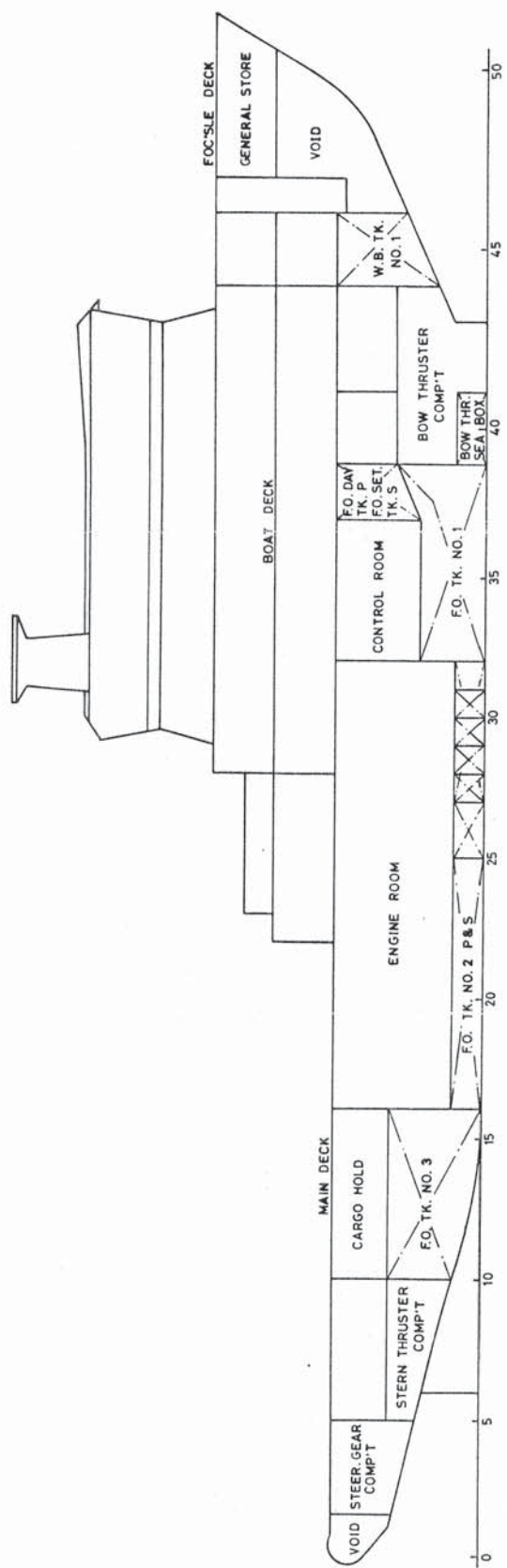
PORT WELLER DRY DOCKS

A DIVISION OF ULS
INTERNATIONAL INC.

ST. CATHARINES

ONTARIO

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY HULL NO. 218 INTACT AND DAMAGED STABILITY BOOKLET	PAGE: 2 OF 41
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C.C.G.S. EARL GREY		HULL NO. 218	PAGE: 3 OF 41
GENERAL ARRANGEMENT		PORT WELDER DRY DOCKS A DIVISION OF ULS INTERNATIONAL INC.	
		ST. CATHARINES ONTARIO	

- 8 - FIRE PUMP SEA CHEST
P & SB
- 1 - WASTE OIL TK.
 - 2 - USED L.O. TK.
 - 3 - F.W. DRAIN TK.
 - 4 - DIRTY OIL TK.
 - 5 - FUEL OVERFLOW TK.
 - 6 - OIL/WATER WASTE TK.
 - 7 - TRANSOUCCER COMPT.

2. Notes for Master

General Precautions - See notes in "Stability Information Booklet",
Page 6.

When sailing in the Canadian Arctic, the vessel's drafts are to be within the side shell's ice belt as stated on the Arctic Shipping Pollution Prevention Regulations certificate (ASPPR).

	<u>Aft</u>	<u>Forward</u>
Lightest Operating Draft (Ext.)	4.618 m	4.028 m
Deepest Operating Draft (Ext.)	5.228 m	5.228 m

(Draft Midship not to exceed applicable Load Line Mark.)

Sufficient fuel is to be on board at all times in Arctic Zones for domestic purposes for 30 days. All Arctic arrival conditions have 30 x 3.0 = 90 tonnes spare fuel included.

Care should be taken to keep the ship without heel ($\theta = 0^\circ$) because there are some difficulties to get an angle of heel after side damage less than 15° .

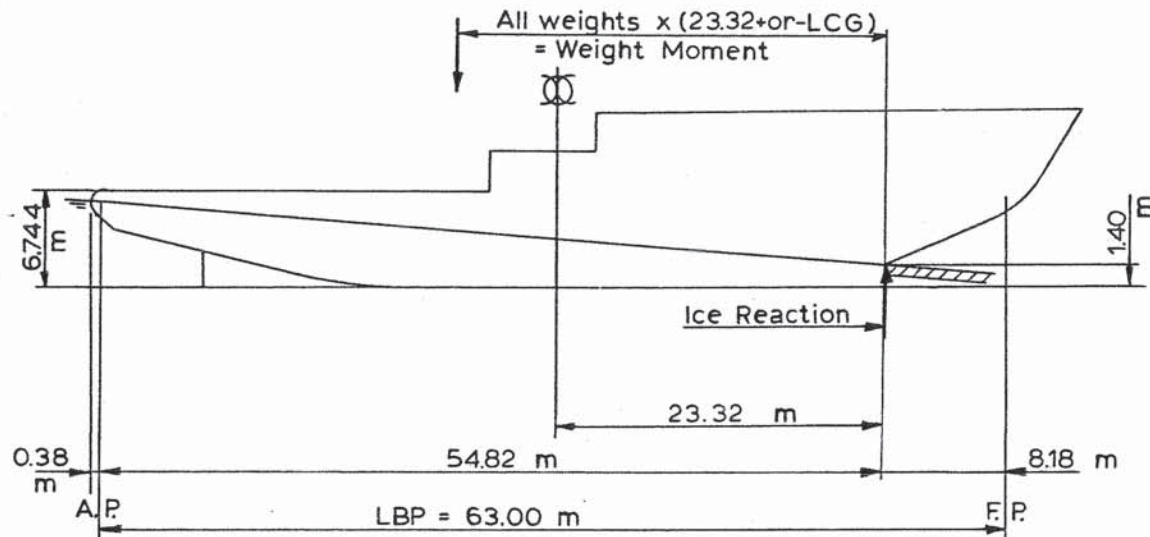
2.1 Vessel On Ice Ridge - Intact Stability

According to the ASPPR, every Arctic class vessel, when the vessel is riding up or sliding off the ice, it shall be considered that:

- the vessel has positive stability and,
- the deck edge of any part of the vessel does not submerge.

The vessel should be loaded as shown in the Stability Information Booklet, conditions no's. 1011, 1012, 1013 and 1014.

3. Hydrostatics for "Vessel Stuck on Ice Ridge"



$$\text{Draft at Transom} = \text{Draft at A.P.} + \frac{0.38}{63} \times \text{Trim}$$

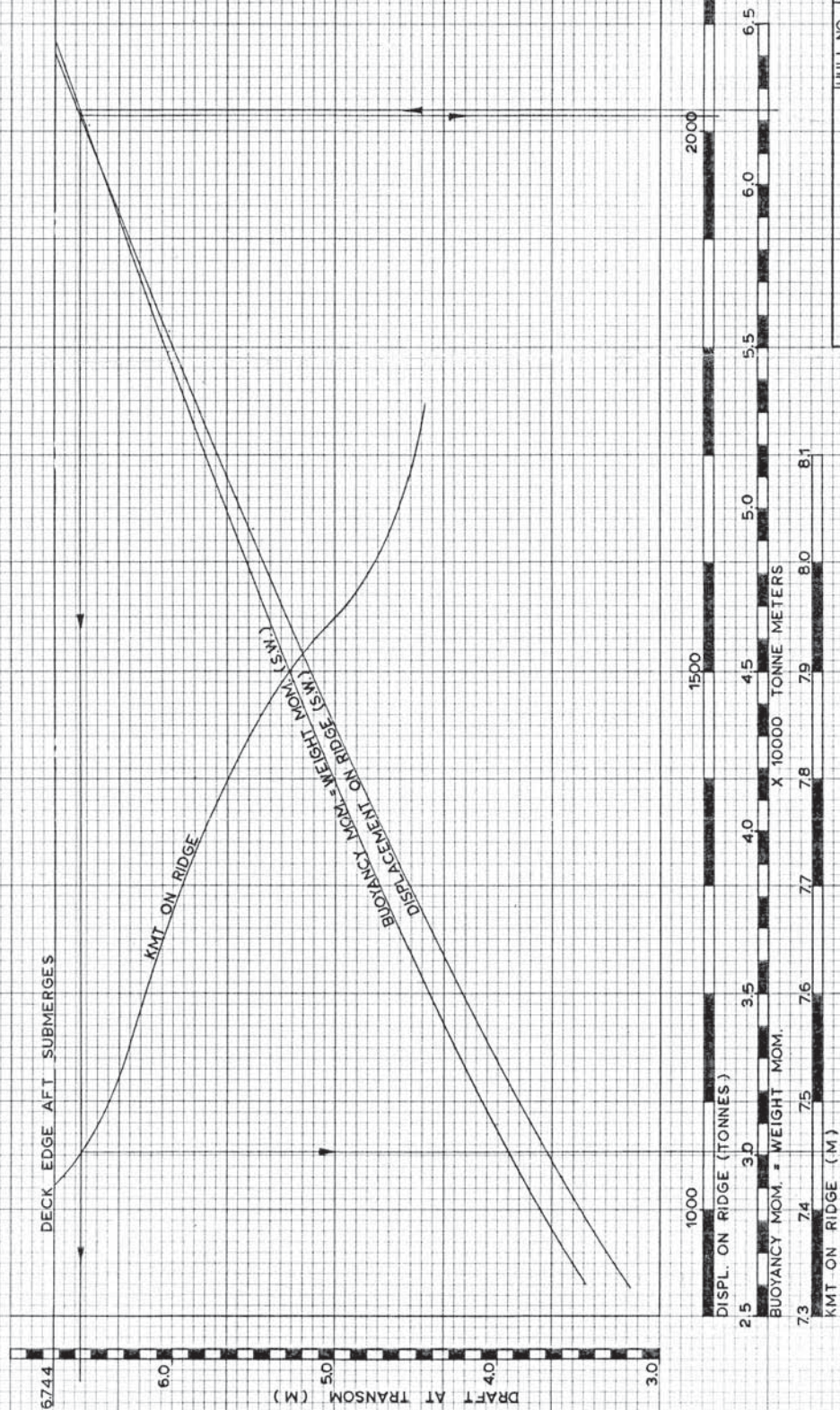
$$\text{Draft at F.P.} = 1.4 - \left[\frac{\text{Draft at A.P.} - 1.4}{54.82} \right] \times$$

$$= 1.609 - 0.1492 \times \text{Draft At A.P.}$$

Hydrostatics Particulars (Salt Water)

Draft At A.P. Ext.	O.1492 x Draft At A.P.	Draft At F.P.	Draft At M	Trim By Stern	Draft at Trans.	Displ. S.W.	L.C.B. M	Lever L.C.B. + 23.32 M	Buoy. MMT.	K.M.T.	Free- Board At Trans.
m	m	m	m	m	m	tonnes	m	m	t.m.	m	m
1	0.1492	1.4597	1.230	-0.460	0.997	429.5	1.575 F	21.745	9339.5	13.464	5.747
1.5	0.2238	1.3851	1.442	0.115	1.501	527.8	0.419 F	22.901	12087.1	12.273	5.243
2	0.2984	1.3105	1.655	0.690	2.004	635.5	0.649 A	23.969	15232.3	11.210	4.740
2.5	0.3730	1.2359	1.868	1.264	2.508	750.6	1.537 A	24.857	18657.6	10.273	4.236
3	0.4476	1.1613	2.081	1.839	3.011	874.1	2.364 A	25.684	22450.4	9.496	3.733
3.5	0.5222	1.0867	2.293	2.413	3.515	1002.2	3.049 A	26.369	26427.0	8.892	3.229
4	0.5968	1.0121	2.506	2.988	4.018	1141.2	3.771 A	27.091	30916.2	8.414	2.726
4.5	0.6714	0.9375	2.719	3.562	4.521	1290.1	4.488 A	27.808	35875.1	8.103	2.223
5	0.7460	0.8629	2.931	4.137	5.025	1453.5	5.289 A	28.609	41583.2	7.947	1.719
5.5	0.8206	0.7883	3.144	4.712	5.528	1630.9	6.097 A	29.417	47976.2	7.846	1.216
6	0.8952	0.7137	3.357	5.286	6.032	1816.4	6.863 A	30.183	54824.4	7.671	0.712
6.5	0.9698	0.6391	3.570	5.861	6.535	2006.1	7.513 A	30.833	61854.1	7.462	0.209
7	1.0444	0.5645	3.782	6.435	7.039	2186.9	7.968 A	31.288	68423.7	7.034	-0.295

4. HYDROSTATICS CURVES FOR "VESSEL STUCK ON ICE RIDGE"



C.C.G.S. EARL GREY	HULL NO. 218	PAGE 7 OF 41
INTACT AND DAMAGED STABILITY BOOKLET	PORT WELER DRY DOCKS A DIV OF ULS INTER. INC. ST. CATH. ONTARIO	

ICE REACTION = DISPL. OF CONDITION - DISPL. ON RIDGE
 FREEBOARD AT TRANSOM = 6.744 - DRAFT AT TRANSOM
 PIVOT POINT 1.4 M ABOVE B.O.K. AT FR. 43

5. EXAMPLE CALCULATION FOR "VESSEL STUCK ON ICE RIDGE"

Example: Condition No. 1012 Ballast Arrival,
10% Consum. + 30 Days (Arctic)

Total Displacement: 2618.2 tonnes S.W.
 $LCG = LCB = 23.32 - (-0.473) = 23.793 \text{ m}$
 Weight Mmt. = $2618.2 \times 23.793 = 62294.8 \text{ tm}$

Buoyancy moment must equal weight moment for equilibrium.

- Find the point of 62294.8 tm on the Buoyancy Moment curve on page 7.

Draw a horizontal line through this point and read:

Displacement on Ridge	=	2016 tonnes
Draft at Transom	=	6.575 m
From	=	6.744 m

Freeboard at Transom = 0.169 m

Deduct Displacement Free Floating	=	2618.2 t
From Displacement on Ridge	=	2016.0 t
Gives Ice Reaction	=	-602.2 t

Recalculated the VCG for the condition with ice reaction deducted:

Total Displacement	2618.2 t at VCG 5.386 m	=	14101.62 tm
Ice Reaction	-602.2 t at VCG 1.400 m	=	-843.08 tm

Displacement on Ridge 2016.0 t at VCG 6.576 m = 13258.54 tm

Now KMT on Ridge	=	7.453 m
VCG on Ridge	=	6.576 m
GM_s	=	0.877 m
F.S. Correction	=	0.175 m
GM fl	=	0.702 m

Since the correction to GM fl for cosine of angle of trim is less than 1 mm, the effect of trim on GM fl has been neglected.

6. Summary: "Vessel Stuck on Ice Ridge"

Vessel in Salt Water

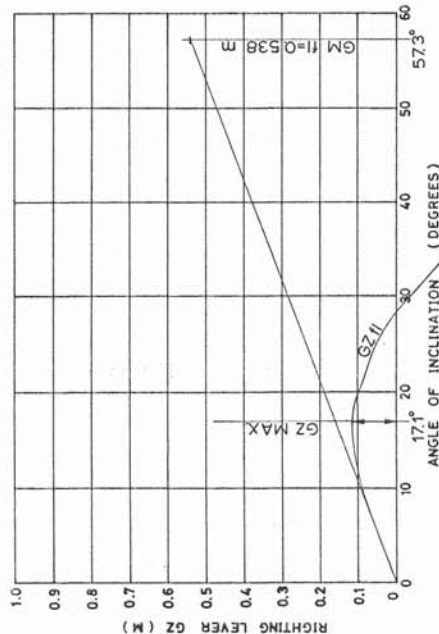
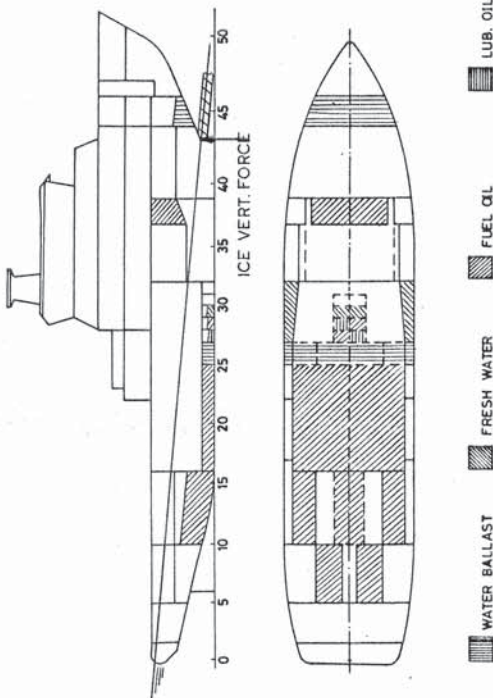
Cond. No.*	Displ. S.W. Free Fl. (t)	L.C.G. From \bar{X} (m)	Lever (m)	Weight MMT (tm)	Displ. S.W. on Ridge (t)	Ice Reaction (t)	Draft at Trans. (m)	Free Board at Trans. (m)	GM fl (m)
	①	②	③ 23.32-②	① x ③	④	④-①	⑤	6.744-⑤	⑥

* Numbers of conditions correspond to the conditions in "Stability Information Booklet".

1011	2760.6	0.051	23.269	64236.4	2067	-693.6	6.726	0.018	0.538
1012	2618.2	-0.473	23.793	62294.8	2016	-602.2	6.575	0.169	0.702
1013	2734.5	-0.099	23.419	64039.2	2062	-672.5	6.710	0.034	0.501
1014	2604.9	-0.485	23.805	62009.6	2005	-599.9	6.568	0.176	0.675

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY HULL NO. 218 INTACT AND DAMAGED STABILITY BOOKLET	PAGE: 10 OF 41
<p>7. Conditions:</p> <p>"Vessel Stuck on Ice Ridge"</p> <p>Condition No. 1011</p> <p>"Vessel Stuck on Ice Ridge"</p> <p>Condition No. 1012</p> <p>"Vessel Stuck on Ice Ridge"</p> <p>Condition No. 1013</p> <p>"Vessel Stuck on Ice Ridge"</p> <p>Condition No. 1014</p> <p>"Vessel Stuck on Ice Ridge"</p>		<p><u>PAGE</u></p> <p>11</p> <p>12</p> <p>13</p> <p>14</p>

NOTE: FOR DESCRIPTION OF TANKS SEE "GENERAL ARRANGEMENT" PAGE 3



AREA UNDER GZ CURVE UP TO 30° 0.035 MR
AREA UNDER GZ CURVE UP TO 40° 0.035 MR
MAXIMUM GZ 0.15 M AT 17.1° ANGLE
DECK EDGE IMMERSED AT 0.4° ANGLE
FREEBOARD AT TRANSOM 0.018 M

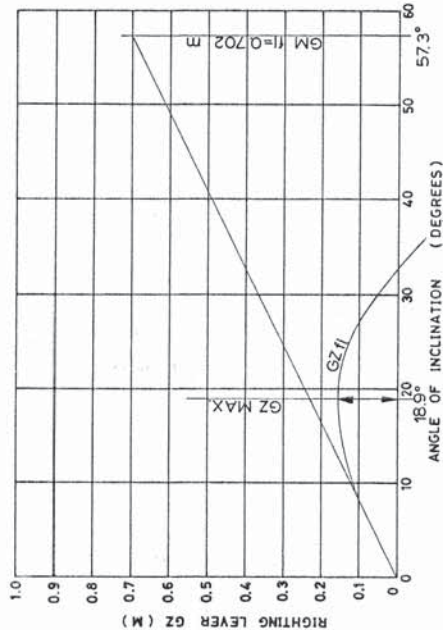
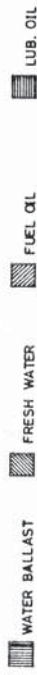
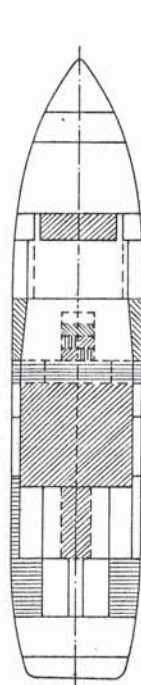
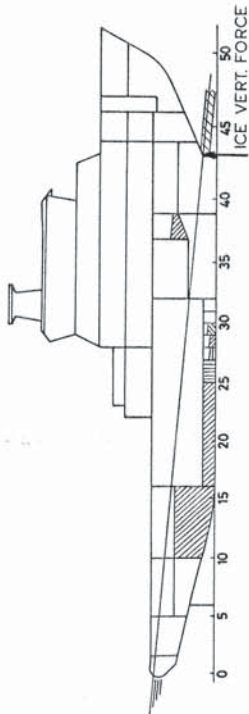
ANGLE OF HEEL
GZ SOLID
GZ FLUID
AREA UNDER GZ (F

10.000 20.000 25.000 30.000 40.000 50.000 60.000
0.108 0.125 0.083 0.001 -0.229 -0.530 -0.899
0.089 0.099 0.034 -0.032 -0.268 -0.575 -0.949
0.008 0.026 0.033 0.035 0.035 0.035 0.035

WEIGHT ITEM	SPECIF. WEIGHT OR UNIT WEIGHT	WEIGHT TON	VCO FROM BL	LCO FROM 1/2	FREE SURFACE FROM MOMENT	TCD SURFACE CL
F. O. TANK NO. 1. FR. 32-39 CENTRE	0.8370	0.0	0.724	-5.764	154.97	-2.731
F. O. TANK NO. 2. FR. 16-23 P	0.8370	56.7	0.724	-5.764	154.97	-2.731
F. O. TANK NO. 2. FR. 16-23 S	0.8370	73.1	3.910	-15.287	7.01	4.719
F. O. TANK NO. 3. FR. 10-16 P	0.8370	21.6	2.084	-14.778	7.01	4.670
F. O. TANK NO. 3. FR. 10-16 S	0.8370	35.0	1.948	-15.077	12.12	0.000
F. O. TANK NO. 4. FR. 5-10 P	0.8370	51.6	4.615	-22.091	8.89	-2.105
F. O. TANK NO. 4. FR. 5-10 S	0.8370	51.6	4.615	-22.091	8.89	-2.105
FUEL OIL DAY TK. FR. 37-39 P	0.8370	25.8	4.983	15.676	11.97	2.072
FUEL OIL DAY TK. FR. 37-39 S	0.8370	25.8	4.983	15.676	11.97	2.072
FUEL OIL SETTling TK. FR. 27-28 P	0.8370	1.5	0.413	3.875	0.61	0.953
FUEL OIL SETTling TK. FR. 27-28 S	0.8370	1.5	0.413	3.875	0.61	0.953
FUEL OVERFLOW TK. FR. 28-29 S	0.9000	1.5	0.388	3.875	0.66	0.951
DIRTY OIL TK. FR. 27-28 S	12.88	12.9	5.180	-10.563	0.66	0.000
LUB. OIL STORAGE TKS	1.025	10.0	3.612	25.982	23.31	-0.000
BALLAST TK. NO. 1. FR. 44-46	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 2. FR. 32-37 P	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 2. FR. 32-37 S	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 3. FR. 27-32 P	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 3. FR. 27-32 S	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 4. FR. 17-22 P	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 4. FR. 17-22 S	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 5. FR. 10-17 P	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 5. FR. 10-17 S	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 6. FR. 5-10 P	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TK. NO. 6. FR. 5-10 S	0.0	0.0	0.0	0.0	0.0	0.0
SANITARY WATER TK. FR. 27-32 P	1.0000	44.8	3.618	5.322	-6.213	-0.949
SANITARY WATER TK. FR. 27-32 S	1.0000	44.8	3.618	5.322	-6.213	-0.949
F. H. DRAIN TK. FR. 29-30 P	1.0000	1.5	0.352	5.125	0.73	-0.949
STAND-BY SEWAGE TK. FR. 37-39 P	0.0	0.0	0.0	0.0	0.0	0.0
STAND-BY SEWAGE TK. FR. 37-39 S	0.0	0.0	0.0	0.0	0.0	0.0
OILY WATER WASTE TK. FR. 29-30 S	1.0000	1.5	0.352	5.125	0.73	0.949
SEWAGE UNIT	0.0	0.0	0.0	0.0	0.0	0.0
DECK CARGO	0.0	0.0	0.0	0.0	0.0	0.0
CARGO HOLD	0.0	0.0	0.0	0.0	0.0	0.0
CONTAINER	0.0	0.0	0.0	0.0	0.0	0.0
DK. MACH. STORES	10.00	10.0	8.000	20.950	0.000	0.000
CREW & EFFECTS	4.900	4.9	11.000	14.000	0.000	0.000
PROVISIONS	5.000	5.0	5.000	20.160	0.000	0.000
ICE VERT. FORCE	1.0000	-693.6	1.400	23.320	0.000	0.000
TOTAL DEADWEIGHT		-154.8	-5.260	124.399	405.12	1.577
LIGHT SHIP		2221.8	5.774	1.448		0.110
TOTAL DISPLACEMENT		2067.0	6.600	-7.757	405.12	0.000
DRAFT EXT. AT L.C.F.					4.075 M	
DRAFT EXT. AFT AT A.P.					6.689 M	
DRAFT EXT. FWD AT F.P.					0.577 M	
TRIM OVER LBP					-6.112 M	
DISPLACEMENT					2067.0 TONNES (S.W.)	
L.C.G.					-7.757 M	
T.C.G.					0.000 M	
V.C.G.					6.600 M	
F.S. CORRECTION					0.196 M	
TRANSVERSE METACENTRE					7.334 M	
GM SOLID					0.734 M	
GM FLUID					0.538 M	

CCGS. EARL GREY HULL NO. 218 PAGE. 11 OF 41
CONDITION NO.1011.
"VESSEL STUCK ON ICE RIDGE"
PORT WELLS DRY DOCKS
A DIVISION OF IUS INTERNATIONAL INC.
ST. CATHARINES, ONTARIO

NOTE: FOR DESCRIPTION OF TANKS SEE "GENERAL ARRANGEMENT" PAGE 3



AREA UNDER GZ CURVE UP TO 30° 0.057 MR
AREA UNDER GZ CURVE UP TO 40° 0.058 MR
AREA UNDER GZ CURVE BETWEEN 30°-40° 0.001 MR
MAXIMUM GZ 0.75 M AT 18.9° ANGLE
DECK EDGE IMMERSED AT 2.1° ANGLE
FREEBOARD AT TRANSOM 0.169 M

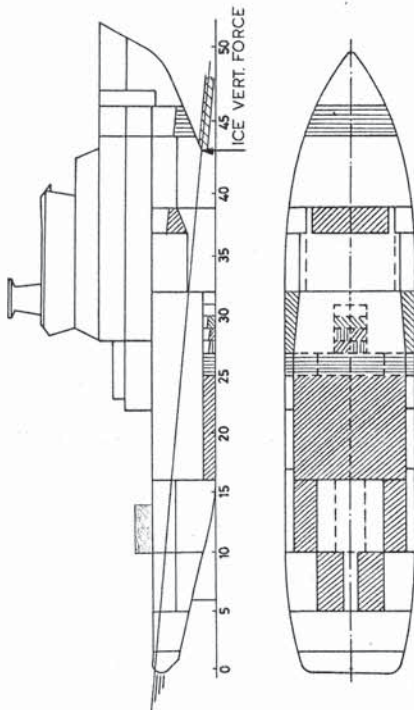
ANGLE OF HEEL
GZ SOLID
GZ FLUID
AREA UNDER GZ (F
0.134 0.176 0.150 0.078 -0.134 -0.458 -0.831
0.118 0.155 0.129 0.055 -0.178 -0.482 -0.855
0.011 0.036 0.049 0.037 0.038 0.038 0.038

WEIGHT ITEM	SPECIF. WEIGHT OR UNIT	WEIGHT TON	VCG FROM BL	LCG FROM L/2	FREE SURFACE MOMENT CL	TCG FROM CL
F.O. TANK NO. 1 FR. 32-39 CENTRE	0.8370	0.0	0.724	-5.764	154.97	-2.731
F.O. TANK NO. 2 FR. 16-25 P	0.8370	0.0	0.724	-5.764	154.97	2.731
F.O. TANK NO. 3 FR. 10-16 P	0.8370	0.0	0.0	0.0	0.0	0.0
F.O. TANK NO. 4 FR. 10-16 S	0.8370	0.0	0.0	0.0	0.0	0.0
F.O. TANK NO. 5 FR. 10-16 CENTRE	0.8370	0.0	0.0	0.0	0.0	0.0
F.O. TANK NO. 6 FR. 5-10 P	0.8370	0.0	0.0	0.0	0.0	0.0
F.O. TANK NO. 7 FR. 37-39 P	0.8370	0.0	0.0	0.0	0.0	0.0
FUEL OIL DAY TANK FR. 37-39 S	0.8370	0.0	0.0	0.0	0.0	0.0
FUEL OIL SETTLING TANK FR. 37-39 S	0.8370	0.0	0.0	0.0	0.0	0.0
WASTE OIL TANK FR. 27-28 P	0.8370	0.0	0.0	0.0	0.0	0.0
FUEL OVERFLOW TANK FR. 28-29 S	0.8370	0.0	0.0	0.0	0.0	0.0
USED L.O. TANK FR. 28-29 P	0.9000	0.0	0.0	0.0	0.0	0.0
DIRTY OIL TANK FR. 27-28 S	0.9000	0.0	0.0	0.0	0.0	0.0
LUB. OIL STORAGE TKS.	12.88	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 1 FR. 44-46	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 2 FR. 32-37 P	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 3 FR. 32-37 S	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 4 FR. 27-32 P	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 5 FR. 27-32 S	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 6 FR. 17-22 P	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 7 FR. 17-22 S	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 8 FR. 10-17 P	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 9 FR. 10-17 S	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 10 FR. 5-10 P	1.025	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 11 FR. 5-10 S	1.025	0.0	0.0	0.0	0.0	0.0
SANITARY WATER TANK FR. 27-32 P	1.0000	0.0	0.0	0.0	0.0	0.0
SANITARY WATER TANK FR. 27-32 S	1.0000	0.0	0.0	0.0	0.0	0.0
STAND-BY WATER TANK FR. 37-39 P	1.0000	0.0	0.0	0.0	0.0	0.0
STAND-BY WATER TANK FR. 37-39 S	1.0000	0.0	0.0	0.0	0.0	0.0
STAND-BY SEWAGE TANK FR. 37-39 S	1.0000	0.0	0.0	0.0	0.0	0.0
STAND-BY WASTE TANK FR. 29-30 S	1.0000	0.0	0.0	0.0	0.0	0.0
SEWAGE UNIT	1.870	0.0	0.0	0.0	0.0	0.0
DECK CARGO	0.0	0.0	0.0	0.0	0.0	0.0
CARGO HOLD	0.0	0.0	0.0	0.0	0.0	0.0
CONTAINER	0.0	0.0	0.0	0.0	0.0	0.0
DK. MACH STORES	10.00	0.0	0.0	0.0	0.0	0.0
CREW & EFFECTS	4.500	0.0	0.0	0.0	0.0	0.0
PROVISIONS	5.000	0.0	0.0	0.0	0.0	0.0
ICE VERT. FORCE	1.0000	-602.2	1.400	23.360	0.000	0.000
TOTAL DEADWEIGHT		-205.8	-2.083	89.894	352.08	1.187
LIGHT SHIP		2221.8	5.774	1.448		0.110
TOTAL DISPLACEMENT		2016.0	6.576	-7.560	352.08	0.000
DRAFT EXT. AT L.C.F.						
DRAFT EXT. AFT AT A.P.						
DRAFT EXT. FWD AT F.P.						
TRIM OVER LBP						
DISPLACEMENT						
L.C.G.						
T.C.G.						
V.C.G.						
F.S. CORRECTION						
TRANSVERSE METACENTRE						
GM SOLID						
GM FLUID						

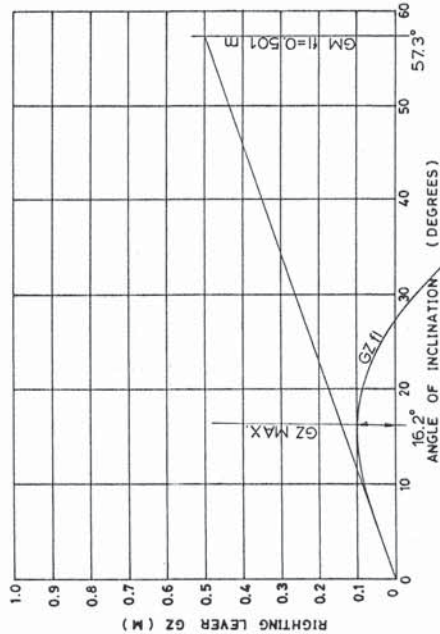
CCGS. EARL GREY
CONDITION No. 1912.
"VESSEL STUCK ON ICE RIDGE"

PAGE: 12 OF 41
PORT WELLS
DRY DOCKS
A DIVISION OF U.S.
INTERNATIONAL INC.
ST. CATHARINES, ONTARIO

NOTE: FOR DESCRIPTION OF TANKS SEE "GENERAL ARRANGEMENT" PAGE 3



WATER BALLAST FRESH WATER FUEL OIL LUB. OIL



AREA UNDER GZ CURVE UP TO 30° 0.030 MR
AREA UNDER GZ CURVE BETWEEN 30°-40° 0.030 MR
MAXIMUM GZ 0.501 M AT 16.2° ANGLE
DECK EDGE IMMERSED AT 0.6° ANGLE
FREEBOARD AT TRANSOM 0.034 M

ANGLE OF HEEL
GZ SOLID
GZ FLUID
AREA UNDER GZ (F

10.000 20.000 25.000 30.000 40.000 50.000 60.000
0.100 0.110 0.066 -0.019 -0.258 -0.566 -0.942
0.083 0.083 0.037 -0.033 -0.299 -0.613 -0.992
0.008 0.024 0.029 0.030 0.030 0.030 0.030

WEIGHT ITEM	SPECIFIC WEIGHT OR WEIGHT	WEIGHT UNIT	LCG FROM BL	LCG FROM L/2	FREE SURFACE MOMENT	TCG FROM CL
F. O. TANK NO. 1 FR. 32-39 CENTRE	0.8370	0.0	0.724	-5.764	154.97	-2.731
F. O. TANK NO. 2 FR. 16-25 P	0.8370	56.7	0.724	-5.764	154.97	2.731
F. O. TANK NO. 3 FR. 10-16 P	0.8370	73.1	3.910	-15.287	7.01	-4.719
F. O. TANK NO. 4 FR. 5-10 P	0.8370	21.6	2.084	-14.778	7.01	4.670
F. O. TANK NO. 5 FR. 10-16 CENTRE	0.8370	0.0	4.615	-22.091	8.89	-2.105
F. O. TANK NO. 6 FR. 5-10 P	0.8370	51.6	4.615	-22.091	8.89	2.105
FUEL OIL DAY TANK FR. 37-39 P	0.8370	12.5	4.171	15.596	11.97	-2.072
FUEL OIL SETTLING TANK FR. 37-39 S	0.8370	12.5	4.171	15.596	11.97	-2.072
WASTE OIL TANK FR. 27-28 P	0.8370	1.5	0.413	2.625	0.61	-0.953
FUEL OVERFLOW TANK FR. 28-29 S	0.8370	1.5	0.413	2.625	0.61	-0.953
USED L. O. TANK FR. 28-29 P	0.9000	1.5	0.388	2.875	0.66	-0.951
DIRTY OIL TANK FR. 27-28 S	0.9000	12.9	5.180	-10.563	23.31	-0.000
LUB. OIL STORAGE TKS.	1.025	10.0	3.612	25.982	23.31	-0.000
BALLAST TANK NO. 1 FR. 44-46	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 2 FR. 32-37 P	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 3 FR. 27-32 P	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 4 FR. 17-22 P	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 5 FR. 10-17 P	0.0	0.0	0.0	0.0	0.0	0.0
BALLAST TANK NO. 6 FR. 5-10 P	0.0	0.0	0.0	0.0	0.0	0.0
SANITARY WATER TANK FR. 27-32 P	1.0000	44.8	3.618	5.322	0.73	-6.213
SANITARY WATER TANK FR. 27-32 S	1.0000	44.8	3.618	5.322	0.73	-6.213
F.W. DRAIN TANK FR. 29-30 P	1.0000	1.5	0.352	5.125	0.73	-0.949
STAND-BY SEWAGE TANK FR. 37-39 P	0.0	0.0	0.0	0.0	0.0	0.0
STAND-BY SEWAGE TANK FR. 37-39 S	0.0	0.0	0.0	0.0	0.0	0.0
OILY WATER WASTE TANK FR. 29-30 S	1.0300	1.5	0.352	5.125	0.73	-0.949
SEWAGE UNIT	1.870	0.5	3.900	10.100	0.000	0.000
DECK CARGO	30.0	30.0	7.700	-14.875	0.000	0.000
CARGO HOLD	5.0	5.0	5.000	-15.500	0.000	0.000
CONTAINER	0.0	0.0	0.0	0.0	0.000	0.000
DR. MACH. STORES	13.00	10.0	8.000	20.930	0.000	0.000
CREW & EFFECTS	4.500	4.5	11.000	14.000	0.000	0.000
PROVISIONS	5.000	5.0	5.000	20.160	0.000	0.000
ICE VERT. FORCE	1.0000	-672.5	1.400	23.320	0.000	0.000
TOTAL DEADWEIGHT		-159.8	-5.594	119.940	393.00	1.527
LIGHT SHIP		2221.8	5.774	1.448	0.110	0.110
TOTAL DISPLACEMENT		2062.0	6.655	-7.737	393.00	0.000
DRAFT EXT. AT L.C.F.					4.067 M	
DRAFT EXT. AFT AT A.P.					6.673 M	
DRAFT EXT. FWD AT F.P.					0.583 M	
TRIM OVER LBP					-6.091 M	
DISPLACEMENT					2062.0 TONNES (S.W.)	
L.C.G.					-7.737 M	
T.C.G.					0.000 M	
V.C.G.					6.655 M	
F.S. CORRECTION					0.191 M	
TRANSVERSE METACENTRE					7.347 M	
GM SOLID					0.692 M	
GM FLUID					0.501 M	

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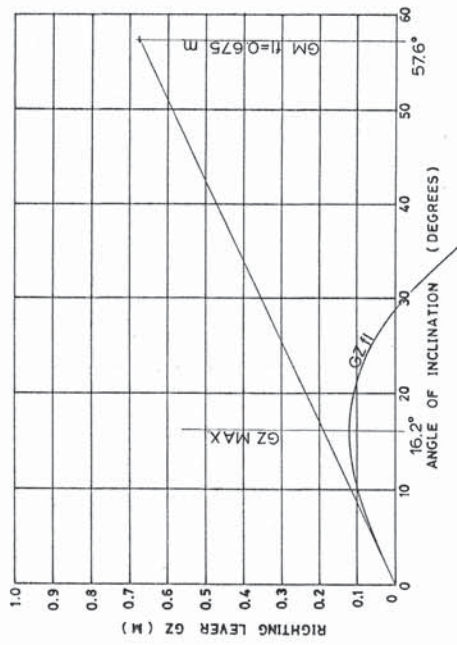
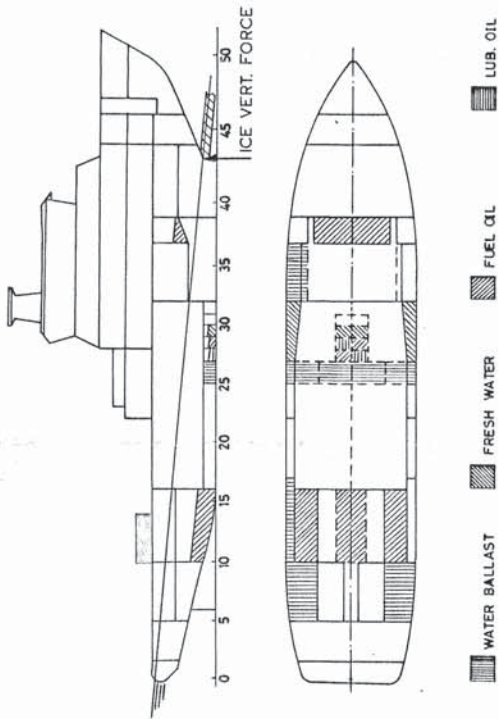
C.C.G.S. EARL GREY

CONDITION NO. 1013

"VESSEL STUCK ON ICE RIDGE"

PORT WELLS
DRY DOCKS
A DIVISION OF ILS
INTERNATIONAL INC.
ST. CATHARINES, ONTARIO

NOTE: FOR DESCRIPTION OF TANKS SEE "GENERAL ARRANGEMENT" PAGE 3



AREA UNDER GZ CURVE UP TO 30° 0.040 MR
AREA UNDER GZ CURVE UP TO 40° 0.040 MR
MAXIMUM GZ 0.122 M AT 16.2° ANGLE
DECK EDGE IMMERSED AT 2.2° ANGLE
FREEBOARD AT TRANSOM 0.176 M

ANGLE OF HEEL
GZ SOLID
GZ FLUID
AREA UNDER GZ (F)

10.000 20.000 25.000 30.000 40.000 50.000 60.000
0.109 0.125 0.089 0.004 -0.253 -0.579 -0.970
0.100 0.108 0.067 -0.023 -0.289 -0.623 -1.027
0.010 0.029 0.037 0.040 0.040 0.040 0.040

WEIGHT ITEM	SPECIF. WEIGHT OR UNIT	WEIGHT TON	VCQ FROM BL	LCQ FROM BL	FREE SURFACE FROM CL	TCQ CL
F. O. TANK NO. 1 FR. 32-39 CENTRE		0.0				
F. O. TANK NO. 2 FR. 16-23 P		0.0				
F. O. TANK NO. 2 FR. 16-23 S		0.0				
F. O. TANK NO. 3 FR. 10-16 P		0.8370	3.341	-15.325	7.01	-4.713
F. O. TANK NO. 3 FR. 10-16 S		0.8370	3.341	-15.325	7.01	-4.713
F. O. TANK NO. 4 FR. 10-16 CENTRE		23.4	1.197	-14.867	12.12	-0.000
F. O. TANK NO. 4 FR. 10-16 P		0.0				
F. O. TANK NO. 4 FR. 10-16 S		0.0				
FUEL OIL DAY TANKS FR. 37-39 P		0.0				
FUEL OIL DAY TANKS FR. 37-39 S		0.0				
FUEL OIL SETTLING TANKS FR. 37-39 S		0.8370	3.748	15.430	11.97	-2.072
WASTE OIL TANK FR. 27-28 P		0.8370	3.748	15.430	11.97	-2.072
FUEL OVERFLOW TANK FR. 28-29 S		1.3	0.413	3.625	0.61	-0.953
USED L. O. TANK FR. 28-29 P		0.8370	0.413	3.625	0.61	-0.953
DIRTY OIL TANK FR. 27-28 S		0.9000	1.3	0.388	0.66	-0.931
LUB. OIL STORAGE TANKS		0.9000	1.3	0.388	0.66	-0.931
BALLAST TANK NO. 1 FR. 44-46		12.88	5.180	-10.563	0.000	0.000
BALLAST TANK NO. 2 FR. 32-37 P		1.025	0.912	9.990	1.16	-3.306
BALLAST TANK NO. 2 FR. 32-37 S		0.0				
BALLAST TANK NO. 3 FR. 27-32 P		0.0				
BALLAST TANK NO. 3 FR. 27-32 S		0.0				
BALLAST TANK NO. 4 FR. 17-22 P		0.0				
BALLAST TANK NO. 4 FR. 17-22 S		0.0				
BALLAST TANK NO. 5 FR. 10-17 P		0.0				
BALLAST TANK NO. 5 FR. 10-17 S		0.0				
BALLAST TANK NO. 6 FR. 9-10 P		1.025	3.863	-14.940	0.54	-6.392
BALLAST TANK NO. 6 FR. 9-10 S		0.0				
SANITARY WATER TANK FR. 27-32 P		43.0	4.621	-21.859	18.58	-3.069
SANITARY WATER TANK FR. 27-32 S		1.025	4.621	-21.859	18.58	-3.069
F. H. DRAIN TANK FR. 29-30 P		15.5	1.567	5.220	0.94	-6.181
STAND-BY SEWAGE TANK FR. 37-39 P		15.5	1.567	5.220	0.94	-6.181
STAND-BY SEWAGE TANK FR. 37-39 S		1.0000	1.5	0.352	0.73	-0.949
OILY WATER WASTE TANK FR. 29-30 S		1.0000	0.0	0.352	0.73	0.949
SEWAGE UNIT		1.870	1.2	3.900	10.100	0.000
DECK CARGO		30.0	7.700	-14.873	0.000	0.000
CARGO HOLD		5.0	5.000	-15.500	0.000	0.000
CONTAINER		0.0				
DK. MACH. STORES		10.00	10.0	8.000	20.950	0.000
CREW & EFFECTS		4.500	4.5	11.000	14.000	0.000
PROVISIONS		5.000	1.7	5.000	20.160	0.000
ICE VERT. FORCE		1.0000	-999.9	1.400	23.320	0.000
TOTAL DEADWEIGHT		-216.8	-3.164	85.209	94.83	1.132
LIGHT SHIP		2221.8	5.774	1.448		0.110
TOTAL DISPLACEMENT		2005.0	6.740	-7.608	94.83	-0.001
DRAFT EXT. AT L.C.F.						3.982 M
DRAFT EXT. AFT AT A.P.						6.532 M
DRAFT EXT. FWD AT F.P.						0.588 M
TRIN OVER LBP						-3.944 M
DISPLACEMENT						2005.0 TONNES (S.W.)
L.C.G.						-7.608 M
T.C.G.						-0.001 M
V.C.G.						6.740 M
F.S. CORRECTION						0.047 M
TRANSVERSE METACENTRE						7.453 M
GM SOLID						0.723 M
GM FLUID						0.675 M

CCGS EARL GREY

CONDITION NO.1014

"VESSEL STUCK ON ICE RIDGE"

MULL NO. 219

PAGE: 14 OF 41

PORT WELLS

DRY DOCKS

UNION OF U.S. INTERIOR

ST. CATHARINES, ONTARIO

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY	HULL NO. 218	PAGE: 15 OF 41
	INTACT AND DAMAGED STABILITY BOOKLET		

8. Damaged Stability Calculations

The SIKOB computer program was used to calculate the damaged cases for this vessel.

SIKOB is a subsystem to the AUTOKON shipbuilding computer program developed by Autokon Data A/S, Oslo, Norway (formerly S.R.S.).

All possible cases of damage were determined and investigated for sinkage and heel during the intermediate and final stages of flooding.

The after damage trim and stability for all loading conditions operating in Canadian Arctic waters shown in Stability Information Booklet have been calculated for these 23 damage cases.

All cases were found to meet the survival criteria in the final as well as in intermediate stages of flooding.

For all loading conditions operating in Canadian Arctic waters, A.S.P.P.R. Damage Criteria were applied.

NOTE: For the purpose of damage stability, volume of the compartments is calculated without reduction for structure (Moulded Volume).

9. Damage Cases as Per A.S.P.P.R.

Damage Case No.	Damaged Compartments	Permability
1.01	Aft Peak Fr. Aft - 1 Steering Gear Compt. Fr. 1 - 5	0.95 0.85
1.02	Steering Gear Compt. Fr. 1 - 5 Ballast Tk. No. 6 Fr. 5 - 10 S	0.85 0.95
1.03	Steering Gear Compt. Fr. 1 - 5 F.O. Tank No. 4 Fr. 5 - 10 P	0.85 0.95
1.04	Ballast Tk. No. 6 Fr. 5 - 10 S F.O. Tank No. 4 Fr. 5 - 10 S	0.95 0.95
1.05	F.O. Tank No. 3 Fr. 10 - 16 Centre F.O. Tank No. 4 Fr. 5 - 10 S	0.95 0.95
1.06	F.O. Tank No. 3 Fr. 10 - 16 S Shaft Alley Fr. 10 - 16 S	0.95 0.95
1.07	F.O. Tank No. 3 Fr. 10 - 16 S Ballast Tk. No. 6 Fr. 5 - 10 S	0.95 0.95
1.08	Ballast Tk. No. 5 Fr. 10 - 17 S Ballast Tk. No. 6 Fr. 5 - 10 S	0.95 0.95
1.09	F.O. Tank No. 1 Fr. 32-39 Centre Ballast Tk. No. 2 Fr. 32 - 37 S	0.95 0.95
1.10	F.O. Tank No. 1 Fr. 32-39 Centre Bow Thruster Compt. Fr. 39 - 44	0.95 0.85
1.11	Bow Thruster Compt. Fr. 39 - 44 Dry Stores Fr. 39 - 44	0.85 0.60

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY HULL NO. 218 INTACT AND DAMAGED STABILITY BOOKLET	PAGE: 17 OF 41
9. <u>Damage Cases As Per A.S.P.P.R. .../Continued</u>		
Damage Case No.	Damaged Compartments	Permability
1.12	Ballast Tk. No. 1 Fr. 44 - 46 Fore Peak Fr. 46 - Fwd.	0.95 0.95
1.13	Ballast Tk. No. 5 Fr. 10 - 17 S F.O. Tank No. 2 Fr. 16 - 25 S	0.95 0.95
1.14	Ballast Tk. No. 3 Fr. 27 - 32 S Sanitary Water Tk. Fr. 27 - 32 S	0.95 0.95
1.15	F.O. Tank No. 3 Fr. 10 - 16 S F.O. Tank No. 2 Fr. 16 - 25 S	0.95 0.95
1.16	Ballast Tk. No. 4 Fr. 17 - 22 S Cofferdam Fr. 22 - 25 S	0.95 0.95
1.17	Sanitary Water Tk. Fr. 27 - 32 S Ballast Tk. No. 2 Fr. 32 - 37 S	0.95 0.95
1.18	Ballast Tk. No. 5 Fr. 10 - 17 S Ballast Tk. No. 4 Fr. 17 - 22 S	0.95 0.95
1.19	Ballast Tk. No. 1 FR. 44-46 Bow Thruster Comp't. FR. 39-44 Dry Stores FR. 39-44	0.95 0.85 0.60
1.20	Dry Stores FR. 39-44 Bow Thruster Comp't. FR. 39-44 Stand-By Sewage Tk. FR. 37-39S Ballast Tk. No. 2 FR. 32-37S	0.60 0.85 0.95 0.95
1.21	Bow Thruster Comp't. FR. 39-44 F.O. Tank No. 1 FR. 32-39 Centre Ballast Tk. No. 2 FR. 32-37S Stand-By Sewage Tk. FR. 37-39S	0.85 0.95 0.95 0.95

9. Damage Cases As Per A.S.P.P.R. .../Continued

Damage Case No.	Damaged Compartments	Permability
1.22	F.O. Tank No. 3 FR. 10-16 Centre Shaft Alley FR. 10-16S F.O. Tank No. 4 FR. 5-10S Stern Thruster Comp't. FR. 5-10	0.95 0.95 0.95 0.85
1.23	Stern Thruster Comp't. FR. 5-10 F.O. Tank No. 4 FR. 5-10S F.O. Tank No. 4 FR. 5-10P Steering Gear Comp't. FR. 1-5	0.85 0.95 0.95 0.85

10. Summary of Damaged Conditions

Damaged Case No. 1.01

Cond. No.*	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	0	5.625	0.427	0.075
1012	0	5.916	0.417	0.072
1013	0	5.686	0.406	0.071
1014	0	5.936	0.379	0.066

Damaged Case No. 1.02

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	2.92	5.340	0.362	0.066
1012	5.20#	5.398	0.425	0.073
1013	3.19	5.375	0.338	0.062
1014	3.00#	5.646	0.368	0.061

* Condition No. correspond to number of conditions in "Stability Information Booklet".

Opposite heeling for Portside or Starboard damage.

► Indicates damaged conditions presented in this book.

Damaged Case No. 1.03

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	0.74#	5.556	0.437	0.075
1012	1.51	5.772	0.407	0.074
1013	0.77#	5.614	0.414	0.071
1014	1.53	5.791	0.365	0.067

Damaged Case No. 1.04

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	1.60	5.466	0.409	0.071
1012	3.40#	5.577	0.445	0.073
1013	1.74	5.514	0.386	0.068
1014	1.03	5.831	0.384	0.062

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY HULL NO. 218 INTACT AND DAMAGED STABILITY BOOKLET	PAGE: 21 OF 41
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10. Summary of Damaged Conditions .../Continued

Damaged Case No. 1.09

Damaged Case No. 1.10

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	2.75	4.829	0.605	0.105
1012	2.74	5.101	0.591	0.101
1013	2.83	4.878	0.581	0.101
1014	2.80	5.114	0.549	0.094

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	0.39#	4.847	0.661	0.113
1012	0.42#	5.104	0.651	0.110
1013	0.41#	4.901	0.639	0.110
1014	0.42#	5.122	0.613	0.104

Damaged Case No. 1.11

Damaged Case No. 1.12

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	0	5.051	0.498	0.082
1012	0	5.373	0.476	0.077
1013	0	5.120	0.475	0.077
1014	0	5.396	0.435	0.071

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	0	5.522	0.477	0.080
1012	0	5.819	0.467	0.077
1013	0	5.594	0.455	0.077
1014	0	5.841	0.429	0.072

10. Summary of Damaged Conditions .../Continued

Damaged Case No. 1.05

Damaged Case No. 1.06

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	0.64#	5.541	0.484	0.083
1012	1.30	5.776	0.470	0.083
1013	0.58#	5.590	0.476	0.083
1014	1.31	5.778	0.434	0.079

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	5.30	5.043	0.437	0.082
1012	7.28	5.117	0.420	0.081
1013	5.60	5.074	0.412	0.079
1014	2.76	5.635	0.394	0.071

Damaged Case No. 1.07

Damaged Case No. 1.08

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	6.89	4.901	0.368	0.069
1012	1.87	5.701	0.371	0.064
1013	7.38	4.909	0.344	0.065
1014	3.67#	5.575	0.347	0.056

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	6.13	4.986	0.394	0.073
1012	1.72#	5.735	0.404	0.064
1013	6.58	5.002	0.370	0.069
1014	1.02	5.820	0.341	0.056

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY HULL NO. 218 INTACT AND DAMAGED STABILITY BOOKLET	PAGE : 23 OF 41
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10. Summary of Damaged Conditions .../Continued

Damaged Case No. 1.17

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area in 20° Range
	Deg.	m	m	MR
1011	2.59	5.309	0.453	0.076
1012	7.54	5.004	0.462	0.082
1013	2.66	5.365	0.430	0.072
1014	6.71	5.134	0.407	0.072

Damaged Case No. 1.18

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area in 20° Range
	Deg.	m	m	MR
1011	5.97	4.980	0.449	0.082
1012	6.43	5.220	0.437	0.080
1013	6.31	5.006	0.424	0.078
1014	6.86	5.196	0.391	0.072

Damaged Case No. 1.19

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area in 20° Range
	Deg.	m	m	MR
1011	0	4.889	0.503	0.082
1012	0	5.208	0.476	0.076
1013	0	4.967	0.478	0.077
1014	0	5.233	0.436	0.070

Damaged Case No. 1.20

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area in 20° Range
	Deg.	m	m	MR
1011	5.90	4.325	0.549	0.096
1012	6.31	4.602	0.524	0.090
1013	6.22	4.360	0.524	0.092
1014	6.78	4.575	0.481	0.083

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY HULL NO. 218 INTACT AND DAMAGED STABILITY BOOKLET	PAGE: 22 OF 41
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10. Summary of Damaged Conditions .../Continued

Damaged Case No. 1.13

Damaged Case No. 1.14

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	3.45	5.253	0.468	0.083
1012	3.75	5.510	0.459	0.081
1013	3.65	5.294	0.445	0.080
1014	6.47	5.187	0.433	0.081

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	0.50	5.541	0.476	0.080
1012	5.09	5.292	0.481	0.086
1013	0.49	5.604	0.455	0.076
1014	4.05	5.444	0.431	0.075

Damaged Case No. 1.15

Damaged Case No. 1.16

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	3.96	5.193	0.443	0.081
1012	5.99	5.260	0.431	0.081
1013	4.19	5.229	0.420	0.078
1014	4.06	5.446	0.418	0.077

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area _o in 20° Range
	Deg.	m	m	MR
1011	4.63	5.112	0.467	0.083
1012	4.97	5.363	0.457	0.081
1013	4.89	5.146	0.443	0.080
1014	5.24	5.357	0.411	0.074

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10. Summary of Damaged Conditions .../Continued

Damaged Case No. 1.21

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area in 20° Range
	Deg.	m	m	MR
1011	3.80	4.397	0.684	0.120
1012	3.82	4.657	0.669	0.115
1013	3.92	4.440	0.660	0.116
1014	3.93	4.665	0.625	0.108

Damaged Case No. 1.22

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area in 20° Range
	Deg.	m	m	MR
1011	1.31	5.451	0.495	0.089
1012	3.21	5.562	0.461	0.088
1013	1.37	5.488	0.479	0.089
1014	3.22	5.564	0.415	0.082

Damaged Case No. 1.23

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area in 20° Range
	Deg.	m	m	MR
1011	0	5.622	0.433	0.074
1012	0	5.912	0.397	0.073
1013	0	5.684	0.410	0.070
1014	0	5.933	0.360	0.067

Damaged Case No.

Cond. No.	Angle of Heel	Flooded W.L. Below Vents	Max. GZ in 20° Range	Area in 20° Range
	Deg.	m	m	MR

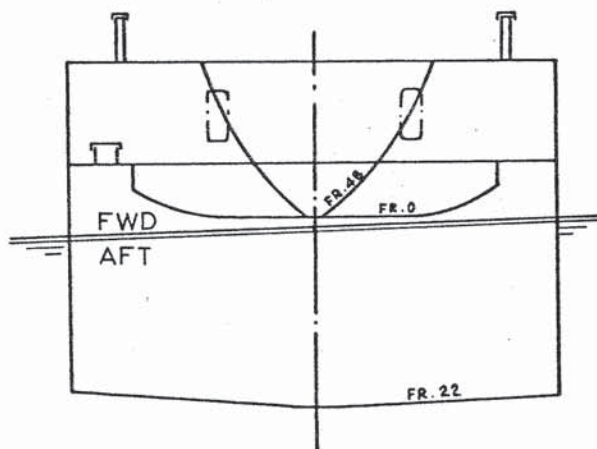
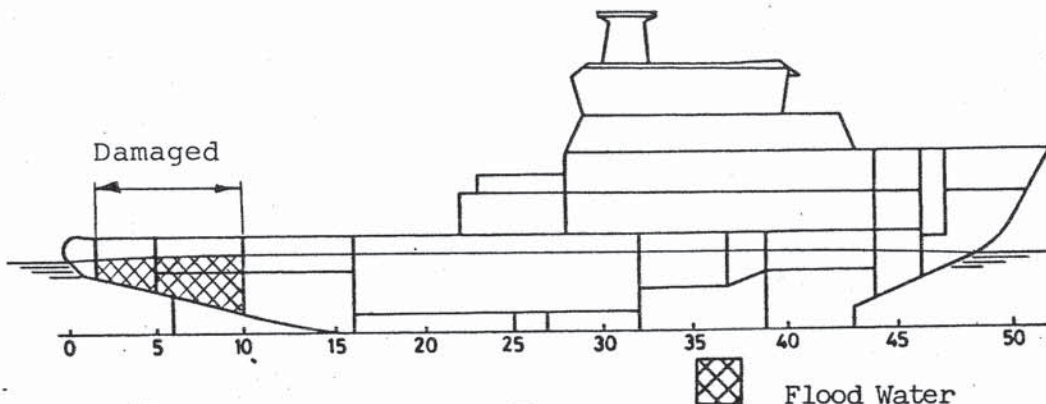
PORT WELLER DRY DOCKS ST.CATH. ONTARIO	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
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11. <u>Worst Damaged Conditions</u>	<u>PAGE</u>
1. Damaged Condition, Case 1.02	26
2. Damaged Condition, Case 1.07	30
3. Damaged Condition, Case 1.17	34
4. Damaged Condition, Case 1.20	38

CONDITION NO. 1013 Max. Deck Cargo, Departure, 60% Consum. (Arctic)

DAMAGE CASE NO. 1.02

NOTE: For Description of Tanks See "General Arrangement" Page 3.



INTACT CONDITION NO. 1013

Deadweight	512.7 t
Displacement	2734.5 t
Mean Draft at L.C.F.	4.995 m
Trim By Bow	0.539 m

DAMAGED CONDITION CASE 1.02

Flood Water	64.7 t
Apparent Displ. Damaged	2799.2 t
Draft Aft at A.P. Mld.	4.997 m
Draft Fwd at F.P. Mld.	5.088 m
Trim By Bow	0.091 m
Angle of Heel	3.19°

Distance of Flooded Waterline

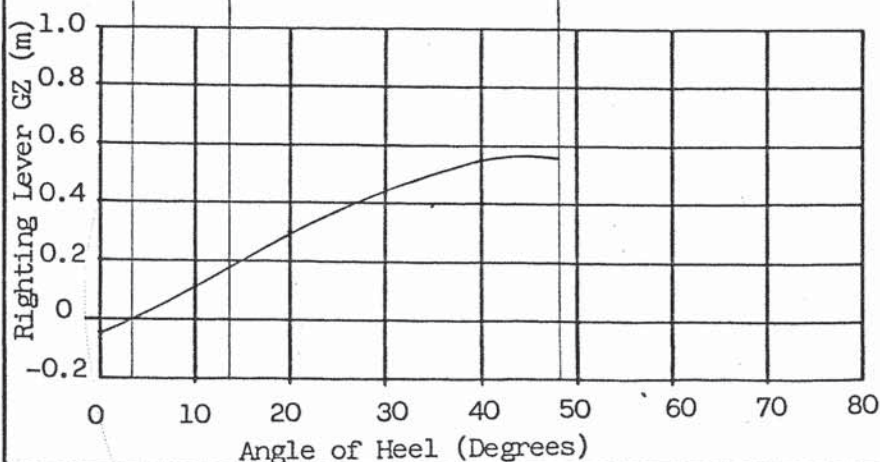
To Galley Vent	5.375 m
To Deck Edge	1.274 m

θ - Angle of Heel After Damage

θ_D - Angle of Deck Immersion

θ_f - Angle of Down Flooding

$\theta = 3.19^\circ$ $\theta_D = 13.48^\circ$ $\theta_f = 48.12^\circ$



Range of positive
GZ curve = 44.93°

Within 20° beyond angle
of heel:

Max. GZ at 23.19°

Max. GZ = 0.338 m

Area under GZ curve
to 23.19° = 0.062 MR

PORT WELLER DRY DOCKS	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
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DAMAGE STABILITY CALCULATION FOR SHIP
C. C. G. S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

LOADING CONDITION NO 1013 DAMAGE CASE NO 1.02
STARBOARD HEELING

INTACT SHIP MAX. DECK CARGO, DEPARTURE, 60% CONSUM. (ARCTIC)
 SW DENSITY 1.02500 (UNITS ARE METRES AND TONNES)
 DRAFT 4.987 TRIM 0.544
 DISPL. S.W. 2734.5 LCG -0.099
 KG 5.365 GM 1.255

LIQUID LOADS IN FOLLOWING COMPARTMENTS
 TAKEN INTO ACCOUNT FOR FREE SURFACES

COMP	WEIGHT	DENSITY	COMPARTMENT
133	56.70	0.8370	F.O. TANK NO. 2 FR. 16-25 P
134	56.70	0.8370	F.O. TANK NO. 2 FR. 16-25 S
105	73.10	0.8370	F.O. TANK NO. 3 FR. 10-16 P
106	21.60	0.8370	F.O. TANK NO. 3 FR. 10-16 S
206	51.60	0.8370	F.O. TANK NO. 4 FR. 5-10 P
208	51.60	0.8370	F.O. TANK NO. 4 FR. 5-10 S
209	12.50	0.8370	FUEL OIL SETTLING TK. FR. 37-39 S
210	12.50	0.8370	FUEL OIL DAY TK. FR. 37-39 P
219	10.00	1.0250	BALLAST TK. NO. 1 FR. 44-46
112	44.80	1.0000	SANITARY WATER TK. FR. 27-32 P
121	44.80	1.0000	SANITARY WATER TK. FR. 27-32 S

DAMAGED SHIP, THE FOLLOWING COMPARTMENTS ARE ASSUMED DAMAGED

NUMBER	PERM	FLSTG	COMPARTMENT
203	0.850	4	STEERING GEAR COMP'T FR. 1-5
205	0.950	4	BALLAST TK. NO. 6 FR. 5-10 S

THE FOLLOWING CALCULATIONS HAVE BEEN PERFORMED
 FOR INTACT CM= 1.255 CORRESPONDING TO KG= 5.365
 THE LEVER IS RELATED TO CONSTANT DISPLACEMENT (THE INTACT DISPLACEMENT)

ANGLE	0.1	5.0	10.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	80.0
SINE	0.0017	0.0872	0.1736	0.2588	0.3420	0.4226	0.5000	0.6428	0.7660	0.8660	0.9397	0.9848
COSIN	1.0000	0.9962	0.9848	0.9659	0.9397	0.9063	0.8660	0.7660	0.6428	0.5000	0.3420	0.1736

INITIAL CONDITION STAGE NO 0

LEVER	0.002	0.102	0.215	0.345	0.461	0.554	0.639	0.774	0.783	0.683	0.475	0.198
DISPL	2734.5	2734.5	2734.5	2734.5	2734.5	2734.5	2734.5	2734.5	2734.5	2734.5	2734.5	2734.5
DRAFT	4.987	4.961	4.886	4.758	4.600	4.422	4.220	3.719	3.070	2.317	1.502	0.646
TRIM	0.54	0.56	0.60	0.65	0.67	0.57	0.36	-0.30	-1.23	-2.31	-3.35	-4.36

FLOODING STAGE NO 1

LEVER	0.001	0.101	0.214	0.344	0.459	0.552	0.637	0.772	0.781	0.681	0.473	0.197
DISPL	2735.7	2735.7	2735.7	2735.7	2735.7	2735.7	2735.7	2735.7	2735.7	2735.7	2735.7	2735.7
DRAFT	4.988	4.963	4.887	4.760	4.601	4.423	4.222	3.721	3.072	2.321	1.506	0.650
TRIM	0.54	0.55	0.59	0.64	0.66	0.56	0.35	-0.31	-1.24	-2.33	-3.37	-4.37

FLOODING STAGE NO 2

LEVER	-0.006	0.095	0.207	0.336	0.449	0.539	0.623	0.757	0.767	0.669	0.463	0.188
DISPL	2742.5	2742.5	2742.5	2742.5	2742.5	2742.5	2742.5	2742.5	2742.5	2742.5	2742.5	2742.5
DRAFT	4.996	4.970	4.895	4.767	4.610	4.433	4.233	3.735	3.088	2.339	1.526	0.671
TRIM	0.49	0.50	0.54	0.60	0.61	0.50	0.29	-0.38	-1.32	-2.41	-3.46	-4.47

FLOODING STAGE NO 3

LEVER	-0.020	0.090	0.191	0.319	0.427	0.513	0.593	0.726	0.735	0.639	0.437	0.167
DISPL	2757.8	2757.8	2757.8	2757.8	2757.8	2757.8	2757.8	2757.8	2757.8	2757.8	2757.8	2757.8
DRAFT	5.013	4.987	4.912	4.785	4.630	4.455	4.259	3.765	3.124	2.379	1.571	0.720
TRIM	0.38	0.39	0.44	0.48	0.49	0.37	0.15	-0.54	-1.49	-2.60	-3.67	-4.70

FLOODING STAGE NO 4 (FINAL STAGE OF FLOODING)

LEVER	-0.049	0.029	0.119	0.223	0.297	0.361	0.428	0.549	0.552	0.464	0.281	0.031
DISPL	2791.0	2804.1	2819.2	2834.3	2844.6	2849.7	2853.5	2860.3	2866.1	2871.4	2876.1	2880.5
DRAFT	5.049	5.038	4.979	4.871	4.744	4.592	4.413	3.971	3.387	2.692	1.928	1.106
TRIM	0.14	0.06	-0.00	-0.07	-0.22	-0.46	-0.80	-1.70	-2.83	-4.13	-5.39	-6.58

DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

LOADING CONDITION NO 1013 DAMAGE CASE NO 1.02

RESULTS OF CRITERION EVALUATIONS

NO = SEQUENCE NO

APPL=0 THE CRITERIA APPLIES AFTER PRIMARY FLOODING

APPL=1 THE CRITERIA APPLIES ALSO DURING FLOODING

APPL=2 THE CRITERIA APPLIES FOR THE FINAL STAGE

(I.E. AFTER CROSSFILLING IF ANY)

NO APPL DESCRIPTION

- 1 1 OPENINGS AT A DISTANCE OF 0.000 ABOVE WL
- 2 1 ANGLE OF HEEL NOT MORE THAN 15.0 DEGREES
- 3 1 GZ= 0.100 IN THE RANGE OF 20.0 DEGREES FROM ANGLE OF LIST
- 4 1 AREA OF 0.0175 UNDER GZ-CURVE IN THE RANGE OF 20.0 DEGREES FROM ANGLE OF LIST

STAGE	CRIT	1	2	3	4
0	GMR	-0.097(0	-0.079(0	0.199(0	0.253(0
	P1	5.680	0.000	0.461	0.078
1	GMR	-0.091(0	-0.074(0	0.197(0	0.248(0
	P1	5.675	0.053	0.460	0.078
2	GMR	-0.061(0	-0.044(0	0.218(0	0.204(0
	P1	5.646	0.367	0.456	0.078
3	GMR	0.003(0	0.022(0	0.275(0	0.199(0
	P1	5.580	1.077	0.446	0.078
4	GMR	0.378(0	0.392(0	0.598(0	0.547(0
	P1	5.375	3.190	0.338	0.062
MAX					
	GMR	0.378(0	0.392(0	0.598(0	0.547(0
OVERALL GM-REQUIREMENT FOR INTACT SHIP= 0.598					
ACTUAL GM = 1.255					
EXCESS GM = 0.657					

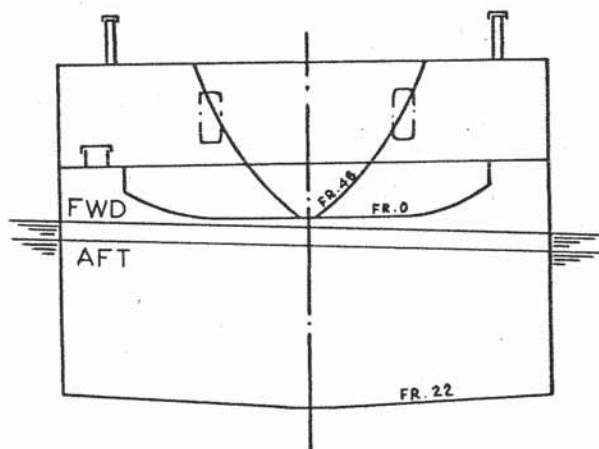
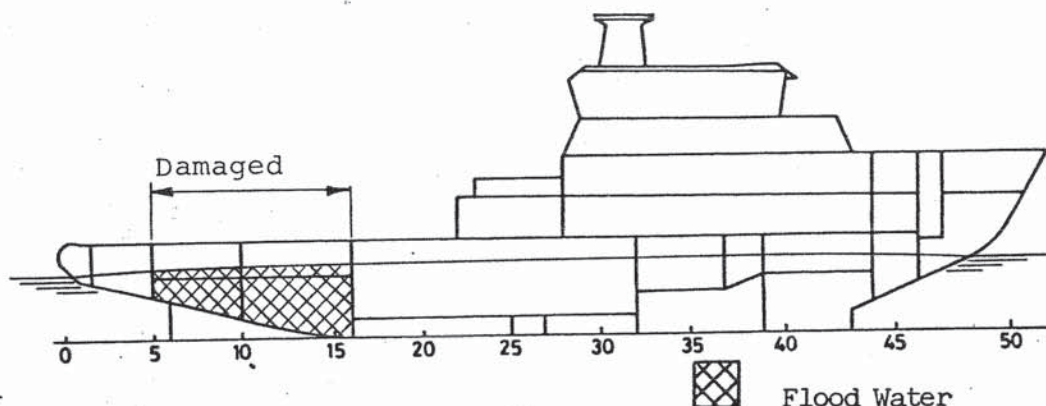
GMR = REQUIRED GM

P1 = ACTUAL VALUE WHEN KG = 5.365 (SEE DESCRIPTION)

IF THE FIGURE FOLLOWING THE BRACKET IS =1 THE CALC RANGE IS TOO SMALL AND THE PRINTED GMR MAY IN THIS CASE BE HIGHER THAN THE REAL GMR

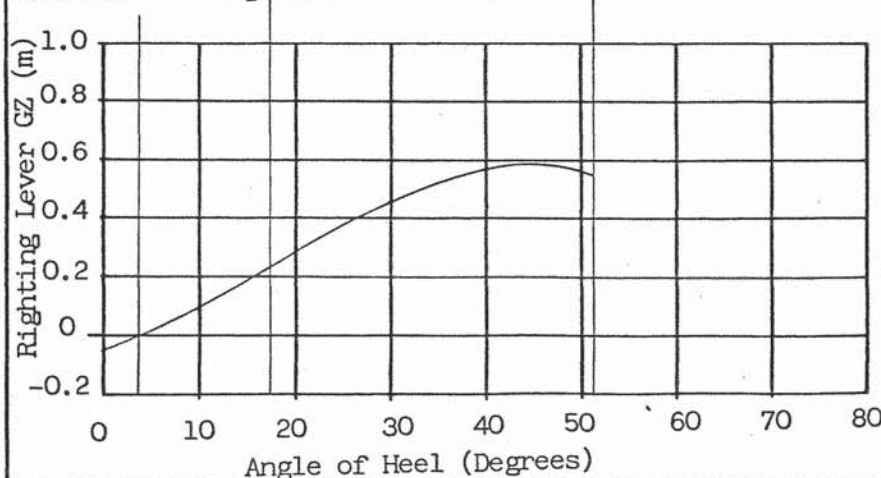
CONDITION NO. 1014 Max. Deck Cargo, Arrival, 10% Consum.
+ 30 Days (Arctic)
DAMAGE CASE NO. 1.07

NOTE: For Description of Tanks See "General Arrangement" Page 3.



- θ - Angle of Heel After Damage
- θ_D - Angle of Deck Immersion
- θ_f - Angle of Down Flooding

$$\theta = 3.67^\circ \quad \theta_D = 17.29^\circ \quad \theta_f = 51.08^\circ$$



INTACT CONDITION NO. 1014	
Deadweight	383.1 t
Displacement	2604.9 t
Mean Draft at L.C.F.	4.825 m
Trim By Bow	0.143 m
DAMAGED CONDITION CASE 1.07	
Flood Water	-35.4 t
Apparent Displ. Damaged	2569.5 t
Draft Aft at A.P. Mld.	4.553 m
Draft Fwd at F.P. Mld.	4.934 m
Trim By Bow	0.381 m
Angle of Heel	3.67°
Distance of Flooded Waterline	
To Galley Vent	5.575 m
To Deck Edge	1.537 m

Range of positive
GZ curve = 47.41°

Within 20° beyond angle
of heel:

Max. GZ at 23.67°

Max. GZ = 0.347 m

Area under GZ curve
to 23.67° = 0.056 MR

PORT WELLER DRY DOCKS	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
ST. CATH. ONTARIO	INTACT AND DAMAGED STABILITY BOOKLET		32 OF 41

DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

LOADING CONDITION NO 1014 DAMAGE CASE NO 1.07

FLOATING POSITION OF THE SHIP SEE THE SUMMARY

DIST=PERPENDICULAR DISTANCE OF REFERENCEPOINTS FROM DAMAGED WATERPLANE
DIST IS NEGATIVE IF IMMersed
DISTWD=DIST FROM CL TO THE INTERSECTION BETWEEN FLOODED WL AND
HORIZONTAL THROUGH THE DECKEDGE

REFERENCE-POINTS

POINT	FR NO	DX	X	Y	Z	DIST	DISTWD
1	0.000	0.000	-31.500	-5.100	6.700	1.807	
2	14.000	0.000	-14.250	-6.850	6.700	1.590	
3	21.000	0.000	-5.500	-6.850	6.700	1.537	
4	22.000	0.000	-4.250	-6.850	9.450	4.274	
5	34.000	0.000	10.750	-6.850	12.150	6.878	

OPENINGS

POINT	FR NO	DX	X	Y	Z	DIST	DISTWD
6	33.000	0.700	10.200	-5.505	10.755	5.575	

IMMERSION LIMIT LINE

POINT	FR NO	DX	X	Y	Z	DIST	DISTWD
7	4.000	0.000	-26.900	-6.100	7.300	2.313	
8	22.000	0.000	-4.250	-3.000	7.300	2.375	

SUMMARY

STAGE OF FLOODING	0	1	2	3	4
ANGLE OF HEEL	0.00	0.88	1.33	1.82	3.67
DRAFT AT AP	4.733	4.689	4.665	4.640	4.553
DRAFT AT FP	4.874	4.889	4.898	4.908	4.934
DIST 1	1.909	1.823	1.778	1.729	1.537
POINT NO	3	3	3	3	3
ANGLE 1	16.21	16.34	16.41	16.48	17.29
DIST 2	5.928	5.848	5.805	5.757	5.575
POINT NO	6	6	6	6	6
ANGLE 2	50.45	50.49	50.51	50.53	51.08
DIST 3	2.506	2.478	2.462	2.443	2.313
POINT NO	8	8	8	7	7
ANGLE 3	24.08	24.42	24.61	24.80	27.28

DIST 1 = MIN DIST FROM WL TO REFERENCE-POINTS
DIST 2 = MIN DIST FROM WL TO OPENINGS
DIST 3 = MIN DIST FROM WL TO IMMERSION LIMIT LINE
NEG DIST MEANS IMMERSION
ANGLE = ANGLE OF HEEL WHEN LOWEST POINT IN QUESTION PASSES WL
POINT NO STATES INDEX TO THE LOWEST POINT IN QUESTION

PORT WELLER DRY DOCKS	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
ST. CATH. ONTARIO	INTACT AND DAMAGED STABILITY BOOKLET		31 OF 41

DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

=====

LOADING CONDITION NO 1014 DAMAGE CASE NO 1.07
PORTSIDE HEELING

=====

INTACT SHIP MAX. DECK CARGO, ARRIVAL, 10% CONSUM. + 30 DAYS (ARCTIC)
SW DENSITY 1.02500 (UNITS ARE METRES AND TONNES)
DRAFT 4.803 TRIM 0.142
DISPL. S.W. 2604.9 LCG -0.485
KG 5.513 GM 1.136

LIQUID LOADS IN FOLLOWING COMPARTMENTS
TAKEN INTO ACCOUNT FOR FREE SURFACES

COMP	WEIGHT	DENSITY	COMPARTMENT
145	23.40	0.8370	F.O. TANK NO. 3 FR. 10-16 CENTRE
210	6.00	0.8370	FUEL OIL DAY TK. FR. 37-39 P
209	6.00	0.8370	FUEL OIL SETTLING TK. FR. 37-39 S
105	56.70	0.8370	F.O. TANK NO. 3 FR. 10-16 P
106	56.70	0.8370	F.O. TANK NO. 3 FR. 10-16 S
205	45.00	1.0250	BALLAST TK. NO. 6 FR. 5-10 S
207	45.00	1.0250	BALLAST TK. NO. 6 FR. 5-10 P
102	35.50	1.0250	BALLAST TK. NO. 5 FR. 10-17 P
122	3.50	1.0250	BALLAST TK. NO. 2 FR. 32-37 P
112	15.50	1.0000	SANITARY WATER TK. FR. 27-32 P
121	15.50	1.0000	SANITARY WATER TK. FR. 27-32 S

=====

DAMAGED SHIP, THE FOLLOWING COMPARTMENTS ARE ASSUMED DAMAGED

NUMBER	PERM	FLSTG	COMPARTMENT
106	0.950	4	F.O. TANK NO. 3 FR. 10-16 S
205	0.950	4	BALLAST TK. NO. 6 FR. 5-10 S

=====

THE FOLLOWING CALCULATIONS HAVE BEEN PERFORMED
FOR INTACT GM= 1.136 CORRESPONDING TO KG= 5.513
THE LEVER IS RELATED TO CONSTANT DISPLACEMENT (THE INTACT DISPLACEMENT)

ANGLE	0.1	5.0	10.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	80.0
SINE	0.0017	0.0872	0.1736	0.2568	0.3420	0.4226	0.5000	0.6428	0.7660	0.8660	0.9397	0.9848
COSIN	1.0000	0.9962	0.9848	0.9659	0.9397	0.9063	0.8660	0.7660	0.6428	0.5000	0.3420	0.1736

INITIAL CONDITION STAGE NO 0

LEVER	0.002	0.098	0.201	0.319	0.434	0.520	0.598	0.702	0.673	0.552	0.321	0.011
DISPL	2604.9	2604.9	2604.9	2604.9	2604.9	2604.9	2604.9	2604.9	2604.9	2604.9	2604.9	2604.9
DRAFT	4.803	4.778	4.704	4.581	4.421	4.244	4.044	3.534	2.875	2.105	1.275	0.405
TRIM	0.14	0.16	0.20	0.27	0.30	0.23	0.05	-0.56	-1.42	-2.49	-3.52	-4.53

FLOODING STAGE NO 1

LEVER	-0.015	0.080	0.182	0.300	0.418	0.506	0.587	0.694	0.668	0.549	0.322	0.013
DISPL	2596.1	2596.1	2596.1	2596.1	2596.1	2596.1	2596.1	2596.1	2596.1	2596.1	2596.1	2596.1
DRAFT	4.793	4.768	4.694	4.571	4.410	4.232	4.030	3.517	2.856	2.082	1.250	0.378
TRIM	0.20	0.21	0.26	0.32	0.36	0.29	0.12	-0.47	-1.33	-2.39	-3.41	-4.42

FLOODING STAGE NO 2

LEVER	-0.024	0.071	0.173	0.291	0.409	0.500	0.582	0.691	0.667	0.550	0.323	0.016
DISPL	2591.8	2591.8	2591.8	2591.8	2591.8	2591.8	2591.8	2591.8	2591.8	2591.8	2591.8	2591.8
DRAFT	4.789	4.763	4.689	4.566	4.405	4.226	4.023	3.509	2.846	2.071	1.238	0.365
TRIM	0.23	0.24	0.30	0.36	0.40	0.33	0.16	-0.43	-1.29	-2.33	-3.36	-4.36

FLOODING STAGE NO 3

LEVER	-0.033	0.061	0.164	0.282	0.400	0.494	0.577	0.688	0.666	0.550	0.324	0.019
DISPL	2587.1	2587.1	2587.1	2587.1	2587.1	2587.1	2587.1	2587.1	2587.1	2587.1	2587.1	2587.1
DRAFT	4.783	4.758	4.684	4.561	4.400	4.219	4.016	3.500	2.835	2.059	1.224	0.351
TRIM	0.26	0.28	0.33	0.39	0.43	0.37	0.20	-0.38	-1.23	-2.28	-3.30	-4.29

FLOODING STAGE NO 4 (FINAL STAGE OF FLOODING)

LEVER	-0.045	0.017	0.087	0.175	0.279	0.370	0.454	0.572	0.572	0.482	0.283	0.011
DISPL	2581.5	2581.5	2581.5	2581.5	2581.5	2581.5	2581.5	2581.5	2581.5	2581.5	2581.5	2581.5
DRAFT	4.776	4.732	4.640	4.502	4.323	4.122	3.900	3.349	2.656	1.854	1.003	0.121
TRIM	0.30	0.41	0.54	0.67	0.79	0.81	0.73	0.27	-0.50	-1.47	-2.44	-3.39

DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

LOADING CONDITION NO 1013 DAMAGE CASE NO 1.02

FLOATING POSITION OF THE SHIP SEE THE SUMMARY

DIST=PERPENDICULAR DISTANCE OF REFERENCEPOINTS FROM DAMAGED WATERPLANE
DIST IS NEGATIVE IF IMMersed
DISTWO=DIST FROM CL TO THE INTERSECTION BETWEEN FLOODED WL AND
HORIZONTAL THROUGH THE DECKEDGE

REFERENCE-POINTS							
POINT	FR NO	DX	X	Y	Z	DIST	DISTWO
1	0.000	0.000	-31.500	5.100	6.700	1.409	
2	14.000	0.000	-14.250	6.850	6.700	1.287	
3	21.000	0.000	-5.500	6.850	6.700	1.274	
4	22.000	0.000	-4.250	6.850	9.450	4.018	
5	34.000	0.000	10.750	6.850	12.150	6.692	

OPENINGS							
POINT	FR NO	DX	X	Y	Z	DIST	DISTWO
6	33.000	0.700	10.200	5.505	10.755	5.375	

IMMERSION LIMIT LINE							
POINT	FR NO	DX	X	Y	Z	DIST	DISTWO
7	4.000	0.000	-26.900	-6.100	7.300	2.625	
8	22.000	0.000	-4.250	3.000	7.300	2.085	

SUMMARY

STAGE OF FLOODING	0	1	2	3	4
ANGLE OF HEEL	0.00	0.05	0.37	1.09	3.19
DRAFT AT AP	4.715	4.720	4.750	4.817	4.997
DRAFT AT FP	5.259	5.256	5.239	5.199	5.088
DIST 1	1.760	1.752	1.704	1.596	1.274
POINT NO	3	3	3	3	3
ANGLE 1	14.98	14.96	14.86	14.62	13.48
DIST 2	5.680	5.675	5.646	5.580	5.375
POINT NO	6	6	6	6	6
ANGLE 2	48.55	48.55	48.52	48.46	48.12
DIST 3	2.349	2.345	2.319	2.260	2.085
POINT NO	8	8	8	8	8
ANGLE 3	38.93	38.88	38.63	38.07	34.57

DIST 1 = MIN DIST FROM WL TO REFERENCE-POINTS

DIST 2 = MIN DIST FROM WL TO OPENINGS

DIST 3 = MIN DIST FROM WL TO IMMERSION LIMIT LINE

NEG DIST MEANS IMMERSION

ANGLE = ANGLE OF HEEL WHEN LOWEST POINT IN QUESTION PASSES WL

POINT NO STATES INDEX TO THE LOWEST POINT IN QUESTION

DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

LOADING CONDITION NO 1014 DAMAGE CASE NO 1.07

RESULTS OF CRITERION EVALUATIONS

NO = SEQUENCE NO

APPL=0 THE CRITERIA APPLIES AFTER PRIMARY FLOODING

APPL=1 THE CRITERIA APPLIES ALSO DURING FLOODING

APPL=2 THE CRITERIA APPLIES FOR THE FINAL STAGE

(I.E. AFTER CROSSFILLING IF ANY)

NO APPL DESCRIPTION

- | | | |
|---|---|---|
| 1 | 1 | OPENINGS AT A DISTANCE OF 0.000 ABOVE WL |
| 2 | 1 | ANGLE OF HEEL NOT MORE THAN 15.0 DEGREES |
| 3 | 1 | GZ= 0.100 IN THE RANGE OF 20.0 DEGREES FROM ANGLE OF LIST |
| 4 | 1 | AREA OF 0.0175 UNDER GZ-CURVE IN THE RANGE OF 20.0 DEGREES FROM ANGLE OF LIST |

STAGE	CRIT	1	2	3	4
0	GMR	-0.134(0	-0.096(0	0.159(0	0.219(0
	P1	5.928	0.000	0.434	0.073
1	GMR	-0.088(0	-0.025(0	0.169(0	0.111(0
	P1	5.848	0.878	0.436	0.073
2	GMR	-0.061(0	0.010(0	0.173(0	0.112(0
	P1	5.805	1.332	0.435	0.073
3	GMR	-0.039(0	0.047(0	0.179(0	0.120(0
	P1	5.757	1.819	0.437	0.074
4	GMR	0.218(0	0.460(0	0.392(0	0.351(0
	P1	5.575	3.672	0.347	0.056

MAX

GMR	0.218(0	0.460(0	0.392(0	0.351(0
OVERALL GM-REQUIREMENT FOR INTACT SHIP=	0.460			
ACTUAL GM =	1.136			
EXCESS GM =	0.676			

GMR = REQUIRED GM

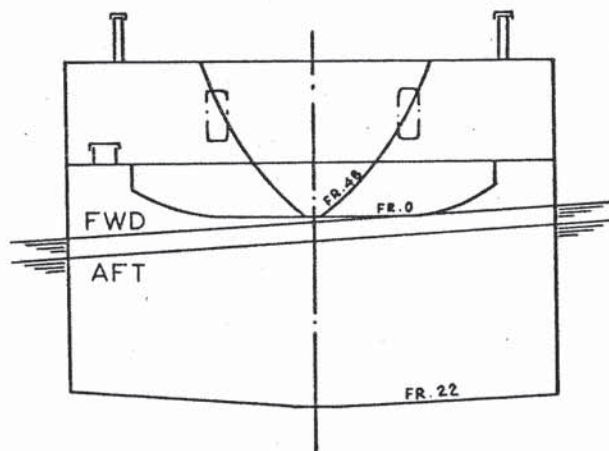
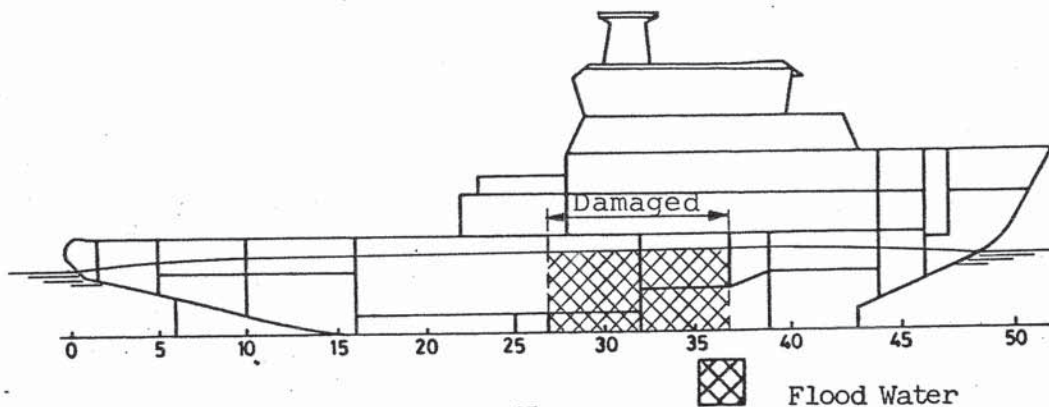
P1 = ACTUAL VALUE WHEN KG = 5.513 (SEE DESCRIPTION)

IF THE FIGURE FOLLOWING THE BRACKET IS =1 THE CALC RANGE IS TOO SMALL AND THE PRINTED GMR MAY IN THIS CASE BE HIGHER THAN THE REAL GMR

CONDITION NO. 1012 Ballast Arrival, 10% Consum. + 30 Days (Arctic)

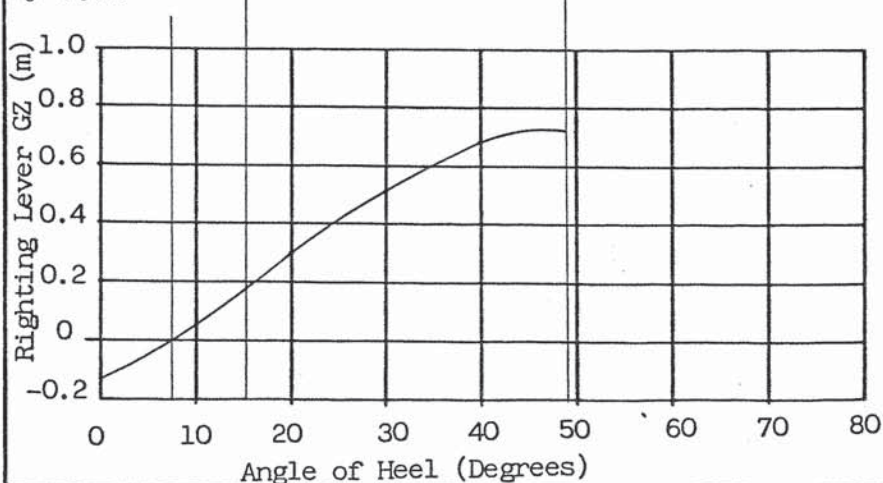
DAMAGE CASE NO. 1.17

NOTE: For Description of Tanks See "General Arrangement" Page 3.



- θ - Angle of Heel After Damage
 θ_D - Angle of Deck Immersion
 θ_f - Angle of Down Flooding

$\theta = 7.54^\circ$ $\theta_D = 15.25^\circ$ $\theta_f = 48.94^\circ$



Range of positive
GZ curve = 41.40°

Within 20° beyond angle
of heel:

Max. GZ at 27.54°

Max. GZ = 0.462 m

Area under GZ curve
to $27.54^\circ = 0.082 \text{ MR}$

INTACT CONDITION NO. 1012

Deadweight	396.4 t
Displacement	2618.2 t
Mean Draft at L.C.F.	4.843 m
Trim By Bow	0.160 m

DAMAGED CONDITION CASE

Flood Water	73.9 t
Apparent Displ. Damaged	2692.1 t
Draft Aft at A.P. Mld.	4.643 m
Draft Fwd at F.P. Mld.	5.085 m
Trim By Bow	0.442 m
Angle of Heel	7.54°

Distance of Flooded Waterline

To Galley Vent	5.004 m
To Deck Edge	0.918 m

PORT WELLER DRY DOCKS	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
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DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
=====

LOADING CONDITION NO 1012 DAMAGE CASE NO 1.17
STARBOARD HEELING
=====

INTACT SHIP BALLAST ARRIVAL, 10% CONSUM. + 30 DAYS (ARCTIC
SW DENSITY 1.02500 (UNITS ARE METRES AND TONNES)
DRAFT 4.822 TRIM 0.159
DISPL. S.W. 2618.2 LCG -0.473
KG 5.388 GM 1.258

LIQUID LOADS IN FOLLOWING COMPARTMENTS
TAKEN INTO ACCOUNT FOR FREE SURFACES
COMP WEIGHT DENSITY COMPARTMENT
209 6.00 0.8370 FUEL OIL SETTling TK. FR. 37-39 S
210 6.00 0.8370 FUEL OIL DAY TK. FR. 37-39 P
133 56.70 0.8370 F.O. TANK NO. 2 FR. 16-25 P
134 56.70 0.8370 F.O. TANK NO. 2 FR. 16-25 S
145 59.30 0.8370 F.O. TANK NO. 3 FR. 10-16 CENTRE
102 38.20 1.0250 BALLAST TK. NO. 5 FR. 10-17 P
207 63.00 1.0250 BALLAST TK. NO. 6 FR. 5-10 P
205 63.00 1.0250 BALLAST TK. NO. 6 FR. 5-10 S
112 4.40 1.0000 SANITARY WATER TK. FR. 27-32 P
121 4.40 1.0000 SANITARY WATER TK. FR. 27-32 S

DAMAGED SHIP, THE FOLLOWING COMPARTMENTS ARE ASSUMED DAMAGED
NUMBER PERM FLSTG COMPARTMENT
121 0.950 4 SANITARY WATER TK. FR. 27-32 S
124 0.950 4 BALLAST TK. NO. 2 FR. 32-37 S

=====

THE FOLLOWING CALCULATIONS HAVE BEEN PERFORMED
FOR INTACT CM= 1.258 CORRESPONDING TO KG= 5.388
THE LEVER IS RELATED TO CONSTANT DISPLACEMENT (THE INTACT DISPLACEMENT)
ANGLE 0.1 5.0 10.0 15.0 20.0 25.0 30.0 40.0 50.0 60.0 70.0 80.0
SINE 0.0017 0.0872 0.1736 0.2583 0.3420 0.4226 0.5000 0.6428 0.7660 0.8660 0.9397 0.9848
COSIN 1.0000 0.9962 0.9848 0.9659 0.9397 0.9063 0.8660 0.7660 0.6428 0.5000 0.3420 0.1736

INITIAL CONDITION STAGE NO 0
LEVER 0.002 0.102 0.217 0.346 0.473 0.569 0.659 0.788 0.783 0.683 0.473 0.188
DISPL 2618.2 2618.2 2618.2 2618.2 2618.2 2618.2 2618.2 2618.2 2618.2 2618.2 2618.2 2618.2
DRAFT 4.822 4.797 4.722 4.598 4.439 4.263 4.062 3.554 2.897 2.129 1.301 0.432
TRIM 0.16 0.18 0.22 0.28 0.31 0.24 0.05 -0.56 -1.44 -2.50 -3.54 -4.55

FLOODING STAGE NO 1
LEVER -0.021 0.091 0.197 0.329 0.456 0.556 0.647 0.781 0.782 0.687 0.480 0.195
DISPL 2628.6 2628.6 2628.6 2628.6 2628.6 2628.6 2628.6 2628.6 2628.6 2628.6 2628.6 2628.6
DRAFT 4.836 4.811 4.737 4.613 4.453 4.276 4.077 3.569 2.913 2.146 1.319 0.452
TRIM -0.19 -0.21 -0.25 0.32 0.34 0.26 0.08 -0.54 -1.42 -2.49 -3.53 -4.54

FLOODING STAGE NO 2
LEVER -0.057 0.047 0.165 0.300 0.430 0.532 0.626 0.769 0.779 0.689 0.486 0.202
DISPL 2644.9 2644.9 2644.9 2644.9 2644.9 2644.9 2644.9 2644.9 2644.9 2644.9 2644.9 2644.9
DRAFT 4.860 4.835 4.760 4.635 4.476 4.299 4.099 3.593 2.937 2.173 1.348 0.482
TRIM 0.25 0.26 0.31 0.37 0.39 0.31 0.12 -0.50 -1.39 -2.46 -3.50 -4.51

FLOODING STAGE NO 3
LEVER -0.095 0.011 0.131 0.269 0.400 0.504 0.601 0.752 0.770 0.687 0.488 0.209
DISPL 2661.4 2661.4 2661.4 2661.4 2661.4 2661.4 2661.4 2661.4 2661.4 2661.4 2661.4 2661.4
DRAFT 4.883 4.858 4.784 4.658 4.499 4.321 4.122 3.616 2.962 2.199 1.376 0.512
TRIM 0.31 0.32 0.36 0.42 0.45 0.36 0.17 -0.46 -1.36 -2.43 -3.47 -4.48

FLOODING STAGE NO 4 (FINAL STAGE OF FLOODING)
LEVER -0.126 -0.049 0.052 0.175 0.301 0.410 0.512 0.680 0.719 0.651 0.472 0.222
DISPL 2679.1 2687.8 2696.6 2705.6 2707.5 2707.5 2707.5 2707.5 2707.5 2707.5 2707.5 2707.5
DRAFT 4.908 4.895 4.833 4.719 4.563 4.385 4.183 3.680 3.030 2.273 1.455 0.596
TRIM 0.37 0.41 0.48 0.57 0.59 0.50 0.29 -0.35 -1.27 -2.35 -3.39 -4.39

DAMAGE STABILITY CALCULATION FOR SHIP
C. C. G. S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

LOADING CONDITION NO 1012 DAMAGE CASE NO 1.17

FLOATING POSITION OF THE SHIP SEE THE SUMMARY

DIST=PERPENUICULAR DISTANCE OF REFERENCEPOINTS FROM DAMAGED WATERPLANE
DIST IS NEGATIVE IF IMMERSED

DISTWD=DIST FROM CL TO THE INTERSECTION BETWEEN FLOODED WL AND
HORISONTAL THROUGH THE DECKEDGE

REFERENCE-POINTS							
POINT	FR NO	DX	X	Y	Z	DIST	DISTWD
1	0.000	0.000	-31.500	5.100	6.700	1.330	
2	14.000	0.000	-14.250	6.850	6.700	0.979	
3	21.000	0.000	-5.500	6.850	6.700	0.918	
4	22.000	0.000	-4.250	6.850	9.450	3.635	
5	34.000	0.000	10.750	6.850	12.150	6.206	

OPENINGS							
POINT	FR NO	DX	X	Y	Z	DIST	DISTWD
6	33.000	0.700	10.200	5.505	10.755	5.004	

IMMERSION LIMIT LINE							
POINT	FR NO	DX	X	Y	Z	DIST	DISTWD
7	4.000	0.000	-26.900	-6.100	7.300	3.362	
8	22.000	0.000	-4.250	3.000	7.300	2.009	

SUMMARY

STAGE OF FLOODING	0	1	2	3	4
ANGLE OF HEEL	0.00	1.14	2.82	4.50	7.54
DRAFT AT AP	4.743	4.734	4.717	4.700	4.643
DRAFT AT FP	4.901	4.928	4.975	5.021	5.085
DIST 1	1.892	1.748	1.531	1.310	0.918
POINT NO	3	3	3	3	3
ANGLE 1	16.07	15.97	15.82	15.67	15.25
DIST 2	5.907	5.781	5.583	5.378	5.004
POINT NO	6	6	6	6	6
ANGLE 2	50.27	50.11	49.86	49.62	48.94
DIST 3	2.489	2.421	2.315	2.204	2.009
POINT NO	8	8	8	8	8
ANGLE 3	41.07	40.86	40.56	40.25	39.42

DIST 1 = MIN DIST FROM WL TO REFERENCE-POINTS

DIST 2 = MIN DIST FROM WL TO OPENINGS

DIST 3 = MIN DIST FROM WL TO IMMERSION LIMIT LINE

NEG DIST MEANS IMMERSION

ANGLE = ANGLE OF HEEL WHEN LOWEST POINT IN QUESTION PASSES WL

POINT NO STATES INDEX TO THE LOWEST POINT IN QUESTION

DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

LOADING CONDITION NO 1012 DAMAGE CASE NO 1.17

RESULTS OF CRITERION EVALUATIONS

NO = SEQUENCE NO

APPL=0 THE CRITERIA APPLIES AFTER PRIMARY FLOODING

APPL=1 THE CRITERIA APPLIES ALSO DURING FLOODING

APPL=2 THE CRITERIA APPLIES FOR THE FINAL STAGE

(I.E. AFTER CROSSFILLING IF ANY)

NO APPL DESCRIPTION

- 1 1 OPENINGS AT A DISTANCE OF 0.000 ABOVE WL
- 2 1 ANGLE OF HEEL NOT MORE THAN 15.0 DEGREES
- 3 1 GZ= 0.100 IN THE RANGE OF 20.0 DEGREES FROM ANGLE OF LIST
- 4 1 AREA OF 0.0175 UNDER GZ-CURVE IN THE RANGE OF 20.0 DEGREES FROM ANGLE OF LIST

STAGE	CRIT	1	2	3	4
0	GMR	-0.123(0	-0.090(0	0.169(0	0.244(0
	P1	5.907	0.000	0.473	0.079
1	GMR	-0.076(0	-0.013(0	0.167(0	0.100(0
	P1	5.781	1.141	0.481	0.081
2	GMR	-0.003(0	0.098(0	0.196(0	0.139(0
	P1	5.583	2.823	0.490	0.085
3	GMR	0.054(0	0.218(0	0.231(0	0.187(0
	P1	5.378	4.496	0.495	0.088
4	GMR	0.195(0	0.582(0	0.356(0	0.318(0
	P1	5.004	7.542	0.462	0.082

MAX

GMR 0.195(0 0.582(0 0.356(0 0.318(0

OVERALL GM-REQUIREMENT FOR INTACT SHIP= 0.582

ACTUAL GM = 1.258

EXCESS GM = 0.676

GMR = REQUIRED GM

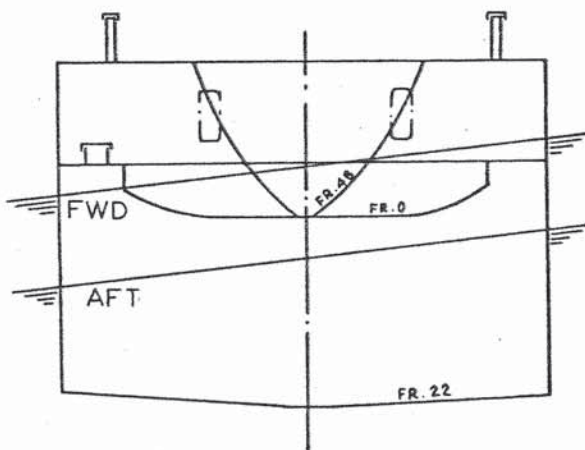
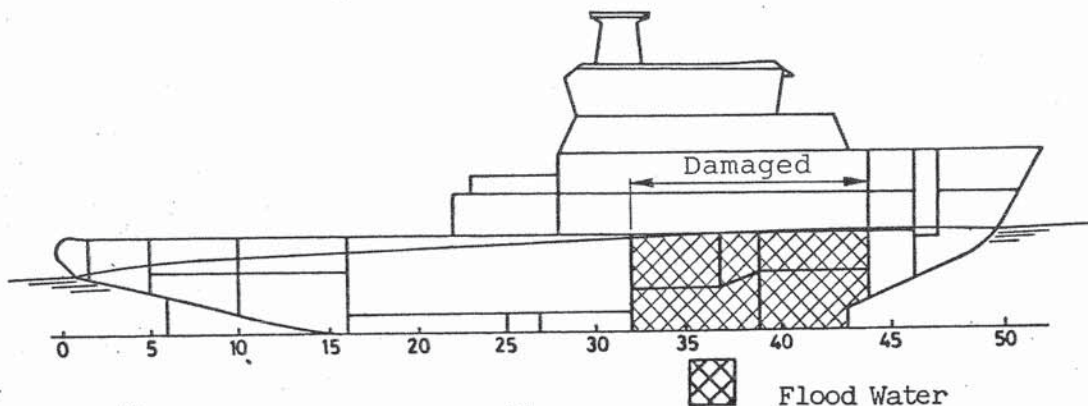
P1 = ACTUAL VALUE WHEN KG = 5.388 (SEE DESCRIPTION)

IF THE FIGURE FOLLOWING THE BRACKET IS =1 THE CALC RANGE IS TOO SMALL AND THE PRINTED GMR MAY IN THIS CASE BE HIGHER THAN THE REAL GMR

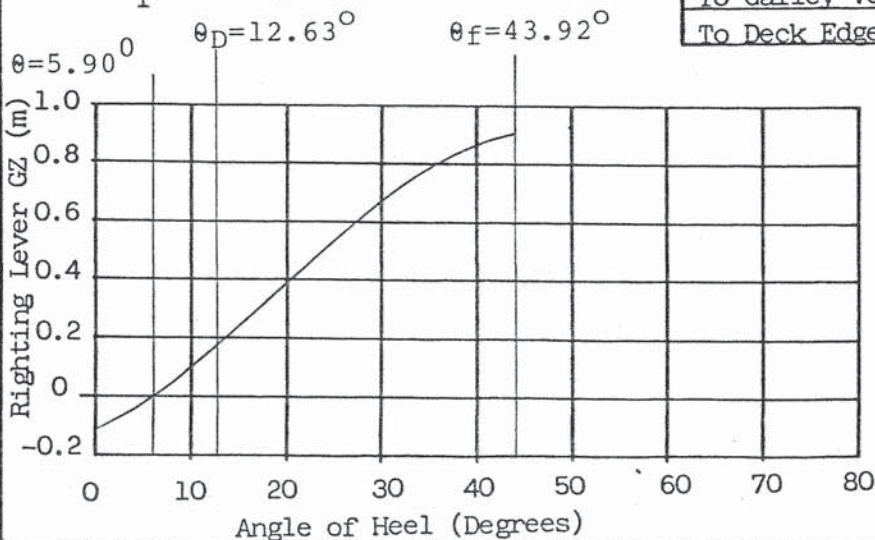
CONDITION NO. 1011 Ballast Departure, 70% Consum. (Arctic)

DAMAGE CASE NO. 1.20

NOTE: For Description of Tanks See "General Arrangement" Page 3.



- θ - Angle of Heel After Damage
- θ_D - Angle of Deck Immersion
- θ_f - Angle of Down Flooding



INTACT CONDITION NO. 1011

Deadweight	538.8 t
Displacement	2760.6 t
Mean Draft at L.C.F.	5.030 m
Trim By Bow	0.696 m

DAMAGED CONDITION CASE 1.20

Flood Water	300.0 t
Apparent Displ. Damaged	3060.6 t
Draft Aft at A.P. Mld.	4.132 m
Draft Fwd at F.P. Mld.	6.663 m
Trim By Bow	2.531 m
Angle of Heel	5.90°

Distance of Flooded Waterline

To Galley Vent	4.325 m
To Deck Edge	0.784 m

Range of positive
GZ curve = 38.02°

Within 20° beyond angle
of heel:

Max. GZ at 25.90°

Max. GZ = 0.549 m

Area under GZ curve
to 25.90° = 0.096 MR

PORT WELLER DRY DOCKS	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
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DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
=====

LOADING CONDITION NO 1011 DAMAGE CASE NO 1.20
STARBOARD HEELING
=====

INTACT SHIP BALLAST DEPARTURE, 70% CONSUM. (ARCTIC)
SW DENSITY 1.02500 (UNITS ARE METRES AND TONNES)
DRAFT 5.025 TRIM 0.687
DISPL. S.W. 2760.6 LCG 0.051
KG 5.296 GM 1.315
LIQUID LOADS IN FOLLOWING COMPARTMENTS
TAKEN INTO ACCOUNT FOR FREE SURFACES
COMP WEIGHT DENSITY COMPARTMENT

133	56.70	0.8370	F.O. TANK NO. 2 FR. 16-25 P
134	56.70	0.8370	F.O. TANK NO. 2 FR. 16-25 S
105	73.10	0.8370	F.O. TANK NO. 3 FR. 10-16 P
106	21.60	0.8370	F.O. TANK NO. 3 FR. 10-16 S
145	35.00	0.8370	F.O. TANK NO. 3 FR. 10-16 CENTRE
206	51.60	0.8370	F.O. TANK NO. 4 FR. 5-10 P
208	51.60	0.8370	F.O. TANK NO. 4 FR. 5-10 S
209	25.80	0.8370	FUEL OIL SETTling TK. FR. 37-39 S
210	25.80	0.8370	FUEL OIL DAY TK. FR. 37-39 P
219	10.00	1.0250	BALLAST TK. NO. 1 FR. 44-66
112	44.80	1.0000	SANITARY WATER TK. FR. 27-32 P
121	44.80	1.0000	SANITARY WATER TK. FR. 27-32 S

=====

DAMAGED SHIP, THE FOLLOWING COMPARTMENTS ARE ASSUMED DAMAGED
NUMBER PERM FLSTG COMPARTMENT

124	0.950	4	BALLAST TK. NO. 2 FR. 32-37 S
142	0.950	4	STAND-BY SEWAGE TK. FR. 37-39 S
126	0.850	4	BOW THRUSTER COMP'T FR. 39-44
228	0.600	4	DRY STORES FR. 39-44

=====

THE FOLLOWING CALCULATIONS HAVE BEEN PERFORMED
FOR INTACT CM= 1.315 CORRESPONDING TO KG= 5.296
THE LEVER IS RELATED TO CONSTANT DISPLACEMENT (THE INTACT DISPLACEMENT)

ANGLE	0.1	5.0	10.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	80.0
SINE	0.0017	0.0372	0.1736	0.2598	0.3420	0.4226	0.5000	0.6428	0.7660	0.8660	0.9397	0.9848
COSIN	1.0000	0.9762	0.9848	0.9659	0.9397	0.9063	0.8660	0.7660	0.6428	0.5000	0.3420	0.1736

INITIAL CONDITION STAGE NO 0

LEVER	0.002	0.107	0.225	0.360	0.482	0.581	0.674	0.822	0.844	0.750	0.545	0.272
DISPL	2760.6	2760.6	2760.6	2760.6	2760.6	2760.6	2760.6	2760.6	2760.6	2760.6	2760.6	2760.6
DRAFT	5.025	5.000	4.924	4.795	4.636	4.457	4.254	3.752	3.103	2.353	1.540	0.686
TRIM	0.69	0.70	0.74	0.79	0.81	0.71	0.50	-0.17	-1.11	-2.19	-3.23	-4.22

FLOODING STAGE NO 1

LEVER	-0.008	0.087	0.202	0.337	0.459	0.560	0.655	0.810	0.840	0.750	0.549	0.280
DISPL	2783.0	2783.0	2783.0	2783.0	2783.0	2783.0	2783.0	2783.0	2783.0	2783.0	2783.0	2783.0
DRAFT	5.058	5.032	4.956	4.827	4.667	4.486	4.282	3.780	3.131	2.383	1.571	0.719
TRIM	0.83	0.84	0.88	0.93	0.94	0.84	0.63	-0.04	-0.99	-2.07	-3.10	-4.08

FLOODING STAGE NO 2

LEVER	-0.033	0.061	0.170	0.302	0.424	0.530	0.632	0.805	0.855	0.773	0.579	0.316
DISPL	2834.5	2834.5	2834.5	2834.5	2834.5	2834.5	2834.5	2834.5	2834.5	2834.5	2834.5	2834.5
DRAFT	5.131	5.105	5.029	4.899	4.737	4.553	4.346	3.842	3.193	2.450	1.641	0.791
TRIM	1.15	1.16	1.19	1.24	1.24	1.14	0.93	0.25	-0.72	-1.78	-2.81	-3.77

FLOODING STAGE NO 3

LEVER	-0.062	0.032	0.140	0.270	0.395	0.513	0.630	0.830	0.909	0.838	0.650	0.394
DISPL	2915.0	2915.0	2915.0	2915.0	2915.0	2915.0	2915.0	2915.0	2915.0	2915.0	2915.0	2915.0
DRAFT	5.243	5.217	5.140	5.008	4.844	4.656	4.443	3.935	3.286	2.549	1.746	0.899
TRIM	1.65	1.66	1.69	1.72	1.73	1.63	1.42	0.72	-0.26	-1.30	-2.31	-3.25

FLOODING STAGE NO 4 (FINAL STAGE OF FLOODING)

LEVER	-0.110	-0.020	0.104	0.252	0.394	0.526	0.654	0.862	0.933	0.841	0.642	0.379
DISPL	3052.2	3060.7	3059.9	3053.6	3046.8	3040.3	3033.3	3015.1	2993.1	2971.5	2952.0	2932.0
DRAFT	5.428	5.412	5.330	5.189	5.013	4.810	4.581	4.049	3.381	2.625	1.802	0.931
TRIM	2.48	2.53	2.54	2.52	2.46	2.32	2.06	1.23	0.11	-1.05	-2.18	-3.25

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY INTACT AND DAMAGED STABILITY BOOKLET	HULL NO. 218 PAGE: 40 OF 41
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DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

LOADING CONOITION NO 1011 DAMAGE CASE NO 1.20

FLOATING POSITION OF THE SHIP SEE THE SUMMARY

DIST=PERPENDICULAR DISTANCE OF REFERENCEPOINTS FROM DAMAGED WATERPLANE
DIST IS NEGATIVE IF IMMERSED
DISTWD=DIST FROM CL TO THE INTERSECTION BETWEEN FLOODED WL AND
HORIZONTAL THROUGH THE DECKEDGE

REFERENCE-POINTS							
POINT	FR NO	DX	X	Y	Z	DIST	DISTWD
1	0.000	0.000	-31.500	5.100	6.700	2.008	
2	14.000	0.000	-14.250	6.850	6.700	1.136	
3	21.000	0.000	-5.500	6.850	6.700	0.784	
4	22.000	0.000	-4.250	6.850	9.450	3.469	
5	34.000	0.000	10.750	6.850	12.150	5.553	

OPENINGS							
POINT	FR NO	DX	X	Y	Z	DIST	DISTWD
6	33.000	0.700	10.200	5.505	10.755	4.325	

IMMERSION LIMIT LINE							
POINT	FR NO	DX	X	Y	Z	DIST	DISTWD
7	4.000	0.000	-26.900	-6.100	7.300	3.571	
8	22.000	0.000	-4.250	3.000	7.300	1.726	

SUMMARY

STAGE OF FLOODING	0	1	2	3	4
ANGLE OF HEEL	0.00	0.54	1.81	3.35	5.90
DRAFT AT AP	4.683	4.640	4.546	4.398	4.132
DRAFT AT FP	5.369	5.471	5.698	6.055	6.663
DIST 1	1.734	1.652	1.459	1.207	0.784
POINT NO	3	3	3	3	3
ANGLE 1	14.76	14.59	14.20	13.62	12.63
DIST 2	5.618	5.513	5.267	4.921	4.325
POINT NO	6	6	6	6	6
ANGLE 2	48.11	47.72	46.83	45.42	43.92
DIST 3	2.320	2.272	2.157	1.998	1.726
POINT NO	8	8	8	8	8
ANGLE 3	38.58	38.30	37.70	36.81	35.57

DIST 1 = MIN DIST FROM WL TO REFERENCE-POINTS
DIST 2 = MIN DIST FROM WL TO OPENINGS
DIST 3 = MIN DIST FROM WL TO IMMERSION LIMIT LINE
NEG DIST MEANS IMMERSION
ANGLE = ANGLE OF HEEL WHEN LOWEST POINT IN QUESTION PASSES WL
POINT NO STATES INDEX TO THE LOWEST POINT IN QUESTION

DAMAGE STABILITY CALCULATION FOR SHIP
C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL

LOADING CONDITION NO 1011 DAMAGE CASE NO 1.20

RESULTS OF CRITERION EVALUATIONS

NO = SEQUENCE NO

APPL=0 THE CRITERIA APPLIES AFTER PRIMARY FLOODING

APPL=1 THE CRITERIA APPLIES ALSO DURING FLOODING

APPL=2 THE CRITERIA APPLIES FOR THE FINAL STAGE

(I.E. AFTER CROSSFILLING IF ANY)

NO APPL DESCRIPTION

- 1 1 OPENINGS AT A DISTANCE OF 0.000 ABOVE WL
- 2 1 ANGLE OF HEEL NOT MORE THAN 15.0 DEGREES
- 3 1 GZ = 0.100 IN THE RANGE OF 20.0 DEGREES FROM ANGLE OF LIST
- 4 1 AREA OF 0.0175 UNDER GZ-CURVE IN THE RANGE OF 20.0 DEGREES FROM ANGLE OF LIST

STAGE	CRIT	1	2	3	4
0	GMR	-0.093(0	-0.078(0	0.197(0	0.253(0
	P1	5.618	0.000	0.482	0.082
1	GMR	-0.027(0	0.011(0	0.208(0	0.147(0
	P1	5.513	0.541	0.470	0.079
2	GMR	0.044(0	0.147(0	0.228(0	0.198(0
	P1	5.267	1.809	0.464	0.078
3	GMR	0.020(0	0.271(0	0.179(0	0.161(0
	P1	4.921	3.347	0.475	0.080
4	GMR	-0.032(0	0.340(0	0.129(0	0.086(0
	P1	4.325	5.898	0.549	0.094
MAX					
	GMR	0.044(0	0.340(0	0.228(0	0.253(0
OVERALL GM-REQUIREMENT FOR INTACT SHIP=					
ACTUAL GM =					
EXCESS GM =					

GMR = REQUIRED GM

P1 = ACTUAL VALUE WHEN KG = 5.296 (SEE DESCRIPTION)

IF THE FIGURE FOLLOWING THE BRACKET IS =1 THE CALC RANGE IS TOO SMALL AND THE PRINTED GMR MAY IN THIS CASE BE HIGHER THAN THE REAL GMR

APPENDIX 'A'

C.C.G.S. EARL GREY

HULL NO.
218

DATE:
APR 1987

PAGE:
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CAPACITY TABLES



PORT WELLER DRY DOCKS

A DIVISION OF ULS
INTERNATIONAL INC.

ST. CATHARINES

ONTARIO

PORT WELLER DRY DOCKS	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
ST. CATH. ONTARIO	CAPACITY TABLES		3 OF 10

C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
FORE PEAK FR. 46-FWD
COMP. NO 220
PERMEABILITY 1.0000

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM		INERTIA MOMENT
BL	BOTTOM		LPP/2	BL CL	
3.602	0.000	0.0			
3.802	0.200	0.018	28.107	3.732 -0.000	0.011
4.002	0.400	0.122	28.301	3.893 -0.000	0.095
4.202	0.600	0.362	28.404	4.039 -0.000	0.370
4.402	0.800	0.802	28.527	4.188 -0.000	0.966
4.602	1.000	1.485	28.637	4.335 -0.000	2.021
4.802	1.200	2.401	28.717	4.477 -0.000	3.617
5.002	1.400	3.659	28.838	4.625 -0.000	5.819
5.202	1.600	5.248	28.947	4.770 -0.000	8.725
5.402	1.800	7.185	29.049	4.915 -0.000	12.372
5.602	2.000	9.468	29.141	5.057 -0.000	16.645
5.802	2.200	12.068	29.220	5.196 -0.000	21.507
6.002	2.400	15.026	29.300	5.336 -0.000	26.882
6.202	2.600	18.342	29.380	5.475 -0.000	32.643
6.402	2.800	21.152	29.479	5.584 -0.000	33.223
6.602	3.000	24.004	29.576	5.693 -0.000	39.752
6.802	3.200	27.208	29.659	5.812 -0.000	21.453
7.002	3.400	30.672	29.728	5.936 -0.000	24.533
7.202	3.600	34.302	29.790	6.059 -0.000	27.890
7.402	3.800	38.102	29.848	6.183 -0.000	31.495
7.602	4.000	42.167	29.910	6.310 -0.000	35.393
7.802	4.200	46.510	29.976	6.441 -0.000	39.681
8.002	4.400	51.124	30.043	6.573 -0.000	44.463
8.202	4.600	56.002	30.110	6.706 -0.000	49.748
8.402	4.800	61.136	30.174	6.840 -0.000	55.512
8.602	5.000	66.518	30.237	6.975 -0.000	61.806
8.802	5.200	72.146	30.297	7.109 -0.000	68.695
9.002	5.400	78.020	30.354	7.244 -0.000	76.264
9.202	5.600	84.143	30.409	7.380 -0.000	84.578
9.402	5.800	90.515	30.461	7.515 -0.000	93.633
9.450	5.848	92.072	30.473	7.547 -0.000	

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
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Stern Thruster Comp't. FR. 5-10			8
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C. C. G. S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
AFT PEAK FR. AFT-1
COMP. NO 201
PERMEABILITY 1.0000

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM			INERTIA MOMENT
BL	BOTTOM		LPP/2	BL	CL	
3.880	0.000	0.0				
3.980	0.100	0.041	-29.925	3.946	-0.000	0.074
4.080	0.200	0.113	-29.958	4.005	-0.000	0.232
4.180	0.300	0.265	-30.026	4.079	-0.000	0.796
4.280	0.400	0.494	-30.063	4.150	-0.000	1.972
4.380	0.500	0.796	-30.084	4.219	-0.000	3.889
4.480	0.600	1.165	-30.096	4.287	-0.000	6.613
4.580	0.700	1.705	-30.147	4.365	-0.000	12.564
4.680	0.800	2.368	-30.189	4.439	-0.000	18.350
4.780	0.900	3.115	-30.216	4.509	-0.000	25.424
4.880	1.000	3.943	-30.235	4.577	-0.000	33.927
4.980	1.100	4.850	-30.248	4.643	-0.000	44.068
5.080	1.200	5.914	-30.272	4.713	-0.000	66.363
5.180	1.300	7.434	-30.342	4.799	-0.000	88.824
5.280	1.400	9.100	-30.395	4.878	-0.000	111.544
5.380	1.500	10.890	-30.434	4.952	-0.000	135.275
5.480	1.600	12.774	-30.465	5.023	-0.000	150.948
5.580	1.700	14.726	-30.489	5.090	-0.000	165.663
5.680	1.800	16.740	-30.503	5.155	-0.000	180.967
5.780	1.900	18.814	-30.524	5.218	-0.000	197.220
5.880	2.000	20.950	-30.537	5.281	-0.000	214.451
5.980	2.100	23.146	-30.549	5.342	-0.000	232.690
6.080	2.200	25.387	-30.559	5.403	-0.000	237.234
6.180	2.300	27.629	-30.567	5.462	-0.000	237.234
6.280	2.400	29.871	-30.574	5.520	-0.000	237.234
6.380	2.500	32.113	-30.580	5.576	-0.000	237.234
6.480	2.600	34.355	-30.585	5.632	-0.000	237.234
6.580	2.700	36.597	-30.590	5.687	-0.000	236.976
6.680	2.800	38.837	-30.594	5.741	-0.000	236.553
6.700	2.820	39.284	-30.595	5.752	-0.000	

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY CAPACITY TABLES	HULL NO. 218 PAGE: 5 OF 10
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C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
COFFERDAM FR 22-25 S
COMP. NO 111
PERMEABILITY 1.0000

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM		INERTIA MOMENT
BL	BOTTOM		LPP/2	BL CL	
0.300	0.000	0.0			
0.500	0.200	0.588	-2.357	0.413	0.236
0.700	0.400	1.270	-2.367	0.513	0.236
0.900	0.600	1.953	-2.370	0.614	0.236
1.100	0.800	2.635	-2.371	0.714	0.236
1.300	1.000	3.318	-2.372	0.814	0.236
1.500	1.200	4.000	-2.372	0.914	0.236
1.700	1.400	4.683	-2.373	1.014	0.236
1.900	1.600	5.365	-2.373	1.114	0.236
2.100	1.800	6.048	-2.373	1.214	0.236
2.300	2.000	6.730	-2.373	1.314	0.236
2.500	2.200	7.413	-2.374	1.414	0.236
2.700	2.400	8.095	-2.374	1.514	0.236
2.900	2.600	8.778	-2.374	1.614	0.236
3.100	2.800	9.460	-2.374	1.714	0.236
3.300	3.000	10.143	-2.374	1.814	0.236
3.500	3.200	10.825	-2.374	1.914	0.236
3.700	3.400	11.508	-2.374	2.014	0.236
3.900	3.600	12.190	-2.374	2.114	0.236
4.100	3.800	12.873	-2.374	2.214	0.236
4.300	4.000	13.555	-2.374	2.314	0.236
4.500	4.200	14.238	-2.374	2.414	0.236
4.700	4.400	14.920	-2.374	2.514	0.236
4.900	4.600	15.603	-2.374	2.614	0.236
5.100	4.800	16.285	-2.374	2.714	0.236
5.300	5.000	16.968	-2.374	2.814	0.236
5.500	5.200	17.650	-2.374	2.914	0.236
5.700	5.400	18.333	-2.374	3.014	0.236
5.900	5.600	19.015	-2.374	3.114	0.236
6.100	5.800	19.698	-2.374	3.214	0.236
6.300	6.000	20.380	-2.374	3.314	0.236
6.500	6.200	21.063	-2.375	3.414	0.236
6.700	6.400	21.745	-2.375	3.514	0.236
6.700	6.400	21.746	-2.375	3.514	0.236

CAPACITY TABLES

C. C. G. S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
 DRY STORES FR. 39-44
 COMP. NO 228
 PERMEABILITY 1.0000

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM			INERTIA MOMENT
BL	BOTTOM		LPP/2	BL	CL	
4.000	0.000	0.0				
4.100	0.100	7.338	20.528	4.050	-0.000	594.455
4.200	0.200	14.801	20.537	4.101	-0.000	619.708
4.300	0.300	22.384	20.546	4.151	-0.000	645.013
4.400	0.400	30.082	20.554	4.202	-0.000	670.265
4.500	0.500	37.892	20.562	4.253	-0.000	695.345
4.600	0.600	45.809	20.570	4.305	-0.000	720.168
4.700	0.700	53.829	20.577	4.356	-0.000	744.840
4.800	0.800	61.950	20.584	4.408	-0.000	769.259
4.900	0.900	70.167	20.591	4.459	-0.000	793.315
5.000	1.000	78.475	20.597	4.511	-0.000	816.894
5.100	1.100	86.872	20.604	4.563	-0.000	839.807
5.200	1.200	95.352	20.609	4.616	-0.000	862.211
5.300	1.300	103.912	20.615	4.668	-0.000	884.118
5.400	1.400	112.550	20.621	4.720	-0.000	905.539
5.500	1.500	121.261	20.626	4.773	-0.000	926.478
5.600	1.600	130.042	20.631	4.825	-0.000	946.750
5.700	1.700	138.891	20.636	4.878	-0.000	966.443
5.800	1.800	147.805	20.641	4.930	-0.000	985.594
5.900	1.900	156.780	20.645	4.983	-0.000	1004.234
6.000	2.000	165.815	20.650	5.036	-0.000	1022.392
6.100	2.100	174.907	20.654	5.088	-0.000	1039.844
6.200	2.200	184.053	20.658	5.141	-0.000	1056.726
6.300	2.300	193.251	20.662	5.194	-0.000	1073.067
6.400	2.400	202.499	20.666	5.247	-0.000	1088.931
6.500	2.500	211.795	20.670	5.300	-0.000	1104.400
6.600	2.600	221.136	20.674	5.352	-0.000	1119.426
6.700	2.700	230.523	20.678	5.405	-0.000	

CAPACITY TABLES

C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
BOW THRUSTER COMP'T FR. 39-44
COMP. NO 126
PERMEABILITY 1.0000

, LEVEL FROM		VOLUME CU3M	CENTRE OF GRAVITY FROM			INERTIA MOMENT
BL	BOTTOM		LPP/2	BL	CL	
-0.011	0.000	0.0				
0.189	0.200	0.536	21.611	0.094	0.000	0.183
0.389	0.400	1.108	21.607	0.195	0.000	0.202
0.589	0.600	1.702	21.584	0.298	0.000	0.339
0.789	0.800	2.401	21.511	0.413	0.000	3.506
0.989	1.000	3.529	21.193	0.568	0.000	17.673
1.189	1.200	5.389	20.791	0.750	-0.000	36.643
1.389	1.400	8.516	20.381	0.954	-0.000	72.911
1.589	1.600	14.355	19.956	1.173	-0.000	94.249
1.789	1.800	20.958	19.808	1.336	-0.000	118.468
1.989	2.000	28.347	19.764	1.490	-0.000	145.723
2.189	2.200	36.548	19.771	1.617	-0.000	176.322
2.389	2.400	45.563	19.803	1.751	-0.000	210.237
2.589	2.600	55.356	19.847	1.881	-0.000	247.067
2.789	2.800	65.893	19.895	2.011	-0.000	286.883
2.989	3.000	77.140	19.943	2.139	-0.000	329.191
3.189	3.200	89.058	19.991	2.266	-0.000	373.519
3.389	3.400	101.559	20.036	2.392	-0.000	400.657
3.589	3.600	114.328	20.082	2.515	-0.000	390.331
3.789	3.800	127.001	20.126	2.632	-0.000	359.726
3.989	4.000	139.405	20.166	2.744	-0.000	330.161
4.000	4.011	140.086	20.168	2.750	-0.000	

CAPACITY TABLES

C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
BOW THRUSTER COMP'T FR. 39-44
COMP. NO 126
PERMEABILITY 1.0000

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM			INERTIA MOMENT
BL	BOTTOM		LPP/2	BL	CL	
-0.011	0.000	0.0				
0.189	0.200	0.536	21.611	0.094	0.000	0.183
0.389	0.400	1.108	21.607	0.195	0.000	0.202
0.589	0.600	1.702	21.584	0.298	0.000	0.339
0.789	0.800	2.401	21.511	0.413	0.000	3.506
0.989	1.000	3.529	21.193	0.568	0.000	17.673
1.189	1.200	5.389	20.791	0.750	-0.000	36.643
1.389	1.400	8.516	20.381	0.954	-0.000	72.911
1.589	1.600	14.355	19.956	1.173	-0.000	94.249
1.789	1.800	20.958	19.808	1.336	-0.000	118.468
1.989	2.000	28.347	19.764	1.480	-0.000	145.723
2.189	2.200	36.548	19.771	1.617	-0.000	176.322
2.389	2.400	45.563	19.803	1.751	-0.000	210.237
2.589	2.600	55.356	19.847	1.881	-0.000	247.067
2.789	2.800	65.893	19.895	2.011	-0.000	286.883
2.989	3.000	77.140	19.943	2.139	-0.000	329.191
3.189	3.200	89.058	19.991	2.266	-0.000	373.519
3.389	3.400	101.559	20.036	2.392	-0.000	400.657
3.589	3.600	114.328	20.082	2.515	-0.000	390.331
3.789	3.800	127.001	20.126	2.632	-0.000	359.726
3.989	4.000	139.405	20.166	2.744	-0.000	330.161
4.000	4.011	140.086	20.168	2.750	-0.000	

CAPACITY TABLES

C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
STERN THRUSTER COMP'T FR. 5-10
COMP. NO 143
PERMEABILITY 1.0000

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM			INERTIA MOMENT
BL	BOTTOM		LPP/2	BL	CL	
1.377	0.000	0.0				
1.477	0.100	0.035	-19.251	1.431	0.000	0.078
1.577	0.200	0.075	-19.251	1.482	0.000	0.078
1.677	0.300	0.161	-19.473	1.568	0.000	0.277
1.777	0.400	0.357	-19.693	1.656	0.000	0.389
1.877	0.500	0.556	-19.758	1.717	0.000	0.389
1.977	0.600	0.803	-19.849	1.783	-0.000	0.544
2.077	0.700	1.082	-19.925	1.846	-0.000	0.544
2.177	0.800	1.362	-19.971	1.904	-0.000	0.633
2.277	0.900	1.782	-20.127	1.980	-0.000	0.855
2.377	1.000	2.220	-20.234	2.049	-0.000	0.855
2.477	1.100	2.685	-20.326	2.115	-0.000	0.956
2.577	1.200	3.201	-20.423	2.181	-0.000	1.010
2.677	1.300	3.719	-20.494	2.243	-0.000	1.010
2.777	1.400	4.372	-20.629	2.316	-0.000	1.321
2.877	1.500	5.050	-20.740	2.384	-0.000	1.321
2.977	1.600	5.775	-20.850	2.453	-0.000	1.477
3.077	1.700	6.532	-20.951	2.519	-0.000	1.477
3.177	1.800	7.384	-21.077	2.590	-0.000	1.778
3.277	1.900	8.300	-21.206	2.660	-0.000	1.788
3.377	2.000	9.247	-21.322	2.728	-0.000	1.865
3.477	2.100	10.204	-21.421	2.794	-0.000	1.865
3.577	2.200	11.160	-21.503	2.857	-0.000	1.865
3.677	2.300	12.116	-21.572	2.917	-0.000	1.865
3.777	2.400	13.072	-21.630	2.977	-0.000	1.865
3.877	2.500	14.029	-21.681	3.035	-0.000	1.865
3.977	2.600	14.985	-21.725	3.092	-0.000	1.865
4.077	2.700	15.941	-21.764	3.148	-0.000	1.865
4.150	2.773	16.637	-21.790	3.188	-0.000	

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY	HULL NO. 218	PAGE:
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C.C.G.S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
 SHAFT ALLEY FR. 10-16 S
 COMP. NO 128
 PERMEABILITY 1.0000

, LEVEL FROM		VOLUME CUBM	CENTRE OF GRAVITY FROM			INERTIA MOMENT
BL	BOTTOM		LPP/2	BL	CL	
0.188	0.000	0.0	-12.020	0.261	1.622	0.013
0.288	0.100	0.014	-12.353	0.335	1.766	0.134
0.388	0.200	0.105	-12.511	0.407	1.930	0.566
0.488	0.300	0.314	-12.705	0.479	2.066	1.343
0.588	0.400	0.677	-12.881	0.548	2.168	1.884
0.688	0.500	1.190	-12.881	0.614	2.228	2.244
0.788	0.600	1.819	-13.046	0.679	2.272	2.810
0.888	0.700	2.551	-13.198	0.744	2.303	3.192
0.988	0.800	3.403	-13.363	0.807	2.325	3.458
1.088	0.900	4.340	-13.512	0.871	2.341	3.695
1.188	1.000	5.369	-13.657	0.934	2.357	4.032
1.288	1.100	6.477	-13.792	0.996	2.371	4.461
1.388	1.200	7.663	-13.920	1.059	2.380	4.690
1.488	1.300	8.927	-14.048	1.121	2.387	4.860
1.588	1.400	10.267	-14.173	1.183	2.394	4.992
1.688	1.500	11.669	-14.290	1.245	2.401	5.302
1.788	1.600	13.134	-14.402	1.307	2.409	5.474
1.888	1.700	14.652	-14.506	1.367	2.416	5.488
1.988	1.800	16.186	-14.595	1.425	2.422	5.554
2.088	1.900	17.733	-14.671	1.483	2.427	5.592
2.188	2.000	19.289	-14.738	1.539	2.432	5.592
2.288	2.100	20.846	-14.795	1.595	2.436	5.592
2.388	2.200	22.403	-14.844	1.649	2.439	5.592
2.488	2.300	23.960	-14.887	1.704	2.443	5.592
2.588	2.400	25.517	-14.924	1.757	2.445	5.592
2.688	2.500	27.074	-14.957	1.811	2.448	5.592
2.788	2.600	28.631	-14.987	1.864	2.450	5.592
2.888	2.700	30.188	-15.013	1.916	2.452	5.592
2.988	2.800	31.745	-15.037	1.969	2.454	5.592
3.088	2.900	33.302	-15.059	2.021	2.455	5.592
3.188	3.000	34.859	-15.078	2.073	2.457	5.592
3.288	3.100	36.416	-15.096	2.125	2.458	5.592
3.388	3.200	37.973	-15.113	2.176	2.459	5.592
3.488	3.300	39.530	-15.128	2.228	2.461	5.592
3.588	3.400	41.087	-15.142	2.280	2.462	5.592
3.688	3.500	42.644	-15.155	2.331	2.463	5.592
3.788	3.600	44.201	-15.168	2.382	2.464	5.592
3.888	3.700	45.758	-15.179	2.433	2.464	5.592
3.988	3.800	47.315	-15.189	2.484	2.465	5.592
4.088	3.900	48.872	-15.199	2.516	2.466	
4.150	3.962	49.842	-15.205			

PORT WELLER DRY DOCKS ST. CATH. ONTARIO	C.C.G.S. EARL GREY CAPACITY TABLES	HULL NO. 218 PAGE: 9 OF 10
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C. C. G. S. EARL GREY - TYPE 1050 NAVIGATION-AIDS VESSEL
STEERING GEAR COMP'T FR. 1-5
COMP. NO 203
PERMEABILITY 1.0000

, LEVEL FROM BL	BOTTOM	VOLUME CUHM	CENTRE OF GRAVITY FROM LPP/2	BL	CL	INERTIA MOMENT
3.287	0.000	0.0				
3.387	0.100	0.032	-25.501	3.342	-0.000	0.101
3.487	0.200	0.146	-25.813	3.427	-0.000	0.513
3.587	0.300	0.391	-25.960	3.499	-0.000	1.465
3.687	0.400	0.793	-26.096	3.571	-0.000	3.372
3.787	0.500	1.448	-26.295	3.648	-0.000	6.768
3.887	0.600	2.410	-26.518	3.725	-0.000	12.424
3.987	0.700	3.715	-26.723	3.800	-0.000	20.991
4.087	0.800	5.314	-26.862	3.872	-0.000	33.247
4.187	0.900	7.209	-26.962	3.942	-0.000	49.925
4.287	1.000	9.400	-27.038	4.011	-0.000	71.775
4.387	1.100	11.887	-27.096	4.079	-0.000	99.550
4.487	1.200	14.669	-27.143	4.147	-0.000	134.002
4.587	1.300	17.748	-27.182	4.215	-0.000	175.867
4.687	1.400	21.123	-27.214	4.283	-0.000	225.908
4.787	1.500	24.794	-27.241	4.350	-0.000	284.610
4.887	1.600	28.760	-27.264	4.417	-0.000	352.787
4.987	1.700	33.014	-27.284	4.484	-0.000	425.251
5.087	1.800	37.533	-27.303	4.551	-0.000	489.780
5.187	1.900	42.270	-27.321	4.617	-0.000	549.533
5.287	2.000	47.186	-27.340	4.681	-0.000	594.729
5.387	2.100	52.221	-27.357	4.745	-0.000	624.487
5.487	2.200	57.332	-27.372	4.806	-0.000	650.460
5.587	2.300	62.515	-27.386	4.867	-0.000	676.429
5.687	2.400	67.767	-27.398	4.927	-0.000	702.266
5.787	2.500	73.085	-27.409	4.986	-0.000	728.567
5.887	2.600	78.472	-27.418	5.044	-0.000	756.115
5.987	2.700	83.928	-27.427	5.102	-0.000	784.444
6.087	2.800	89.426	-27.435	5.160	-0.000	788.139
6.187	2.900	94.924	-27.443	5.216	-0.000	788.128
6.287	3.000	100.423	-27.449	5.272	-0.000	788.137
6.387	3.100	105.921	-27.455	5.327	-0.000	788.150
6.487	3.200	111.420	-27.460	5.382	-0.000	788.161
6.587	3.300	116.919	-27.464	5.437	-0.000	788.158
6.687	3.400	122.417	-27.469	5.490	-0.000	788.152
6.700	3.413	123.126	-27.469	5.497	-0.000	

CCGS Earl Grey VLE Refit (F7049-140284/A)	PVN et Radoub NGCC Earl Grey (F7049-140284/A)
Amendment #1 - Q&As 1, 3, 4 and 5	Modification no 1 - Q&R 1, 3, 4 et 5
<p>Q-1 In reviewing the Attachments provided with the above Invitation to Tender we have been unable to open the .dwg files, however we have noted that the folder includes .pdf files with the same number/name prefix (Ex. File 1 Specs & App\Append\A20 - Emerg Air Comp\ C14-40-551-02 R0 Emerg Air Comp Instal.dwg and C14-40-551-02 R0 Emerg Air Comp Instal.pdf). Is the .pdf document provided just a PDF version of the .dwg file with all information the same in both?</p> <p>A-1 Yes, the pdf is the same version as the dwg file.</p>	<p>Q-1 En examinant les pièces jointes fournies avec l'invitation à soumissionner ci-dessus, nous n'avons pas pu ouvrir les fichiers .dwg, mais nous avons noté que le dossier contient les fichiers .pdf avec le même numéro / nom préfixe (Ex. Fichier 1 Specs & App \ Append \ A20 - Emerg Air Comp \ C14-40-551-02 R0 Emerg Air Comp Instal.dwg et C14-40-551-02 R0 Emerg Air Comp Instal.pdf). Est-ce que le document .pdf fourni est juste une version PDF du fichier .dwg avec toutes les informations les mêmes dans les deux ?</p> <p>R-1 Oui, le fichier pdf est le même que le fichier dwg.</p>
<p>Q-2 Regarding the CCGS Earl Grey ITT published on Friday, is it possible to have a copy of the complete stability booklet? The only documents on the publication are the hydrostatic and cross curves.</p> <p>A-2 The response to this question will published with the Q&A Amendment 2.</p>	<p>Q-2 Concernant l'appel d'offre du NGCC Earl Grey paru vendredi passé, est-ce possible de nous faire parvenir le livret de stabilité complet du navire? Les seuls documents qui sont sur la publication sont les hydrostatiques et les cross curves.</p> <p>R-2 La réponse à cette question sera publié avec la Modification no 2 sur les Q&R.</p>
<p>Q-3 Drawing Folder (S24 – Bow Thruster) contains the Sub-Folder “Transverse Thruster Installation Instructions”. This folder contains no documents. Are these documents missing from the specification?</p> <p>A3 This folder will have additional technical information that will be posted as soon as it will become available to Canada. The technical information will provide supplemental engineering details to the existing specifications to aid the bidders in their proposals.</p>	<p>Q-3 Le dossier (S24 - Bow Thruster) contient le sous-dossier "Transverse Thurster Installation Instructions". Ce dossier ne contient pas de documents. Est-ce que ces documents sont manquants de la spécification ?</p> <p>R-3 Ce dossier aura de l'informations technique supplémentaire qui sera affichée dès qu'il sera disponible au Canada. L'information technique fournira des détails d'ingénierie supplémentaires aux spécifications existantes afin d'aider les soumissionnaires dans leurs propositions.</p>

<p>Q-4 Drawing Folder (S27 – Stern Thruster) contains the Sub-Folder “Rolls Royce Installation Instructions”. This folder contains no documents. Are these documents missing from the specification?</p> <p>A-4 This folder will have additional technical information that will be posted as soon as it will become available to Canada. The technical information will provide supplemental engineering details to the existing specifications to aid the bidders in their proposals.</p>	<p>Q-4 Le dossier (S27 - Stern Thruster) contient le sous-dossier "Rolls Royce Installation Instructions". Ce dossier ne contient pas de documents. Est-ce que ces documents sont manquants de la spécification?</p> <p>R-4 Ce dossier aura de l'informations technique supplémentaire qui sera affichée dès qu'il sera disponible au Canada. L'information technique fournira des détails d'ingénierie supplémentaires aux spécifications existantes afin d'aider les soumissionnaires dans leurs propositions.</p>
<p>Q-5 Drawing Folder (S28 – Boat Davit) contains no documents. Are these documents missing from the specification?</p> <p>A-5 This folder will have additional technical information that will be posted as soon as it will become available to Canada. The technical information will provide supplemental engineering details to the existing specifications to aid the bidders in their proposals.</p>	<p>Q-5 Le dossier (S28 - Boat Davit) ne contient pas de documents. Est-ce que ces documents sont manquants de la spécification ?</p> <p>R-5 Ce dossier aura de l'informations technique supplémentaire qui sera affichée dès qu'il sera disponible au Canada. L'information technique fournira des détails d'ingénierie supplémentaires aux spécifications existantes afin d'aider les soumissionnaires dans leurs propositions.</p>
Amendment #2 - Q&A 2	Modification no 2 - Q&R 2
<p>Q-2 Regarding the CCGS Earl Grey ITT published on Friday, is it possible to have a copy of the complete stability booklet? The only documents on the publication are the hydrostatic and cross curves.</p> <p>A-2 Stability Booklets are made available through this Solicitation Amendment.</p>	<p>Q-2 Concernant l’appel d’offre du NGCC Earl Grey paru vendredi passé, est-ce possible de nous faire parvenir le livret de stabilité complet du navire? Les seuls documents qui sont sur la publication sont les hydrostatiques et les cross curves.</p> <p>R-2 Les cahiers de stabilité sont rendus disponibles par l'entremise de la présente modification.</p>