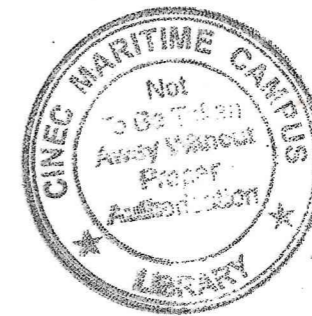


0011492



|            |                 |
|------------|-----------------|
| ACC. NO.   | 0011492         |
| CLASS. NO. | 623.8171<br>BHA |

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PRICE RS. 40/-

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| ACC. NO.   | 006047        |
| CLASS. NO. | 623.81<br>BNA |



**M. V. "HINDSHIP"**

When using the Trim and Stability Data for M. V. "Hindship", the following should be taken into account *unless otherwise stated* :-

- Relative densities of liquids shall be taken as follows :-
 

|                 |       |               |      |
|-----------------|-------|---------------|------|
| Salt Water      | 1.025 | Fresh Water   | 1.00 |
| Heavy Fuel Oil. | 0.95  | Diesel Oil.   | 0.88 |
| Lub. Oil.       | 0.90  | Cylinder Oil. | 0.92 |
- GZ curves, hydrostatic curves and displacement scale are for inspection only. For actual calculations, tables on page 21-22 and 7 & 8 respectively should be used. Interpolated values shall be considered correct for in between displacements/drafts.
- Draft marks are to be assumed as at the fore and aft perpendicular.
- KG means the KG without allowing for free surface correction.
- GM (Solid) means GM without allowing for free surface correction.
- GM (Fluid) means GM (Solid)—FSC
- F.S.C. is to be applied to the GM and *NOT* to the KG except when determining GZ values from KN.
- Corrected KG means KG—FSC. (when determining GZ from KN.).
- Kg of liquid in any tank is always to be presumed as for full tank.
- Moment of inertia for calculations of FSC is to be obtained from page 19 and the FSC is to be worked out as indicated on page 18—20.
- Hydrostatic draft means the draft at the Centre of Flotation.
- All information taken from pages 8 & 9 relates to hydrostatic draft. However, when trim of the ship given, the mean draft may be considered to be the same as the hydrostatic draft.
- A tank shall be considered to be full when filled to its 100% capacity.
- When a large change of displacement is involved, the hydrostatic data is to be obtained corresponding to the final draft/displacement.
- Trim is to be calculated as indicated.
- Righting arm (KN) values from Column 'B' only to be used where both 'A' & 'B' are given on pages 21 and 22.
- Weights added or removed from any compartment are to be assumed at or from the respective Centre of Gravity of the compartment (Both vertical and longitudinal).
- For calculations involving capacities of cargo compartments, the grain capacities are to be used.





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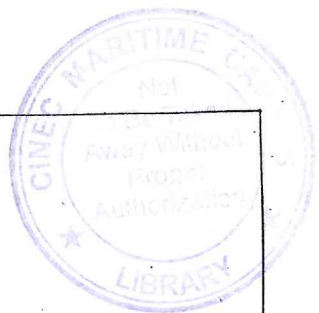
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## GENERAL PARTICULARS

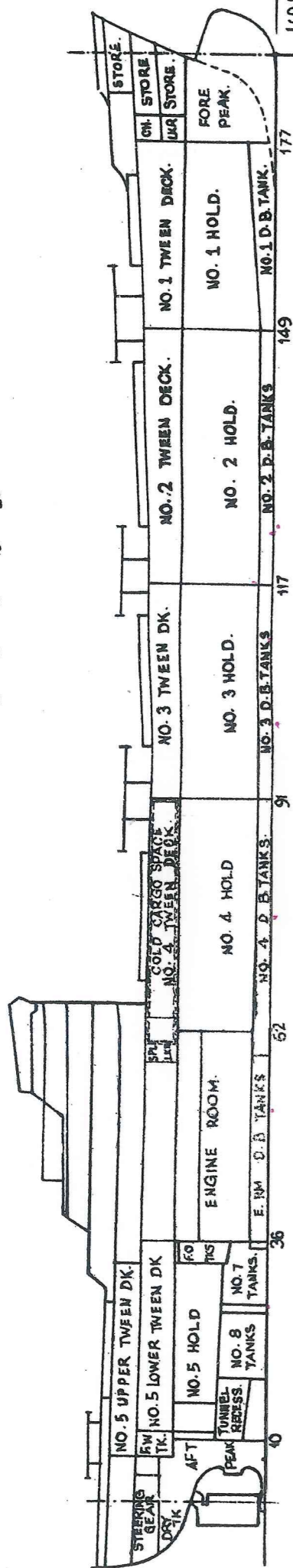
## MOULDED DIMENSIONS:

|  | METRES        | FEET          |
|--|---------------|---------------|
| LENGTH OVERALL TO EXTREME POINT ON BULB: ..... | 153.965       | 505'-1.3/4"   |
| LENGTH OVERALL TO EXTREME POINT ON STEM: ..... | 153.475       | 503'-6.7/16"  |
| LENGTH BETWEEN PERPENDICULARS .....            | 143.160       | 469'-8.5/16"  |
| BREADTH MOULDED .....                          | 20.000        | 65'-7.7/16"   |
| DEPTH MOULDED TO UPPER DECK .....              | 11.818        | 38'-9.5/16"   |
| DEPTH MOULDED TO SECOND DECK .....             | 8.819         | 28'-11.13/16" |
| SUMMER LOAD DRAUGHT .....                      | 9.233         | 30'-3.1/2"    |
| BLOCK COEFFICIENT .....                        | 0.722         |               |
| DISPLACEMENT .....                             | 19617 TONNES  | 19307 TONS    |
| DEADWEIGHT .....                               | 14117 TONNES  | 13894 TONS    |
| GROSS TONNAGE .....                            | 10015.80 TONS |               |
| NET TONNAGE .....                              | 5494.76 TONS  |               |

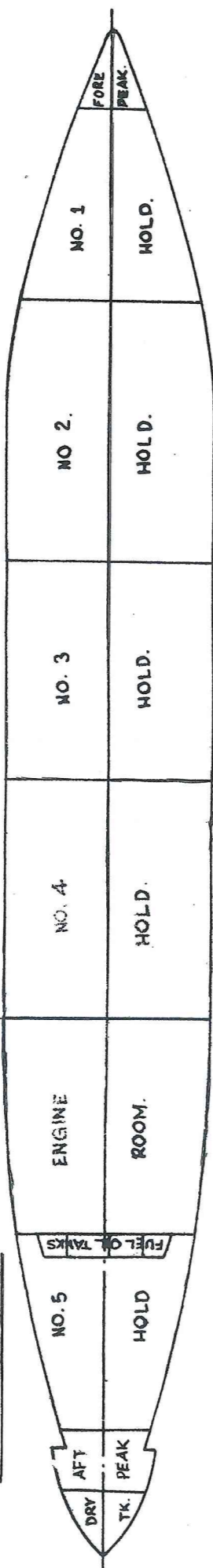




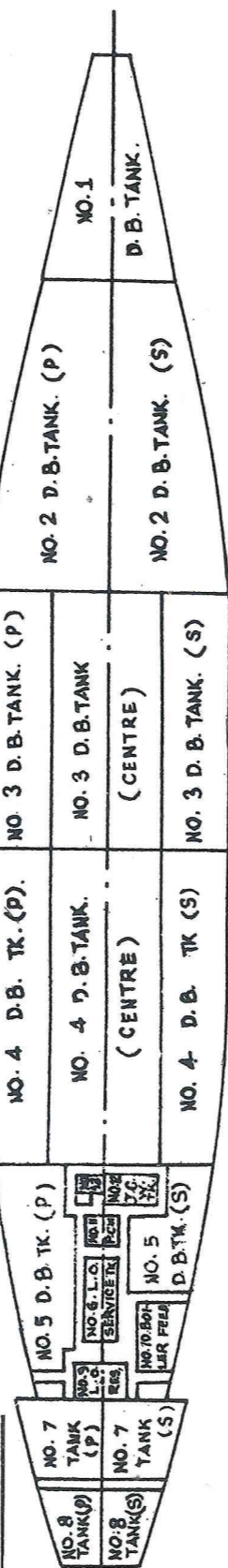
PLAN SHOWING CARGO SPACES, STORE ROOMS AND TANKS.



PLAN THROUGH HOLD.



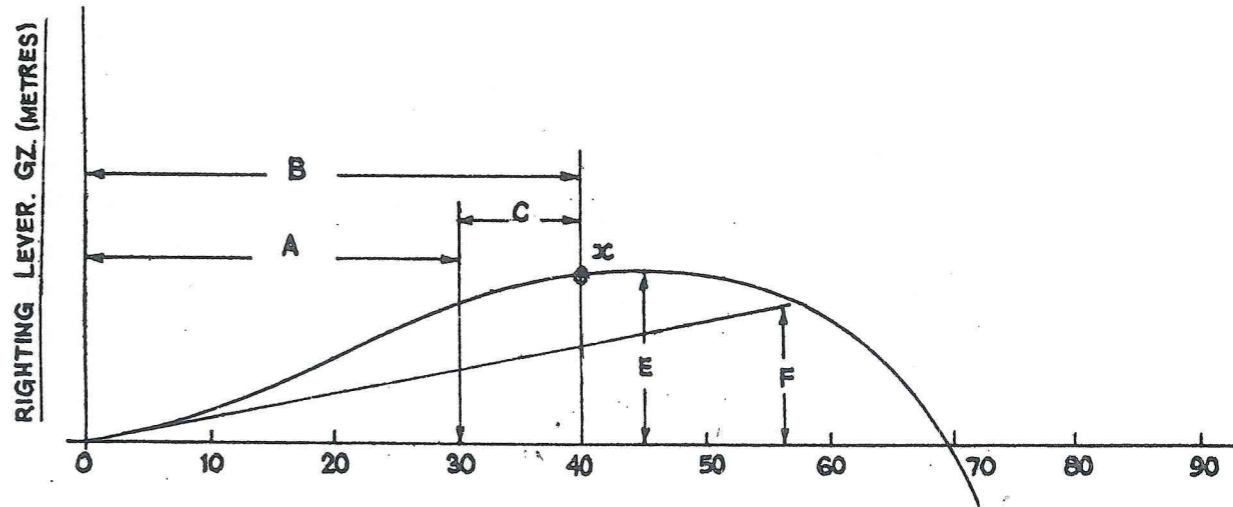
PLAN AT TANK TOP.



SPECIAL NOTES REGARDING THE STABILITY AND LOADING OF THE SHIP

(1) As this ship is required to comply with Regulation 10 (1) and (2) of the Load Line Convention 1966 the G. O. INDIA considers it important to ensure that in any sailing condition the stability complies at least with the following minimum criteria:

STATIC STABILITY CURVE



ANGLE OF INCLINATION (DEGREES)

- A — Area under curve up to 30° to be not less than 0.055 metre radians
- B — do do X° —do— 0.09 —do—
- C — Area between 30° and X° —do— 0.03 —do—
- X — 40° or lesser angle at which water could enter hull
- E — Max. GZ to occur at angle not less than 30°, and to be at least 0.20 metres (0.66 ft.) in height.
- F — Initial G. M. to be not less than 0.15 metres (0.49 ft.).

(2) In order that the required minimum Bow Height is always maintained the forward draught should not exceed 11.211 M.



## METRIC CONVERSIONS

## Metric Equivalents

| Multiply by | To Convert from   | To obtain  |                      |
|-------------|---|--|----------------------|
| 0.03937     | Millimetres   | Inches   | 25.400               |
| 0.3937      | Centimetres   | Inches   | 2.5400               |
| 3.2808      | Metres  | Feet   | 0.3048               |
| 2.2048      | Kilogrammes   | Pounds   | 0.45359              |
| 0.0005842   | Kilogrammes   | Tons (2240 Lbs)                                    | 1016.047             |
| 0.9842      | Metric (i.e. Tonnes<br>Tons of 1000 Kilos)                    | Tons (2240 Lbs)                                    | 1.016                |
| 2.4998      | Metric Tons per Centimetre (of<br>Immersion)                  | Tons per Inch (Immersion)                          | 0.4000               |
| 8.2014      | Moment to change Trim one centi-<br>metre (Tonne metre units) | Moment to change Trim<br>one inch (Foot Ton Units) | 0.122                |
| 187.9767    | Metre Radians   | Feet Degrees                                       | 0.0053               |
|             | To obtain   | To Convert from                                    | Multiply by<br>above |

## Relation between weight and Volume.

10 mm. cubed = 1 Cubic Centimetre

1 Cubic Centimetre of fresh water (S. G. 1.0) = 1 gramme

1000 " " " " " ( " ) = 1 Kilogram (1000 gms)

1 " metre " " " ( " ) = 1 Tonne (1000 Kilos)

1 " " " Salt water (S.G. 1.025) = 1.025 Tonnes

1 Tonne " " " ( " ) = 0.975 Cubic Metres.

1 Cubic Metre = 35.316 Cubic Feet

1 Cubic Feet = 0.0283 Cubic Metres.

## HYDROSTATIC PARTICULARS

(In Salt water)

(S. G. 1.025)

| Draught<br>B.K.<br>(Metres) | Displace-<br>ment<br>(Metric<br>Tonnes)<br>i.e. 1000<br>Kilograms | T.P.C.I.<br>(Tonnes<br>per Cm.<br>Immersion) | M.C.T.C.<br>(Moment<br>to change<br>Trim one<br>Cm) | L.C.B.<br>F.W.D.<br>of AP<br>(Metres) | L.C.F.<br>F.W.D.<br>of AP<br>(Metres) | V.C.B.<br>Above<br>Base<br>(Metres) | K.M. (T)<br>Transverse<br>Meta-<br>centre<br>A.B.<br>(Metres) | K.M. (L)<br>Longl.<br>Meta-<br>centre<br>A.B.<br>(Metres) |
|-----------------------------|---|--|---|---------------------------------------|---------------------------------------|-------------------------------------|---|---|
| 2.80                        | 5063  | 20.72  | 145.2   | 72.946                                | 73.117                                | 1.496                               | 12.152  | 415.4   |
| 3.00                        | 5478  | 20.90  | 148.0   | 72.958                                | 73.131                                | 1.604                               | 11.674  | 391.3   |
| 3.20                        | 5897  | 21.09  | 150.7   | 72.970                                | 73.145                                | 1.712                               | 11.234  | 369.2   |
| 3.40                        | 6320  | 21.24  | 153.2   | 72.981                                | 73.145                                | 1.822                               | 10.834  | 349.5   |
| 3.60                        | 6746  | 21.38  | 155.2   | 72.992                                | 73.145                                | 1.930                               | 10.478  | 332.5   |
| 3.80                        | 7174  | 21.50  | 157.1   | 73.000                                | 73.145                                | 2.038                               | 10.154  | 317.0   |
| 4.00                        | 7605  | 21.62  | 158.9   | 73.010                                | 73.131                                | 2.146                               | 9.864   | 303.3   |
| 4.20                        | 8038  | 21.72  | 160.7   | 73.014                                | 73.103                                | 2.256                               | 9.610   | 290.1   |
| 4.40                        | 8473  | 21.82  | 162.4   | 73.017                                | 73.060                                | 2.366                               | 9.386   | 278.4   |
| 4.60                        | 8910  | 21.91  | 163.8   | 73.019                                | 73.017                                | 2.472                               | 9.196   | 267.5   |
| 4.80                        | 9348  | 21.99  | 165.4   | 73.018                                | 72.974                                | 2.576                               | 9.032   | 257.3   |
| 5.00                        | 9788  | 22.08  | 166.8   | 73.016                                | 72.917                                | 2.684                               | 8.890   | 247.7   |
| 5.20                        | 10230   | 22.16  | 168.2   | 73.013                                | 72.846                                | 2.88                                | 8.770   | 238.8   |
| 5.40                        | 10674   | 22.24  | 169.6   | 73.005                                | 72.761                                | 2.892                               | 8.664   | 230.9   |
| 5.60                        | 11120   | 22.32  | 171.0   | 72.992                                | 72.675                                | 2.998                               | 8.578   | 223.3   |
| 5.80                        | 11569   | 22.39  | 172.4   | 72.979                                | 72.590                                | 3.102                               | 8.502   | 216.4   |
| 6.00                        | 12019   | 22.47  | 174.0   | 72.962                                | 72.476                                | 3.204                               | 8.438   | 210.6   |
| 6.20                        | 12472   | 22.56  | 175.7   | 72.941                                | 72.333                                | 3.308                               | 8.384   | 205.0   |
| 6.40                        | 12927   | 22.66  | 177.5   | 72.916                                | 72.176                                | 3.412                               | 8.340   | 200.0   |
| 6.60                        | 13383   | 22.75  | 179.3   | 72.889                                | 72.005                                | 3.516                               | 8.304   | 195.8   |
| 6.80                        | 13840   | 22.85  | 181.4   | 72.858                                | 71.806                                | 3.620                               | 8.280   | 191.6   |

Note:—The hydrostatic particulars given above have been developed with the vessel floating on water lines which are level to the keel.

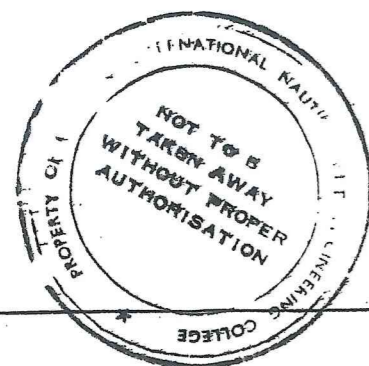


## HYDROSTATIC PARTICULARS

(In Salt water)  
(S. G. 1.025)

| Draught<br>B.K.<br>(Metres) | Displace-<br>ment<br>(Metric<br>Tonnes)<br><i>i.e.</i> 1000<br>Kilograms | T.P.C.I.<br>(Tonnes<br>per Cm.<br>Immersion) | M.C.T.C.<br>(Moment<br>to change<br>Trim one<br>Cm) | L.C.B.<br>F.W.D.<br>of AP<br>(Metres) | L.C.F.<br>F.W.D.<br>of AP<br>(Metres) | V.C.B.<br>Above<br>Base<br>(Metres) | K.M.(T)<br>Transverse<br>Meta-<br>centre<br>A.B.<br>(Metres) | K.M.(L)<br>Longl.<br>Meta-<br>centre<br>A.B.<br>(Metres) |
|-----------------------------|--|--|---|---------------------------------------|---------------------------------------|-------------------------------------|--|--|
| 7.00                        | 14299  | 22.95  | 183.8   | 72.821                                | 71.606                                | 3.724                               | 8.258  | 188.0  |
| 7.20                        | 14761  | 23.07  | 186.4   | 72.781                                | 71.393                                | 3.828                               | 8.244  | 184.7  |
| 7.40                        | 15226  | 23.19  | 189.0   | 72.737                                | 71.193                                | 3.934                               | 8.238  | 181.7  |
| 7.60                        | 15693  | 23.29  | 191.8   | 72.690                                | 70.979                                | 4.040                               | 8.238  | 178.9  |
| 7.80                        | 16161  | 23.41  | 194.6   | 72.641                                | 70.780                                | 4.144                               | 8.240  | 176.6  |
| 8.00                        | 16635  | 23.54  | 197.4   | 72.588                                | 70.595                                | 4.252                               | 8.250  | 174.1  |
| 8.20                        | 17116  | 23.66  | 200.2   | 72.532                                | 70.409                                | 4.356                               | 8.270  | 172.0  |
| 8.40                        | 17598  | 23.78  | 203.1   | 72.473                                | 70.238                                | 4.460                               | 8.292  | 170.2  |
| 8.60                        | 18081  | 23.90  | 206.0   | 72.413                                | 70.067                                | 4.566                               | 8.318  | 168.2  |
| 8.80                        | 18565  | 24.02  | 209.0   | 72.351                                | 69.911                                | 4.674                               | 8.352  | 166.3  |
| 9.00                        | 19051  | 24.14  | 211.8   | 72.288                                | 69.768                                | 4.782                               | 8.388  | 164.6  |
| 9.20                        | 19537  | 24.26  | 214.5   | 72.223                                | 69.611                                | 4.892                               | 8.428  | 162.9  |
| 9.40                        | 20024  | 24.36  | 217.4   | 72.159                                | 69.483                                | 5.000                               | 8.468  | 161.1  |
| 9.60                        | 20514  | 24.46  | 220.0   | 72.093                                | 69.355                                | 5.108                               | 8.514  | 159.2  |
| 9.80                        | 21006  | 24.57  | 222.6   | 72.027                                | 69.241                                | 5.216                               | 8.562  | 157.4  |
| 10.00                       | 21498  | 24.69  | 225.0   | 71.962                                | 69.127                                | 5.324                               | 8.618  | 155.8  |

Note:—The hydrostatic particulars given above have been developed with the vessel floating on water lines which are level to the keel.

CAPACITIES AND CENTRES OF GRAVITY  
OF DRY CARGO SPACES

| COMPARTMENT                     | Loca-<br>cation<br>(Frame<br>Nos.) | CAPACITIES     |                 | CENTRES OF GRAVITY             |                                   |                               |  |
|---------------------------------|------------------------------------|----------------|-----------------|--------------------------------|-----------------------------------|-------------------------------|--|
|                                 |                                    | Bale<br>Cu. M. | Grain<br>Cu. M. | Vertl.<br>Above<br>Base<br>(M) | V. Mo-<br>ments<br>M-Ton-<br>nes. | Longl.<br>from<br>A.P.<br>(M) | L. Mo-<br>ments<br>Abt. A.P.<br>M-Tonnes |
| No. 1 HOLD                      | 149-177                            | 1248.3         | 1356.8          | 5.59                           | 7585                              | 123.52                        | 167592                                   |
| No. 2 HOLD                      | 117-149                            | 3299.8         | 3586.7          | 4.98                           | 17862                             | 103.14                        | 369932                                   |
| No. 3 HOLD                      | 91-117                             | 2885.3         | 3136.2          | 5.00                           | 15681                             | 80.63                         | 252872                                   |
| No. 4 HOLD                      | 62-91                              | 3240.3         | 3522.1          | 4.99                           | 17575                             | 58.66                         | 206606                                   |
| No. 5 HOLD                      | 11-33                              | 629.3          | 684.0           | 6.91                           | 4726                              | 17.31                         | 11840                                    |
| TOTAL IN HOLDS                  |                                    | 11303.0        | 12285.8         | 5.16                           | 63429                             | 82.11                         | 1008842                                  |
| No. 1 TWEEN DECK                | 149-177                            | 1027.5         | 1116.8          | 11.17                          | 12475                             | 124.67                        | 139231                                   |
| No. 2 TWEEN DECK                | 117-149                            | 1706.5         | 1854.9          | 10.72                          | 19885                             | 103.91                        | 192743                                   |
| No. 3 TWEEN DECK                | 91-117                             | 1338.0         | 1454.4          | 10.37                          | 15082                             | 80.79                         | 117501                                   |
| No. 4 TWEEN DECK                | 64-85½                             | 467.1          | 507.7           | 10.76                          | 5463                              | 57.44                         | 29162                                    |
| No. 5 TWEEN DECK LOWER          | 11-36                              | 1080.1         | 1174.0          | 10.69                          | 12550                             | 17.24                         | 20240                                    |
| No. 5 UPPER TWEEN DECK          | 7-33                               | 818.9          | 890.1           | 13.76                          | 12248                             | 14.78                         | 13156                                    |
| TOTAL IN TWEEN DECKS            |                                    | 6438.1         | 6997.9          | 11.10                          | 77703                             | 73.17                         | 512033                                   |
| SPECIAL CARGO LOCKER (C)        | 58-64                              | 106.6          | 115.9           | 10.50                          | 1217                              | 46.36                         | 5373                                     |
| COLD CARGO CHAMBER No. 1<br>(P) | 59-91                              | 317.1          | 317.1           | 10.36                          | 3285                              | 60.22                         | 19096                                    |
| COLD CARGO CHAMBER No. 2<br>(S) | 59-91                              | 313.7          | 313.7           | 10.36                          | 3250                              | 60.12                         | 18860                                    |
| TOTAL OF COLD CARGO             |                                    | 630.8          | 630.8           | 10.36                          | 6535                              | 60.17                         | 37956                                    |
| MAIL ROOM                       | 173-182                            | 38.7           | 38.7            | 14.81                          | 573                               | 135.01                        | 5225                                     |
| GRAND TOTAL                     |                                    | 18517.2        | 20069.1         | 7.44                           | 149457                            | 78.20                         | 1569429                                  |



**STORE ROOMS  
CAPACITIES AND CENTRES OF GRAVITY**

| COMPARTMENT                | Location<br>(Between<br>Frames) | Bale<br>Capacity<br>Cubic<br>Metres | Centres of Gravity<br>(Metres) |                           |
|----------------------------|---------------------------------|-------------------------------------|--------------------------------|---------------------------|
|                            |                                 |                                     | Vertical<br>(Above Base)       | Longitudinal<br>from A.P. |
| <b>BOAT DECK:</b>          |                                 |                                     |                                |                           |
| Linen Locker (P)           | 54-57                           | 14.9                                | 20.87                          | 41.90                     |
| <b>BRIDGE DECK:</b>        |                                 |                                     |                                |                           |
| Linen Locker (S)           | 39-42                           | 10.9                                | 18.40                          | 29.75                     |
| Locker (P)                 | 39-44                           | 15.9                                | 18.56                          | 30.57                     |
| Med. Locker (S)            | 48-50                           | 6.3                                 | 18.64                          | 27.14                     |
| Custom Locker (P)          | 51-54                           | 8.9                                 | 18.42                          | 39.55                     |
| <b>LONG POOP:</b>          |                                 |                                     |                                |                           |
| Daily Provision Stores (S) | 38-41                           | 6.4                                 | 16.06                          | 29.32                     |
| Oil Skin Locker (P)        | 57-58                           | 2.2                                 | 15.98                          | 43.47                     |
| <b>UPPER DECK:</b>         |                                 |                                     |                                |                           |
| Bosun's Store              | 185-FE                          | 37.5                                | 15.35                          | 140.82                    |
| Paint Room (S)             | 180-185                         | 16.5                                | 15.08                          | 138.19                    |
| Mail Room (P)              | 173-182                         | 38.7                                | 14.81                          | 135.01                    |
| Lamp Room (S)              | 175-180                         | 10.4                                | 14.92                          | 135.14                    |
| Carpenter Workshop (S)     | 173-180                         | 22.7                                | 14.31                          | 133.92                    |
| Electrical Store (S)       | 2-7                             | 87.1                                | 14.19                          | 2.97                      |
| Baggage Room               | d-Aft                           | 51.7                                | 14.37                          | -3.60                     |
| <b>PLATFORM DECK:</b>      |                                 |                                     |                                |                           |
| Engine Store (P)           | 44-52                           | 94.4                                | 7.46                           | 35.89                     |
| <b>UNDER UPPER DECK:</b>   |                                 |                                     |                                |                           |
| Bosun's Store              | 181-FE                          | 45.4                                | 12.71                          | 138.00                    |
| <b>SECOND DECK:</b>        |                                 |                                     |                                |                           |
| Bosun Store                | 181-FE                          | 24.3                                | 10.00                          | 137.70                    |
| Beer Locker (P)            | 43½-46                          | 37.7                                | 10.53                          | 33.24                     |
| Bond Locker (P)            | 46-48½                          | 38.0                                | 10.53                          | 35.24                     |
| Dry Provision Store (P)    | 48½-59                          | 157.6                               | 10.48                          | 40.44                     |

**CAPACITIES AND CENTRES OF GRAVITY OF  
STORE ROOMS AND CREW AND EFFECTS AND  
DECK CARGO.**

**CREW, STORES AND EFFECTS**

| ITEM                          | DEPARTURE |                    |                    | ARRIVAL |                    |                           |
|-------------------------------|-----------|--------------------|--------------------|---------|--------------------|---------------------------|
|                               | Tonnes    | Centres of Gravity |                    | Tonnes  | Centres of Gravity |                           |
|                               |           | Vertl.<br>A.B.     | Longl.<br>From AP. |         | K.G. (M)<br>A.B.   | LCG (M)<br>Ford of<br>AP. |
| Stores, Spares and Provisions | 84.5      | 11.97              | 65.25              | 75.4    | 11.70              | 64.78                     |
| Crew and Effects              | 10.9      | 14.47              | 38.28              | 10.9    | 14.47              | 38.28                     |

**DISTRIBUTION OF CREW AND EFFECTS:**

|                   | Weight<br>in<br>Tonnes | KG. in<br>(M) above<br>Base | LCG in<br>(M) Ford<br>of A.P. |
|-------------------|------------------------|-----------------------------|-------------------------------|
| ON UPPER DECK     | 6.825                  | 13.01                       | 37.25                         |
| ON LONG POOP DECK | 1.050                  | 15.44                       | 37.44                         |
| ON BRIDGE DECK    | 2.275                  | 17.89                       | 40.06                         |
| ON BOAT DECK      | 0.700                  | 20.34                       | 43.84                         |
| <b>TOTAL:</b>     | <b>10.850</b>          | <b>14.47</b>                | <b>38.28</b>                  |

**WEIGHT, KG., AND L.C.G. OF DECK CARGO:**

| Position            | Weight<br>in<br>Tonnes | KG. in (M)<br>above<br>base | LCG in<br>(M) Ford<br>of AP. |
|---------------------|------------------------|-----------------------------|------------------------------|
| Bet. Frames 131-150 | 190.0                  | 14.20                       | 109.44                       |
| —do— 109-127        | 190.0                  | 13.82                       | 91.84                        |
| —do— 89-107         | 190.0                  | 13.63                       | 75.84                        |
| —do— 68-86          | 190.0                  | 13.65                       | 50.04                        |
| <b>TOTAL:</b>       | <b>760.0</b>           | <b>13.83</b>                | <b>84.04</b>                 |



**CAPACITIES AND CENTRES OF GRAVITY OF  
REFRIGERATED CARGO DOMESTIC CHAMBERS**

| COMPARTMENT              | Location<br>(Frame<br>Number) | Bale<br>Capacity<br>Cubic<br>Metres | Centres of<br>Gravity (Metres) |                     |
|--------------------------|-------------------------------|-------------------------------------|--------------------------------|---------------------|
|                          |                               |                                     | Vertical<br>above base         | Longl.<br>from A.P. |
| NO. 1 COLD CARGO SPACE P | 59-91                         | 317.1                               | 10.36                          | 60.215              |
| NO. 2 COLD CARGO SPACE S | 59-91                         | 313.7                               | 10.36                          | 60.115              |
| <b>DOMESTIC CHAMBERS</b> |                               |                                     |                                |                     |
| MEAT                     | 36-38½                        | 18.4                                | 10.54                          | 27.240              |
| FISH                     | 38½-41                        | 10.5                                | 10.54                          | 29.240              |
| VEGETABLES               | 41-43½                        | 18.7                                | 10.50                          | 31.240              |

**CAPACITIES, CENTRES OF GRAVITY AND FREE  
SURFACE MOMENTS OF OIL AND OTHER TANKS**

| COMPARTMENT  | Loca-<br>tion<br>Frame<br>No. | CAPACITIES                      |                 |                          | Centres of<br>Gravity (M) |                        | Free<br>Surface<br>Moment<br>AT. S.G.<br>1.0 (Ton-<br>ne/M) |
|--|-------------------------------|---------------------------------|-----------------|--------------------------|---------------------------|------------------------|---|
|  |                               | 100%<br>Full<br>Cubic<br>Metres | 98% full        |                          | Vertl.<br>A.B.            | Longl.<br>from<br>A.P. |   |
|  |                               |                                 | Cubic<br>Metres | Tonnes<br>AT. SG.<br>1.0 |                           |                        |   |
| <b>OIL FUEL TANKS: 0.95 Tonnes/M<sup>3</sup> or 37.8 Cu. ft./Ton (approx.)</b>   |                               |                                 |                 |                          |                           |                        |   |
| NO. 1 D. B. TANK   | 149-177                       | 157.6                           | 154.4           | 154.4                    | 1.14                      | 124.63                 | 657   |
| NO. 2 D. B. TANK P.  | 117-149                       | 202.4                           | 198.4           | 198.4                    | 0.65                      | 102.20                 | 718   |
| —Do— S.  | 117-149                       | 202.4                           | 198.4           | 198.4                    | 0.65                      | 102.20                 | 718   |
| NO. 3 D. B. TANK P.  | 91-117                        | 110.5                           | 108.3           | 108.3                    | 0.67                      | 80.62                  | 227   |
| —Do— S.  | 91-117                        | 110.5                           | 108.3           | 108.3                    | 0.67                      | 80.62                  | 227   |
| —Do— C.  | 91-117                        | 210.7                           | 206.5           | 206.5                    | 0.61                      | 80.64                  | 1181  |
| NO. 4 D. B. TANK P.  | 60-91                         | 127.4                           | 124.9           | 124.9                    | 0.68                      | 58.14                  | 271   |
| —Do— S.  | 60-91                         | 127.4                           | 124.9           | 124.9                    | 0.68                      | 58.14                  | 271   |
| —Do— C.  | 60-91                         | 257.4                           | 252.3           | 252.3                    | 0.63                      | 57.58                  | 1408  |
| NO. 5 D. B. TANK S.  | 47-60                         | 48.8                            | 47.8            | 47.8                     | 0.87                      | 39.73                  | 95  |
| SETTING TANK T1 P.   | 33-36                         | 34.4                            | 33.7            | 33.7                     | 6.00                      | 25.06                  | 9   |
| —Do— S.  | 33-36                         | 34.6                            | 33.9            | 33.9                     | 6.15                      | 25.04                  | 9   |
| SERVICE TANK T2 P.   | 33-36                         | 34.4                            | 33.7            | 33.7                     | 6.11                      | 25.09                  | 6   |
| —Do— S.  | 33-36                         | 34.4                            | 33.7            | 33.7                     | 6.11                      | 25.09                  | 6   |
| <b>TOTAL</b>   |                               | <b>1692.9</b>                   | <b>1659.2</b>   | <b>1659.2</b>            |                           |                        |   |
| <b>DIESEL OIL TANKS: 0.88 Tonnes/M<sup>3</sup> or 40.8 Cu. Ft./Ton (approx.)</b> |                               |                                 |                 |                          |                           |                        |   |
| NO. 5 D. B. TANK P.  | 39-60                         | 83.5                            | 81.8            | 81.8                     | 0.85                      | 38.24                  | 172   |
| NO. 7 TANK P.  | 28-36                         | 114.6                           | 112.3           | 112.3                    | 2.62                      | 22.97                  | 50  |
| NO. 7 TANK S.  | 28-36                         | 101.9                           | 99.9            | 99.9                     | 2.59                      | 22.97                  | 33  |
| SERVICE TANK FOR<br>M.E. T3. P.  | 36-40                         | 14.6                            | 14.3            | 14.3                     | 7.31                      | 27.92                  | 3   |
| SERVICE TANK FOR<br>A.E. T4. P.  | 36-40                         | 10.3                            | 10.1            | 10.1                     | 7.06                      | 27.84                  | 1   |
| <b>TOTAL</b>   |                               | <b>324.9</b>                    | <b>318.4</b>    | <b>318.4</b>             |                           |                        |   |

**NOTE:—** TO OBTAIN WEIGHT OF THE LIQUID CONTENTS OF ANY COMPARTMENT MULTIPLY  
"TONNES AT S.G. 1.0" BY THE ACTUAL SPECIFIC GRAVITY OF THE LIQUID.



**CAPACITIES, CENTRES OF GRAVITY AND FREE SURFACE MOMENTS OF OIL AND FUEL TANKS (CONTD.)**

| COMPARTMENT   | Location Frame Nos. | CAPACITIES |          |                    | CENTRES OF GRAVITIES |                  | Free Surface Moments AT S.G. 1.0 (T/M) |
|---|---------------------|------------|----------|--------------------|----------------------|------------------|--|
|   |                     | 100% FULL  | 98% FULL |                    | Vertl. A.B. Metres   | Longl. from A.P. |  |
|   |                     | Cubic      | Cubic    | Tonnes At S.G. 1.0 |                      |                  |  |
| <b>ENGINE ROOM: LUB. OIL CYLINDER OIL AND OTHER TANKS:</b>                  |                     |            |          |                    |                      |                  |  |
| <b>LUB. OIL: 0.90 M<sup>3</sup>/Tonne or 39.9 Cu. ft./Ton (approx.)</b>     |                     |            |          |                    |                      |                  |  |
| <b>CYLINDER OIL: 0.92 M<sup>3</sup>/Tonne or 39.0 Cu. ft./Ton (approx.)</b> |                     |            |          |                    |                      |                  |  |
| No. 6 D. B. SER. TK. L.O. C.  | 41-50               | 19.4       | 19.0     | 19.0               | 1.21                 | 33.84            | 12                                     |
| No. 9 D. B. SER. TK. L. O. C.   | 36-40               | 21.3       | 20.9     | 20.9               | 0.82                 | 27.91            | 20                                     |
| STORAGE TK. FOR M.E. T7 L.O. S.   | 42-47               | 17.1       | 16.8     | 16.8               | 7.06                 | 33.24            | 5                                      |
| SETTING. TANK FOR M.E. T8 L.O. S.   | 42-47               | 17.4       | 16.9     | 16.9               | 7.19                 | 33.24            | 5                                      |
| STORAGE TK. FOR A.E. T10 L.O. P.  | 41-44               | 6.4        | 6.3      | 6.3                | 7.06                 | 31.44            | Negligible.                            |
| L.O. SLUDGE TK. T22 S.  | 42-46               | 1.4        | 1.4      | 1.4                | 3.02                 | 32.64            | —do—                                   |
| CYL. OIL TK. FOR M.E. T9 P.   | 41-44               | 5.4        | 5.3      | 5.3                | 7.06                 | 31.44            | —do—                                   |
| —DO— T9. P.   | 41-44               | 5.4        | 5.3      | 5.3                | 7.06                 | 31.44            | —do—                                   |
| CYL. OIL MEASR. TK. T27 S.  | 39-40               | 0.2        | 0.2      | 0.2                | 10.50                | 29.08            | —do—                                   |
| H.F.O. SLUDGE TK. T6. P.  | 37-42               | 3.8        | 3.7      | 3.7                | 3.05                 | 29.04            | —do—                                   |
| CONDENSATE FEED TANK T11. S.  | 36-38               | 0.8        | 0.8      | 0.8                | 3.17                 | 27.04            | —do—                                   |
| COMPENSATION TK. FOR M.E. JACKETS T13. S.                                   | 55-57               | 1.8        | 1.8      | 1.8                | 13.40                | 42.33            | —do—                                   |
| COMPENSATION TK. FOR M.E. NOZZLES T15. S.                                   | 42-43               | 0.6        | 0.6      | 0.6                | 12.65                | 31.44            | —do—                                   |
| COMPENSATION TANK FOR A.E. T16. P.  | 56-57               | 0.7        | 0.7      | 0.7                | 13.40                | 42.63            | —do—                                   |
| COMPRESSOR OIL TANK T18 P.  | 49-50               | 0.2        | 0.2      | 0.2                | 6.80                 | 35.84            | —do—                                   |
| PARAFFIN TANK T19. P.   | 51-52               | 0.2        | 0.2      | 0.2                | 6.80                 | 38.64            | —do—                                   |
| ANTI-CORROSIVE OIL TANK T20. P.   | 50-51               | 0.2        | 0.2      | 0.2                | 6.80                 | 37.84            | —do—                                   |

**CAPACITIES, CENTRES OF GRAVITY AND FREE SURFACE MOMENTS OF OIL AND WATER TANKS (contd.)**

| COMPARTMENT   | Location Frame No. | CAPACITIES    |               |                    | CENTRES OF GRAVITY |                       | Free Surface Moment AT SG. 1.0 (Ton/M) |
|---|--------------------|---------------|---------------|--------------------|--------------------|-----------------------|--|
|   |                    | 100% full     | 98% full      | Tonnes AT S.G. 1.0 | Vertl. Metres A.B. | Longl. Metres From AP |  |
|   |                    | Cubic Metres  | Cubic Metres  |                    |                    |                       |  |
| <b>FRESH AND FEED WATER TANKS: 1.0 M<sup>3</sup>/Tonne or 36 Cu. Ft./Ton.</b>     |                    |               |               |                    |                    |                       |  |
| No. 8 TANK P.   | 19-27              | 74.1          | 72.6          | 72.6               | 2.76               | 16.24                 | 15                                     |
| No. 8 TANK S.   | 19-27              | 63.4          | 62.1          | 62.1               | 2.77               | 16.21                 | 8                                      |
| TWEEN DK. DRINKING WATER TANK P.  | 7-11               | 49.7          | 48.7          | 48.7               | 11.19              | 5.86                  | 37                                     |
| —DO— S.   | 7-11               | 43.7          | 42.8          | 42.8               | 11.23              | 5.80                  | 42                                     |
| AFT PEAK TANK   | 0-10               | 117.8         | 115.4         | 115.4              | 8.81               | 3.58                  | 18                                     |
| NO. 10 BOILER FEED TANK —S.   | 39-46              | 14.1          | 13.8          | 13.8               | 0.90               | 31.74                 | 16                                     |
| No. 11 PISTON COOLING WATER TANK — C.   | 52-55              | 6.3           | 6.2           | 6.2                | 1.20               | 40.21                 | 4                                      |
| No. 12 JACKET COOLING WATER TANK —S.  | 56-59              | 14.4          | 14.1          | 14.1               | 0.72               | 43.44                 | 17                                     |
| No. 13 LEAKAGE WATER TANK — P.  | 57-59              | 4.7           | 4.6           | 4.6                | 0.71               | 43.84                 | 1                                      |
| <b>TOTAL:</b>   |                    | <b>388.2</b>  | <b>380.3</b>  | <b>380.3</b>       |                    |                       |  |
| <b>BALLAST WATER TANKS: 1.025 M<sup>3</sup>/Tonne or 35 Cu. ft./Ton (approx.)</b> |                    |               |               |                    |                    |                       |  |
| FORE PEAK TANK  | 177-F.E.           | 103.5         | 101.4         | 101.4              | 6.31               | 137.18                | 9                                      |
| No. 1 D. B. TANK  | 149-177            | 157.6         | 154.4         | 154.4              | 1.14               | 124.63                | 419                                    |
| No. 2 D. B. TANK P.   | 117-149            | 202.4         | 198.4         | 198.4              | 0.65               | 102.20                | 718                                    |
| —DO— S.   | 117-149            | 202.4         | 198.4         | 198.4              | 0.65               | 102.20                | 718                                    |
| No. 3 D. B. TANK P.   | 91-117             | 110.5         | 108.3         | 108.3              | 0.67               | 80.62                 | 227                                    |
| —DO— S.   | 91-117             | 110.5         | 108.3         | 108.3              | 0.67               | 80.62                 | 227                                    |
| —DO— C.   | 91-117             | 210.7         | 206.5         | 206.5              | 0.61               | 80.64                 | 1181                                   |
| No. 4 D. B. TANK P.   | 60-91              | 127.4         | 124.9         | 124.9              | 0.68               | 58.14                 | 271                                    |
| —DO— S.   | 60-91              | 127.4         | 124.9         | 124.9              | 0.68               | 58.14                 | 271                                    |
| —DO— C.   | 60-91              | 257.4         | 252.3         | 252.3              | 0.63               | 57.58                 | 1408                                   |
| AFT PEAK  | 0-10               | 117.8         | 115.4         | 115.4              | 8.81               | 3.58                  | 18                                     |
| <b>TOTAL</b>  |                    | <b>1727.6</b> | <b>1693.2</b> | <b>1693.2</b>      |                    |                       |  |

**NOTE:—TO OBTAIN WEIGHT OF THE LIQUID CONTENTS OF ANY COMPARTMENT MULTIPLY "TONNES AT S. G. 1.0" BY THE ACTUAL SPECIFIC GRAVITY OF THE LIQUID.**

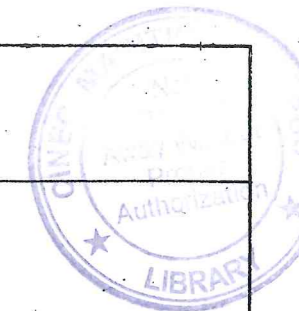


**TANKS IN ENGINE ROOM  
CONTENTS, CENTRES OF GRAVITY AND MOMENTS**

| TANKS                                   | Bet. Frames. | Weight in Tonnes | K.G. (M) | Vertl. Moments M-Tonnes | LCG. (M) Ford of A.P. | Longl. Moments M-Tonnes |
|---|--------------|------------------|----------|-------------------------|-----------------------|-------------------------|
| L. O. Sludge Tank S.                    | 42-46        | 1.26             | 3.02     | 3.8                     | 32.64                 | 41.1                    |
| Cyl. Oil Measuring Tank S.              | 39-40        | 0.22             | 10.50    | 2.3                     | 29.08                 | 6.4                     |
| H. F. O. Sludge Tank P.                 | 37-42        | 3.62             | 3.05     | 11.0                    | 29.04                 | 105.1                   |
| Condensate Feed Tank S.                 | 36-38        | 0.80             | 3.97     | 3.2                     | 27.04                 | 21.6                    |
| Compensation Tank for M. E. Jackets. S. | 55-57        | 1.79             | 13.40    | 24.0                    | 42.33                 | 75.8                    |
| Compensation Tank for M.E. Nozzles. S.  | 42-43        | 0.61             | 12.65    | 7.7                     | 31.44                 | 19.2                    |
| Compensation Tank for A.E.              | 56-57        | 0.72             | 13.40    | 9.6                     | 42.63                 | 30.7                    |
| Compressor Oil Tank P.                  | 49-50        | 0.20             | 6.80     | 1.4                     | 35.84                 | 7.2                     |
| Paraffin Tank                           | 51-52        | 0.19             | 6.80     | 1.3                     | 38.64                 | 7.3                     |
| Anti-corrosive Oil Tank P.              | 50-51        | 0.20             | 6.80     | 1.4                     | 37.84                 | 7.6                     |
| <b>DEPARTURE CONDITIONS</b>             |              | 9.61             | 6.84     | 65.7                    | 33.51                 | 322.0                   |

| TANKS                                   | Bet. Frames | Weight in Tonnes | K.G. (M) | Vertl. Moments M-Tonnes | L.C.G. (M) Ford of A.P. | Longl. Moments M-Tonnes |
|---|-------------|------------------|----------|-------------------------|-------------------------|-------------------------|
| L. O. Sludge Tank S.                    | 42-46       | 1.26             | 3.02     | 3.8                     | 32.64                   | 41.1                    |
| Cyl. Oil Measuring Tk. S.               | 39-40       | 0.22             | 10.50    | 2.3                     | 29.08                   | 6.4                     |
| H. F. O. Sludge Tank P.                 | 37-42       | 3.62             | 3.05     | 11.0                    | 29.04                   | 105.1                   |
| Condensate Feed Tank. S.                | 36-38       | 0.80             | 3.97     | 3.2                     | 27.04                   | 21.6                    |
| Compensation Tank for M. E. Jackets. S. | 55-57       | 1.79             | 13.40    | 24.0                    | 42.33                   | 75.8                    |
| Compensation Tank for M. E. Nozzles. S. | 42-43       | 0.61             | 12.65    | 7.7                     | 31.44                   | 19.2                    |
| Compensation Tank for A.E. P.           | 56-57       | 0.72             | 13.40    | 9.6                     | 42.63                   | 30.7                    |
| Compressor Oil Tank                     | 49-50       | 0.10             | 6.58     | 0.7                     | 35.84                   | 3.6                     |
| Paraffin Tank P.                        | 51-52       | 0.09             | 6.58     | 0.6                     | 38.64                   | 3.5                     |
| Anti-corrosive Oil Tank P.              | 50-51       | 0.10             | 6.58     | 0.7                     | 37.84                   | 3.8                     |

**NOTES ON USE OF FREE SURFACE MOMENTS**



PROVIDED A TANK IS COMPLETELY FILLED WITH LIQUID, NO MOVEMENT OF THE LIQUID IS POSSIBLE AND THE EFFECT ON THE SHIP'S STABILITY IS PRECISELY THE SAME AS IF THE TANK CONTAINED SOLID MATERIAL.

IMMEDIATELY A QUANTITY OF LIQUID IS WITHDRAWN FROM THE TANK, THE SITUATION CHANGES COMPLETELY AND THE STABILITY OF THE SHIP IS ADVERSELY AFFECTED BY WHAT IS KNOWN AS THE "FREE SURFACE EFFECTS".

THIS ADVERSE EFFECT ON THE STABILITY IS REFERRED TO AS A "LOSS IN G.M." OR AS A "VIRTUAL RISE IN V.C.G." AND IS CALCULATED AS FOLLOWS:

$$\left. \begin{array}{l} \text{LOSS OF G. M. DUE TO} \\ \text{FREE SURFACE EFFECTS} \\ \text{(METRES)} \end{array} \right\} = \frac{\text{FREE SURFACE MOMENT (TONNES METRES)} \times \text{SP. GRAVITY OF LIQUID IN TANK}}{\text{DISPLACEMENT OF VESSEL IN TONNES.}}$$

N.B.—THE "FREE SURFACE EFFECTS" OF ALL OIL-FUEL, FRESH WATER, FEED WATER AND SERVICE TANKS SHOULD BE TAKEN INTO ACCOUNT IN BOTH THE ARRIVAL AND DEPARTURE CONDITIONS.



## FREE SURFACE CORRECTIONS

- N.B.—1. To find the loss of GM due to free surface for any tank divide the moment of inertia of the particular tank by  $A/1.025$  in that particular condition.
2. Moment of inertia ( $i$ ) is not indicated for tanks, where loss of GM due to free surface is considered negligible.

| COMPARTMENT   | Between Frames | Moment of inertia ( $im^4$ ) |
|---|----------------|------------------------------|
| Fore Peak Tank  | 177—FE         | 9                            |
| No. 1. D. B. Tank                                     | 149—177        | 419                          |
| No. 2 D. B. Tank P or S                               | 117—149        | 718                          |
| No. 3 D. B. Tank P or S                               | 91—117         | 227                          |
| No. 3 D. B. Tank Centre                               | 91—117         | 1181                         |
| No. 4 D. B. Tank P or S                               | 60—91          | 271                          |
| No. 4 D. B. Tank Centre                               | 60—91          | 1408                         |
| No. 5 D. B. Tank P                                    | 39—60          | 172                          |
| No. 5 D. B. Tank S                                    | 47—60          | 95                           |
| No. 6 D. B. Tank C                                    | 41—50          | 12                           |
| No. 7 D. B. Tank P                                    | 28—36          | 50                           |
| No. 7 D. B. Tank S                                    | 28—36          | 33                           |
| No. 8 D. B. Tank P                                    | 19—27          | 15                           |
| No. 8 D. B. Tank S                                    | 19—27          | 8                            |
| No. 9 D. B. Tank C                                    | 36—40          | 20                           |
| No. 10 D. B. Tank S                                   | 39—46          | 16                           |
| No. 11 D. B. Tank C                                   | 52—55          | 4                            |
| No. 12 D. B. Tank S                                   | 56—59          | 17                           |
| Tween deck F. W. Tanks P                              | 7—11           | 37                           |
| Tween deck F. W. Tank S.                              | 7—11           | 42                           |
| T1 H. F. O. Settling Tanks P or S                     | 33—36          | 9                            |
| T2 H. F. O. Service Tanks P or S                      | 33—36          | 6                            |
| T3 D. O. Service Tank for M.E. P                      | 36—40          | 3                            |
| T4 D. O. Settling Tank for A.E. P. and service (each) | 36—40          | 1                            |
| T7 L. O. Storage Tank for M.E.S.                      | 42—47          | 5                            |
| T8 L. O. Settling Tank for M. E. S.                   | 42—47          | 5                            |

TYPICAL EXAMPLE ON FREE SURFACE  
MOMENTSEFFECT ON G.M. OF SHIP DUE TO FREE SURFACE OF  
LIQUID IN TANK

IN LOADED ARRIVAL CONDITION No. 5 THE FOLLOWING TANKS WERE  
CONSIDERED SLACK AND THEIR FREE SURFACE MOMENTS ARE SHOWN AGAINST  
EACH TANK.

TABLE OF 'I' IS SHOWN ON PAGE 19

| TANKS  | 1              | Sp. Gr.        | Free Surface Moments. |
|--|----------------|----------------|-----------------------|
| NO. 3 D. B. TANKS C. (W.B.)                  | 1181           | $\times 1.025$ | = 1210                |
| NO. 5 D. B. TANK P. (D.O.) 46—47             | 172            | $\times 0.88$  | = 152                 |
| NO. 5 D. B. TANK S. (H.F.O.) 48—49           | 25             | $\times 0.95$  | = 90                  |
| F. W. FOR ENGINES S & C (F.W.) 50—51         | 21             | $\times 1.00$  | = 21                  |
| H. F. O. SETTLG. & SERVICE TKS. P & S. 52—53 | 30             | $\times 0.95$  | = 28                  |
| D. O. SETTLG. & SERVICE TKS. 54—55           | 4              | $\times 0.88$  | = 4                   |
| L. O. STORAGE & SETTLING TKS. 56—57          | 5              | $\times 0.90$  | = 5                   |
| DRINKING WATER TANKS. S. (F.W.) 58—59        | 42             | $\times 1.00$  | = 42                  |
|  | <b>TOTAL I</b> |                | <b>= 1552</b>         |

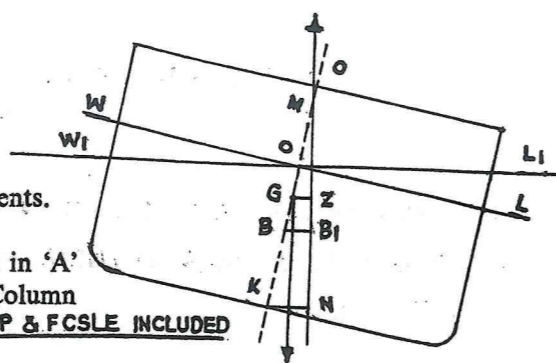
THE TOTAL FREE SURFACE MOMENTS ARE THEN DIVIDED BY  
THE DISPLACEMENT OF 18529.3 TONNES, WHICH GIVES THE  
LOSS OF G. M. DUE TO FREE SURFACE OF LIQUIDS.



CROSS CURVES OF STABILITY PARTICULARS

NOTE:—

- (1) Centre of Gravity is assumed on Base Line.
- (2) Interpolated values will hold good for in between displacements.
- (3) For 30°, 40°, 45°, 60° & 75° Inclinations, values given in 'A' Column are without superstructure and values given in 'B' Column are inclusive of superstructure.



| Displacement in Tonnes | RIGHTING ARM IN METRES |       |       |       |       |       |       | Deck Edge Immersed. |
|------------------------|------------------------|-------|-------|-------|-------|-------|-------|---------------------|
|                        | 5°                     | 10°   | 15°   | 20°   | 25°   | 30°   |       |                     |
|                        |                        |       |       |       |       | A     | B     |                     |
| 5000                   | 1.085                  | 2.135 | 3.142 | 4.000 | 4.695 | 5.320 | 5.320 | 42.1°               |
| 5500                   | 1.025                  | 2.030 | 3.005 | 3.870 | 4.580 | 5.230 | 5.230 | 41.4°               |
| 6000                   | 0.980                  | 1.940 | 2.880 | 3.748 | 4.465 | 5.144 | 5.144 | 40.6°               |
| 6500                   | 0.940                  | 1.868 | 2.770 | 3.640 | 4.375 | 5.068 | 5.068 | 39.7°               |
| 7000                   | 0.908                  | 1.800 | 2.675 | 3.540 | 4.280 | 4.997 | 4.997 | 38.9°               |
| 7500                   | 0.883                  | 1.750 | 2.597 | 3.452 | 4.210 | 4.932 | 4.932 | 38.1°               |
| 8000                   | 0.865                  | 1.708 | 2.527 | 3.375 | 4.140 | 4.875 | 4.875 | 37.3°               |
| 8500                   | 0.848                  | 1.672 | 2.475 | 3.310 | 4.075 | 4.823 | 4.823 | 36.4°               |
| 9000                   | 0.833                  | 1.642 | 2.432 | 3.252 | 4.015 | 4.773 | 4.773 | 35.6°               |
| 9500                   | 0.819                  | 1.620 | 2.397 | 3.202 | 3.960 | 4.727 | 4.727 | 34.7°               |
| 10000                  | 0.807                  | 1.598 | 2.365 | 3.157 | 3.910 | 4.682 | 4.682 | 33.8°               |
| 10500                  | 0.797                  | 1.580 | 2.335 | 3.121 | 3.867 | 4.645 | 4.645 | 32.9°               |
| 11000                  | 0.788                  | 1.564 | 2.310 | 3.087 | 3.835 | 4.612 | 4.612 | 31.9°               |
| 11500                  | 0.780                  | 1.550 | 2.288 | 3.057 | 3.805 | 4.580 | 4.580 | 30.9°               |
| 12000                  | 0.772                  | 1.538 | 2.272 | 3.033 | 3.780 | 4.554 | 4.554 | 30.0°               |
| 12500                  | 0.765                  | 1.528 | 2.258 | 3.017 | 3.760 | 4.530 | 4.530 | 29.1°               |
| 13000                  | 0.760                  | 1.519 | 2.247 | 3.003 | 3.740 | 4.508 | 4.508 | 28.1°               |
| 13500                  | 0.757                  | 1.512 | 2.238 | 2.991 | 3.730 | 4.488 | 4.488 | 27.2°               |
| 14000                  | 0.755                  | 1.506 | 2.231 | 2.981 | 3.722 | 4.470 | 4.470 | 26.2°               |
| 14500                  | 0.755                  | 1.502 | 2.225 | 2.970 | 3.713 | 4.452 | 4.452 | 25.2°               |
| 15000                  | 0.756                  | 1.500 | 2.222 | 2.962 | 3.705 | 4.435 | 4.435 | 24.1°               |
| 15500                  | 0.757                  | 1.500 | 2.220 | 2.965 | 3.700 | 4.415 | 4.415 | 23.1°               |
| 16000                  | 0.760                  | 1.500 | 2.222 | 2.968 | 3.690 | 4.385 | 4.398 | 22.1°               |
| 16500                  | 0.757                  | 1.500 | 2.225 | 2.972 | 3.680 | 4.355 | 4.380 | 21.0°               |
| 17000                  | 0.755                  | 1.502 | 2.229 | 2.978 | 3.670 | 4.325 | 4.362 | 19.9°               |
| 17500                  | 0.755                  | 1.505 | 2.236 | 2.984 | 3.660 | 4.295 | 4.345 | 18.9°               |
| 18000                  | 0.757                  | 1.509 | 2.244 | 2.990 | 3.645 | 4.265 | 4.330 | 17.8°               |
| 18500                  | 0.760                  | 1.516 | 2.252 | 2.990 | 3.630 | 4.230 | 4.313 | 16.7°               |
| 19000                  | 0.764                  | 1.525 | 2.260 | 2.985 | 3.615 | 4.190 | 4.295 | 15.6°               |
| 19500                  | 0.769                  | 1.537 | 2.267 | 2.978 | 3.598 | 4.154 | 4.277 | 14.6°               |
| 20000                  | 0.773                  | 1.550 | 2.271 | 2.970 | 3.580 | 4.120 | 4.260 | 13.5°               |
| 20500                  | 0.776                  | 1.555 | 2.269 | 2.960 | 3.650 | 4.085 | 4.242 | 12.4°               |
| 21000                  | 0.780                  | 1.560 | 2.265 | 2.947 | 3.540 | 4.050 | 4.225 | 11.3°               |

CROSS CURVES OF STABILITY PARTICULARS.

| Displacement in Tonnes | RIGHTING ARM IN METRES |       |       |       |       |       |       |       |
|------------------------|------------------------|-------|-------|-------|-------|-------|-------|-------|
|                        | 40°                    |       | 45°   |       | 60°   |       | 75°   |       |
|                        | A                      | B     | A     | B     | A     | B     | A     | B     |
| 5000                   | 6.328                  | 6.328 | 6.752 | 6.752 | 7.648 | 7.668 | 7.673 | 7.977 |
| 5500                   | 6.288                  | 6.288 | 6.740 | 6.740 | 7.665 | 7.710 | 7.660 | 7.965 |
| 6000                   | 6.253                  | 6.253 | 6.729 | 6.729 | 7.663 | 7.745 | 7.640 | 7.953 |
| 6500                   | 6.223                  | 6.223 | 6.720 | 6.720 | 7.645 | 7.775 | 7.610 | 7.940 |
| 7000                   | 6.195                  | 6.195 | 6.706 | 6.706 | 7.617 | 7.795 | 7.580 | 7.926 |
| 7500                   | 6.168                  | 6.168 | 6.690 | 6.690 | 7.577 | 7.805 | 7.550 | 7.912 |
| 8000                   | 6.145                  | 6.145 | 6.673 | 6.673 | 7.535 | 7.785 | 7.520 | 7.897 |
| 8500                   | 6.120                  | 6.120 | 6.652 | 6.652 | 7.490 | 7.755 | 7.485 | 7.880 |
| 9000                   | 6.092                  | 6.092 | 6.620 | 6.630 | 7.443 | 7.720 | 7.446 | 7.861 |
| 9500                   | 6.060                  | 6.060 | 6.585 | 6.618 | 7.395 | 7.685 | 7.405 | 7.842 |
| 10000                  | 6.026                  | 6.032 | 6.545 | 6.585 | 7.350 | 7.650 | 7.368 | 7.822 |
| 10500                  | 5.990                  | 6.005 | 6.500 | 6.561 | 7.305 | 7.615 | 7.332 | 7.800 |
| 11000                  | 5.956                  | 5.982 | 6.452 | 6.536 | 7.260 | 7.578 | 7.298 | 7.777 |
| 11500                  | 5.922                  | 5.955 | 6.405 | 6.508 | 7.215 | 7.539 | 7.262 | 7.753 |
| 12000                  | 5.885                  | 5.925 | 6.358 | 6.479 | 7.168 | 7.498 | 7.224 | 7.727 |
| 12500                  | 5.845                  | 5.898 | 6.313 | 6.450 | 7.120 | 7.457 | 7.188 | 7.700 |
| 13000                  | 5.802                  | 5.871 | 6.265 | 6.420 | 7.073 | 7.417 | 7.153 | 7.673 |
| 13500                  | 5.760                  | 5.845 | 6.215 | 6.385 | 7.026 | 7.382 | 7.120 | 7.645 |
| 14000                  | 5.716                  | 5.817 | 6.163 | 6.347 | 6.980 | 7.350 | 7.090 | 7.617 |
| 14500                  | 5.670                  | 5.787 | 6.111 | 6.307 | 6.934 | 7.316 | 7.064 | 7.589 |
| 15000                  | 5.622                  | 5.755 | 6.058 | 6.267 | 6.889 | 7.281 | 7.040 | 7.563 |
| 15500                  | 5.570                  | 5.725 | 6.004 | 6.227 | 6.844 | 7.245 | 7.018 | 7.540 |
| 16000                  | 5.518                  | 5.692 | 5.950 | 6.186 | 6.798 | 7.210 | 6.998 | 7.520 |
| 16500                  | 5.462                  | 5.657 | 5.894 | 6.145 | 6.750 | 7.175 | 6.980 | 7.500 |
| 17000                  | 5.402                  | 5.620 | 5.837 | 6.103 | 6.700 | 7.138 | 6.960 | 7.480 |
| 17500                  | 5.347                  | 5.580 | 5.779 | 6.061 | 6.652 | 7.102 | 6.935 | 7.459 |
| 18000                  | 5.293                  | 5.540 | 5.720 | 6.020 | 6.605 | 7.066 | 6.910 | 7.438 |
| 18500                  | 5.240                  | 5.500 | 5.660 | 5.980 | 6.558 | 7.029 | 6.885 | 7.417 |
| 19000                  | 5.190                  | 5.460 | 5.600 | 5.940 | 6.511 | 6.991 | 6.859 | 7.396 |
| 19500                  | 5.137                  | 5.420 | 5.542 | 5.900 | 6.464 | 6.954 | 6.833 | 7.375 |
| 20000                  | 5.083                  | 5.380 | 5.485 | 5.860 | 6.417 | 6.918 | 6.805 | 7.357 |
| 20500                  | 5.027                  | 5.340 | 5.429 | 5.820 | 6.370 | 6.875 | 6.778 | 7.339 |
| 21000                  | 4.975                  | 5.300 | 5.375 | 5.780 | 6.325 | 6.820 | 6.755 | 7.322 |



EXAMPLE SHOWING USE OF CROSS CURVES (KN).

The purpose of the cross curves is to enable statical stability curves to be drawn for the ship in any sailing condition, e.g.,

Assume the displacement of the ship to be 19617.0 Tonnes, and the vertical centre of gravity of the ship above bottom of keel =  $7.272 + 0.070 = 7.342$  Metres.

(Corrected for free surface effects) in condition No. 4.

Then the Righting lever  $GZ = KN - KG \sin \theta$ .

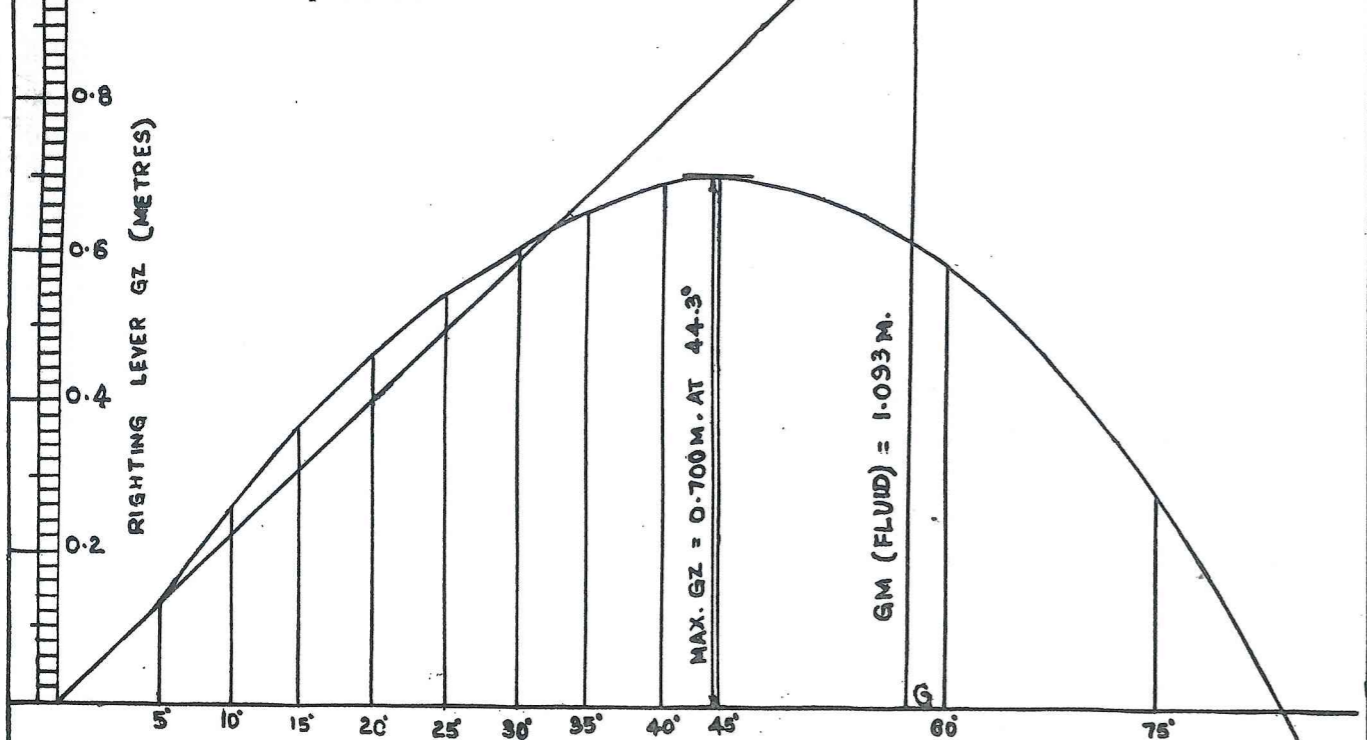
where  $KN$  = Cross curve ordinate

and  $KG$  = Centre of gravity above keel (corrected for free surface effects).

and  $\theta$  = Angle of inclination.

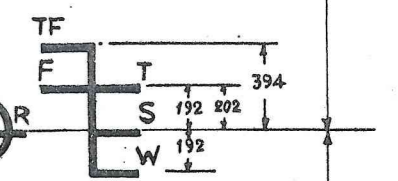
| KN at 19617 Tonnes | $\theta$ | $\sin \theta$ | $KG \sin \theta$ M | $GZ = (KN - KG \sin \theta)$ M |
|--------------------|----------|---------------|--------------------|--------------------------------|
| 0.770              | 5°       | .087          | 0.639              | 0.131                          |
| 1.540 M            | 10°      | .174          | 1.278              | 0.262                          |
| 2.976 M            | 20°      | .342          | 2.511              | 0.465                          |
| 4.273 M            | 30°      | .500          | 3.671              | 0.602                          |
| 5.891 M            | 45°      | .707          | 5.191              | 0.700                          |
| 6.946 M            | 60°      | .866          | 6.358              | 0.588                          |
| 7.371 M            | 75°      | .966          | 7.092              | 0.279                          |

Then by using the GZ values in the last column a statical stability curve can be drawn for the ship at the assumed displacement.



LOADING SCALE.

| DRAUGHT |   | DW IN 1000 KG |       | DW IN 1016 KG. |       | DISPL. SALT W. |          | DISPL. SALT W. |          | MOMENT TO CHANGE TRIM (CM/T) | IMMERSION IN T'S PER CM IN | DRAUGHT |       |
|---------|---|---------------|-------|----------------|-------|----------------|----------|----------------|----------|------------------------------|----------------------------|---------|-------|
| FEET    | M | SALT W        | FRESH | SALT W.        | FRESH | 1000 KG        | 1016 KG. | 1000 KG.       | 1016 KG. |                              |                            | M.      | FEET. |
| 32      |   |               | 15000 | 15000          | 15000 | 21000          | 21000    |                |          |                              |                            | 32      |       |
| 31      |   | 15000         | 14000 | 14000          | 14000 | 20000          | 20000    |                |          | 220                          | 51                         | 31      |       |
| 30      |   | 14000         | 13000 | 13000          | 13000 | 19000          | 19000    |                |          |                              |                            | 9       |       |
| 29      | 9 | 13000         | 12000 | 12000          | 12000 | 18000          | 18000    |                |          | 210                          | 24 50                      | 29      |       |
| 28      |   | 12000         | 11000 | 11000          | 11000 | 17000          | 17000    |                |          |                              |                            | 28      |       |
| 27      |   | 11000         | 10000 | 10000          | 10000 | 16000          | 16000    |                |          | 200                          | 29 8                       | 27      |       |
| 26      | 8 | 10000         | 9000  | 9000           | 9000  | 15000          | 15000    |                |          | 190                          | 38                         | 26      |       |
| 25      |   | 9000          | 8000  | 8000           | 8000  | 14000          | 14000    |                |          |                              |                            | 25      |       |
| 24      |   | 8000          | 7000  | 7000           | 7000  | 13000          | 13000    |                |          | 180                          | 37                         | 24      |       |
| 23      | 7 | 7000          | 6000  | 6000           | 6000  | 12000          | 12000    |                |          |                              |                            | 23      |       |
| 22      |   | 6000          | 5000  | 5000           | 5000  | 11000          | 11000    |                |          | 170                          |                            | 22      |       |
| 21      |   | 5000          | 4000  | 4000           | 4000  | 10000          | 10000    |                |          |                              |                            | 21      |       |
| 20      | 6 | 4000          | 3000  | 3000           | 3000  | 9000           | 9000     |                |          |                              |                            | 20      |       |
| 19      |   | 3000          | 2000  | 2000           | 2000  | 8000           | 8000     |                |          | 160                          |                            | 19      |       |
| 18      |   | 2000          | 1000  | 1000           | 1000  | 7000           | 7000     |                |          |                              |                            | 18      |       |
| 17      |   | 1000          | 0     | 0              | 0     | 6000           | 6000     |                |          | 150                          | 21                         | 17      |       |
| 16      | 5 | 0             | 0     | 0              | 0     | 5000           | 5000     |                |          |                              |                            | 16      |       |
| 15      |   |               |       |                |       |                |          |                |          |                              |                            | 15      |       |
| 14      |   |               |       |                |       |                |          |                |          |                              |                            | 14      |       |
| 13      | 4 |               |       |                |       |                |          |                |          |                              |                            | 13      |       |
| 12      |   |               |       |                |       |                |          |                |          |                              |                            | 12      |       |
| 11      |   |               |       |                |       |                |          |                |          |                              |                            | 11      |       |
| 10      | 3 |               |       |                |       |                |          |                |          |                              |                            | 10      |       |
| 9       |   |               |       |                |       |                |          |                |          |                              |                            | 9       |       |



2626 BELOW TOP OF STEEL UPPER DECK AT SIDE

SUMMER DRAFT FROM BOTTOM OF KEEL 9.233 METRES

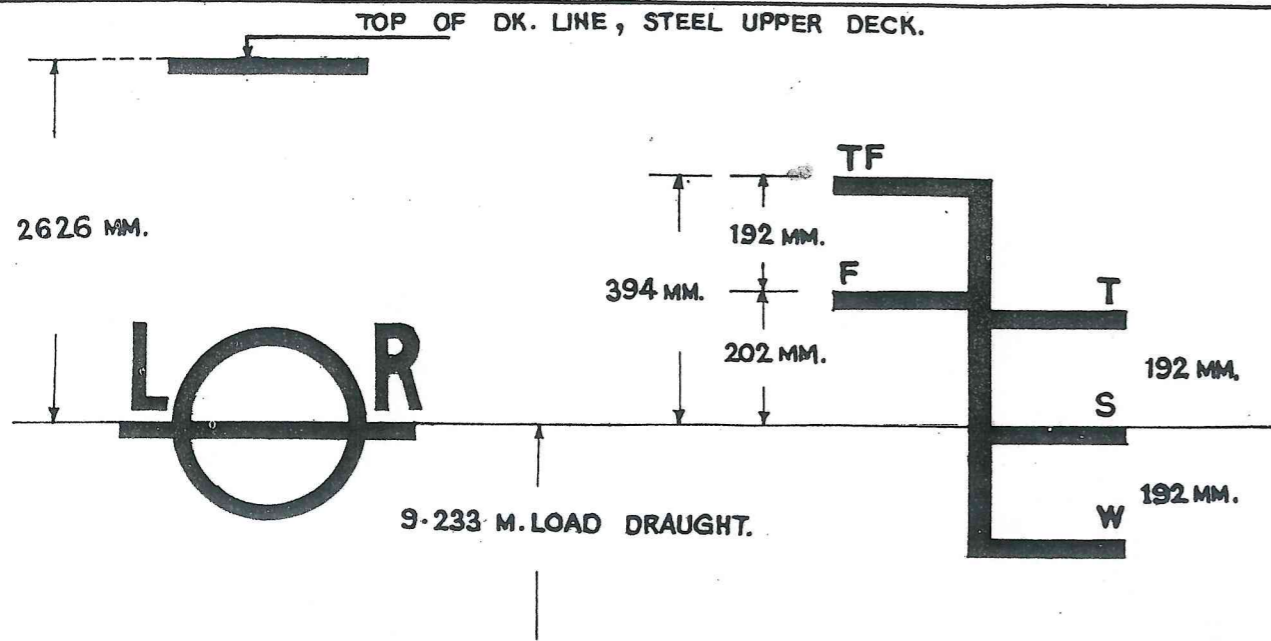
TONNAGE MARK DRAUGHT 7.788 M. FROM BOTTOM OF KEEL

|      | DRAFT M. | DEADWEIGHT |       |
|------|----------|------------|-------|
|      |          | t          | ts    |
| TF   | 9.627    | 14579      | 14349 |
| T    | 9.425    | 14585      | 14355 |
| F    | 9.435    | 14117      | 13894 |
| S    | 9.233    | 14117      | 13894 |
| W    | 9.041    | 13651      | 13435 |
| ∇ SW | 7.788    | 10633      | 10465 |
| ∇ FW | 7.951    | 10633      | 10465 |

LIGHT SHIP 5500 t = 5413 ts

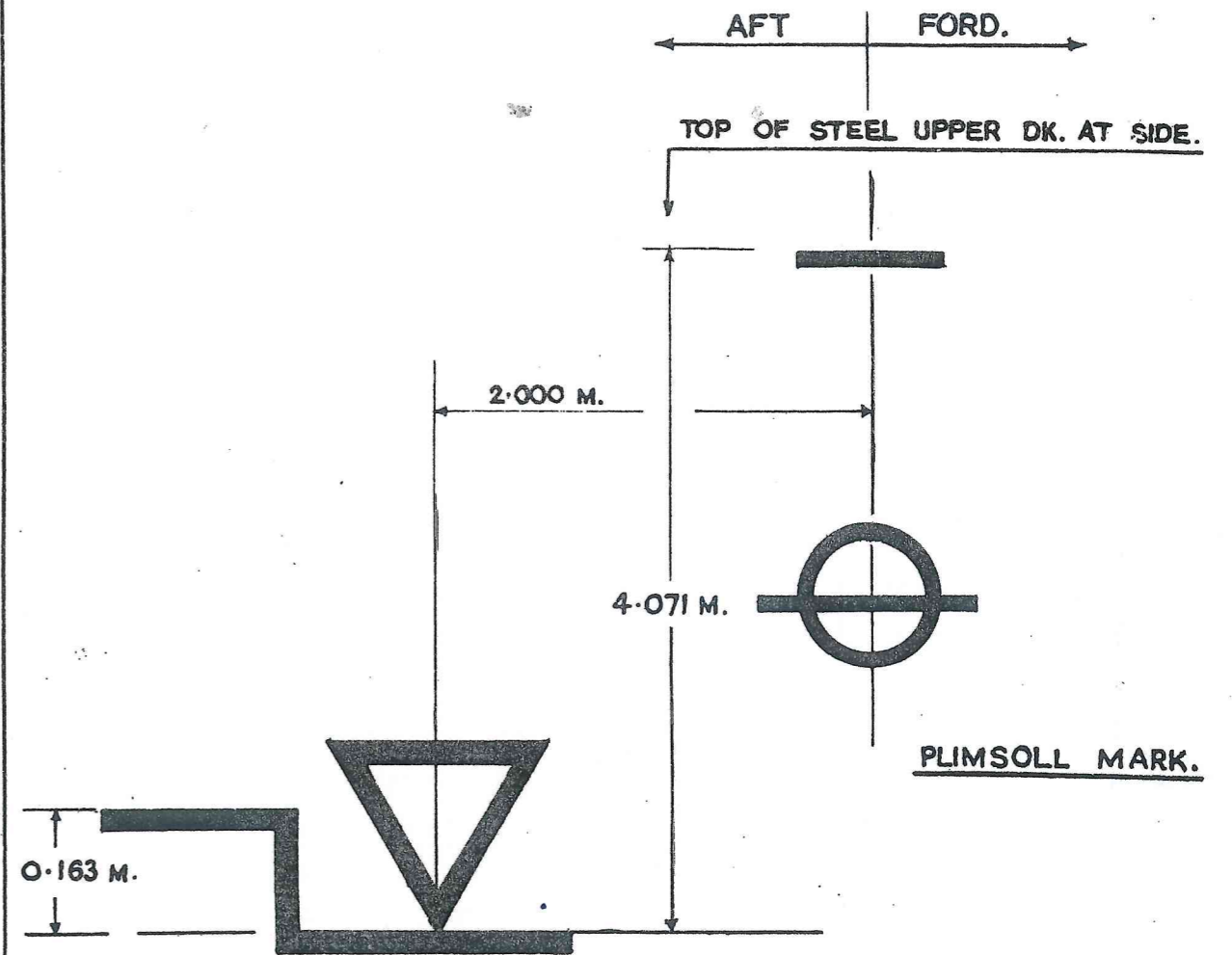


PLIMSOLL MARK DETAILS



|               | DRAUGHTS FULL |              | FREEBOARD |              | DISPLACEMENT FULL |       | DEAD-WEIGHT |       |
|---------------|---------------|--------------|-----------|--------------|-------------------|-------|-------------|-------|
|               | METRES        | FEET         | METRES    | FEET         | TONNES            | TONS. | TONNES      | TONS. |
| SUMMER }      | 9.233         | 30'-3-1/2"   | 2.626     | 8'-7-3/8"    | 19617             | 19307 | 14117       | 13894 |
| WINTER } SW   | 9.041         | 29'-7-15/16" | 2.818     | 9'-2-15/16"  | 19151             | 18848 | 13651       | 13435 |
| TROPICAL }    | 9.425         | 30'-11-1/16" | 2.434     | 7'-11-13/16" | 20085             | 19768 | 14585       | 14355 |
| FRESH WATER   | 9.435         | 30'-11-1/2"  | 2.424     | 7'-11-7/16"  | 19617             | 19307 | 14117       | 13894 |
| TROPICAL F.W. | 9.627         | 31'-7-1/16"  | 2.222     | 7'-3-7/8"    | 20079             | 19762 | 14579       | 14349 |

TONNAGE MARK DETAILS



|        | DRAUGHTS FULL |             | FREEBOARD |            | DISPLACEMENT FULL |       | DEAD-WEIGHT |       |
|--------|---------------|-------------|-----------|------------|-------------------|-------|-------------|-------|
|        | METRES        | FEET        | METRES    | FEET       | TONNES            | TONS. | TONNES      | TONS. |
| SUMMER | 7.788         | 25'-6-5/8"  | 4.071     | 14'-4-1/4" | 16133             | 15878 | 10633       | 10465 |
| FRESH  | 7.951         | 26'-1-1/16" | 3.908     | 12'-9-7/8" | 16133             | 15878 | 10633       | 10465 |

23/07/19



TANKS  
TRIM TABLES

CHANGE IN DRAUGHTS IN CM. WHEN EACH TANK IS FILLED + IMMERSION -- = EMERSION

| TANKS                        | Con-<br>tent. | Capa-<br>city<br>in<br>Tonnes | DRAUGHTS |       |       |       |       |       |
|------------------------------|---------------|-------------------------------|----------|-------|-------|-------|-------|-------|
|                              |               |                               | 5.0 M.   |       | 7.0 M |       | 9.0 M |       |
|                              |               |                               | Aft      | Ford  | Aft   | Ford  | Aft   | Ford  |
| Bulbous Bow (Void Space)     | F.W.          | 182.0                         | -29.0    | +43.7 | -25.3 | +40.8 | -20.8 | +37.0 |
| Fore Peak Tank               | W.B.          | 106.1                         | -15.1    | +24.8 | -14.4 | +23.5 | -12.1 | +21.7 |
| No. 1 D.B. Tank              | W.B.          | 161.5                         | -18.3    | +31.8 | -16.4 | +30.2 | -13.8 | +28.0 |
| No. 1 D.B. Tank              | H.F.O.        | 149.7                         | -16.9    | +29.5 | -15.2 | +28.0 | -12.8 | +26.0 |
| No. 2 D.B. Tanks P & S       | W.B.          | 415.0                         | -18.5    | +54.4 | -16.6 | +52.5 | -13.9 | +49.6 |
| No. 2 D.B. Tanks P & S.      | H.F.O.        | 384.6                         | -17.1    | +50.4 | -15.4 | +48.6 | -12.9 | +46.0 |
| No. 3 D.B. Tank P & S.       | W.B.          | 226.6                         | + 4.8    | +15.3 | + 4.3 | +15.4 | + 3.7 | +15.3 |
| No. 3 D.B. Tank P & S.       | H.F.O.        | 210.0                         | + 4.5    | +14.2 | + 4.0 | +14.3 | + 3.4 | +14.2 |
| No. 3 D.B. Tank (C)          | W.B.          | 216.0                         | + 4.7    | +14.7 | + 4.1 | +14.7 | + 3.5 | +14.6 |
| No. 3 D.B. Tank (C)          | H.F.O.        | 200.2                         | + 4.3    | +13.6 | + 3.8 | +13.6 | + 3.3 | +13.6 |
| No. 4 D.B. Tank P & S.       | W.B.          | 261.2                         | +23.6    | + 0.5 | +21.0 | + 1.9 | +17.8 | + 3.5 |
| No. 4 D.B. Tank P & S.       | H.F.O.        | 242.0                         | +22.0    | + 0.6 | +19.4 | + 1.7 | +16.5 | + 3.2 |
| No. 4 D.B. Tank (C)          | H.F.O.        | 244.5                         | +22.6    | + 0.1 | +20.0 | + 1.4 | +17.0 | + 2.9 |
| No. 4 D.B. Tank (C)          | W.B.          | 263.8                         | +24.3    | + 0.1 | +21.6 | + 1.5 | +18.3 | + 5.8 |
| No. 5 D.B. Tank (P)          | D.O.          | 73.5                          | +10.1    | - 3.1 | + 8.9 | - 2.5 | + 7.6 | - 1.7 |
| No. 5 D.B. Tank (S)          | H.F.O.        | 46.4                          | + 6.8    | - 2.4 | + 6.0 | - 2.0 | + 5.1 | - 1.5 |
| No. 6 D.B. Tank (C)          | L.O.          | 17.5                          | + 2.9    | - 1.2 | + 2.6 | - 1.0 | + 2.2 | - 0.8 |
| No. 7 D.B. Tank (P)          | D.O.          | 100.8                         | +20.1    | -10.1 | +17.8 | - 8.9 | +15.1 | - 7.2 |
| No. 7 D.B. Tank (S)          | D.O.          | 89.7                          | +17.8    | - 9.0 | +15.8 | - 7.9 | +13.4 | - 6.4 |
| No. 8 D.B. Tank (P)          | F.W.          | 74.1                          | +16.3    | - 8.9 | +14.4 | - 7.9 | +12.3 | - 6.4 |
| No. 8 D.B. Tank (S)          | F.W.          | 63.4                          | +14.0    | - 7.6 | +12.4 | - 6.7 | +10.4 | - 5.6 |
| No. 9 L.O. Reserve Tk. (C)   | L.O.          | 19.2                          | + 3.6    | - 1.6 | + 3.1 | - 1.5 | + 2.7 | - 1.1 |
| No. 10 Boiler Feed Tk. (S)   | F.W.          | 14.1                          | + 2.5    | - 1.0 | + 2.2 | - 1.0 | + 1.9 | - 0.7 |
| No. 11 Piston Cooling (C)    | F.W.          | 6.3                           | + 0.9    | - 0.3 | + 0.2 | - 0.2 | + 0.7 | - 0.2 |
| No. 12 Cooling Water Tk. (S) | F.W.          | 14.4                          | + 2.0    | - 0.5 | - 1.7 | - 0.5 | + 1.5 | - 0.3 |
| No. 13 Leakage Water Tk. (P) | F.W.          | 4.7                           | + 0.6    | - 0.2 | + 0.6 | - 0.1 | + 0.5 | - 0.1 |
| Aft Peak                     | W.B.          | 120.7                         | +31.2    | -19.0 | +27.8 | -16.9 | +23.5 | -14.2 |
| Aft Peak                     | F.W.          | 117.8                         | +30.4    | -18.6 | +27.0 | -16.6 | +22.9 | -13.9 |
| Tween Deck Tank (P)          | F.W.          | 49.7                          | +12.5    | - 7.5 | +11.3 | - 6.8 | + 9.7 | - 5.9 |
| Tween Deck Tank (S)          | F.W.          | 43.7                          | +11.0    | - 6.6 | +9.9  | - 6.0 | + 8.5 | - 5.2 |

TRIM TABLES AT VARIOUS FRAMES.

CHANGE OF DRAUGHT AT A.P. & F.P. DUE TO AN ADDITIONAL LOAD OF  
100 TONNES AT VARIOUS POINTS

Mean Draught = 3.0 M., + = Immersion: -- = Emersion.

| Dis-<br>tance<br>of CG<br>of<br>load<br>from<br>φ in<br>Metres | Near<br>Fr.<br>No. | Sinkage in C.M. |       | Sinkage in<br>Inches |       | Dis-<br>tance<br>of CG<br>of<br>load<br>from<br>φ in<br>Metres | Near<br>Fr.<br>No. | Sinkage in<br>C.M. |       | Sinkage in<br>Inches |        |
|--|--------------------|-----------------|-------|----------------------|-------|--|--------------------|--------------------|-------|----------------------|--------|
|  |                    | Aft.            | Ford  | Aft.                 | Ford  |  |                    | Aft.               | Ford  | Aft.                 | Ford   |
|  |                    | Mid-<br>ship    | 92    | + 5.5                | + 4.2 |  |                    | +2.17              | +1.65 |                      |        |
| 3 A  | 88                 | + 6.5           | + 3.2 | + 2.56               | +1.26 | 3 F  | 96<br>92.7         | + 4.4              | + 5.2 | +1.73                | +2.05  |
| 6 A  | 85                 | + 7.5           | + 2.2 | + 2.96               | +0.87 | 6 F  | 100                | + 3.4              | + 6.2 | +1.34                | +2.44  |
| 9 A  | 81                 | + 8.6           | + 1.2 | + 3.39               | +0.47 | 9 F  | 104                | + 2.3              | + 7.1 | +0.91                | +2.80  |
| 12 A   | 77                 | + 9.6           | + 0.2 | + 3.78               | +0.08 | 12 F   | 107                | + 1.3              | + 8.1 | +0.51                | +3.19  |
| 15 A   | 73                 | +10.7           | - 0.7 | + 4.22               | -0.28 | 15 F   | 111                | + 0.2              | + 9.1 | +0.08                | +3.59  |
| 18 A   | 70                 | +11.7           | - 1.7 | + 4.61               | -0.67 | 18 F   | 115                | - 0.8              | +10.1 | -0.32                | +3.98  |
| 21 A   | 66                 | +12.8           | - 2.7 | + 5.04               | -1.06 | 21 F   | 119                | - 1.8              | +11.1 | -0.71                | +4.37  |
| 24 A   | 62                 | +13.8           | - 3.7 | + 5.44               | -1.46 | 24 F   | 122                | - 2.8              | +12.1 | -1.10                | +4.77  |
| 27 A   | 58                 | +14.8           | - 4.7 | + 5.83               | -1.85 | 27 F   | 126                | - 3.9              | +13.1 | -1.54                | +5.16  |
| 30 A   | 55                 | +15.8           | - 5.7 | + 6.23               | -2.25 | 30 F   | 130                | - 5.0              | +14.0 | -1.97                | +5.52  |
| 33 A   | 51                 | +16.9           | - 6.7 | + 6.66               | -2.64 | 33 F   | 134                | - 6.0              | +15.0 | -2.36                | +5.91  |
| 36 A   | 47                 | +17.9           | - 7.7 | + 7.05               | -3.03 | 36 F   | 137                | - 7.1              | +16.0 | -2.80                | +6.30  |
| 39 A   | 43                 | +19.0           | - 8.6 | + 7.49               | -3.39 | 39 F   | 141                | - 8.1              | +17.0 | -3.19                | +6.70  |
| 42 A   | 40                 | +20.0           | - 9.6 | + 7.88               | -3.78 | 42 F   | 145                | - 9.1              | +18.0 | -3.59                | +7.09  |
| 45 A   | 36                 | +21.1           | -10.6 | + 8.31               | -4.18 | 45 F   | 149                | -10.1              | +19.0 | -3.98                | +7.49  |
| 48 A   | 32                 | +22.1           | -11.6 | + 8.71               | -4.57 | 48 F   | 153                | -11.2              | +20.0 | -4.41                | +7.88  |
| 51 A   | 28                 | +23.1           | -12.6 | + 9.10               | -4.96 | 51 F   | 158                | -12.2              | +21.0 | -4.81                | +8.27  |
| 54 A   | 25                 | +24.2           | -13.6 | + 9.53               | -5.36 | 54 F   | 162                | -13.3              | +21.9 | -5.24                | +8.63  |
| 57 A   | 21                 | +25.2           | -14.6 | + 9.93               | -5.75 | 57 F   | 167                | -14.3              | +22.9 | -5.63                | +9.02  |
| 60 A   | 17                 | +26.3           | -15.5 | +10.36               | -6.11 | 60 F   | 171                | -15.4              | +23.9 | -6.08                | +9.42  |
| 63 A   | 13                 | +27.3           | -16.5 | +10.76               | -6.50 | 63 F   | 176                | -16.4              | +24.9 | -6.46                | +9.81  |
| 66 A   | 8                  | +28.4           | -17.5 | +11.19               | -6.90 | 66 F   | 181                | -17.4              | +25.9 | -6.86                | +10.20 |



TRIM TABLES AT VARIOUS FRAMES

CHANGE OF DRAUGHT AT A.P. & F.P. DUE TO AN ADDITIONAL LOAD OF  
100 TONNES AT VARIOUS POINTS

Mean Draught = 5.0 M.: + = Immersion: - = Emersion.

| Dis-<br>tance<br>of CG<br>of<br>Load<br>from<br>φ in<br>Mtrs. | Near<br>Fr.<br>No. | Sinkage in<br>C.M. |       | Sinkage in<br>Inches |       | Dis-<br>tance<br>of CG<br>of<br>load<br>from<br>φ in<br>Mtrs. | Near<br>Fr.<br>No. | Sinkage in<br>Cm. |       | Sinkage in<br>Inches |       |
|---|--------------------|--------------------|-------|----------------------|-------|---|--------------------|-------------------|-------|----------------------|-------|
|   |                    | Aft.               | Ford. | Aft.                 | Ford. |   |                    | Aft.              | Ford. | Aft.                 | Ford. |
|   |                    | Mid-ship           | 92    | + 5.0                | + 4.0 |   |                    | +1.97             | +1.58 |                      |       |
| 3 A   | 88                 | + 5.9              | + 3.1 | +2.32                | +1.22 | 3 F   | 96                 | + 4.1             | + 4.9 | +1.62                | +1.93 |
| 6 A   | 85                 | + 6.9              | + 2.3 | +2.72                | +0.91 | 6 F   | 100                | + 3.2             | + 5.8 | +1.26                | +2.29 |
| 9 A   | 81                 | + 7.8              | + 1.4 | +3.07                | +0.55 | 9 F   | 104                | + 2.2             | + 6.6 | +0.87                | +2.60 |
| 12 A  | 77                 | + 8.7              | + 0.5 | +3.43                | +0.20 | 12 F  | 107                | + 1.3             | + 7.5 | +0.51                | +2.96 |
| 15 A  | 73                 | + 9.6              | - 0.4 | +3.78                | -0.16 | 15 F  | 111                | + 0.4             | + 8.4 | +0.16                | +3.31 |
| 18 A  | 70                 | +10.5              | - 1.3 | +4.14                | -0.51 | 18 F  | 115                | - 0.5             | + 9.3 | -0.20                | +3.66 |
| 21 A  | 66                 | +11.5              | - 2.1 | +4.53                | -0.83 | 21 F  | 119                | - 1.4             | +10.2 | -0.55                | +4.02 |
| 24 A  | 62                 | +12.4              | - 3.0 | +4.89                | -1.18 | 24 F  | 122                | - 2.4             | +11.0 | -0.95                | +4.33 |
| 27 A  | 58                 | +13.3              | - 3.9 | +5.24                | -1.54 | 27 F  | 126                | - 3.3             | +11.9 | -1.30                | +4.69 |
| 30 A  | 55                 | +14.2              | - 4.8 | +5.59                | -1.89 | 30 F  | 130                | - 4.2             | +12.8 | -1.65                | +5.04 |
| 33 A  | 51                 | +15.1              | - 5.7 | +5.95                | -2.25 | 33 F  | 134                | - 5.1             | +13.7 | -2.01                | +5.40 |
| 36 A  | 47                 | +16.1              | - 6.5 | +6.34                | -2.56 | 36 F  | 137                | - 6.0             | +14.6 | -2.36                | +5.75 |
| 39 A  | 43                 | +17.0              | - 7.4 | +6.70                | -2.92 | 39 F  | 141                | - 7.0             | +15.4 | -2.76                | +6.07 |
| 42 A  | 40                 | +17.9              | - 8.3 | +7.05                | -3.27 | 42 F  | 145                | - 7.9             | +16.3 | -3.11                | +6.42 |
| 45 A  | 36                 | +18.8              | - 9.2 | +7.41                | -3.62 | 45 F  | 149                | - 8.8             | +17.2 | -3.47                | +6.78 |
| 48 A  | 32                 | +19.7              | -10.1 | +7.76                | -3.98 | 48 F  | 153                | - 9.7             | +18.1 | -3.82                | +7.13 |
| 51 A  | 28                 | +20.7              | -10.9 | +8.16                | -4.29 | 51 F  | 158                | -10.6             | +19.0 | -4.18                | +7.49 |
| 54 A  | 25                 | +21.6              | -11.8 | +8.51                | -4.65 | 54 F  | 162                | -11.6             | +19.8 | -4.57                | +7.80 |
| 57 A  | 21                 | +22.5              | -12.7 | +8.87                | -5.00 | 57 F  | 167                | -12.5             | +20.7 | -4.93                | +8.16 |
| 60 A  | 17                 | +23.4              | -13.6 | +9.22                | -5.36 | 60 F  | 171                | -13.4             | +21.6 | -5.28                | +8.51 |
| 63 A  | 13                 | +24.4              | -14.4 | +9.61                | -5.67 | 63 F  | 176                | -14.3             | +22.5 | -5.63                | +8.87 |
| 66 A  | 8                  | +25.3              | -15.3 | +9.97                | -6.03 | 66 F  | 181                | -15.3             | +23.3 | -6.03                | +9.18 |

TRIM TABLES AT VARIOUS FRAMES.

CHANGE OF DRAUGHT AT A.P. AND F.P. DUE TO AN ADDITIONAL LOAD OF  
100 TONNES AT VARIOUS POINTS.

Mean Draught = 7.0M: + = Immersion: - = Emersion.

| Dis-<br>tance<br>of CG<br>load<br>from<br>φ in<br>Mtrs. | Near<br>Fr.<br>No. | Sinkage in<br>Cm. |       | Sinkage in<br>Inches |       | Dis-<br>tance<br>of CG<br>of<br>Load<br>from<br>φ in<br>Mtrs. | Near<br>Fr.<br>No. | Sinkage in<br>Cm. |       | Sinkage in<br>Inches |       |
|---|--------------------|-------------------|-------|----------------------|-------|---|--------------------|-------------------|-------|----------------------|-------|
|   |                    | Aft.              | Ford. | Aft.                 | Ford. |   |                    | Aft.              | Ford. | Aft.                 | Ford. |
|   |                    | Mid-ship          | 92    | + 4.5                | + 4.3 |   |                    | +1.77             | +1.69 |                      |       |
| 3 A   | 88                 | + 5.3             | + 3.5 | +2.09                | +1.38 | 3 F   | 96                 | + 3.7             | + 5.1 | +1.46                | +2.01 |
| 6 A   | 85                 | + 6.2             | + 2.7 | +2.44                | +1.06 | 6 F   | 100                | + 2.8             | + 5.9 | +1.10                | +2.32 |
| 9 A   | 81                 | + 7.0             | + 1.9 | +2.76                | +0.75 | 9 F   | 104                | + 2.0             | + 6.7 | +0.79                | +2.64 |
| 12 A  | 77                 | + 7.8             | + 1.1 | +3.07                | +0.43 | 12 F  | 107                | + 1.2             | + 7.5 | +0.47                | +2.96 |
| 15 A  | 73                 | + 8.6             | + 0.2 | +3.39                | +0.08 | 15 F  | 111                | + 0.4             | + 8.4 | +0.16                | +3.31 |
| 18 A  | 70                 | + 9.4             | - 0.6 | +3.70                | -0.24 | 18 F  | 115                | - 0.4             | + 9.2 | -0.16                | +3.62 |
| 21 A  | 66                 | +10.2             | - 1.4 | +4.02                | -0.55 | 21 F  | 119                | - 1.2             | +10.0 | -0.47                | +3.94 |
| 24 A  | 62                 | +11.1             | - 2.2 | +4.37                | -0.87 | 24 F  | 122                | - 2.1             | +10.8 | -0.83                | +4.26 |
| 27 A  | 58                 | +11.9             | - 3.0 | +4.69                | -1.18 | 27 F  | 126                | - 2.9             | +11.6 | -1.14                | +4.57 |
| 30 A  | 55                 | +12.7             | - 3.8 | +5.00                | -1.50 | 30 F  | 130                | - 3.7             | +12.4 | -1.46                | +4.89 |
| 33 A  | 51                 | +13.5             | - 4.6 | +5.32                | -1.81 | 33 F  | 134                | - 4.5             | +13.3 | -1.77                | +5.24 |
| 36 A  | 47                 | +14.3             | - 5.5 | +5.63                | -2.17 | 36 F  | 137                | - 5.3             | +14.1 | -2.09                | +5.56 |
| 39 A  | 43                 | +15.2             | - 6.2 | +5.99                | -2.44 | 39 F  | 141                | - 6.2             | +14.8 | -2.44                | +5.83 |
| 42 A  | 40                 | +16.0             | - 7.0 | +6.30                | -2.76 | 42 F  | 145                | - 7.0             | +15.7 | -2.76                | +6.91 |
| 45 A  | 36                 | +16.8             | - 7.9 | +6.62                | -3.11 | 45 F  | 149                | - 7.8             | +16.5 | -3.07                | +6.50 |
| 48 A  | 32                 | +17.8             | - 8.7 | +6.93                | -3.43 | 48 F  | 153                | - 8.6             | +17.7 | -3.38                | +6.82 |
| 51 A  | 28                 | +18.4             | - 9.5 | +7.25                | -3.74 | 51 F  | 158                | - 9.5             | +18.1 | -3.74                | +7.13 |
| 54 A  | 25                 | +19.3             | -10.3 | +7.60                | -4.06 | 54 F  | 162                | -10.3             | +18.9 | -4.06                | +7.45 |
| 57 A  | 21                 | +20.1             | -11.1 | +7.92                | -4.37 | 57 F  | 167                | -11.1             | +19.7 | -4.37                | +7.76 |
| 60 A  | 17                 | +20.9             | -11.9 | +8.23                | -4.69 | 60 F  | 171                | -11.9             | +20.6 | -4.69                | +8.12 |
| 63 A  | 13                 | +21.7             | -12.8 | +8.55                | -5.04 | 63 F  | 176                | -12.7             | +21.4 | -5.00                | +8.43 |
| 66 A  | 8                  | +22.5             | -13.6 | +8.87                | -5.36 | 66 F  | 181                | -13.5             | +22.2 | -5.32                | +8.75 |
| 69 A  | 3                  | +23.3             | -14.4 | +9.18                | -5.67 | 69 F  | 188                | -14.3             | +23.0 | -5.63                | +9.06 |



## TRIM TABLES AT VARIOUS FRAMES.

CHANGE OF DRAUGHT AT A.P. AND F.P. DUE TO AN ADDITIONAL LOAD OF  
100 TONNES AT VARIOUS POINTS.

Mean Draught: = 9.0 M: + = Immersion: - = Emersion.

| Dis-<br>tance<br>of CG<br>of<br>load<br>from<br>ϕ in<br>Mtrs. | Near<br>Fr.<br>No. | Sinkage in<br>Cm. |       | Sinkage in<br>Inches |       | Dis-<br>tance<br>of CG<br>of<br>load<br>from<br>ϕ in<br>Mtrs. | Near<br>Fr.<br>No. | Sinkage in<br>Cm. |       | Sinkage in<br>Inches |       |
|---|--------------------|-------------------|-------|----------------------|-------|---|--------------------|-------------------|-------|----------------------|-------|
|   |                    | Aft.              | Ford  | Aft.                 | Ford  |   |                    | Aft.              | Ford  | Aft.                 | Ford  |
|   |                    |                   |       |                      |       | Mid-<br>ship  | 92                 | + 3.8             | + 4.5 | +1.50                | +1.77 |
| 3 A   | 88                 | + 4.4             | + 3.7 | +1.73                | +1.46 | 3 F   | 96                 | + 3.1             | + 5.2 | +1.22                | +2.05 |
| 6 A   | 85                 | + 5.1             | + 3.0 | +2.01                | +1.18 | 6 F   | 100                | + 2.4             | + 5.9 | +0.95                | +2.32 |
| 9 A   | 81                 | + 5.8             | + 2.3 | +2.29                | +0.91 | 9 F   | 104                | + 1.7             | + 6.6 | +0.67                | +2.60 |
| 12 A  | 77                 | + 6.5             | + 1.5 | +2.56                | +0.59 | 12 F  | 107                | + 1.0             | + 7.4 | +0.39                | +2.92 |
| 15 A  | 73                 | + 7.2             | + 0.8 | +2.84                | +0.32 | 15 F  | 111                | + 0.3             | + 8.1 | +0.12                | +3.19 |
| 18 A  | 70                 | + 7.9             | + 0.1 | +3.11                | +0.04 | 18 F  | 115                | - 0.4             | + 8.8 | -0.16                | +3.47 |
| 21 A  | 66                 | + 8.6             | - 0.6 | +3.39                | -0.24 | 21 F  | 119                | - 1.1             | + 9.5 | -0.43                | +3.74 |
| 24 A  | 62                 | + 9.3             | - 1.2 | +3.66                | -0.51 | 24 F  | 122                | - 1.8             | +10.2 | -0.71                | +4.02 |
| 27 A  | 58                 | +10.0             | - 2.0 | +3.94                | -0.79 | 27 F  | 126                | - 2.5             | +10.9 | -0.99                | +4.29 |
| 30 A  | 55                 | +10.7             | - 2.8 | +4.22                | -1.10 | 30 F  | 130                | - 3.2             | +11.7 | -1.26                | +4.61 |
| 35 A  | 51                 | +11.4             | - 3.5 | +4.49                | -1.38 | 33 F  | 134                | - 3.9             | +12.4 | -1.54                | +4.89 |
| 36 A  | 47                 | +12.1             | - 4.2 | +4.77                | -1.65 | 36 F  | 137                | - 4.6             | +13.1 | -1.81                | +5.16 |
| 39 A  | 43                 | +12.8             | - 4.9 | +5.04                | -1.93 | 39 F  | 141                | - 5.3             | +13.8 | -2.09                | +5.44 |
| 42 A  | 40                 | +13.5             | - 5.6 | +5.32                | -2.21 | 42 F  | 145                | - 5.9             | +14.6 | -2.32                | +5.75 |
| 45 A  | 36                 | +14.2             | - 6.3 | +5.59                | -2.48 | 45 F  | 149                | - 6.6             | +15.3 | -2.60                | +6.03 |
| 48 A  | 32                 | +14.9             | - 7.1 | +5.87                | -2.80 | 48 F  | 153                | - 7.4             | +16.0 | -2.92                | +6.30 |
| 51 A  | 28                 | +15.6             | - 7.8 | +6.15                | -3.07 | 51 F  | 158                | - 8.0             | +16.8 | -3.15                | +6.62 |
| 54 A  | 25                 | +16.2             | - 8.6 | +6.38                | -3.39 | 54 F  | 162                | - 8.7             | +17.5 | -3.43                | +6.90 |
| 57 A  | 21                 | +16.9             | - 9.3 | +6.66                | -3.66 | 57 F  | 167                | - 9.4             | +18.2 | -3.70                | +7.17 |
| 60 A  | 17                 | +17.6             | -10.0 | +6.93                | -3.94 | 60 F  | 171                | -10.1             | +18.9 | -3.98                | +7.45 |
| 63 A  | 13                 | +18.3             | -10.7 | +7.21                | -4.22 | 63 F  | 176                | -10.8             | +19.6 | -4.26                | +7.72 |
| 66 A  | 8                  | +19.0             | -11.5 | +7.49                | -4.53 | 66 F  | 181                | -11.5             | +20.4 | -4.53                | +8.04 |
| 69 A  | 3                  | +19.7             | -12.2 | +7.76                | -4.81 | 69 F  | 186                | -12.2             | +21.1 | -4.81                | +8.31 |

## REPORT ON INCLINING EXPERIMENT.

The inclining experiment of the ship MSV HINDSALIP was conducted by Messrs. Hindustan Shipyard Ltd., Visakhapatnam, off their Fitting Out Jetty on 7-3-1975 between 7-30 hours and 16-00 hours.

The proceedings of the experiment were witnessed by:—

1. Surveyor-in-Charge, Mercantile Marine Department, Visakhapatnam.
2. Owner's representative.
3. Representatives of the Shipyard.

## OBSERVATIONS:

Ship's direction: Facing East      Weather: Fair

Sp. Gr. of water:      1.021

Observed drafts, Stern      5.693 M

„ „      Stem      2.071 M

Corrected drafts: A.P.      5.838 M

„ „      F.P.      2.052 M

Net displacement after correction 7381.6 Tonnes.

For C. F. and Sp. Gravity. (Appendix—I)

## INCLINING WEIGHTS:

16 Blocks of cast-iron weighing 42.894 Tonnes were placed on Upper Deck (See Appendix IV).

## NO. 3 HATCH:

| Weight        | Position | Distance shifted. |
|---------------|----------|-------------------|
| 10.627 tonnes | Port     | 17.589 M          |
| 10.747 „      | Stbd.    | 17.589 M          |

## No. 4 HATCH :

| Weight        | Position. | Distance shifted. |
|---------------|-----------|-------------------|
| 10.759 Tonnes | Port      | 17.601 M          |
| 10.761 „      | Stbd.     | 17.601 M          |

## PENDULUMS:

ARRANGED IN HOLDS NO. 2 AND 4 AT FRAMES 144 AND 84 RESPECTIVELY. THE LENGTH OF THE PENDULUM AT HOLD No. 2 IS 8.498 METRES, AND THE LENGTH OF THE PENDULUM AT HOLD NO. 4 IS 8.498 METRES.



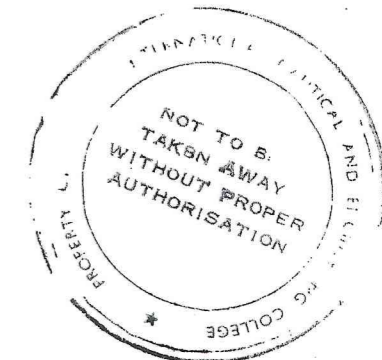
## REPORT ON INCLINING EXPERIMENT.

|   |        |         |
|---|--------|---------|
| Men on board  | 76     | Men     |
| Condition of Ship:                                  |        |         |
| 1. Vessel almost complete in all respects except:   |        |         |
|   |        | Tonnes. |
| A. Awnings on boat deck                             | 1.0    |         |
| B.  |        |         |
| C.  |        |         |
| D.  |        |         |
| E.  |        |         |
| F.  |        |         |
| Total weight of items to go on board                | 1.0    |         |
| 2. Items on board that were not part of Light Ship: |        |         |
| Solids:   |        |         |
| A. Inclining weights (Appendix IV)                  | 42.894 | Tonnes  |
| B. Spares etc.                                      | 36.684 | "       |
| C. Shipyard equipment                               | 6.807  | "       |
| D. Men on board                                     | 4.572  | "       |
| Total solids  | 90.957 | "       |
| Say   | 91.0   | "       |
| Fluids: (Appendix III)                              | 1791.8 | "       |
| Total to come off the board                         | 1882.8 | Tonnes. |
| Calculation for K. G. (As heeled condition)         |        |         |
| K. M. (from hydrostatics)                           | 9.942  | Metres. |
| G. M. (as calculated in Appendix II)                | 2.539  | "       |
| K. G. (Before F. S. Correction)                     | 7.403  | "       |
| F. S. correction (Appendix III)                     | 0.019  | Metres. |
| K. G. as heeled                                     | 7.384  |         |

REPORT ON INCLINING EXPERIMENT  
CALCULATION FOR LIGHT SHIP, K.G. & L.C.G.

| Item                           | Weight in Tonnes | K.G. M | V Moments | L.C.G. A.P. | L Moments |
|--------------------------------|------------------|--------|-----------|-------------|-----------|
| 1. Condition as heeled         | 7381.6           | 7.384  | 54506     | 65.111      | 480623    |
| 2. Wts. to come off:           |                  |        |           |             |           |
| A. Solids                      | 91.0             | 12.303 | 1120      | 48.100      | 4377      |
| B. Liquids                     | 1791.8           | 2.684  | 4809      | 81.385      | 145826    |
| Total to come off              | 1882.8           | 3.149  | 5929      | 79.776      | 150203    |
| 3. Resultant of 1—2            | 5498.8           | 8.831  | 48577     | 60.089      | 330420    |
| 4. Wts. to go on board         | 1.0              | 19.0   | 19        | 28.7        | 29        |
| 5. Resultant of 3—4 Light ship | 5499.8           | 8.836  | 48596     | 60.084      | 330449    |

|                          |        |         |
|--------------------------|--------|---------|
| Light ship               | 5499.8 | Tonnes  |
| Mean draught             | 3.010  | Metres. |
| K.M. (from hydrostatics) | 11.652 | "       |
| K.G.                     | 8.836  | "       |
| G.M.                     | 2.816  | "       |
| Draft aft.               | 5.464  | "       |
| Draft ford.              | 0.683  | "       |





REPORT ON INCLINING EXPERIMENT  
CALCULATION FOR LIGHT SHIP, K.G. & L.C.G.

| Item                           | Weight in Tonnes | K.G. M | V Moments | L.C.G A.P. | L Moments |
|--------------------------------|------------------|--------|-----------|------------|-----------|
| 1. Condition as heeled         | 7381.6           | 7.384  | 54506     | 65.111     | 480623    |
| 2. Wts. to come off:           |                  |        |           |            |           |
| A. Solids                      | 91.0             | 12.303 | 1120      | 48.100     | 4377      |
| B. Liquids                     | 1791.8           | 2.684  | 4809      | 81.385     | 145826    |
| Total to come off              | 1882.8           | 3.149  | 5929      | 79.776     | 150203    |
| 3. Resultant of 1—2            | 5498.8           | 8.831  | 48577     | 60.089     | 330420    |
| 4. Wts. to go on board         | 1.0              | 19.0   | 19        | 28.7       | 29        |
| 5. Resultant of 3—4 Light ship | 5499.8           | 8.836  | 48596     | 60.084     | 330449    |

|                          |        |         |
|--------------------------|--------|---------|
| Light ship               | 5499.8 | Tonnes  |
| Mean draught             | 3.010  | Metres. |
| K.M. (from hydrostatics) | 11.652 | "       |
| K.G.                     | 8.836  | "       |
| G.M.                     | 2.816  | "       |
| Draft aft.               | 5.464  | "       |
| Draft ford.              | 0.683  | "       |

REPORT ON INCLINING EXPERIMENT

APPENDIX II

DISPLACEMENT AS HEELED. 7381.6 TONNES.

$$GM = \frac{W \times d}{4 \times \tan \theta}$$

| DIRECTION OF SHIFT | WEIGHT IN TONNES W. | DISTANCE MOVED d (M) | WEIGHT x DISTANCE W x D | PENDULUM NO. 1   |          | PENDULUM NO. 2   |         | STABILOGRAPH. |       | GM. IN METRES.  |                 |
|--------------------|---------------------|----------------------|-------------------------|------------------|----------|------------------|---------|---------------|-------|-----------------|-----------------|
|                    |                     |                      |                         | DEFLECTION IN MM | TAN θ.   | DEFLECTION IN MM | TAN θ.  | ANGLE.        | TAN θ | PENDULUM NO. 1. | PENDULUM NO. 2. |
| S-P                | 5.267               | 17.601               | 92.7                    | 89               | 0.01047  | 87               | 0.01024 |               |       | 2.423           | 2.478           |
|                    | 5.381               | 17.589               | 94.6                    |                  |          |                  |         |               |       |                 |                 |
| S-P                | 5.494               | 17.601               | 96.7                    | 93               | 0.01094  | 81               | 0.00953 |               |       | 2.366           | 2.717           |
|                    | 5.366               | 17.589               | 94.4                    |                  |          |                  |         |               |       |                 |                 |
| P-S                | 10.761              | 17.601               | 189.4                   | 182              | 0.02142  | 168              | 0.01977 |               |       | 2.393           | 2.593           |
|                    | 10.747              | 17.589               | 189.0                   |                  |          |                  |         |               |       |                 |                 |
| P-S                | 5.494               | 17.601               | 96.7                    | 87               | 0.01024. | 98               | 0.01153 |               |       | 2.528           | 2.245           |
|                    | 5.366               | 17.589               | 94.4                    |                  |          |                  |         |               |       |                 |                 |
| P-S                | 5.267               | 17.601               | 92.7                    | 79               | 0.00930  | 79               | 0.00930 |               |       | 2.728           | 2.728           |
|                    | 5.381               | 17.589               | 94.6                    |                  |          |                  |         |               |       |                 |                 |
| P-S                | 10.761              | 17.601               | 189.4                   | 166              | 0.01953  | 177              | 0.02083 |               |       | 2.625           | 2.461           |
|                    | 10.747              | 17.589               | 189.0                   |                  |          |                  |         |               |       |                 |                 |
| P-S                | 5.327               | 17.601               | 93.8                    | 88               | 0.01036  | 102              | 0.01200 |               |       | 2.441           | 2.108           |
|                    | 5.284               | 17.589               | 92.9                    |                  |          |                  |         |               |       |                 |                 |
| P-S                | 5.432               | 17.601               | 95.6                    | 83               | 0.00977  | 69               | 0.00812 |               |       | 2.629           | 3.163           |
|                    | 5.343               | 17.589               | 94.0                    |                  |          |                  |         |               |       |                 |                 |
| S-P                | 10.759              | 17.601               | 189.4                   | 171              | 0.02012  | 171              | 0.02012 |               |       | 2.534           | 2.534           |
|                    | 10.627              | 17.589               | 186.9                   |                  |          |                  |         |               |       |                 |                 |
| S-P                | 5.432               | 17.601               | 95.6                    | 81               | 0.00953  | 82               | 0.00965 |               |       | 2.695           | 2.662           |
|                    | 5.343               | 17.589               | 94.0                    |                  |          |                  |         |               |       |                 |                 |
| S-P                | 5.327               | 17.601               | 93.8                    | 86               | 0.01012  | 93               | 0.01094 |               |       | 2.499           | 2.312           |
|                    | 5.284               | 17.589               | 92.9                    |                  |          |                  |         |               |       |                 |                 |
| —                  | 10.759              | 17.601               | 189.4                   | 167              | 0.01965  | 175              | 0.02059 |               |       | 2.594           | 2.476           |
|                    | 10.827              | 17.589               | 186.9                   |                  |          |                  |         |               |       |                 |                 |

MEAN. GM.

MEAN OF PENDULUM ... 2.539

| PENDULUM NO | AT. FR | FEET         | METRES. |
|-------------|--------|--------------|---------|
| 1           | 144    | 27'-10-9/16" | 8.498   |
| 2           | 84     | 27'-10-9/16" | 8.498   |



## REPORT ON INCLINING EXPERIMENT

## APPENDIX III

LIQUIDS ON BOARD AT THE TIME OF  
INCLINING EXPERIMENT

| Compartment                   | Bet. frames | Content  | Sounding in mm |            | Capacity in Tonnes | Condition | F.S. correction (M) 4 |
|-------------------------------|-------------|----------|----------------|------------|--------------------|-----------|-----------------------|
|                               |             |          | Measured.      | Corrected. |                    |           |                       |
| 1                             | 2           | 3        | 4              | 5          | 6                  | 7         | 8                     |
| Bulbous bow                   |             | SW       |                | Max.       | 186.6              | Full      | ..                    |
| Fore peak tank                | 177-FE      | SW       |                | Max.       | 106.1              | Full      | ..                    |
| No. 1 D. B. tank              | 149-177     | SW       |                | Max.       | 161.5              | Full      | ..                    |
| No. 2 D. B. tank P            | 117-149     | SW       |                | Max.       | 207.5              | Full      | ..                    |
| No. 2 D. B. tank P            | 117-149     | SW       |                | Max.       | 207.5              | Full      | ..                    |
| No. 3 D. B. tank P            | 91-117      | SW       |                | Max.       | 113.3              | Full      | ..                    |
| No. 3 D. B. tank S            | 91-117      | SW       |                | Max.       | 113.3              | Full      | ..                    |
| No. 3 D. B. tank C            | 91-117      | SW       |                | Max.       | 216.0              | Full      | ..                    |
| No. 7 D. B. tank P            | 28-36       | DO       | 450            | 366        | 0.4                | Slack     | 44                    |
| No. 7 D. B. tank S            | 28-36       | DO       | 5860           | 5776       | 51.4               | Slack     | 29                    |
| No. 8 D. B. tank P            | 19-27       | FW       |                | Max.       | 74.1               | Full      | ..                    |
| No. 8 D. B. tank S            | 19-27       | FW       |                | Max.       | 63.4               | Full      | ..                    |
| Aft peak tank                 | 0-10        | FW       |                | Max.       | 117.8              | Full      | ..                    |
| Tween dk. water tk. P         | 7-11        | FW       |                | Max.       | 49.7               | Full      | ..                    |
| Tween dk. „ „ S               | 7-11        | FW       |                | Max.       | 43.7               | Full      | ..                    |
| No. 12 Jacket cool Tank S     | 56-59       | FW       |                | Max.       | 14.4               | Full      | ..                    |
| No. 11 piston cool Tank C     | 52-55       | FW       | 850            | 820        | 5.3                | Slack     | 4                     |
| No. 10 Boiler feed Tank S     | 39-46       | FW       | 1140           | 1092       | 12.7               | Slack     | 16                    |
| No. 6 DB L. O. serv. tk. C    | 41-50       | LO       | 640            | 543        | 9.7                | Slack     | 11                    |
| T1 HFO settl. tk. P           | 33-36       | HFO      | 720            | 720        | 2.6                | Slack     | 9                     |
| T1 —do— S                     | 33-36       | HFO      | 60             | 60         | 0.2                | Slack     | 9                     |
| T2 „ Serv. tk. P              | 33-36       | „        | 1780           | 1780       | 8.9                | Slack     | 6                     |
| T2 HFO. Serv. TK. S           | 33-36       | „        | 500            | 500        | 2.3                | Slack     | 6                     |
| T3 D. O. Serv. Tk. for ME P   | 36-40       | DO       | 1660           | 1660       | 11.2               | Slack     | 3                     |
| T4 —do— AE P                  | 36-40       | DO       | 1640           | 1640       | 7.9                | Slack     | 1                     |
| T6 HFO sludge TK. .           | 37-42       | HFO      | 160            | 160        | 0.8                | Slack     | Negligible            |
| T11 Condensate fd. tk. S      | 36-38       | FW       | 620            | 620        | 0.5                | Slack     | „                     |
| T13 Comp. tk. for ME. jkts. S | 55-57       | FW       | 1230           | 1230       | 1.5                | Slack     | „                     |
| T15 —do— Nozzles S            | 42-43       | FW       | 1070           | 1070       | 0.6                | Slack     | „                     |
| T16 Comp. Tk. for A.E.P       | 56-57       | FW       | 1400           | 1400       | 0.7                | Slack     | „                     |
| No. 27 cylinder oil Tk.       | 39-40       | Cyl. oil | 750            | 750        | 0.2                | Slack     | „                     |
| Total                         |             |          |                |            | 1791.8             |           | 138                   |

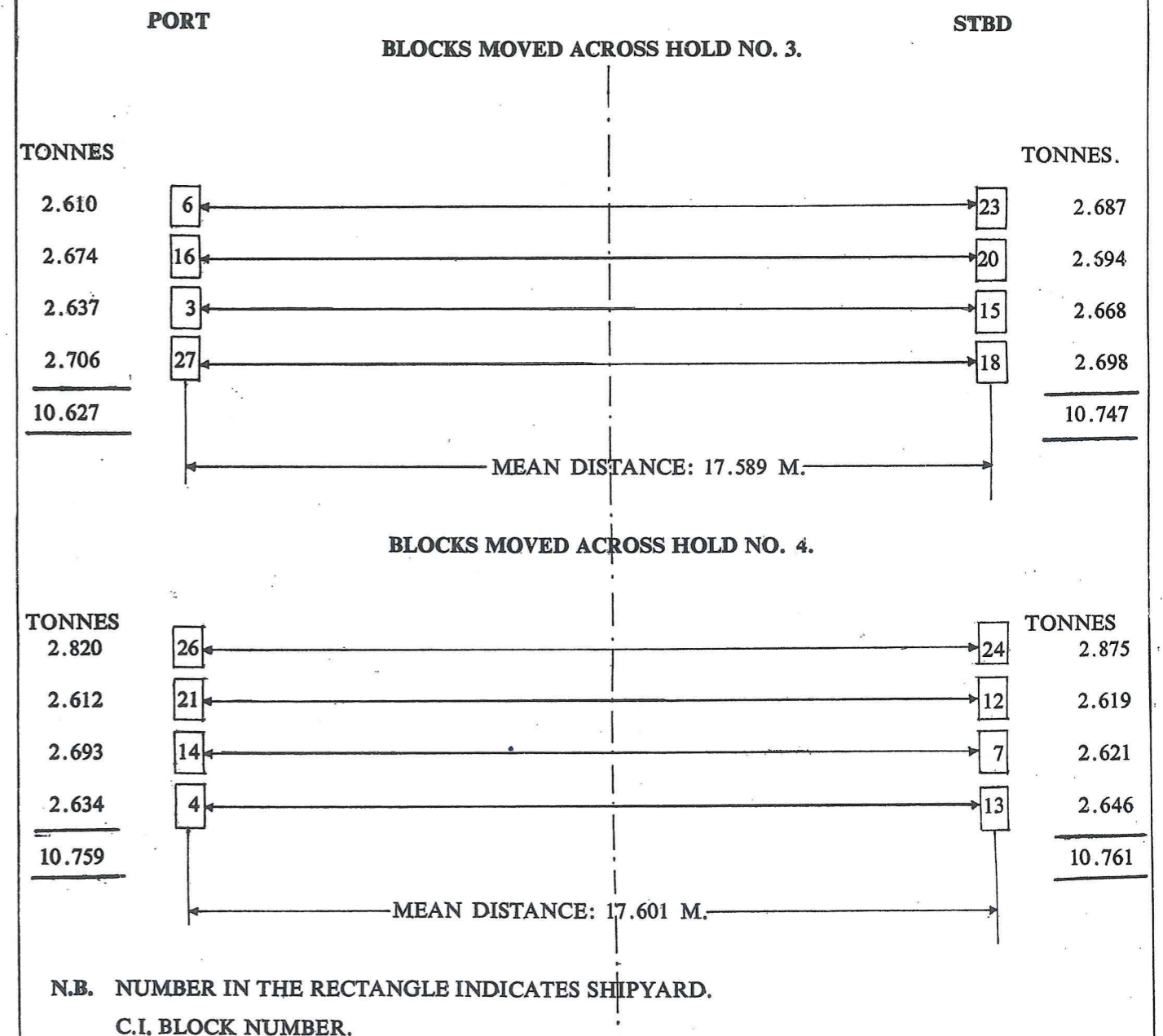
NOTE: The soundings of all the tanks of the ship were taken on the day of the experiment. The dry tanks are not indicated above.

$$\text{Total correction for F. S.} = \frac{I}{V} = \frac{138}{7201.0} = 0.019.$$

## REPORT ON INCLINING EXPERIMENT.

## APPENDIX IV.

## POSITION OF CAST IRON BLOCKS





CONDITION NO. 1—LIGHT SHIP-FULLY EQUIPPED.  
CALCULATION OF DISPLACEMENT, K. G. / L. C. G. CONDITION.

| ITEMS OF DISPLACEMENT.          | CON-<br>TENT. | WEIGHT<br>TONNES. | K. G.<br>M. | V. MO-<br>MENTS<br>M-T. | L.C.G.<br>(M) FORD<br>(A.P.) | L. MO-<br>MENTS<br>M-T. | Free<br>surface<br>M-T. |
|---------------------------------|---------------|-------------------|-------------|-------------------------|------------------------------|-------------------------|-------------------------|
| FORE PEAK TANK.                 |               |                   |             |                         |                              |                         |                         |
| NO. 1 D. B. TANK.               |               |                   |             |                         |                              |                         |                         |
| NO. 2 D. B. TANKS. P & S.       |               |                   |             |                         |                              |                         |                         |
| NO. 3 D. B. TANKS. P, S & C.    |               |                   |             |                         |                              |                         |                         |
| NO. 4 D. B. TANKS. P & S.       |               |                   |             |                         |                              |                         |                         |
| NO. 4 D. B. TANKS. C.           |               |                   |             |                         |                              |                         |                         |
| NO. 5 D. B. TANK. P.            |               |                   |             |                         |                              |                         |                         |
| NO. 5 D. B. TANK. S.            |               |                   |             |                         |                              |                         |                         |
| NO. 6 D. B. TANKS. P & S.       |               |                   |             |                         |                              |                         |                         |
| F. W. FOR ENGINES. S.           |               |                   |             |                         |                              |                         |                         |
| HFO. SETTLG. & SER. TKS. P & S. |               |                   |             |                         |                              |                         |                         |
| D. O. SETTLG. & SER. TANKS.     |               |                   |             |                         |                              |                         |                         |
| L.O. STORAGE & SETTLG. TANKS.   |               |                   |             |                         |                              |                         |                         |
| NO. 7 TANKS. P & S.             |               |                   |             |                         |                              |                         |                         |
| NO. 8 TANKS. P & S.             |               |                   |             |                         |                              |                         |                         |
| AFT PEAK TANK.                  |               |                   |             |                         |                              |                         |                         |
| DRINKING WATER TANKS. P & S.    |               |                   |             |                         |                              |                         |                         |
| SMALL TANKS IN ENGINE ROOM      |               |                   |             |                         |                              |                         |                         |
| NO. 1 HOLD.                     |               |                   |             |                         |                              |                         |                         |
| NO. 2 HOLD.                     |               |                   |             |                         |                              |                         |                         |
| NO. 3 HOLD.                     |               |                   |             |                         |                              |                         |                         |
| NO. 4 HOLD.                     |               |                   |             |                         |                              |                         |                         |
| NO. 5 HOLD.                     |               |                   |             |                         |                              |                         |                         |
| NO. 1 TWEEN DECK.               |               |                   |             |                         |                              |                         |                         |
| NO. 2 TWEEN DECK.               |               |                   |             |                         |                              |                         |                         |
| NO. 3 TWEEN DECK.               |               |                   |             |                         |                              |                         |                         |
| NO. 4 TWEEN DECK.               |               |                   |             |                         |                              |                         |                         |
| NO. 5 TWEEN DECK.               |               |                   |             |                         |                              |                         |                         |
| NO. 5 POOP DECK.                |               |                   |             |                         |                              |                         |                         |
| REFRIGERATED CARGO.             |               |                   |             |                         |                              |                         |                         |
| MAIL CARGO.                     |               |                   |             |                         |                              |                         |                         |
| DECK CARGO.                     |               |                   |             |                         |                              |                         |                         |
| CREW AND EFFECTS.               |               |                   |             |                         |                              |                         |                         |
| STORES, SPARES & PROVISIONS.    |               |                   |             |                         |                              |                         |                         |
| DEADWEIGHT.                     |               |                   |             |                         |                              |                         |                         |
| LIGHT SHIP.                     |               | 5499.8            | 8.836       | 48596                   | 60.084                       | 330449                  |                         |
| DISPLACEMENT.                   |               | 5499.8            | 8.836       | 48596                   | 60.084                       | 330449                  |                         |

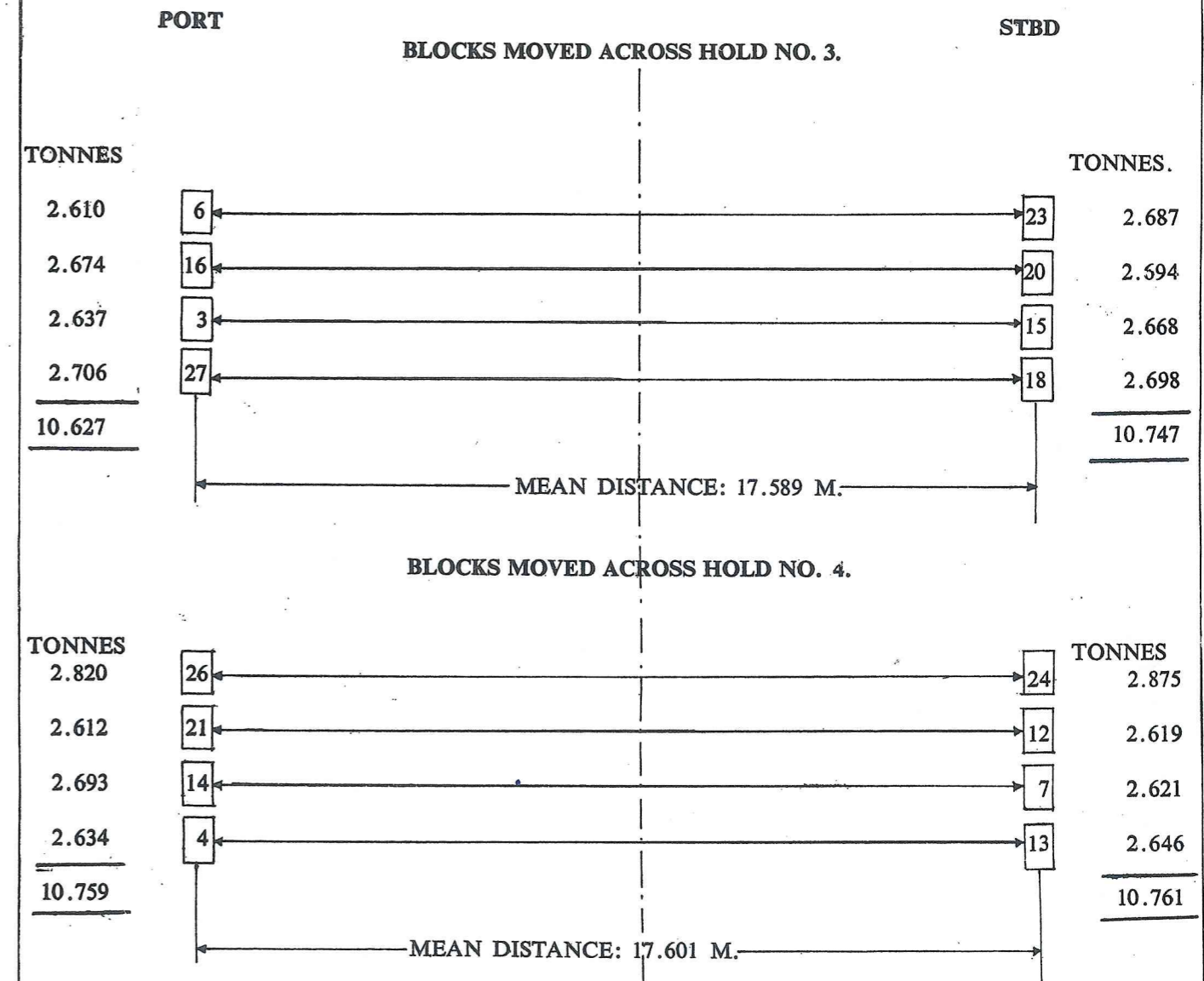
## TRIM AND DRAUGHTS.

|                  |   |        |        |                   |   |       |    |
|------------------|---|--------|--------|-------------------|---|-------|----|
| DISPLACEMENT.    | = | 5499.8 | TONNES | TRIM. BY Stern    | = | 4.781 | M. |
| L.C.G. FROM A.P. | = | 60.084 | M.     | IMMERSION AT A.P. | = | 2.454 | M. |
| L.C.B. FROM A.P. | = | 72.958 | M.     | EMERSION AT F.P.  | = | 2.327 | M. |
| L.C.F. FROM A.P. | = | 51.32  | %      | MEAN DRAUGHT.     | = | 3.010 | M. |
| M.C.T. 1 CM.     | = | 148.1  | M-T    | DRAUGHT AT A.P.   | = | 5.464 | M. |
| TRIMMING MOMENT. | = | 70804  | M-T    | DRAUGHT AT F.P.   | = | 0.683 | M. |

## REPORT ON INCLINING EXPERIMENT.

## APPENDIX IV.

## POSITION OF CAST IRON BLOCKS



N.B. NUMBER IN THE RECTANGLE INDICATES SHIPYARD.  
C.I. BLOCK NUMBER.



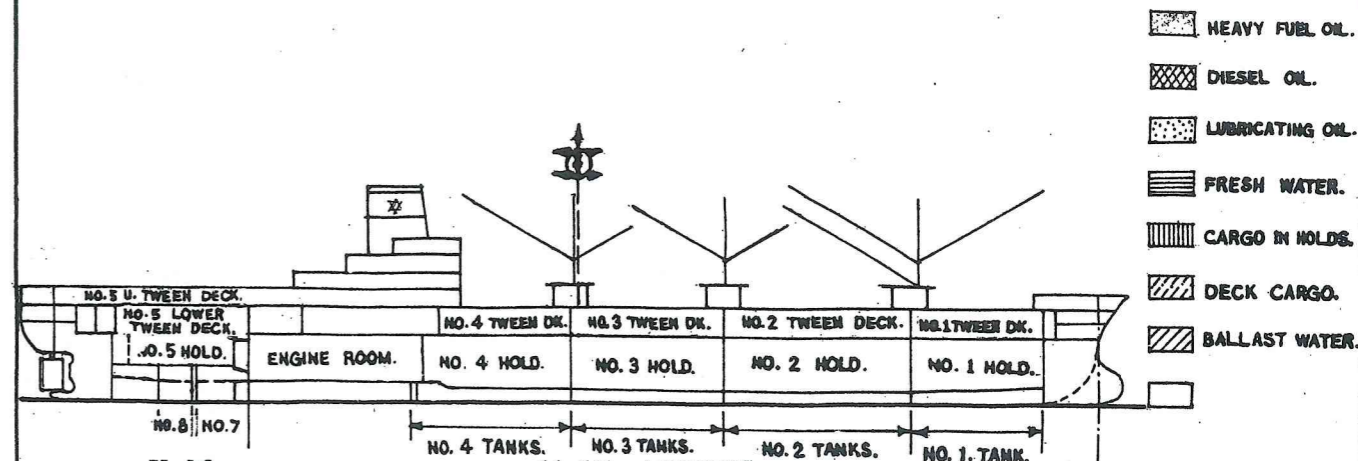
CONDITION NO. 1—LIGHT SHIP-FULLY EQUIPPED.  
CALCULATION OF DISPLACEMENT, K. G. / L. C. G. CONDITION.

| ITEMS OF DISPLACEMENT.          | CON-TENT. | WEIGHT TONNES. | K. G. M. | V. MO-MENTS M-T. | L.C.G. (M) FORD (AP.) | L. MO-MENTS M-T. | Free surface M-T. |
|---------------------------------|-----------|----------------|----------|------------------|-----------------------|------------------|-------------------|
| FORE PEAK TANK.                 |           |                |          |                  |                       |                  |                   |
| NO. 1 D. B. TANK.               |           |                |          |                  |                       |                  |                   |
| NO. 2 D. B. TANKS. P & S.       |           |                |          |                  |                       |                  |                   |
| NO. 3 D. B. TANKS. P, S & C.    |           |                |          |                  |                       |                  |                   |
| NO. 4 D. B. TANKS. P & S.       |           |                |          |                  |                       |                  |                   |
| NO. 4 D. B. TANKS. C.           |           |                |          |                  |                       |                  |                   |
| NO. 5 D. B. TANK. P.            |           |                |          |                  |                       |                  |                   |
| NO. 5 D. B. TANK. S.            |           |                |          |                  |                       |                  |                   |
| NO. 6 D. B. TANKS. P & S.       |           |                |          |                  |                       |                  |                   |
| F. W. FOR ENGINES. S.           |           |                |          |                  |                       |                  |                   |
| HFO. SETTLG. & SER. TKS. P & S. |           |                |          |                  |                       |                  |                   |
| D. O. SETTLG. & SER. TANKS.     |           |                |          |                  |                       |                  |                   |
| L.O. STORAGE & SETTLG. TANKS.   |           |                |          |                  |                       |                  |                   |
| NO. 7 TANKS. P & S.             |           |                |          |                  |                       |                  |                   |
| NO. 8 TANKS. P & S.             |           |                |          |                  |                       |                  |                   |
| AFT PEAK TANK.                  |           |                |          |                  |                       |                  |                   |
| DRINKING WATER TANKS. P & S.    |           |                |          |                  |                       |                  |                   |
| SMALL TANKS IN ENGINE ROOM      |           |                |          |                  |                       |                  |                   |
| NO. 1 HOLD.                     |           |                |          |                  |                       |                  |                   |
| NO. 2 HOLD.                     |           |                |          |                  |                       |                  |                   |
| NO. 3 HOLD.                     |           |                |          |                  |                       |                  |                   |
| NO. 4 HOLD.                     |           |                |          |                  |                       |                  |                   |
| NO. 5 HOLD.                     |           |                |          |                  |                       |                  |                   |
| NO. 1 TWEEN DECK.               |           |                |          |                  |                       |                  |                   |
| NO. 2 TWEEN DECK.               |           |                |          |                  |                       |                  |                   |
| NO. 3 TWEEN DECK.               |           |                |          |                  |                       |                  |                   |
| NO. 4 TWEEN DECK.               |           |                |          |                  |                       |                  |                   |
| NO. 5 TWEEN DECK.               |           |                |          |                  |                       |                  |                   |
| NO. 5 POOP DECK.                |           |                |          |                  |                       |                  |                   |
| REFRIGERATED CARGO.             |           |                |          |                  |                       |                  |                   |
| MAIL CARGO.                     |           |                |          |                  |                       |                  |                   |
| DECK CARGO.                     |           |                |          |                  |                       |                  |                   |
| CREW AND EFFECTS.               |           |                |          |                  |                       |                  |                   |
| STORES, SPARES & PROVISIONS.    |           |                |          |                  |                       |                  |                   |
| DEADWEIGHT.                     |           |                |          |                  |                       |                  |                   |
| LIGHT SHIP.                     |           | 5499.8         | 8.836    | 48596            | 60.084                | 330449           |                   |
| DISPLACEMENT.                   |           | 5499.8         | 8.836    | 48596            | 60.084                | 330449           |                   |

TRIM AND DRAUGHTS.

|                  |   |               |                   |   |          |
|------------------|---|---------------|-------------------|---|----------|
| DISPLACEMENT.    | = | 5499.8 TONNES | TRIM. BY Stern    | = | 4.781 M. |
| L.C.G. FROM A.P. | = | 60.084 M.     | IMMERSION AT A.P. | = | 2.454 M. |
| L.C.B. FROM A.P. | = | 72.958 M.     | EMERSION AT F.P.  | = | 2.327 M. |
| L.C.F. FROM A.P. | = | 51.32 %       | MEAN DRAUGHT.     | = | 3.010 M. |
| M.C.T. 1 CM.     | = | 148.1 M-T     | DRAUGHT AT A.P.   | = | 5.464 M. |
| TRIMMING MOMENT. | = | 70804 M-T     | DRAUGHT AT F.P.   | = | 0.683 M. |

CONDITION NO. 1 LIGHT SHIP-FULLY EQUIPPED.



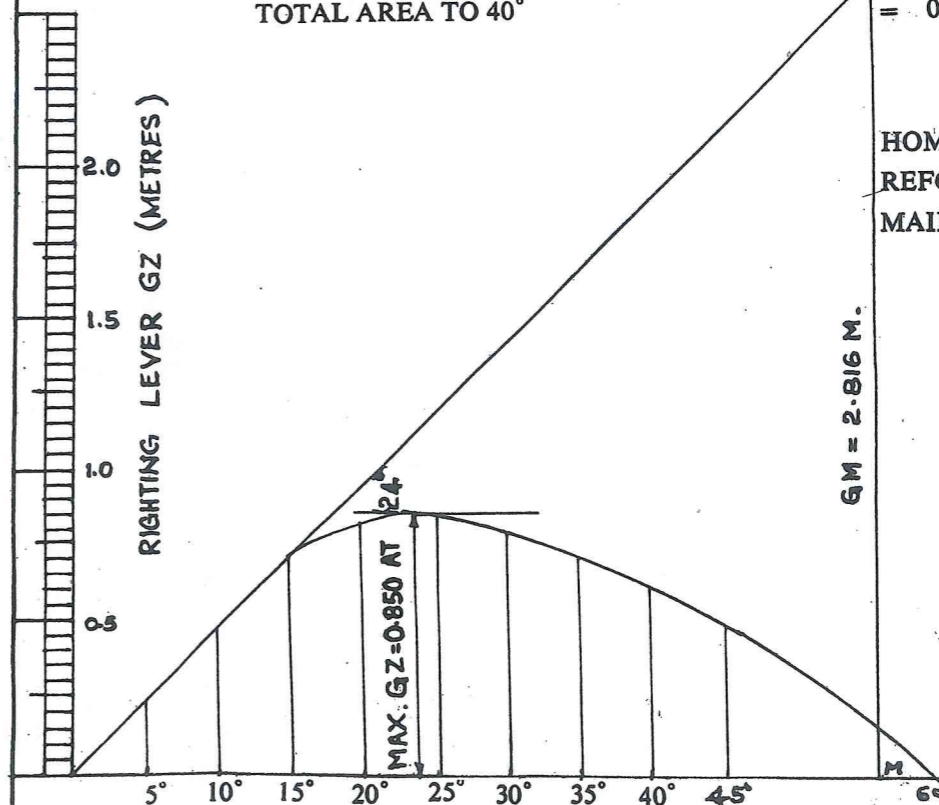
K. M. .... = 11.652 METRES.  
 K. G. .... = 8.836 "  
 G. M. .... = 2.816 "  
 F. S. CORRECTION. .... = - "  
 CORRECTED G. M. .... = + 2.816 METRES.

| $\theta$                       | 5°    | 10°   | 15°   | 20°   | 25°   | 30°   | 35°    | 40°   |
|--------------------------------|-------|-------|-------|-------|-------|-------|--------|-------|
| SIN $\theta$ .                 | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574  | 0.643 |
| LEVER FROM BASE LINE           | 1.025 | 2.030 | 3.005 | 3.870 | 4.580 | 5.230 | 5.779  | 6.288 |
| - K. G. SIN $\theta$ (KN)      | 0.769 | 1.537 | 2.289 | 3.022 | 3.738 | 4.418 | 5.072  | 5.682 |
| G. Z = (KN - KG SIN $\theta$ ) | 0.256 | 0.493 | 0.716 | 0.848 | 0.842 | 0.812 | 0.707  | 0.606 |
| SIMPSON MULTIPLIERS.           | 4     | 2     | 4     | 2     | 4     | 1     | SUM.   |       |
| PRODUCT.                       | 1.024 | 0.986 | 2.864 | 1.696 | 3.368 | 0.812 | 10.750 |       |

SIMPSON MULTIPLIERS.

|       |       |       |       |
|-------|-------|-------|-------|
| 1     | 4     | 1     | SUM.  |
| 0.812 | 2.828 | 0.606 | 4.246 |

AREA UNDER G. Z. CURVE UPTO 30° = 0.0291 x 10.750 = 0.313 M-RAD.  
 BETWEEN 30° AND 40° = 0.0291 x 4.246 = 0.124 M-RAD.  
 TOTAL AREA TO 40° = 0.437 M-RAD.



STOW. RATE OF CARGO.  
 HOM. CARGO = — M<sup>3</sup> TONNE.  
 REFG. CARGO = — M<sup>3</sup> TONNE.  
 MAIL CARGO = — M<sup>3</sup> TONNE.



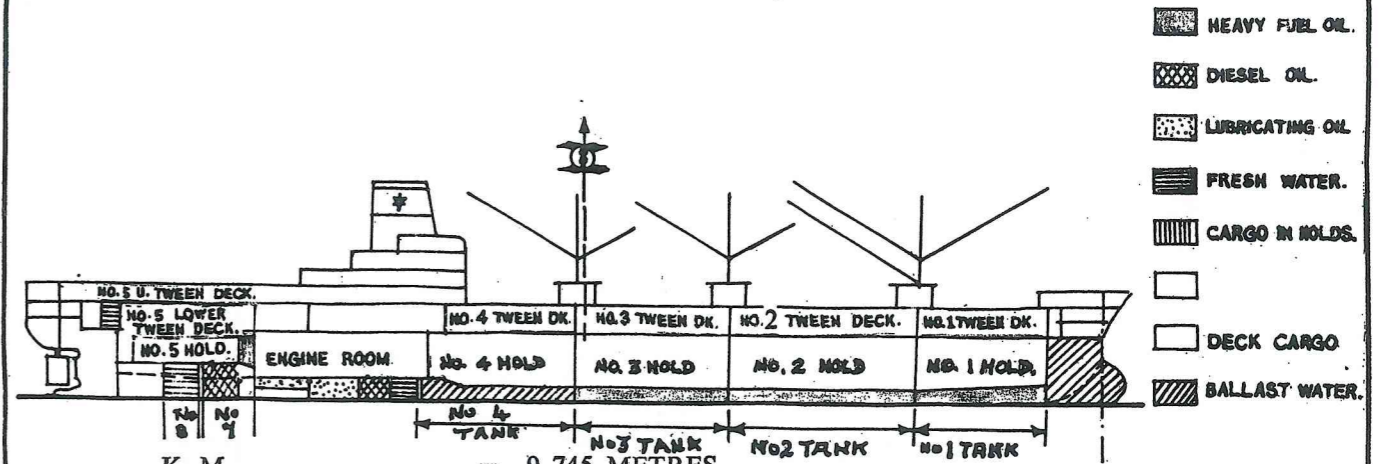
CONDITION NO. 2—SHIP IN BALLAST-DEPARTURE  
CALCULATION OF DISPLACEMENT, K. G. / L. C. G. CONDITION.

| ITEMS OF DISPLACEMENT.          | CON-TENT. | WEIGHT TONNES. | K. G. M. | V. MO-MENTS M-T. | L. C. G. (M) FORD (A.P.) | L. MO-MENTS M-T. | Free surface M-T. |
|---------------------------------|-----------|----------------|----------|------------------|--------------------------|------------------|-------------------|
| FORE PEAK TANK.                 | W.B.      | 106.1          | 6.31     | 669              | 137.18                   | 14555            | —                 |
| NO. 1 D. B. TANK.               | H.F.O.    | 149.7          | 1.14     | 171              | 124.63                   | 18657            | —                 |
| NO. 2 D. B. TANKS. P & S.       | H. F. O.  | 384.6          | 0.65     | 250              | 102.20                   | 39306            | —                 |
| NO. 3 D. B. TANKS. P. S & C.    | H.F.O.    | 410.2          | 0.64     | 263              | 80.63                    | 33074            | —                 |
| NO. 4 D. B. TANKS. P & S.       | W. B.     | 261.2          | 0.68     | 178              | 58.14                    | 15186            | 278               |
| NO. 4 D. B. TANKS. C.           | H.F.O.    | 244.5          | 0.63     | 154              | 57.58                    | 14078            | 1338              |
| NO. 5 D. B. TANK. P.            | D.O.      | 73.5           | 0.85     | 62               | 38.24                    | 2811             | —                 |
| NO. 5 D. B. TANK. S.            | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 6 & 9 D. B. TANKS. C.       | L.O.      | 36.7           | 1.01     | 37               | 30.74                    | 1128             | 18                |
| F. W. FOR ENGINES. S.           | F. W.     | 34.8           | 0.89     | 31               | 38.13                    | 1327             | 16                |
| HFO. SETTLG. & SER. TKS. P & S. | H.F.O.    | 131.0          | 6.09     | 798              | 25.06                    | 3283             | 15                |
| D. O. SETTLG & SER. TANKS.      | D.O.      | 21.9           | 7.21     | 158              | 27.85                    | 610              | 3                 |
| L.O. STORAGE & SETTLG. TANKS.   | L.O.      | 36.9           | 7.13     | 263              | 32.95                    | 1216             | 5                 |
| NO. 7 TANKS. P & S.             | D. O.     | 10.5           | 0.97     | 10               | 23.25                    | 244              | 44                |
| NO. 8 TANKS. P & S.             | F.W.      | 50.0           | 1.30     | 65               | 16.18                    | 809              | 23                |
| AFT PEAK TANK.                  | —         | —              | —        | —                | —                        | —                | —                 |
| DRINKING WATER TANKS P & S.     | F. W.     | 46.0           | 10.20    | 469              | 5.82                     | 268              | 79                |
| SMALL TANKS IN ENGINE ROOM.     | —         | 9.6            | 6.84     | 66               | 33.51                    | 322              | —                 |
| NO. 1 HOLD.                     | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 2 HOLD.                     | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 3 HOLD.                     | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 4 HOLD.                     | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 5 HOLD.                     | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 1 TWEEN DECK.               | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 2 TWEEN DECK.               | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 3 TWEEN DECK.               | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 4 TWEEN DECK.               | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 5 TWEEN DECK.               | —         | —              | —        | —                | —                        | —                | —                 |
| NO. 5 POOP DECK.                | —         | —              | —        | —                | —                        | —                | —                 |
| Cyl. oil tanks                  | Cyl. oil  | 10.0           | 7.06     | 71               | 31.44                    | 314              | —                 |
| BULBUS BOW.                     | W.B.      | 186.6          | 3.52     | 657              | 139.60                   | 26049            | —                 |
| REFRIGERATED CARGO.             | —         | —              | —        | —                | —                        | —                | —                 |
| MAIL CARGO.                     | —         | —              | —        | —                | —                        | —                | —                 |
| DECK CARGO.                     | —         | —              | —        | —                | —                        | —                | —                 |
| CREW AND EFFECTS.               | —         | 10.9           | 14.47    | 158              | 38.28                    | 417              | —                 |
| STORES, SPARES & PROVISIONS.    | —         | 84.5           | 11.97    | 1011             | 65.25                    | 5514             | —                 |
| DEAD WEIGHT.                    | —         | 2299.2         | 2.410    | 5541             | 77.926                   | 179168           | —                 |
| LIGHT SHIP.                     | —         | 5499.8         | 8.836    | 48596            | 60.084                   | 330449           | —                 |
| DISPLACEMENT.                   | —         | 7799.0         | 6.942    | 54137            | 65.344                   | 509617           | 1819              |

TRIM AND DRAUGHTS.

|                  |   |                |                   |   |       |    |
|------------------|---|----------------|-------------------|---|-------|----|
| DISPLACEMENT.    | = | 7799.0 TONNES. | TRIM. BY Stern    | = | 3.745 | M. |
| L.C.G. FROM A.P. | = | 65.344 M.      | IMMERSION AT A.P. | = | 1.922 | M. |
| L.C.B. FROM A.P. | = | 73.012 M.      | EMERSION AT F.P.  | = | 1.823 | M. |
| L.C.F. FROM A.P. | = | 51.31 %        | MEAN DRAUGHT.     | = | 4.090 | M. |
| M.C.T. 1 CM.     | = | 159.7 M-T.     | DRAUGHT AT A.P.   | = | 6.012 | M. |
| TRIMMING MOMENT. | = | 59803 M-T.     | DRAUGHT AT F.P.   | = | 2.267 | M. |

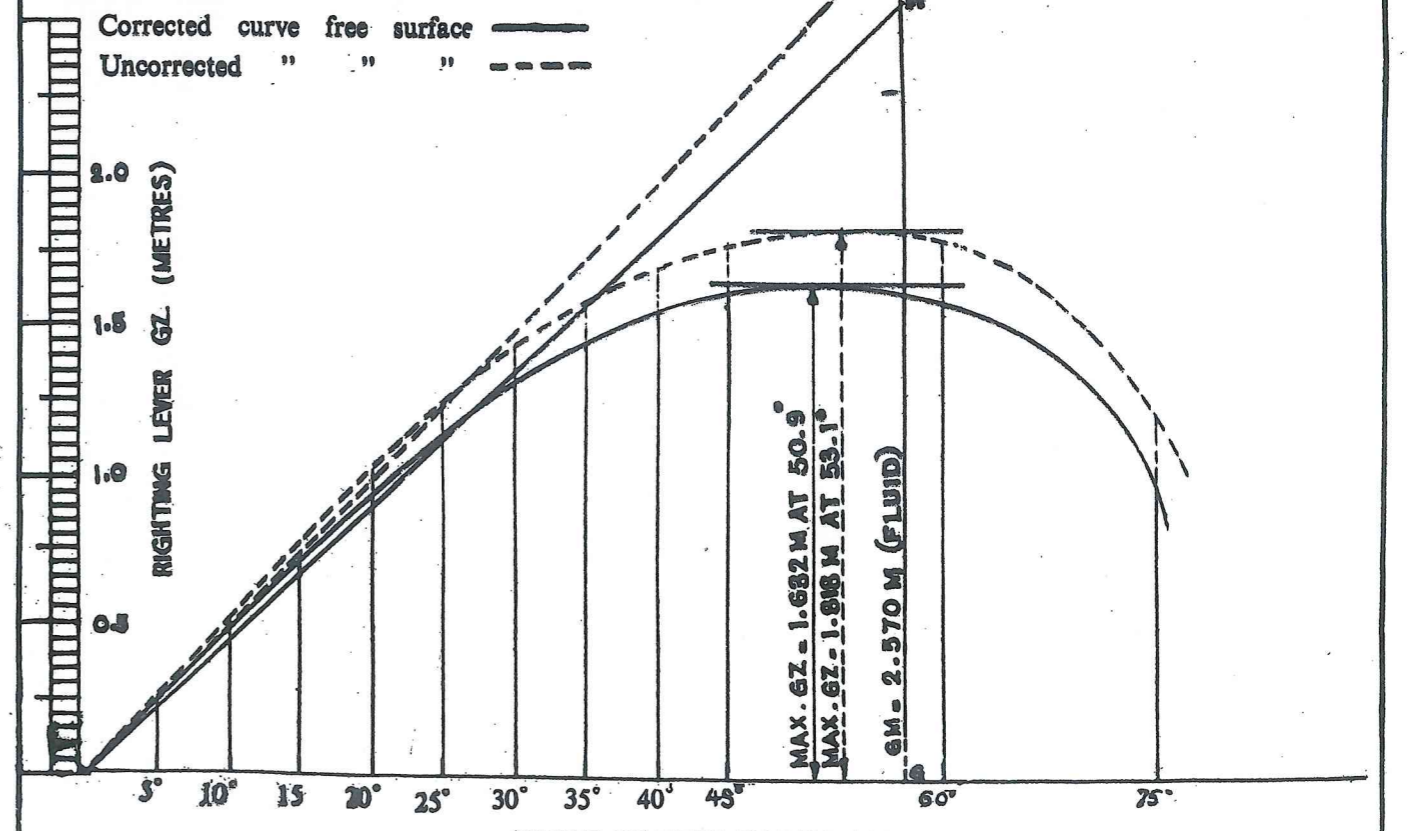
CONDITION NO. 2. SHIP IN BALLAST - DEPARTURE.



K. M. .... = 9.745 METRES.  
 K. G. .... = 6.942 "  
 G. M. (Solid) .... = 2.803 "  
 F. S. CORRECTION. .... = -0.233 "  
 CORRECTED. G. M. (Fluid) = +2.570 METRES.

| SIN θ.                    | 5°    | 10°   | 15    | 20°   | 25°   | 30°   | 35°    | 40°   |
|---------------------------|-------|-------|-------|-------|-------|-------|--------|-------|
| SIN θ.                    | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574  | 0.643 |
| LEVER FROM BASE LINE (KN) | 0.872 | 1.725 | 2.555 | 3.406 | 4.168 | 4.898 | 5.536  | 6.154 |
| — K. G. SIN θ.            | 0.624 | 1.248 | 1.858 | 2.454 | 3.035 | 3.588 | 4.118  | 4.614 |
| G. Z. = (KN—KG SIN θ)     | 0.248 | 0.477 | 0.697 | 0.952 | 1.133 | 1.310 | 1.418  | 1.540 |
| SIMPSON MULTIPLIERS.      | 4     | 2     | 4     | 2     | 4     | 1     | SUM.   |       |
| PRODUCT.                  | 0.992 | 0.954 | 2.788 | 1.904 | 4.532 | 1.310 | 12.840 |       |

AREA UNDER SIMPSON MULTIPLIERS. 1 4 1 SUM.  
 G. Z. CURVE UPTO 30° = 0.0291 × 12.480 = 0.363 M—RAD.  
 BETWEEN 30° AND 40° = 0.0291 × 8.522 = 0.248 M—RAD  
 TOTAL AREA TO 40° = 0.611 M—RAD. G.M. (SOLID) = 2.803 M.





CONDITION NO. 3 : SHIP IN BALLAST-ARRIVAL  
CALCULATION OF DISPLACEMENT, K.G. / L.C.G. CONDITION

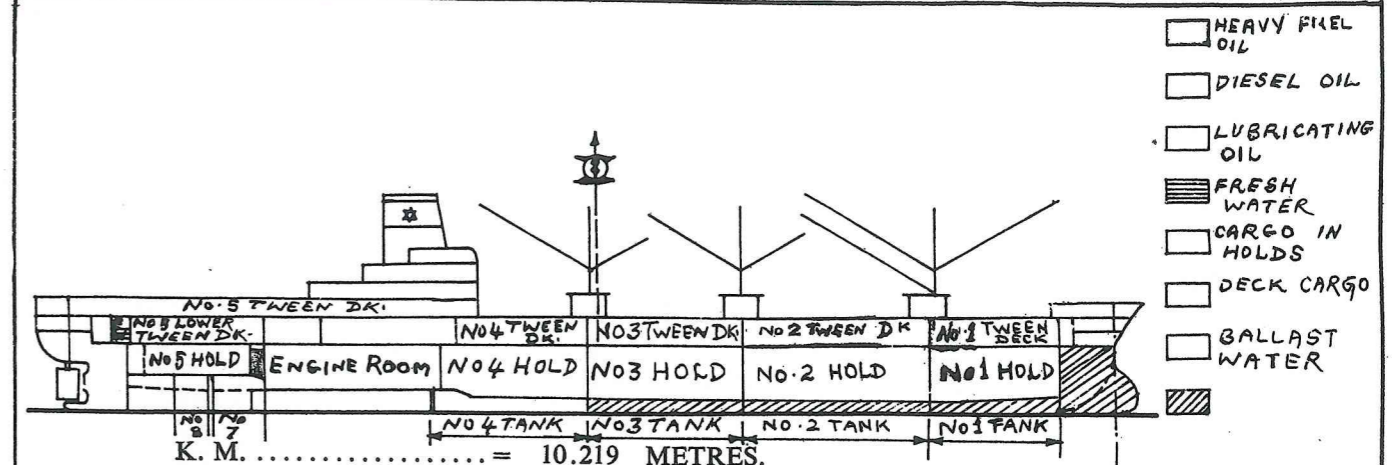
| ITEMS OF DISPLACEMENT.           | CON-TENT. | WIGHT TONNES. | K. G. M. | V. MO-MENTS M-T. | L.C.G. (M) FORD (AP.) | L. MO-MENTS M-T. | Free SURFA-CE M-T. |
|----------------------------------|-----------|---------------|----------|------------------|-----------------------|------------------|--------------------|
| FORE PEAK TANK.                  | W.B.      | 106.1         | 6.31     | 669              | 137.18                | 14555            | —                  |
| NO. 1 D. B. TANK.                | W.B.      | 161.5         | 1.14     | 184              | 124.63                | 20128            | —                  |
| NO. 2 D. B. TANKS. P & S.        | W. B.     | 414.9         | 0.65     | 270              | 102.20                | 42403            | —                  |
| NO. 3 D. B. TANKS. P. S & C      | W. B.     | 442.5         | 0.64     | 283              | 80.63                 | 35679            | 1211               |
| NO. 4 D. B. TANKS. P & S.        | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 4 D. B. TANKS. C.            | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 5 D. B. TANK. P.             | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 5 D. B. TANK. S.             | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 6 D. B. TANKS. P & S.        | —         | —             | —        | —                | —                     | —                | —                  |
| F. W. FOR ENGINES. S. & C.       | F. W.     | 20.7          | 0.87     | 18               | 42.46                 | 879              | 21                 |
| HFO. SETT LG. & SER. TKS. P & S. | H. F. O.  | 131.0         | 6.09     | 798              | 25.06                 | 3283             | 15                 |
| D.O. SETT LG. & SER. TANKS.      | D. O.     | 10.6          | 6.70     | 71               | 27.92                 | 296              | 4                  |
| L.O. STORAGE & SETT LG. TANKS    | L. O.     | 7.4           | 6.35     | 47               | 32.84                 | 243              | 5                  |
| NO. 7 TANKS. P & S.              | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 8 TANKS. P & S.              | —         | —             | —        | —                | —                     | —                | —                  |
| AFT PEAK TANK.                   | —         | —             | —        | —                | —                     | —                | —                  |
| DRINKING WATER TANKS.            | F. W.     | 9.6           | 9.91     | 95               | 5.86                  | 56               | 42                 |
| SMALL TANKS IN ENGINE ROOM       | —         | 9.3           | 6.83     | 64               | 33.38                 | 310              | —                  |
| NO. 1 HOLD.                      | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 2 HOLD.                      | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 3 HOLD.                      | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 4 HOLD.                      | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 5 HOLD.                      | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 1 TWEEN DECK.                | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 2 TWEEN DECK.                | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 3 TWEEN DECK.                | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 4 TWEEN DECK.                | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 5 TWEEN DECK.                | —         | —             | —        | —                | —                     | —                | —                  |
| NO. 5 POOP DECK.                 | —         | —             | —        | —                | —                     | —                | —                  |
| Cyl. oil.                        | Cyl. oil  | 1.0           | 6.80     | 7                | 31.44                 | 31               | —                  |
| BUL BUS BOW                      | W.B.      | 186.6         | 3.52     | 657              | 139.60                | 26049            | —                  |
| REFRIGERATED CARGO.              | —         | —             | —        | —                | —                     | —                | —                  |
| MAIL CARGO.                      | —         | —             | —        | —                | —                     | —                | —                  |
| DECK CARGO.                      | —         | —             | —        | —                | —                     | —                | —                  |
| CREW AND EFFECTS.                | —         | 10.9          | 14.47    | 158              | 38.28                 | 417              | —                  |
| STORES, SPARES & PROVISIONS.     | —         | 75.4          | 11.70    | 882              | 64.78                 | 4884             | —                  |
| DEAD WEIGHT.                     | —         | 1587.5        | 2.648    | 4203             | 93.992                | 149213           | —                  |
| LIGHT SHIP.                      | —         | 5499.8        | 8.836    | 48596            | 60.084                | 330449           | —                  |
| DISPLACEMENT.                    | —         | 7087.3        | 7.450    | 52799            | 67.679                | 479662           | 1298               |

TRIM AND DRAUGHTS.

|                  |   |                |                   |   |          |
|------------------|---|----------------|-------------------|---|----------|
| DISPLACEMENT     | = | 7087.3 TONNES. | TRIM. (by stern)  | = | 2.406 M. |
| L.C.G. FROM A.P. | = | 67.679 M.      | IMMERSION AT A.P. | = | 1.235 M. |
| L.C.B. FROM A.P. | = | 72.998 M.      | EMERSION AT F.P.  | = | 1.171 M. |
| L.C.F. FROM A.P. | = | 51.33 %        | MEAN DRAUGHT.     | = | 3.759 M. |
| M.C.T. 1 CM.     | = | 156.7 M-T.     | DRAUGHT AT A.P.   | = | 4.994 M. |
| TRIMMING MOMENT. | = | 37697 M-T.     | DRAUGHT AT F.P.   | = | 2.588 M. |

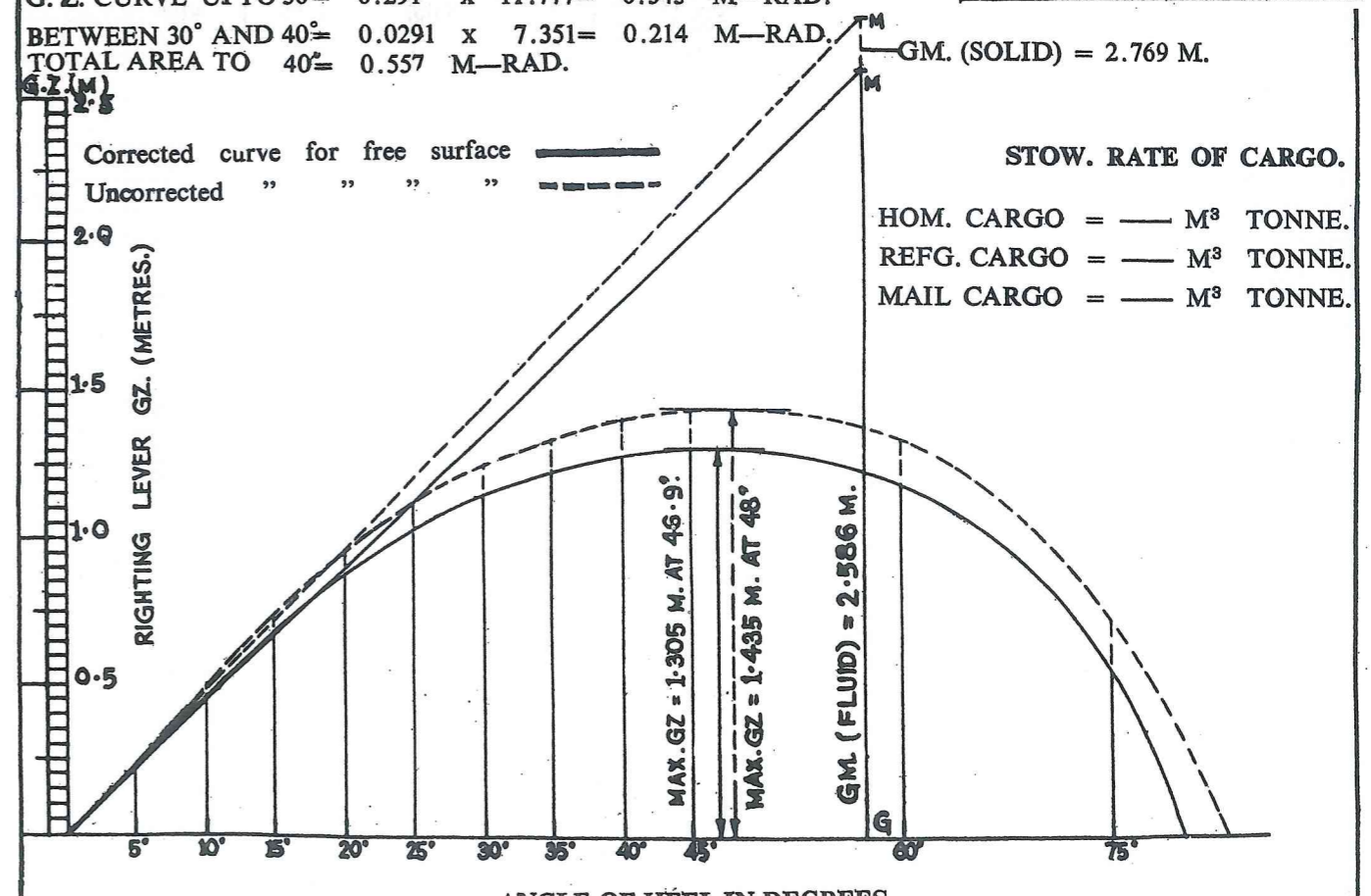
CONDITION NO. 3.

SHIP IN BALLAST-ARRIVAL



K. M. .... = 10.219 METRES.  
K. G. .... = 7.450 "  
G. M. (Solid) .... = 2.769 "  
F. S. CORRECTION .... = -0.183 "  
CORRECTED G. M. .... = + 2.586 METRES.  
(Fluid)

| θ.                              | 5°                            | 10°   | 15°   | 20°   | 25°   | 30°   | 35°    | 40°   |       |       |
|---------------------------------|-------------------------------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| SIN θ.                          | 0.087                         | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574  | 0.643 |       |       |
| LIVER FROM BASE LINE (KN)       | 0.904                         | 1.791 | 2.661 | 3.525 | 4.268 | 4.986 | 5.606  | 6.190 |       |       |
| — K. G. SIN θ.                  | 0.664                         | 1.328 | 1.977 | 2.610 | 3.229 | 3.617 | 4.381  | 4.908 |       |       |
| G. Z. = (KN-KG SIN θ)           | 0.240                         | 0.463 | 0.684 | 0.915 | 1.039 | 1.169 | 1.225  | 1.282 |       |       |
| SIMPSON MULTIPLIERS.            | 4                             | 2     | 4     | 2     | 4     | 1     | SUM.   |       |       |       |
| PRODUCT.                        | 0.960                         | 0.926 | 2.736 | 1.830 | 4.156 | 1.169 | 11.777 |       |       |       |
| AREA UNDER G. Z. CURVE UPTO 30° | 0.291 x 11.777 = 0.343 M-RAD. |       |       |       |       |       |        |       |       |       |
| BETWEEN 30° AND 40°             | 0.0291 x 7.351 = 0.214 M-RAD. |       |       |       |       |       |        |       |       |       |
| TOTAL AREA TO 40°               | 0.557 M-RAD.                  |       |       |       |       |       |        |       |       |       |
| G.M. (SOLID)                    | = 2.769 M.                    |       |       |       |       |       |        |       |       |       |
| SIMPSON MULTIPLIERS.            |                               |       |       |       |       |       | 1      | 4     | 1     | SUM.  |
|                                 |                               |       |       |       |       |       | 1.169  | 4.900 | 1.282 | 7.351 |





CONDITION NO. 4 - DEPARTURE.  
CALCULATION OF DISPLACEMENT, K.G. / L.C.G. CONDITION.

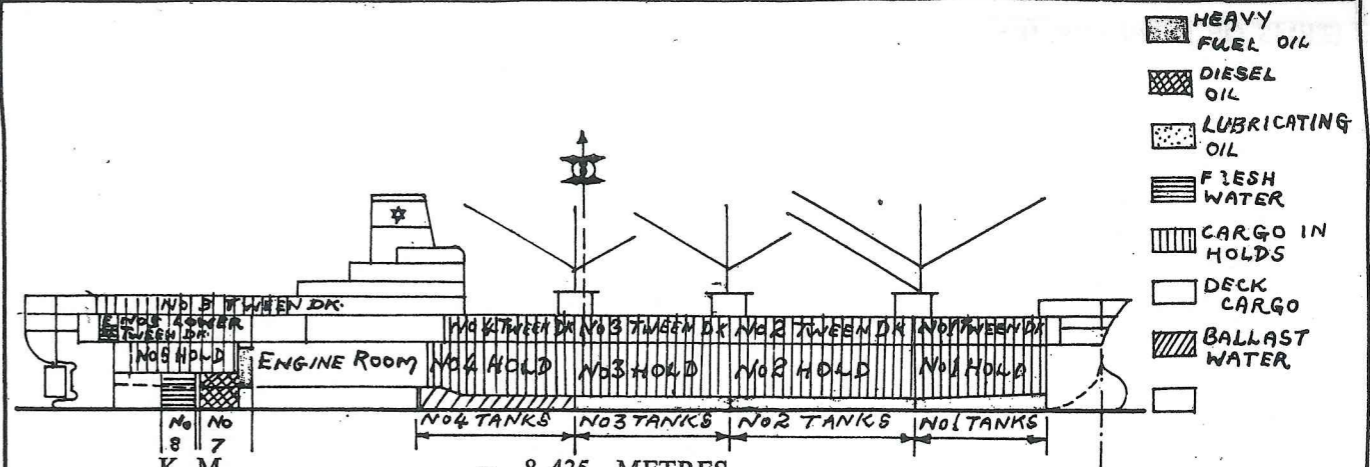
| ITEMS OF DISPLACEMENT.          | CON-TENT.  | WEIGHT TONNES. | K. G. M. | V. MO-MENTS M-T. | L.C.G. (M) FORD (A.P.) | L. MO-MENTS M-T. | Free Surface M-T |
|---------------------------------|------------|----------------|----------|------------------|------------------------|------------------|------------------|
| FORE PEAK TANK.                 | —          | —              | —        | —                | —                      | —                | —                |
| NO. 1 D. B. TANK.               | H.F.O.     | 149.7          | 1.14     | 171              | 124.63                 | 18657            | —                |
| NO. 2 D. B. TANKS. P & S.       | H.F.O.     | 384.6          | 0.65     | 250              | 102.20                 | 39306            | —                |
| NO. 3 D. B. TANKS. P, S & C.    | H.F.O.     | 410.2          | 0.64     | 263              | 80.63                  | 33074            | 1122             |
| NO. 4 D. B. TANKS. P & S.       | H. F.O.    | 242.1          | 0.68     | 0.68             | 58.14                  | 14076            | —                |
| NO. 4 D. B. TANKS. C.           | —          | —              | —        | —                | —                      | —                | —                |
| NO. 5 D. B. TANK. P.            | D.O.       | 73.5           | 0.85     | 62               | 38.24                  | 2811             | 151              |
| NO. 5 D. B. TANK. S.            | H.F.O.     | 46.4           | 0.87     | 40               | 39.73                  | 1843             | —                |
| NO. 6 & 9 D. B. TANKS. C        | L.O.       | 36.7           | 1.01     | 37               | 30.74                  | 1128             | 18               |
| F.W. FOR ENGINES, S. & C        | F.W.       | 34.8           | 0.89     | 31               | 38.13                  | 1327             | 16               |
| HFO. SETTLG. & SER. TKS. P & S. | H.F.O.     | 131.0          | 6.09     | 798              | 25.06                  | 3283             | 15               |
| D.O. SETTLG. & SER. TANKS.      | D.O.       | 21.9           | 7.21     | 158              | 27.85                  | 610              | 3                |
| L.O. STORAGE & SETTLG. TANKS.   | L.O.       | 36.9           | 7.13     | 263              | 32.95                  | 1216             | 5                |
| NO. 7 TANKS. P. & S.            | D.O.       | 190.5          | 2.60     | 495              | 22.97                  | 4376             | —                |
| NO. 8 TANKS. P & S.             | F.W.       | 137.5          | 2.77     | 381              | 16.23                  | 2232             | —                |
| AFT PEAK TANK.                  | —          | —              | —        | —                | —                      | —                | —                |
| DRINKING WATER TANKS. P&S.      | F.W.       | 93.4           | 11.21    | 1047             | 5.82                   | 544              | 42               |
| SMALL TANKS IN ENGINE ROOM.     | —          | 9.6            | 6.84     | 66               | 33.51                  | 322              | —                |
| NO. 1 HOLD.                     | Hom. cargo | 827.6          | 5.59     | 4626             | 123.52                 | 102225           | —                |
| NO. 2 HOLD.                     | "          | 2189.8         | 4.98     | 10905            | 103.14                 | 225856           | —                |
| NO. 3 HOLD.                     | "          | 1913.1         | 5.00     | 9566             | 80.63                  | 154253           | —                |
| NO. 4 HOLD.                     | "          | 2148.6         | 4.99     | 10722            | 58.66                  | 126037           | —                |
| NO. 5 HOLD.                     | "          | 417.9          | 6.91     | 2888             | 17.31                  | 7234             | —                |
| NO. 1 TWEEN DECK.               | "          | 681.7          | 11.17    | 7615             | 124.67                 | 84988            | —                |
| NO. 2 TWEEN DECK.               | "          | 1131.4         | 10.72    | 12129            | 103.91                 | 117564           | —                |
| NO. 3 TWEEN DECK.               | "          | 887.7          | 10.37    | 9205             | 80.79                  | 71717            | —                |
| NO. 4 TWEEN DECK.               | "          | 316.7          | 10.42    | 3300             | 57.68                  | 18267            | —                |
| NO. 5 TWEEN DECK.               | "          | 715.8          | 10.69    | 7652             | 17.24                  | 12340            | —                |
| NO. 5 POOP DECK.                | "          | 542.6          | 13.76    | 7466             | 14.78                  | 8020             | —                |
| Cyl. OIL tank                   | Cyl. oil   | 10.0           | 7.06     | 71               | 31.44                  | 314              | —                |
| REFRIGERATED CARGO.             |            | 235.0          | 10.36    | 2435             | 60.17                  | 14140            | —                |
| MAIL CARGO.                     |            | 5.1            | 14.81    | 76               | 135.01                 | 689              | —                |
| DECK CARGO.                     |            | —              | —        | —                | —                      | —                | —                |
| CREW AND EFFECTS.               |            | 10.9           | 14.47    | 158              | 38.28                  | 417              | —                |
| STORES, SPARES & PROVISIONS.    |            | 84.5           | 11.97    | 1011             | 65.25                  | 5514             | —                |
| DEAD WEIGHT.                    |            | 14117.2        | 6.662    | 94052            | 76.104                 | 1074380          | —                |
| LIGHT SHIP.                     |            | 5499.8         | 8.836    | 48596            | 60.084                 | 330449           | —                |
| DISPLACEMENT.                   |            | 19617.0        | 7.272    | 142648           | 71.613                 | 1404829          | 1372             |

TRIM AND DRAUGHTS.

|                  |   |         |         |                   |   |       |    |
|------------------|---|---------|---------|-------------------|---|-------|----|
| DISPLACEMENT.    | = | 19617.0 | TONNES. | TRIM. by stern    | = | 0.547 | M. |
| L.C.G. FROM A.P. | = | 71.613  | M.      | IMMERSION AT A.P. | = | 0.267 | M. |
| L.C.B. FROM A.P. | = | 72.212  | M.      | EMERSION AT F.P.  | = | 0.280 | M. |
| L.C.F. FROM A.P. | = | 48.84   | %       | MEAN DRAUGHT.     | = | 9.233 | M. |
| M.C.T. 1 CM.     | = | 215.0   | M-T.    | DRAUGHT AT A.P.   | = | 9.500 | M. |
| TRIMMING MOMENT. | = | 11751   | M-T.    | DRAUGHT AT F.P.   | = | 8.953 | M. |

CONDITION NO. 4.

UPPER DECK AS FREEBOARD DECK - DEPARTURE  
SHIP WITH HOMOGENEOUS CARGO IN ALL HOLDS  
AND TWEEN DECKS.



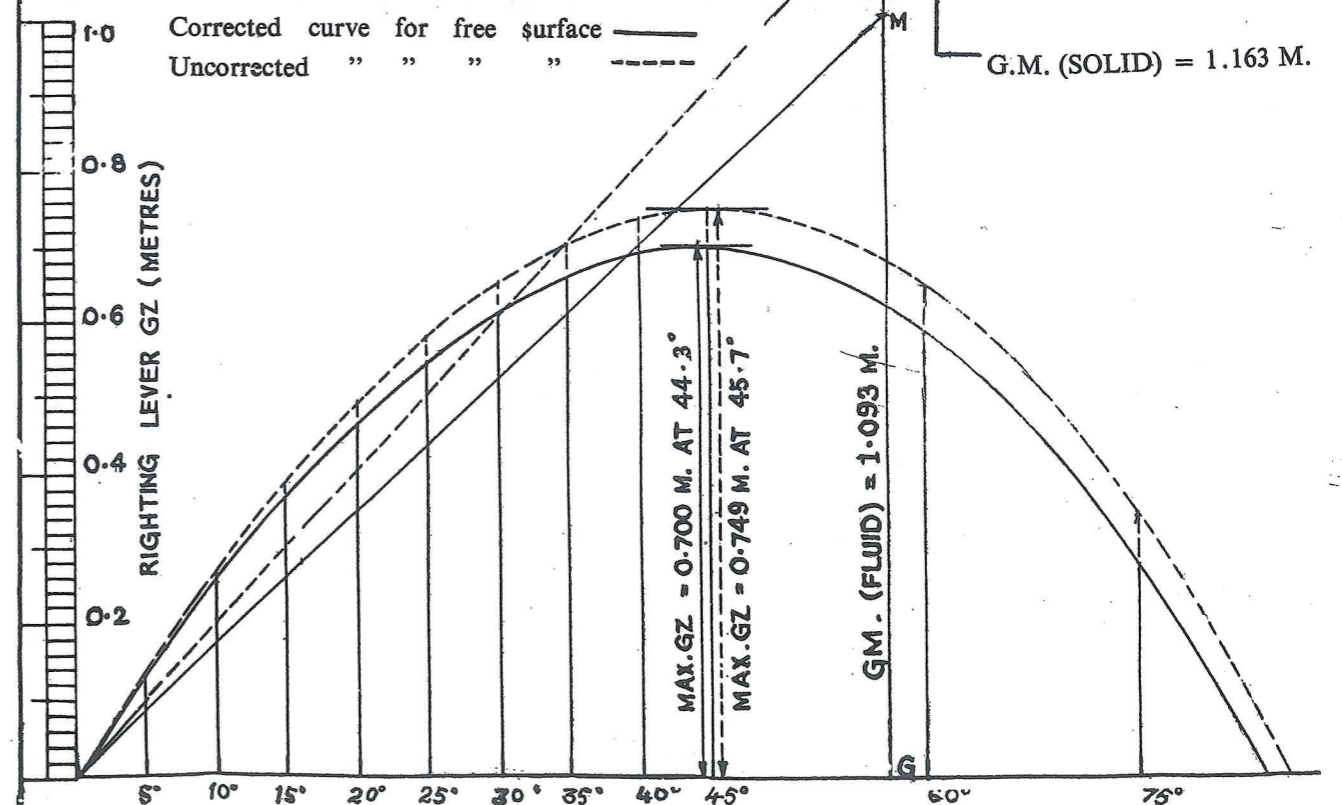
K. M. .... = 8.435 METRES.  
K. G. .... = 7.272 "  
G. M. (Solid) ..... = 1.163 "  
F. S. CORRECTION..... = -0.070 "  
CORRECTED G. M. .... = +1.093 METRES.

STOW. RATE OF CARGO

HOM. CARGO = 1.508 M<sup>3</sup> TONNE.  
REFG. CARGO = 2.684 M<sup>3</sup> TONNE.  
MAIL CARGO = 7.588 M<sup>3</sup> TONNE.

| $\theta$ .                     | 5°    | 10°   | 15°   | 20°   | 25°   | 30°   | 35°   | 40°   |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| SIN $\theta$ .                 | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574 | 0.643 |
| LEVER FROM BASE LINE (KN)      | 0.770 | 1.540 | 2.268 | 2.976 | 3.594 | 4.273 | 4.871 | 5.411 |
| - K. G. SIN $\theta$ .         | 0.639 | 1.278 | 1.902 | 2.511 | 3.106 | 3.671 | 4.214 | 4.721 |
| G. Z. = (KN-KG SIN $\theta$ .) | 0.131 | 0.262 | 0.366 | 0.465 | 0.488 | 0.602 | 0.657 | 0.690 |
| SIMPSON MULTIPLIERS.           | 4     | 2     | 4     | 2     | 4     | 1     | SUM.  |       |
| PRODUCT.                       | 0.524 | 0.524 | 1.464 | 0.930 | 1.952 | 0.602 | 5.996 |       |

AREA UNDER G. Z. CURVE UPTO 30° = 0.0291 x 5.996 = 0.174 M-RAD  
BETWEEN 30° AND 40° = 0.0291 x 3.920 = 0.114 M-RAD  
TOTAL AREA TO 40° = 0.288 M-RAD.





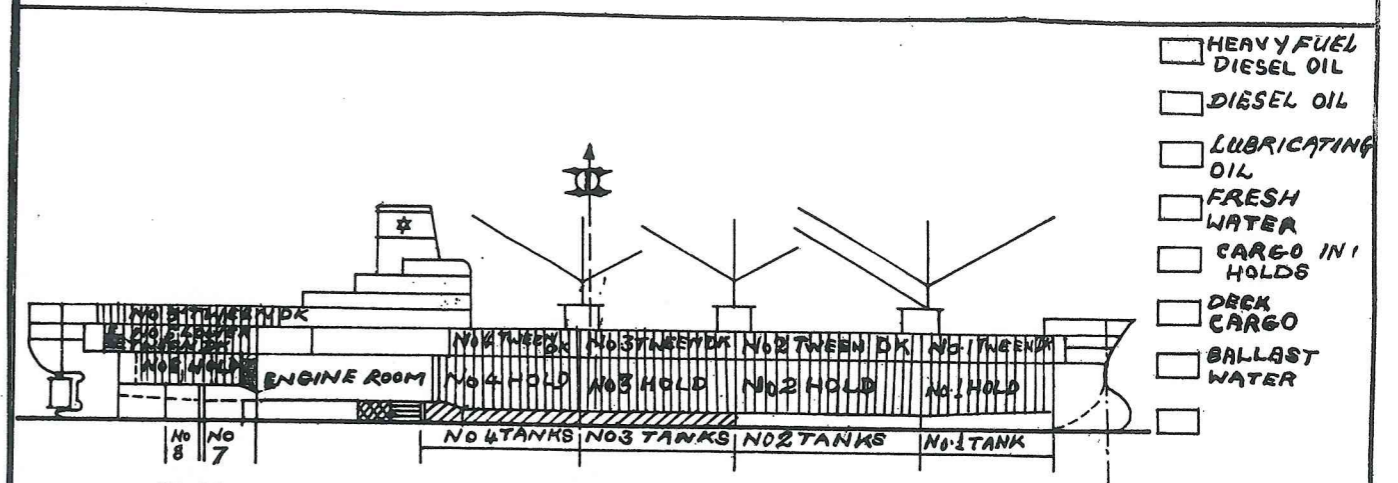
CONDITION NO. 5 : ARRIVAL  
CALCULATION OF DISPLACEMENT, K.G. & L.C.G. CONDITION.

| ITEMS OF DISPLACEMENT.        | CON-<br>TENT. | WEIGHT<br>TONNES | K.G.<br>M. | V. MO-<br>MENTS<br>M-T. | L.C.G.<br>(M) FORD<br>(A.P.) | L. MO-<br>MENTS<br>M-T. | Free<br>Surface<br>M-T. |
|-------------------------------|---------------|------------------|------------|-------------------------|------------------------------|-------------------------|-------------------------|
| FORE PEAK TANK.               | —             | —                | —          | —                       | —                            | —                       | —                       |
| NO. 1 D. B. TANK.             | —             | —                | —          | —                       | —                            | —                       | —                       |
| NO. 2 D. B. TANKS. P & S.     | W.B.          | 414.9            | 0.65       | 270                     | 102.20                       | 42403                   | —                       |
| NO. 3 D. B. TANKS. P, S & C.  | W.B.          | 442.5            | 0.64       | 283                     | 80.63                        | 35679                   | 1210                    |
| NO. 4 D. B. TANKS. P & S.     | W.B.          | 261.2            | 0.68       | 178                     | 58.14                        | 15186                   | —                       |
| NO. 4 D. B. TANKS. C.         | —             | —                | —          | —                       | —                            | —                       | —                       |
| NO. 5 D. B. TANK. P.          | D.O.          | 17.7             | 0.21       | 4                       | 38.24                        | 677                     | 152                     |
| NO. 5 D. B. TANK. S.          | H.F.O.        | 38.0             | 0.64       | 24                      | 39.73                        | 1510                    | 90                      |
| NO. 6 D. B. TANKS. P & S.     | —             | —                | —          | —                       | —                            | —                       | —                       |
| F.W. FOR ENGINES. S & C.      | F.W.          | 20.7             | 0.87       | 18                      | 42.46                        | 879                     | 21                      |
| HFO. SETTLG. & SER. TKS. P&S. | H.F.O.        | 98.4             | 5.69       | 560                     | 25.06                        | 2466                    | 28                      |
| D.O. SETTLG. & SER. TANKS.    | D.O.          | 10.9             | 6.61       | 72                      | 27.89                        | 304                     | 4                       |
| L.O. STORAGE & SETTLG. TANKS  | L.O.          | 7.4              | 6.46       | 48                      | 32.75                        | 242                     | 5                       |
| NO. 7 TANKS. P & S.           | —             | —                | —          | —                       | —                            | —                       | —                       |
| NO. 8 TANKS. P & S.           | —             | —                | —          | —                       | —                            | —                       | —                       |
| AFT PEAK TANK.                | —             | —                | —          | —                       | —                            | —                       | —                       |
| DRINKING WATER TANKS. S       | F.W.          | 23.1             | 9.57       | 221                     | 5.80                         | 134                     | 42                      |
| SMALL TANKS IN ENGINE ROOM.   | —             | 9.3              | 5.83       | 64                      | 33.38                        | 310                     | —                       |
| NO. 1 HOLD.                   | Hom. Cargo    | 827.6            | 5.59       | 4626                    | 123.52                       | 102225                  | —                       |
| NO. 2 HOLD.                   | "             | 2189.8           | 4.98       | 10905                   | 103.14                       | 225856                  | —                       |
| NO. 3 HOLD.                   | "             | 1913.1           | 5.00       | 9566                    | 80.63                        | 154253                  | —                       |
| NO. 4 HOLD.                   | "             | 2148.6           | 4.99       | 10722                   | 58.66                        | 126037                  | —                       |
| NO. 5 HOLD.                   | "             | 417.9            | 6.91       | 2888                    | 17.31                        | 7234                    | —                       |
| NO. 1 TWEEN DECK.             | "             | 681.7            | 11.17      | 7615                    | 124.67                       | 84988                   | —                       |
| NO. 2 TWEEN DECK.             | "             | 1131.4           | 10.72      | 12129                   | 103.91                       | 117564                  | —                       |
| NO. 3 TWEEN DECK.             | "             | 887.7            | 10.37      | 9205                    | 80.79                        | 71717                   | —                       |
| NO. 4 TWEEN DECK.             | "             | 316.7            | 10.42      | 3300                    | 57.68                        | 18267                   | —                       |
| NO. 5 TWEEN DECK.             | "             | 715.8            | 10.69      | 7652                    | 17.24                        | 12340                   | —                       |
| NO. 5 POOP DECK.              | "             | 542.6            | 13.76      | 7466                    | 14.78                        | 8020                    | —                       |
| Cyl. oil                      | Cyl. oil      | 1.0              | 6.80       | 7                       | 31.44                        | 31                      | —                       |
| REFRIGERATED CARGO.           | —             | 235.0            | 10.36      | 2435                    | 60.17                        | 14140                   | —                       |
| MAIL CARGO.                   | —             | 5.1              | 14.81      | 76                      | 135.01                       | 689                     | —                       |
| DECK CARGO.                   | —             | —                | —          | —                       | —                            | —                       | —                       |
| CREW AND EFFECTS.             | —             | 10.9             | 14.47      | 158                     | 38.28                        | 417                     | —                       |
| STORES, SPARES & PROVISIONS.  | —             | 75.4             | 11.70      | 882                     | 64.78                        | 4884                    | —                       |
| DEAD WEIGHT.                  | —             | 13029.5          | 6.992      | 91104                   | 77.213                       | 1006049                 | —                       |
| LIGHT SHIP.                   | —             | 5499.8           | 8.836      | 48596                   | 60.084                       | 330449                  | —                       |
| DISPLACEMENT.                 | —             | 18529.3          | 7.539      | 139700                  | 72.129                       | 1336498                 | 1552                    |

TRIM AND DRAUGHTS.

|                  |   |         |        |                   |   |       |    |
|------------------|---|---------|--------|-------------------|---|-------|----|
| DISPLACEMENT.    | = | 18529.3 | TONNES | TRIM. by stern    | = | 0.201 | M. |
| L.C.G. FROM A.P. | = | 72.129  | M.     | IMMERSION AT A.P. | = | 0.099 | M. |
| L.C.B. FROM A.P. | = | 72.356  | M.     | EMERSION AT F.P.  | = | 0.102 | M. |
| L.C.F. FROM A.P. | = | 49.07   | %      | MEAN DRAUGHT.     | = | 8.785 | M. |
| M.C.T. 1 CM.     | = | 208.8   | M-T.   | DRAUGHT AT A.P.   | = | 8.884 | M. |
| TRIMMING MOMENT. | = | 4206    | M-T.   | DRAUGHT AT F.P.   | = | 8.683 | M. |

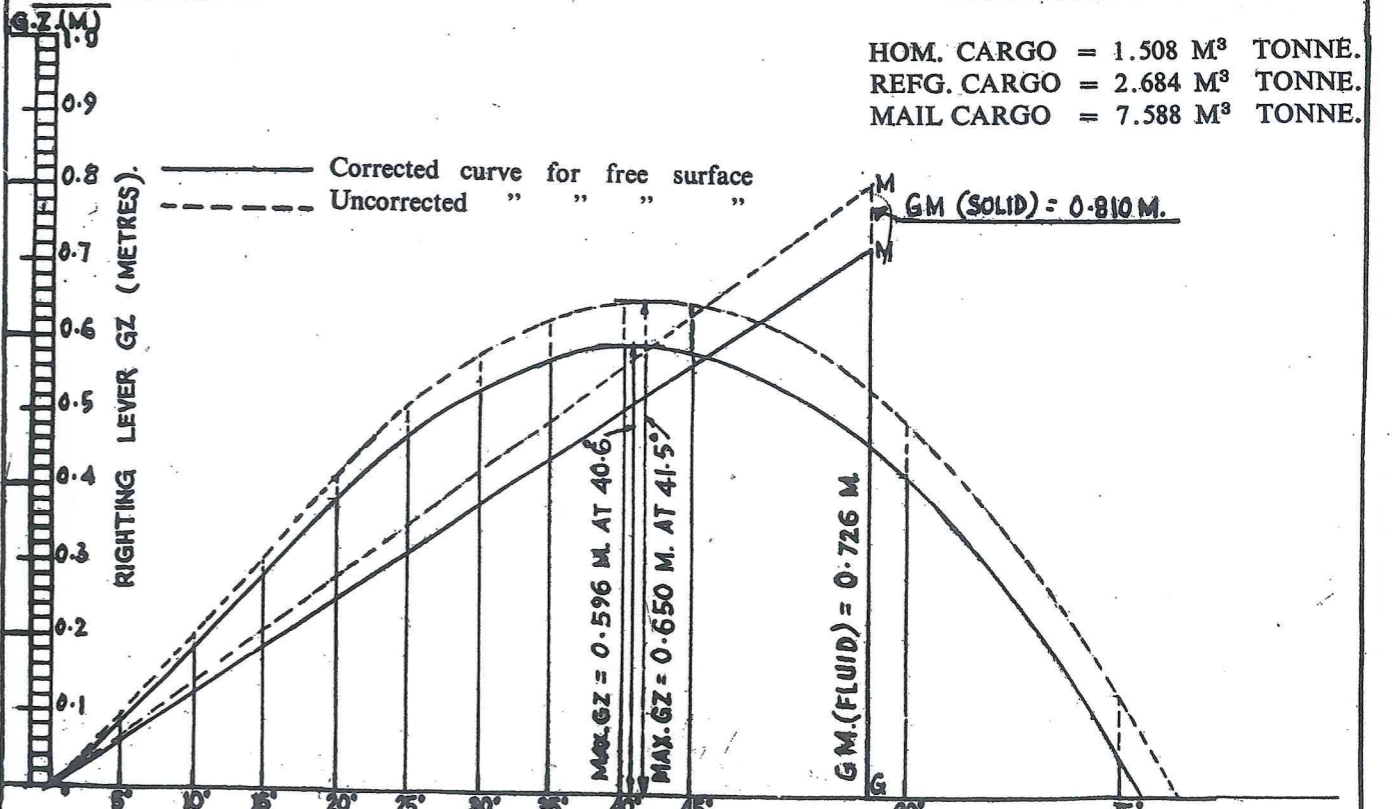
CONDITION NO. 5.  
UPPER DECK AS FREE BOARD DECK - ARRIVAL  
SHIP WITH HOMOGENEOUS CARGO IN ALL HOLDS  
AND TWEEN DECKS.



K. M. .... = 8.349 METRES.  
K. G. .... = 7.539 "  
G. M. (Solid) .... = 0.810 "  
F. S. CORRECTION .... = - 0.084 "  
CORRECTED G. M. .... = + 0.726 METRES.

| $\theta$ .                      | 5°    | 10°   | 15°   | 20°   | 25°   | 30°   | 35°   | 40°   |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| SIN $\theta$ .                  | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574 | 0.643 |
| LEVER FROM BASE LINE (KN)       | 0.760 | 1.517 | 2.252 | 2.990 | 3.629 | 4.312 | 4.948 | 5.498 |
| - K. G. SIN $\theta$ .          | 0.663 | 1.326 | 1.974 | 2.607 | 3.225 | 3.912 | 4.376 | 4.902 |
| G. Z. = (KN - KG SIN $\theta$ ) | 0.097 | 0.191 | 0.278 | 0.383 | 0.404 | 0.500 | 0.572 | 0.596 |
| SIMPSON MULTIPLIERS.            | 4     | 2     | 4     | 2     | 4     | 1     | SUM.  |       |
| PRODUCT.                        | 0.388 | 0.382 | 1.112 | 0.766 | 1.616 | 0.500 | 4.764 |       |

AREA UNDER  
G. Z. CURVE UPTO 30° = 0.0291 x 4.764 = 1.139 M-RAD.  
BETWEEN 30° AND 40° = 0.0291 x 3.384 = 0.098 M-RAD.  
TOTAL AREA TO 40° = 0.237 M-RAD. STOW. RATE OF CARGO.



HOM. CARGO = 1.508 M³ TONNE.  
REFG. CARGO = 2.684 M³ TONNE.  
MAIL CARGO = 7.588 M³ TONNE.



CONDITION NO. 6 : DEPARTURE  
CALCULATION OF DISPLACEMENT, K.G. & L.C.G. CONDITION.

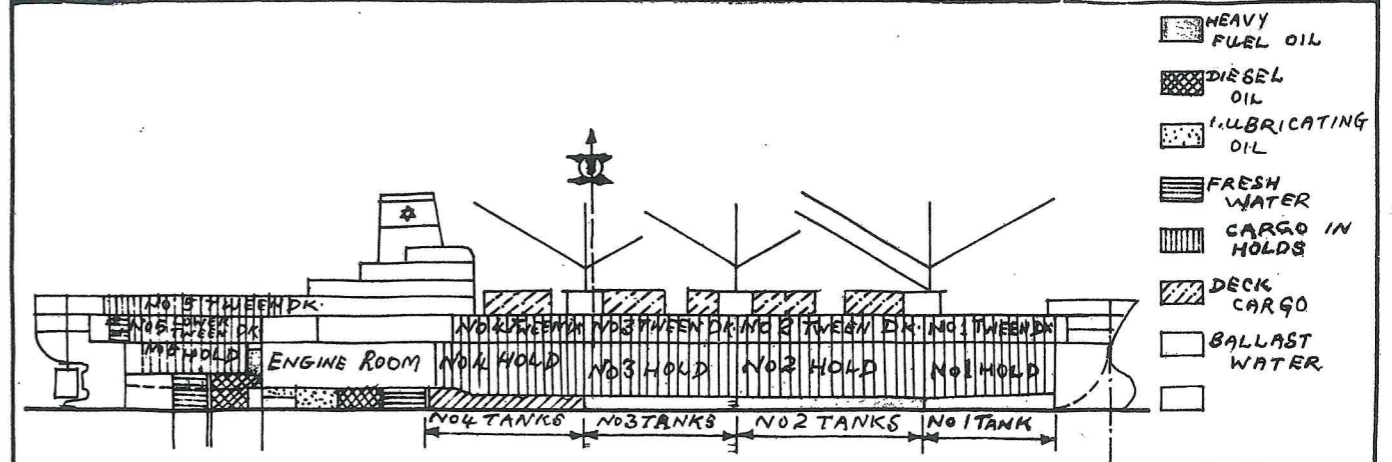
| ITEMS OF DISPLACEMENT.          | CON-<br>TENT. | WEIGHT<br>TONNES. | K. G.<br>M. | V. MO-<br>MENTS<br>M-T. | L.C.G.<br>(M) FORD<br>(A.P.) | L. MO-<br>MENTS<br>M-T. | Free<br>surface<br>M-T. |
|---------------------------------|---------------|-------------------|-------------|-------------------------|------------------------------|-------------------------|-------------------------|
| FORE PEAK TANK.                 | —             | —                 | —           | —                       | —                            | —                       | —                       |
| NO. 1 D. B. TANK.               | H.F.O.        | 149.7             | 1.14        | 171                     | 124.63                       | 18657                   | —                       |
| NO. 2 D. B. TANKS. P & S.       | H.F.O.        | 384.6             | 0.65        | 250                     | 102.20                       | 39306                   | —                       |
| NO. 3 D. B. TANKS. P, S & C.    | H.F.O.        | 410.2             | 0.64        | 263                     | 80.63                        | 33074                   | 1122                    |
| NO. 4 D. B. TANKS. P & S.       | H.F.O.        | 242.1             | 0.68        | 165                     | 58.14                        | 14076                   | —                       |
| NO. 4 D. B. TANKS. C.           | —             | —                 | —           | —                       | —                            | —                       | —                       |
| NO. 5 D. B. TANK. P.            | D.O.          | 73.5              | 0.85        | 62                      | 38.24                        | 2811                    | 151                     |
| NO. 5 D. B. TANK. S.            | H.F.O.        | 46.4              | 0.87        | 40                      | 39.73                        | 1843                    | —                       |
| NO. 6 & 9 D. B. TANKS. C        | L.O.          | 36.7              | 1.01        | 37                      | 30.74                        | 1128                    | 18                      |
| F.W. FOR ENGINES. S. & C        | F.W.          | 34.8              | 0.89        | 31                      | 38.13                        | 1327                    | 16                      |
| HFO. SETTLG. & SER. TKS. P & S. | H.F.O.        | 131.0             | 6.09        | 798                     | 25.06                        | 3283                    | 15                      |
| D.O. SETTLG. & SER. TANKS.      | D.O.          | 21.9              | 7.21        | 158                     | 27.85                        | 610                     | 3                       |
| L.O. STORAGE & SETTLG. TANKS.   | L.O.          | 36.9              | 7.13        | 263                     | 32.95                        | 1216                    | 5                       |
| NO. 7 TANKS. P & S.             | D.O.          | 190.5             | 2.60        | 495                     | 22.97                        | 4376                    | —                       |
| NO. 8 TANKS. P & S.             | F.W.          | 137.5             | 2.77        | 381                     | 16.23                        | 2232                    | —                       |
| AFT PEAK TANK.                  | —             | —                 | —           | —                       | —                            | —                       | —                       |
| DRINKING WATER TANKS. P&S.      | F.W.          | 93.4              | 11.21       | 1047                    | 5.82                         | 544                     | 42                      |
| SMALL TANKS IN ENGINE ROOM      | —             | 9.6               | 6.84        | 66                      | 33.51                        | 322                     | —                       |
| NO. 1 HOLD.                     | Hom. cargo    | 774.2             | 5.59        | 4328                    | 123.52                       | 95629                   | —                       |
| NO. 2 HOLD.                     | "             | 2048.4            | 4.98        | 10201                   | 103.14                       | 211272                  | —                       |
| NO. 3 HOLD.                     | "             | 1789.6            | 5.00        | 8948                    | 80.63                        | 144295                  | —                       |
| NO. 4 HOLD.                     | "             | 2009.8            | 4.99        | 10029                   | 58.66                        | 117895                  | —                       |
| NO. 5 HOLD.                     | "             | 391.0             | 6.91        | 2702                    | 17.31                        | 6768                    | —                       |
| NO. 1 TWEEN DECK.               | "             | 637.6             | 11.17       | 7122                    | 124.67                       | 79490                   | —                       |
| NO. 2 TWEEN DECK.               | "             | 1058.4            | 10.72       | 11346                   | 103.91                       | 109978                  | —                       |
| NO. 3 TWEEN DECK.               | "             | 830.4             | 10.37       | 8611                    | 80.79                        | 67088                   | —                       |
| NO. 4 TWEEN DECK.               | "             | 296.2             | 10.42       | 3086                    | 57.68                        | 17085                   | —                       |
| NO. 5 TWEEN DECK.               | "             | 669.6             | 10.69       | 7158                    | 17.24                        | 11544                   | —                       |
| NO. 5 POOP DECK.                | "             | 507.7             | 13.76       | 6986                    | 14.78                        | 7504                    | —                       |
| Cylinder oil tanks              | Cyl. oil      | 10.0              | 7.06        | 71                      | 31.44                        | 314                     | —                       |
| REFRIGERATED CARGO.             | —             | 235.0             | 10.36       | 2435                    | 60.17                        | 14140                   | —                       |
| MAIL CARGO.                     | —             | 5.1               | 14.81       | 76                      | 135.01                       | 689                     | —                       |
| DECK CARGO. (LOCOMOTIVES)       | —             | 760.0             | 13.83       | 10510                   | 84.04                        | 63870                   | —                       |
| CREW AND EFFECTS.               | —             | 10.9              | 14.47       | 158                     | 38.28                        | 417                     | —                       |
| STORES, SPARES & PROVISIONS.    | —             | 84.5              | 11.97       | 1011                    | 65.25                        | 5514                    | —                       |
| DEAD WEIGHT.                    | —             | 14117.2           | 7.013       | 99005                   | 76.382                       | 1078297                 | —                       |
| LIGHT SHIP.                     | —             | 5499.8            | 8.836       | 48596                   | 60.084                       | 330449                  | —                       |
| DISPLACEMENT.                   | —             | 19617.0           | 7.524       | 147601                  | 71.813                       | 1408746                 | 1372                    |

TRIM AND DRAUGHTS.

|                  |   |         |        |                   |   |       |    |
|------------------|---|---------|--------|-------------------|---|-------|----|
| DISPLACEMENT.    | = | 19617.0 | TONNES | TRIM. by Stern    | = | 0.364 | M. |
| L.C.G. FROM A.P. | = | 71.813  | M.     | IMMERSION AT A.P. | = | 0.178 | M. |
| L.C.B. FROM A.P. | = | 72.212  | M.     | EMERSION AT F.P.  | = | 0.186 | M. |
| L.C.F. FROM A.P. | = | 48.84   | %      | MEAN DRAGUHT      | = | 9.233 | M. |
| M.C.T. 1 CM.     | = | 215.0   | M-T.   | DRAUGHT AT A.P.   | = | 9.411 | M. |

CONDITION NO. 6.

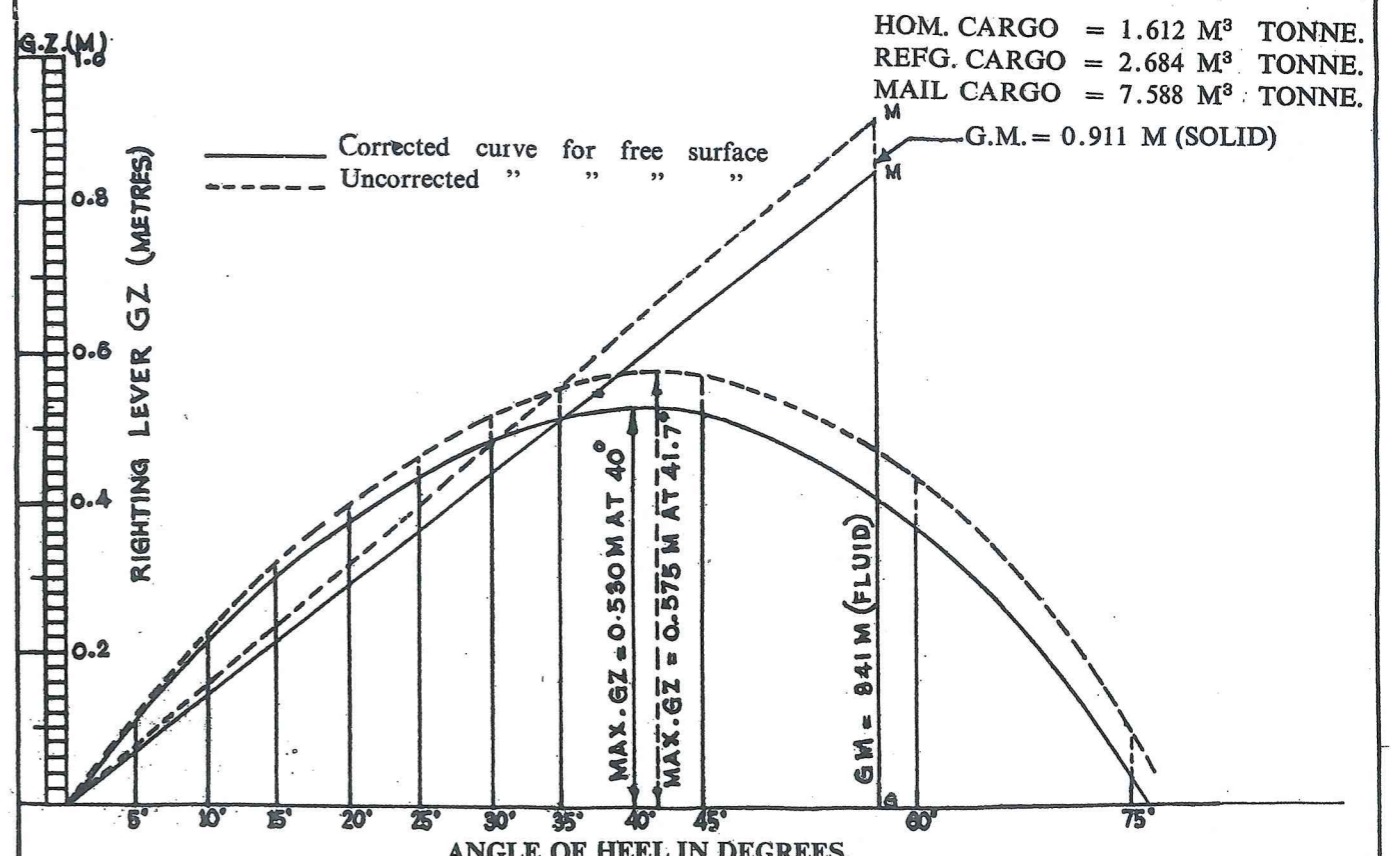
UPPER DECK AS FREE BOARD DECK - DEPARTURE  
SHIP WITH HOMOGENEOUS CARGO IN ALL HOLDS  
AND TWEEN DECKS AND LOCOMOTIVES ON UPPER DECK.



K. M. .... = 8.435 METRES.  
K. G. .... = 7.524 "  
G. M. (Solid) ..... = 0.911 "  
F. S. CORRECTION .... = - 0.070 "  
CORRECTED G. M. .... = + 0.841 METRES.  
(Flu d)

| $\theta$ .                     | 5°    | 10°   | 15°   | 20°   | 25°   | 30°   | 35°   | 40°   |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| SIN $\theta$ .                 | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574 | 0.643 |
| LEVER FAOM BASE LINE (KN)      | 0.770 | 1.540 | 2.268 | 2.976 | 3.594 | 4.273 | 4.870 | 5.411 |
| - K. G. SIN $\theta$ .         | 0.661 | 1.321 | 1.967 | 2.597 | 3.212 | 3.797 | 4.359 | 4.883 |
| G. Z. = (KN-KG SIN $\theta$ .) | 0.109 | 0.219 | 0.301 | 0.379 | 0.382 | 0.476 | 0.511 | 0.528 |
| SIMPSON MULTIPLIERS.           | 4     | 2     | 4     | 2     | 4     | 1     | SUM.  |       |
| PRODUCT.                       | 0.436 | 0.438 | 1.204 | 0.758 | 1.528 | 0.476 | 4.840 |       |

AREA UNDER SIMPSON MULTIPLIERS. 1 4 1 SUM.  
G. Z. CURVE UPTO 30° = 0.0291 x 4.840 = 0.141 M-RAD.  
BETWEEN 30° AND 40° = 0.0291 x 3.048 = 0.092 M-RAD. STOW. RATE OF CARGO  
TOTAL AREA TO 40° = 0.233 M-RAD.





CONDITION NO. 7 - ARRIVAL.  
CALCULATION OF DISPLACEMENT, K.G. & L.C.G. CONDITION.

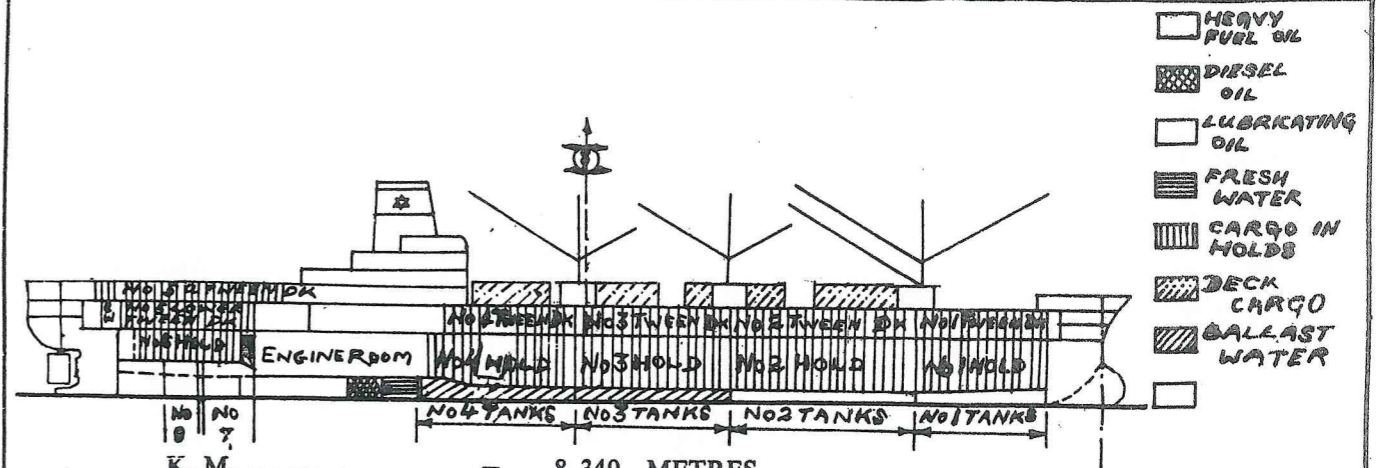
| ITEMS OF DISPLACEMENT.          | CON-TENT.  | WEIGHT TONNES | K.G. M. | V. MO-MENTS M-T. | L.C.G. (M) FORD (AP.) | L. MO-MENTS M-T. | free Surface Moment |
|---------------------------------|------------|---------------|---------|------------------|-----------------------|------------------|---------------------|
| FORE PEAK TANK.                 | —          | —             | —       | —                | —                     | —                | —                   |
| NO. 1 D. B. TANK.               | —          | —             | —       | —                | —                     | —                | —                   |
| NO. 2 D. B. TANKS. P & S.       | W.B.       | 414.9         | 0.65    | 270              | 102.20                | 42403            | —                   |
| NO. 3 D. B. TANKS. P, S & C.    | W.B.       | 442.5         | 0.64    | 283              | 80.63                 | 35679            | 1210                |
| NO. 4 D. B. TANKS. P & S.       | W.B.       | 261.2         | 0.68    | 178              | 58.14                 | 15186            | —                   |
| NO. 4 D. B. TANKS. C.           | —          | —             | —       | —                | —                     | —                | —                   |
| NO. 5 D. B. TANK. P.            | D.O.       | 17.7          | 0.21    | 4                | 38.24                 | 677              | 152                 |
| NO. 5 D. B. TANK. S.            | H.F.O.     | 38.0          | 0.64    | 24               | 39.73                 | 1510             | 90                  |
| NO. 6 D. B. TANKS. P & S.       | —          | —             | —       | —                | —                     | —                | —                   |
| F.W. FOR ENGINES. S. & C        | F.W.       | 20.7          | 0.87    | 18               | 42.46                 | 879              | 21                  |
| HFO. SETTLG. & SER. TKS. P & S. | H.F.O.     | 98.4          | 5.69    | 560              | 25.06                 | 2466             | 28                  |
| D.O. SETTLG. & SER. TANKS.      | D.O.       | 10.9          | 6.61    | 72               | 27.89                 | 304              | 4                   |
| L.O. STORAGE & SETTLG. TANKS.   | L.O.       | 7.4           | 6.46    | 48               | 32.75                 | 242              | 5                   |
| NO. 7 TANKS. P & S.             | —          | —             | —       | —                | —                     | —                | —                   |
| NO. 8 TANKS. P. & S.            | —          | —             | —       | —                | —                     | —                | —                   |
| AFT PEAK TANK.                  | —          | —             | —       | —                | —                     | —                | —                   |
| DRINKING WATER TANKS. S.        | F.W.       | 23.1          | 9.57    | 221              | 5.80                  | 134              | 42                  |
| SMALL TANKS IN ENGINE ROOM      | —          | 9.3           | 6.83    | 64               | 33.38                 | 310              | —                   |
| NO. 1 HOLD.                     | Hom. cargo | 774.2         | 5.59    | 4328             | 123.52                | 95629            | —                   |
| NO. 2 HOLD.                     | "          | 2048.4        | 4.98    | 10201            | 103.14                | 211272           | —                   |
| NO. 3 HOLD.                     | "          | 1789.6        | 5.00    | 8948             | 80.63                 | 144205           | —                   |
| NO. 4 HOLD.                     | "          | 2009.8        | 4.99    | 10029            | 58.66                 | 117895           | —                   |
| NO. 5 HOLD.                     | "          | 391.0         | 6.91    | 2702             | 17.31                 | 6768             | —                   |
| NO. 1 TWEEN DECK.               | "          | 637.6         | 11.17   | 7122             | 124.67                | 79490            | —                   |
| NO. 2 TWEEN DECK.               | "          | 1058.4        | 10.72   | 11346            | 103.91                | 109978           | —                   |
| NO. 3 TWEEN DECK.               | "          | 830.4         | 10.37   | 8611             | 80.79                 | 67088            | —                   |
| NO. 4 TWEEN DECK.               | "          | 296.2         | 10.42   | 3086             | 57.68                 | 17085            | —                   |
| NO. 5 TWEEN DECK.               | "          | 669.6         | 10.69   | 7158             | 17.24                 | 11544            | —                   |
| NO. 5 POOP DECK.                | "          | 507.7         | 13.76   | 6986             | 14.78                 | 7504             | —                   |
| Cyl. oil tanks.                 | Cyl. oil   | 1.0           | 6.80    | 7                | 31.44                 | 31               | —                   |
| REFRIGERATED CARGO.             |            | 235.0         | 10.36   | 2435             | 60.17                 | 14140            | —                   |
| MAIL CARGO.                     |            | 5.1           | 14.81   | 76               | 135.01                | 689              | —                   |
| DECK CARGO. (LOCOMOTIVES)       |            | 760.0         | 13.83   | 10510            | 84.04                 | 63870            | —                   |
| CREW AND EFFECTS.               |            | 10.9          | 14.47   | 158              | 38.28                 | 417              | —                   |
| STORES, SPARES & PROVISIONS.    |            | 75.4          | 11.70   | 882              | 64.78                 | 4884             | —                   |
| DEAD WEIGHT.                    |            | 13029.5       | 7.372   | 96057            | 77.514                | 1009966          |                     |
| LIGHT SHIP.                     |            | 5499.8        | 8.836   | 48596            | 60.084                | 330449           |                     |
| DISPLACEMENT.                   |            | 18529.3       | 7.807   | 144653           | 72.340                | 1340415          | 1552                |

TRIM AND DRAUGHTS.

|                  |   |                |                   |   |          |
|------------------|---|----------------|-------------------|---|----------|
| DISPLACEMENT.    | = | 18529.3 TONNES | TRIM. by Stern    | = | 0.014 M. |
| L.C.G. FROM A.P. | = | 72.340 M.      | IMMERSION AT A.P. | = | 0.007 M. |
| L.C.B. FROM A.P. | = | 72.356 M.      | EMERSION AT F.P.  | = | 0.007 M. |
| L.C.F. FROM A.P. | = | 49.07 %        | MEAN DRAUGHT.     | = | 8.785 M. |
| M.C.T. 1 CM.     | = | 208.8 M-T.     | DRAUGHT AT A.P.   | = | 8.792 M. |
| TRIMMING MOMENT  | = | 296 M-T.       | DRAUGHT AT F.P.   | = | 8.778 M. |

CONDITION NO. 7

UPPER DECK AS FREE BOARD DECK-ARRIVAL  
SHIP WITH HOMOGENEOUS CARGO IN ALL HOLDS  
AND TWEEN DECKS AND LOCOMOTIVES ON UPPER DECK



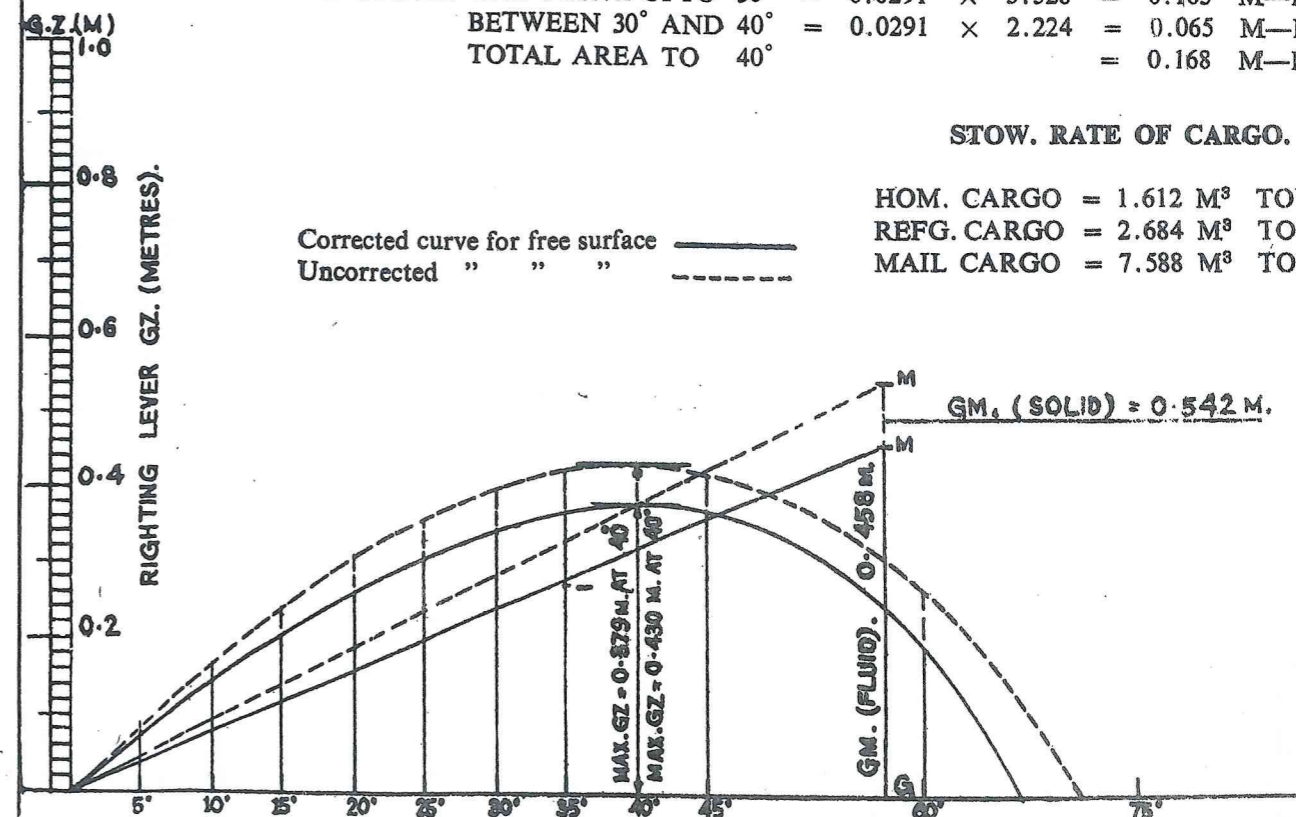
K. M. .... = 8.349 METRES  
K. G. .... = 7.807 "  
G. M. (Solid) .... = 0.542 "  
F. S. CORRECTION .... = - 0.084 "  
CORRECTED G. M. .... = + 0.458 METRES.  
(Fluid)

| $\theta$ .                    | 5°    | 10°   | 15°   | 20°   | 25°   | 30°   | 35°   | 40°   |       |       |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| SIN $\theta$ .                | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574 | 0.643 |       |       |
| LEVER FROM BASE LINE (KN)     | 0.760 | 1.517 | 2.252 | 2.990 | 3.629 | 4.312 | 4.900 | 5.448 |       |       |
| - K. G. SIN $\theta$ .        | 0.687 | 1.373 | 2.044 | 2.699 | 3.338 | 3.946 | 4.529 | 5.074 |       |       |
| G. Z. = (KN-KG SIN $\theta$ ) | 0.073 | 0.144 | 0.208 | 0.291 | 0.291 | 0.366 | 0.371 | 0.374 |       |       |
| SIMPSON MULTIPLIERS.          | 4     | 2     | 4     | 2     | 4     | 1     | SUM.  |       |       |       |
| PRODUCT.                      | 0.292 | 0.288 | 0.832 | 0.582 | 1.164 | 0.366 | 3.526 |       |       |       |
| SIMPSON MULTIPLIERS.          |       |       |       |       |       |       | 1     | 4     | 1     | SUM.  |
|                               |       |       |       |       |       |       | 0.366 | 1.484 | 0.374 | 2.224 |

AREA UNDER G. Z. CURVE UPTO 30° = 0.0291 × 3.526 = 0.103 M-RAD.  
BETWEEN 30° AND 40° = 0.0291 × 2.224 = 0.065 M-RAD.  
TOTAL AREA TO 40° = 0.168 M-RAD.

STOW. RATE OF CARGO.

HOM. CARGO = 1.612 M<sup>3</sup> TONNE.  
REFG. CARGO = 2.684 M<sup>3</sup> TONNE.  
MAIL CARGO = 7.588 M<sup>3</sup> TONNE.





CONDITION NO. 8 - DEPARTURE  
CALCULATION OF DISPLACEMENT, K.G. & L.C.G. CONDITION

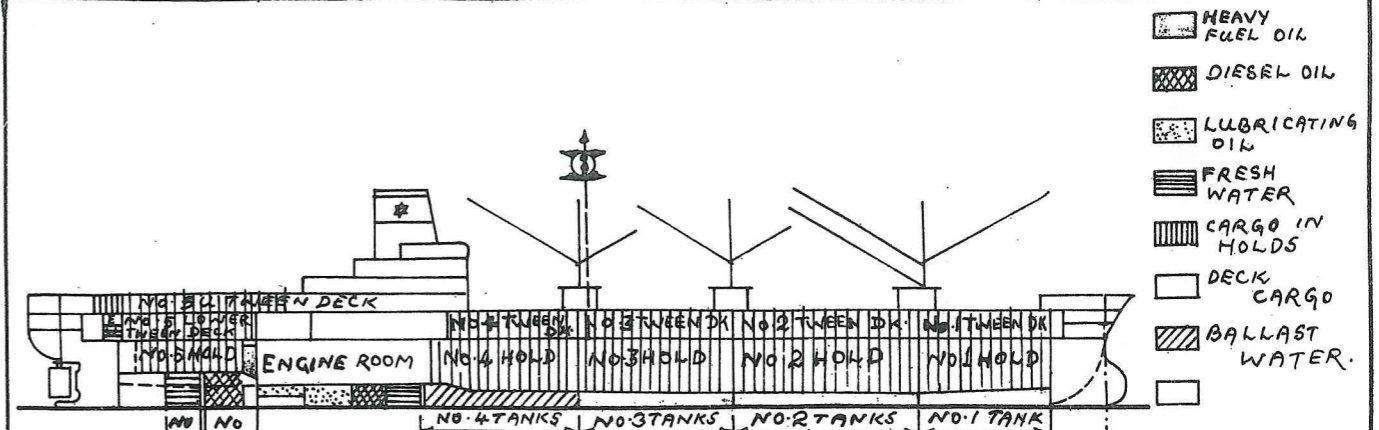
| ITEMS OF DISPLACEMENT           | CON-TENT.  | WEIGHT TONNES | K.G. M. | V. MO-MENTS M-T. | L.C.G. (M) FORD (AP.) | L. MO-MENTS M-T. | Free surface M-T. |
|---------------------------------|------------|---------------|---------|------------------|-----------------------|------------------|-------------------|
| FORE PEAK TANK.                 | —          | —             | —       | —                | —                     | —                | —                 |
| NO. 1 D. B. TANK.               | H.F.O.     | 149.7         | 1.14    | 171              | 124.63                | 18657            | —                 |
| NO. 2 D. B. TANKS. P & S.       | H.F.O.     | 384.6         | 0.65    | 250              | 102.20                | 39306            | —                 |
| NO. 3 D. B. TANKS. P, S & C.    | H.F.O.     | 410.2         | 0.64    | 263              | 80.63                 | 33074            | 1122              |
| NO. 4 D. B. TANKS. P & S.       | H.F.O.     | 242.1         | 0.68    | 165              | 58.14                 | 14076            | —                 |
| NO. 4 D. B. TANKS. C.           | —          | —             | —       | —                | —                     | —                | —                 |
| NO. 5 D. B. TANK. P.            | D. O.      | 73.5          | 0.85    | 62               | 38.24                 | 2811             | 151               |
| NO. 5 D. B. TANK. S.            | H.F.O.     | 46.4          | 0.87    | 40               | 39.73                 | 1843             | —                 |
| NO. 6 & 9 D.B. TANK C.          | L.O.       | 36.7          | 1.01    | 37               | 30.74                 | 1128             | 18                |
| F.W. FOR ENGINES. S. & C.       | F.W.       | 34.8          | 0.89    | 31               | 38.13                 | 1327             | 16                |
| HFO. SETTLG. & SER. TKS. P & S. | H.F.O.     | 131.0         | 6.09    | 798              | 25.06                 | 3283             | 15                |
| D.O. SETTLG. & SER. TANKS.      | D.O.       | 21.9          | 7.21    | 158              | 27.85                 | 610              | 3                 |
| L.O. STORAGE & SETTLG. TANKS    | L.O.       | 36.9          | 7.13    | 263              | 32.95                 | 1216             | 5                 |
| NO. 7 TANKS. P & S.             | D.O.       | 190.5         | 2.60    | 495              | 22.97                 | 4376             | —                 |
| NO. 8 TANKS. P & S.             | F.W.       | 137.5         | 2.77    | 381              | 16.23                 | 2232             | —                 |
| AFT PEAK TANK.                  | —          | —             | —       | —                | —                     | —                | —                 |
| DRINKING WATER TANKS. P&S.      | F.W.       | 93.4          | 11.21   | 1047             | 5.82                  | 544              | 42                |
| SMALL TANKS IN ENGINE ROOM      | —          | 9.6           | 6.84    | 66               | 33.51                 | 322              | —                 |
| NO. 1 HOLD.                     | Hom. cargo | 582.7         | 5.59    | 3257             | 123.52                | 71975            | —                 |
| NO. 2 HOLD.                     | "          | 1541.7        | 4.98    | 7678             | 103.14                | 159011           | —                 |
| NO. 3 HOLD.                     | "          | 1346.9        | 5.00    | 6735             | 80.63                 | 108601           | —                 |
| NO. 4 HOLD.                     | "          | 1512.7        | 4.99    | 7548             | 58.66                 | 88735            | —                 |
| NO. 5 HOLD.                     | "          | 294.3         | 6.91    | 2034             | 17.31                 | 5094             | —                 |
| NO. 1 TWEEN DECK.               | "          | 479.9         | 11.17   | 5360             | 124.67                | 59829            | —                 |
| NO. 2 TWEEN DECK.               | "          | 796.6         | 10.72   | 8540             | 103.91                | 82775            | —                 |
| NO. 3 TWEEN DECK.               | "          | 625.0         | 10.37   | 6481             | 30.79                 | 50494            | —                 |
| NO. 4 TWEEN DECK.               | "          | 223.0         | 10.42   | 2324             | 57.68                 | 12863            | —                 |
| NO. 5 TWEEN DECK.               | "          | 504.0         | 10.69   | 5388             | 17.24                 | 8689             | —                 |
| NO. 5 POOP DECK.                | "          | 382.1         | 13.76   | 5258             | 14.78                 | 5647             | —                 |
| Cylinder oil tanks              | Cyl. oil   | 10.0          | 7.06    | 71               | 31.44                 | 314              | —                 |
| REFRIGERATED CARGO.             | —          | 235.0         | 10.36   | 2435             | 60.17                 | 14140            | —                 |
| MAIL CARGO.                     | —          | 5.1           | 14.81   | 76               | 135.01                | 689              | —                 |
| DECK CARGO.                     | —          | —             | —       | —                | —                     | —                | —                 |
| CREW AND EFFECTS.               | —          | 10.9          | 14.47   | 158              | 38.28                 | 417              | —                 |
| STORES, SPARES & PROVISIONS.    | —          | 84.5          | 11.97   | 1011             | 65.25                 | 5514             | —                 |
| DEAD WEIGHT.                    |            | 10633.2       | 6.450   | 68581            | 71.198                | 799592           |                   |
| LIGHT SHIP.                     |            | 5499.8        | 8.836   | 48596            | 60.084                | 330449           |                   |
| DISPLACEMENT.                   |            | 16133.0       | 7.263   | 117177           | 70.045                | 1130041          | 1372              |

TRIM AND DRAUGHTS.

|                  |   |                |                   |   |          |
|------------------|---|----------------|-------------------|---|----------|
| DISPLACEMENT.    | = | 16133.0 TONNES | TRIM. By Stern    | = | 2.157 M. |
| L.C.G. FROM A.P. | = | 70.045 M.      | IMMERSION AT A.P. | = | 1.072 M. |
| L.C.B. FROM A.P. | = | 72.644 M.      | EMERSION AT F.P.  | = | 1.085 M. |
| L.C.F. FROM A.P. | = | 49.68 %        | MEAN DRAUGHT.     | = | 7.788 M. |
| M.C.T. 1 CM.     | = | 194.4 M-T.     | DRAUGHT AT A.P.   | = | 8.860 M. |
| TRIMMING MOMENT. | = | 41930 M-T.     | DRAUGHT AT F.P.   | = | 6.703 M. |

CONDITION NO. 8.

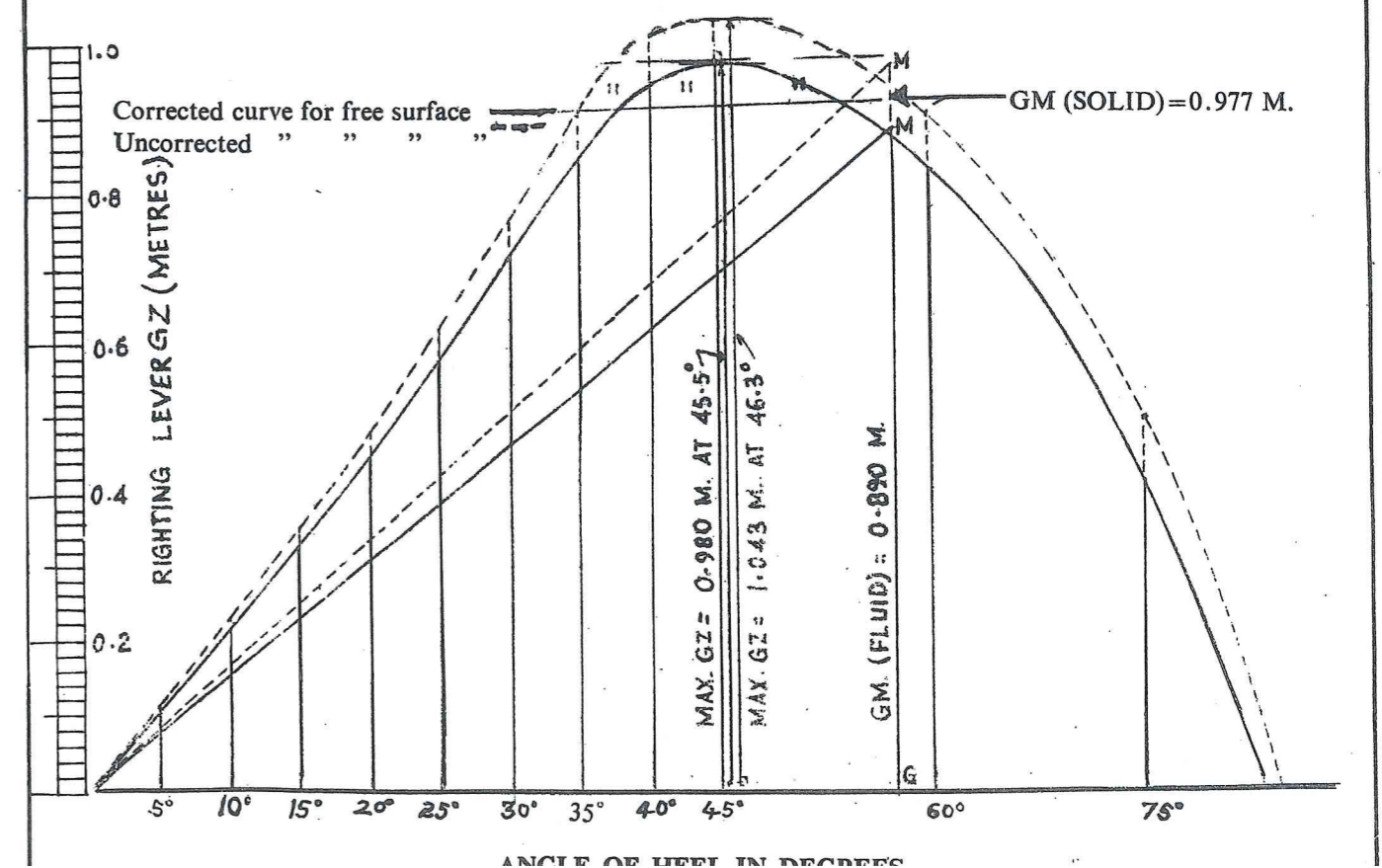
SERVICE CONDITION-DEPARTURE  
SHIP WITH HOMOGENEOUS CARGO IN ALL HOLDS  
AND TWEEN DECKS.



STOW. RATE OF CARGO.  
 K. M. .... = 8.240 METRES.  
 K. G. .... = 7.263 "  
 G. M. (Solid) .... = 0.977 "  
 F. S. CORRECTION = -0.087 "  
 CORRECTED G. M. (Fluid) = +0.890 METRES.  
 HOM. CARGO = 2.142 M<sup>3</sup> TONNE.  
 REFG. CARGO = 2.684 M<sup>3</sup> TONNE.  
 MAIL CARGO = 7.588 M<sup>3</sup> TONNE.

| θ.                        | 5°    | 10°   | 15°   | 20°   | 25°   | 30°   | 35°   | 40°   |       |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| SIN θ.                    | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574 | 0.643 |       |
| LEVER FROM BASE LINE (KN) | 0.759 | 1.500 | 2.223 | 2.969 | 3.687 | 4.393 | 5.074 | 5.683 |       |
| — K. G. SIN θ.            | 0.639 | 1.279 | 1.904 | 2.514 | 3.109 | 3.675 | 4.219 | 4.726 |       |
| G.Z. = (KN—KG SIN θ)      | 0.120 | 0.221 | 0.319 | 0.455 | 0.578 | 0.718 | 0.855 | 0.957 |       |
| SIMPSON MULTIPLIERS.      | 4     | 2     | 4     | 2     | 4     | 1     | SUM.  |       |       |
| PRODUCT.                  | 0.480 | 0.442 | 1.276 | 0.910 | 2.312 | 0.718 | 6.138 |       |       |
| SIMPSON MULTIPLIERS.      |       |       |       |       |       | 1     | 4     | 1     | SUM.  |
|                           |       |       |       |       |       | 0.718 | 3.420 | 0.957 | 5.095 |

AREA UNDER G. Z. CURVE UPTO 30° = 0.0291 x 6.138 = 0.179 M—RAD.  
 BETWEEN 30° AND 40° = 0.0291 x 5.095 = 0.148 M—RAD.  
 TOTAL AREA TO 40° = 0.327 M—RAD.





CONDITION NO. 9 — ARRIVAL  
CALCULATION OF DISPLACEMENT, K.G. & L.C.G. CONDITION.

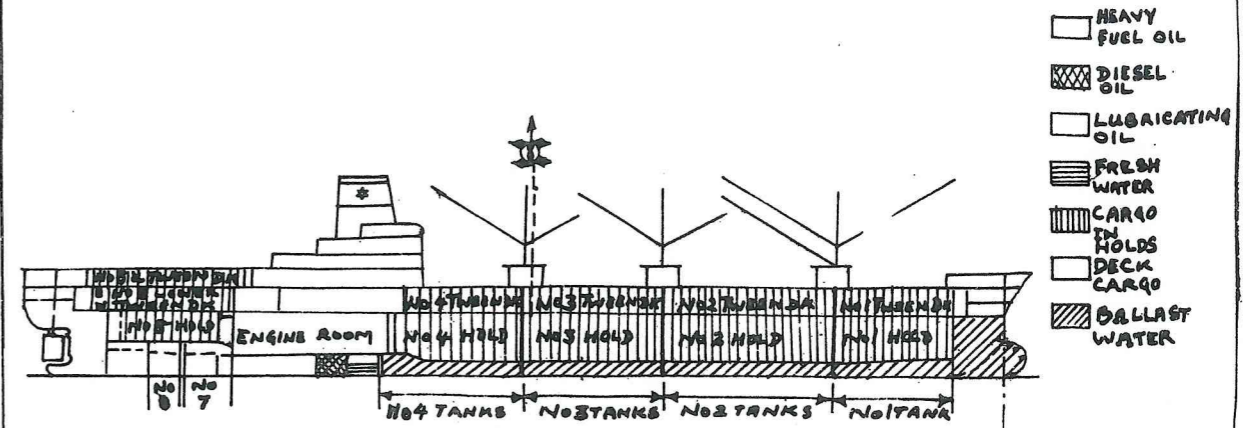
| ITEMS OF DISPLACEMENT.          | CON-TENT.  | WEIGHT TONNES | K.G. M. | V. MO-MENTS M-T. | L.C.G. (M) FORD (AP.) | L. MO-MENTS M-T. | Free surface M-T. |
|---------------------------------|------------|---------------|---------|------------------|-----------------------|------------------|-------------------|
| FORE PEAK TANK.                 | W.B.       | 106.1         | 6.31    | 669              | 137.18                | 14555            | —                 |
| NO. 1 D. B. TANK.               | W.B.       | 161.5         | 1.14    | 184              | 124.63                | 20128            | —                 |
| NO. 2 D. B. TANKS. P & S.       | W.B.       | 414.9         | 0.65    | 270              | 102.20                | 42403            | —                 |
| NO. 3 D. B. TANKS. P. S. & C.   | W.B.       | 442.5         | 0.64    | 283              | 80.63                 | 35679            | 1210              |
| NO. 4 D. B. TANKS. P & S.       | W.B.       | 261.2         | 0.68    | 178              | 58.14                 | 15186            | —                 |
| NO. 4 D. B. TANKS. C.           | —          | —             | —       | —                | —                     | —                | —                 |
| NO. 5 D. B. TANK. P.            | D.O.       | 17.7          | 0.21    | 4                | 38.24                 | 677              | 152               |
| NO. 5 D. B. TANK. S.            | H.F.O.     | 38.0          | 0.64    | 24               | 39.73                 | 1510             | 90                |
| NO. 6 D. B. TANKS. P & S.       | —          | —             | —       | —                | —                     | —                | —                 |
| F.W. FOR ENGINES. S & C.        | F.W.       | 20.7          | 0.87    | 18               | 42.46                 | 879              | 21                |
| HFO. SETTLG. & SER. TKS. P & S. | H.F.O.     | 98.4          | 5.69    | 560              | 25.06                 | 2466             | 28                |
| D. O. SETTLG. & SER. TANKS.     | D.O.       | 10.9          | 6.61    | 72               | 27.89                 | 304              | 4                 |
| L.O. STORAGE & SETTLG. TANKS    | L.O.       | 7.4           | 6.46    | 48               | 32.75                 | 242              | 5                 |
| NO. 7 TANKS. P & S.             | —          | —             | —       | —                | —                     | —                | —                 |
| NO. 8 TANKS. P & S.             | —          | —             | —       | —                | —                     | —                | —                 |
| AFT PEAK TANK.                  | —          | —             | —       | —                | —                     | —                | —                 |
| DRINKING WATER TANKS. S.        | F.W.       | 23.1          | 9.57    | 221              | 5.80                  | 134              | 42                |
| SMALL TANKS IN ENGINE ROOM      | —          | 9.3           | 6.83    | 64               | 33.38                 | 310              | —                 |
| NO. 1 HOLD.                     | Hom. cargo | 582.7         | 5.59    | 3257             | 123.52                | 71975            | —                 |
| NO. 2 HOLD.                     | -do-       | 1541.7        | 4.98    | 7678             | 103.14                | 159011           | —                 |
| NO. 3 HOLD.                     | -do-       | 1346.9        | 5.00    | 6735             | 80.63                 | 108601           | —                 |
| NO. 4 HOLD.                     | -do-       | 1512.7        | 4.99    | 7548             | 58.66                 | 88735            | —                 |
| NO. 5 HOLD.                     | -do-       | 294.3         | 6.91    | 2034             | 17.31                 | 5094             | —                 |
| NO. 1 TWEEN DECK.               | -do-       | 479.8         | 11.17   | 5360             | 124.61                | 59829            | —                 |
| NO. 2 TWEEN DECK.               | -do-       | 796.6         | 10.72   | 8540             | 103.91                | 82775            | —                 |
| NO. 3 TWEEN DECK.               | -do-       | 625.0         | 10.37   | 6481             | 80.79                 | 50494            | —                 |
| NO. 4 TWEEN DECK.               | -do-       | 223.0         | 10.42   | 2324             | 57.68                 | 12863            | —                 |
| NO. 5 TWEEN DECK.               | -do-       | 504.0         | 10.69   | 5388             | 17.24                 | 8689             | —                 |
| NO. 5 POOP DECK.                | —          | 382.1         | 13.76   | 5258             | 14.78                 | 5647             | —                 |
| Cyl. oil tanks                  | Cyl. oil   | 1.0           | 6.80    | 7                | 31.44                 | 31               | —                 |
| REFRIGERATED CARGO.             | —          | 235.0         | 10.36   | 2435             | 60.17                 | 14140            | —                 |
| MAIL CARGO.                     | —          | 5.1           | 14.81   | 76               | 135.01                | 689              | —                 |
| DECK CARGO.                     | —          | —             | —       | —                | —                     | —                | —                 |
| CREW AND EFFECTS.               | —          | 10.9          | 14.47   | 158              | 38.28                 | 417              | —                 |
| STORES, SPARES & PROVISIONS.    | —          | 75.4          | 11.70   | 882              | 64.78                 | 4884             | —                 |
| DEAD WEIGHT.                    |            | 10228.0       | 6.527   | 66756            | 79.033                | 808347           |                   |
| LIGHT SHIP.                     |            | 5499.8        | 8.836   | 48596            | 60.084                | 330449           |                   |
| DISPLACEMENT.                   |            | 15727.8       | 7.334   | 115352           | 72.407                | 1138797          | 1552              |

TRIM AND DRAUGHTS.

|                  |   |                |                   |   |          |
|------------------|---|----------------|-------------------|---|----------|
| DISPLACEMENT.    | = | 15727.8 TONNES | TRIM. By Stern.   | = | 0.229 M. |
| L.C.G. FROM A.P. | = | 72.407 M.      | IMMERSION AT A.P. | = | 0.114 M. |
| L.C.B. FROM A.P. | = | 72.686 M.      | EMERSION AT F.P.  | = | 0.115 M. |
| L.C.F. FROM A.P. | = | 49.80 %        | MEAN DRAUGHT.     | = | 7.615 M. |
| M.C.T. 1 CM.     | = | 192.0 M-T.     | DRAUGHT AT A.P.   | = | 7.729 M. |
| TRIMMING MOMENT. | = | 4388 M-T.      | DRAUGHT AT F.P.   | = | 7.500 M. |

CONDITION NO. 9.

SERVICE CONDITION -ARRIVAL SHIP WITH  
HOMOGENEOUS CARGO IN ALL HOLDS AND TWEEN DECKS

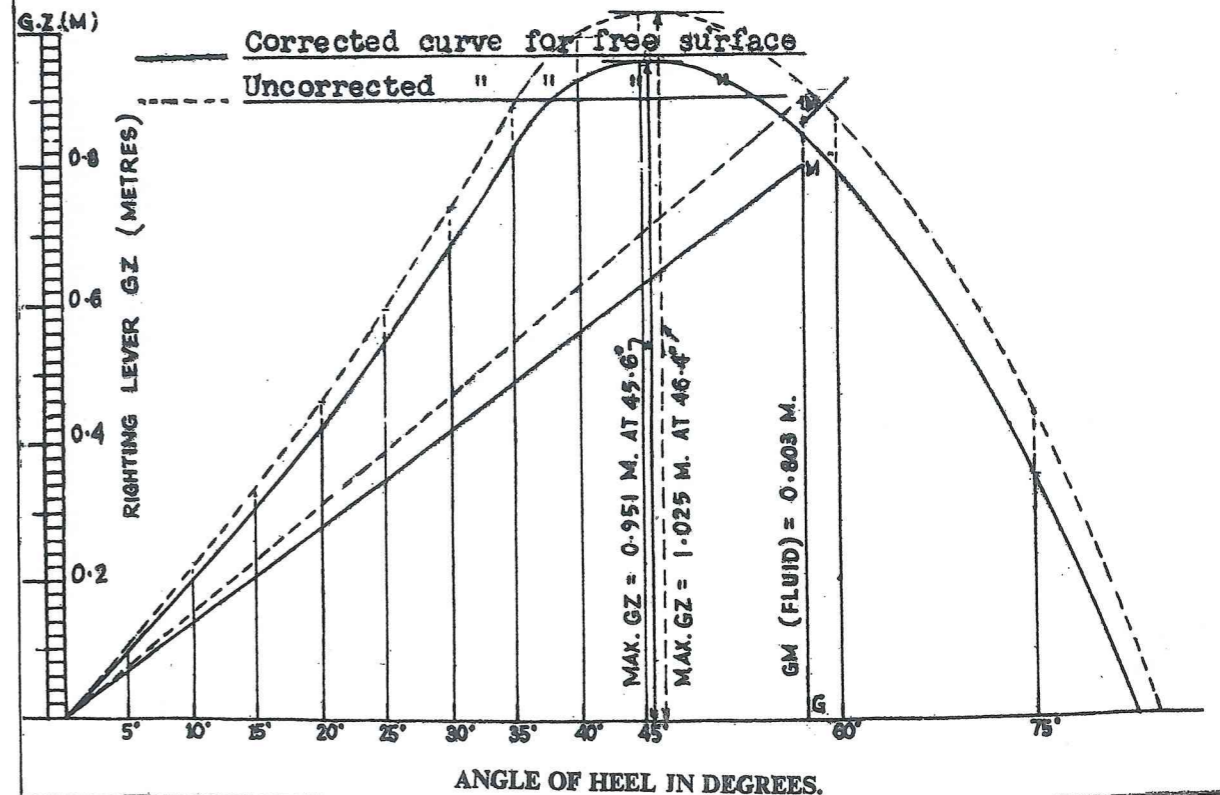


K.M. .... = 8.238 METRES.  
K.G. .... = 7.334 "  
G.M. (Solid) .... = 0.904 "  
F. S. CORRECTION .... = - 0.101 "  
CORRECTED G. M. .... = + 0.803 METRES.

STOW. RATE OF CARGO.  
HOM. CARGO = 2.142 M<sup>3</sup> TONNE.  
REFG. CARGO = 2.684 M<sup>3</sup> TONNE.  
MAIL CARGO = 7.588 M<sup>3</sup> TONNE.

| θ.                       | 5°    | 10°   | 15°   | 20°   | 25°   | 30°   | 35°   | 40°   |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| SIN θ.                   | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574 | 0.643 |
| LEVER FROM BASE LINE(KN) | 0.758 | 1.500 | 2.221 | 2.966 | 2.695 | 4.407 | 5.098 | 5.710 |
| - K.G. SIN θ.            | 0.647 | 1.294 | 1.926 | 2.543 | 3.145 | 3.718 | 4.268 | 4.781 |
| G.Z. = (KN-KG SIN θ.)    | 0.111 | 0.206 | 0.295 | 0.423 | 0.550 | 0.689 | 0.830 | 0.929 |
| SIMPSON MULTIPLIERS      | 4     | 2     | 4     | 2     | 4     | 1     | SUM.  |       |
| PRODUCT.                 | 0.444 | 0.412 | 1.180 | 0.846 | 2.200 | 0.689 | 5.771 |       |
| SIMPSON MULTIPLIERS.     |       | 1     | 4     | 1     | SUM.  |       |       |       |
|                          |       | 0.689 | 3.320 | 0.929 | 4.938 |       |       |       |

AREA UNDER G. Z. CURVE UPTO 30° = 0.3291 x 5.771 = 0.168 M-RAD.  
BETWEEN 30° AND 40° = 0.0791 x 4.938 = 0.144 M-RAD.  
TOTAL AREA TO 40° = 0.312 M-RAD.  
G.M (SOLID) = 0.904 M.





CONDITION NO. 10 - DEPARTURE  
CALCULATION OF DISPLACEMENT, K.G. & L.C.G. CONDITION.

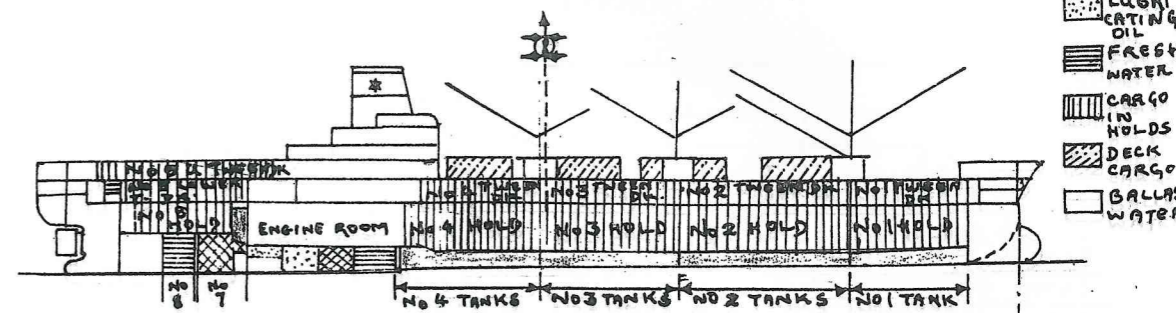
| ITEMS OF DISPLACEMENT.            | CON-TENT.  | WEIGHT TONNES. | K.G. M. | V. MO-MENTS M-T. | L.C.G. (M) FORD (AP.) | L. MO-MENTS M-T. | Free surface M-T. |
|-----------------------------------|------------|----------------|---------|------------------|-----------------------|------------------|-------------------|
| FORE PEAK TANK.                   | —          | —              | —       | —                | —                     | —                | —                 |
| NO. 1 D. B. TANK.                 | H.F.O.     | 149.7          | 1.14    | 171              | 124.63                | 18657            | —                 |
| NO. 2 D. B. TANKS. P & S.         | H.F.O.     | 384.6          | 0.65    | 250              | 102.20                | 39306            | —                 |
| NO. 3 D. B. TANKS. P, S & C.      | H.F.O.     | 410.2          | 0.64    | 263              | 80.43                 | 33074            | 1122              |
| NO. 4 D. B. TANKS. P & S.         | H.F.O.     | 242.1          | 0.68    | 165              | 58.14                 | 14076            | —                 |
| NO. 4 D. B. TANKS. C.             | —          | —              | —       | —                | —                     | —                | —                 |
| NO. 5 D. B. TANK. P.              | D.O.       | 73.5           | 0.85    | 62               | 38.24                 | 2811             | 151               |
| NO. 5 D. B. TANK. S.              | H.F.O.     | 46.4           | 0.87    | 40               | 39.73                 | 1843             | —                 |
| NO. 6 & 9 D. B. TANKS C.          | L.O.       | 36.7           | 1.01    | 37               | 30.74                 | 1128             | 18                |
| F.W. FOR ENGINES, S. & C.         | F.W.       | 34.8           | 0.89    | 31               | 38.13                 | 1327             | 16                |
| H.F.O. SETTLG. & SER. TKS. P & S. | H.F.O.     | 131.0          | 6.09    | 798              | 25.06                 | 3283             | 15                |
| D.O. SETTLG & SER. TANKS.         | D.O.       | 21.9           | 7.21    | 158              | 27.85                 | 610              | 3                 |
| L.O. STORAGE & SETTLG. TANKS      | L.O.       | 36.9           | 7.13    | 263              | 32.95                 | 1216             | 5                 |
| NO. 7 TANKS. P & S.               | D.O.       | 190.5          | 2.60    | 495              | 22.97                 | 4376             | —                 |
| NO. 8 TANKS. P & S.               | F.W.       | 137.5          | 2.77    | 381              | 16.23                 | 2232             | —                 |
| AFT PEAK TANK.                    | —          | —              | —       | —                | —                     | —                | —                 |
| DRINKING WATER TANKS. P&S.        | F. W.      | 93.4           | 11.21   | 1047             | 5.82                  | 544              | 42                |
| SMALL TANKS IN ENGINE ROOM        | —          | 9.6            | 6.84    | 66               | 32.51                 | 322              | —                 |
| NO. 1 HOLD.                       | Hom. cargo | 529.3          | 5.59    | 2959             | 123.52                | 65379            | —                 |
| NO. 2 HOLD.                       | -do-       | 1400.4         | 4.98    | 6974             | 103.14                | 144437           | —                 |
| NO. 3 HOLD.                       | -do-       | 1223.4         | 5.00    | 6117             | 80.63                 | 98643            | —                 |
| NO. 4 HOLD.                       | -do-       | 1374.0         | 4.99    | 6856             | 58.66                 | 80599            | —                 |
| NO. 5 HOLD.                       | -do-       | 267.3          | 6.91    | 1847             | 17.31                 | 4627             | —                 |
| NO. 1 TWEEN DECK.                 | -do-       | 435.9          | 11.17   | 4869             | 124.67                | 54344            | —                 |
| NO. 2 TWEEN DECK.                 | -do-       | 723.5          | 10.72   | 7756             | 103.91                | 75179            | —                 |
| NO. 3 TWEEN DECK.                 | -do-       | 567.7          | 10.37   | 5887             | 80.79                 | 45864            | —                 |
| NO. 4 TWEEN DECK.                 | -do-       | 202.5          | 10.42   | 2110             | 57.68                 | 11680            | —                 |
| NO. 5 TWEEN DECK.                 | -do-       | 457.8          | 10.69   | 4894             | 17.24                 | 7892             | —                 |
| NO. 5 POOP DECK.                  | -do-       | 347.1          | 13.76   | 4776             | 14.78                 | 5130             | —                 |
| Cylinder oil tank.                | Cyl. oil   | 10.0           | 7.96    | 71               | 31.44                 | 314              | —                 |
| REFRIGERATED CARGO.               |            | 235.0          | 10.36   | 2435             | 60.17                 | 14140            | —                 |
| MAIL CARGO.                       |            | 5.1            | 14.81   | 76               | 135.01                | 689              | —                 |
| DECK CARGO. Locomotives           |            | 760.0          | 13.83   | 10510            | 84.04                 | 63870            | —                 |
| CREW AND EFFECTS.                 |            | 10.9           | 14.47   | 158              | 38.28                 | 417              | —                 |
| STORES, SPARES & PROVISIONS.      |            | 84.5           | 11.97   | 1011             | 65.25                 | 5514             | —                 |
| DEAD WEIGHT.                      |            | 10633.2        | 6.915   | 73533            | 75.567                | 803523           |                   |
| LIGHT SHIP.                       |            | 5499.8         | 8.836   | 48596            | 60.084                | 330449           |                   |
| DISPLACEMENT.                     |            | 16133.0        | 7.570   | 122129           | 70.289                | 1133972          | 1372              |

TRIM AND DRAUGHTS.

|                    |   |                 |                   |   |       |    |
|--------------------|---|-----------------|-------------------|---|-------|----|
| DISPLACEMENT.      | = | 16133.0 TONNES. | TRIM. By Stern    | = | 1.954 | M. |
| L. C. G. FROM A.P. | = | 70.289 M.       | IMMERSION AT A.P. | = | 0.971 | M. |
| L. C. B. FROM A.P. | = | 72.644 M.       | EMERSION AT F.P.  | = | 0.983 | M. |
| L. C. F. FROM A.P. | = | 49.68 %         | MEAN DRAUGHT.     | = | 7.788 | M. |
| M.C.T. 1 CM.       | = | 194.4 M-T.      | DRAUGHT AT A.P.   | = | 8.759 | M. |
| TRIMMING MOMENT.   | = | 37993 M-T.      | DRAUGHT AT F.P.   | = | 6.805 | M. |

CONDITION NO. : 10.

SERVICE CONDITION-DEPARTURE SHIP WITH  
HOMOGENEOUS CARGO IN ALL HOLDS AND TWEEN DECKS  
AND LOCOMOTIVES ON UPPER CONDITION.



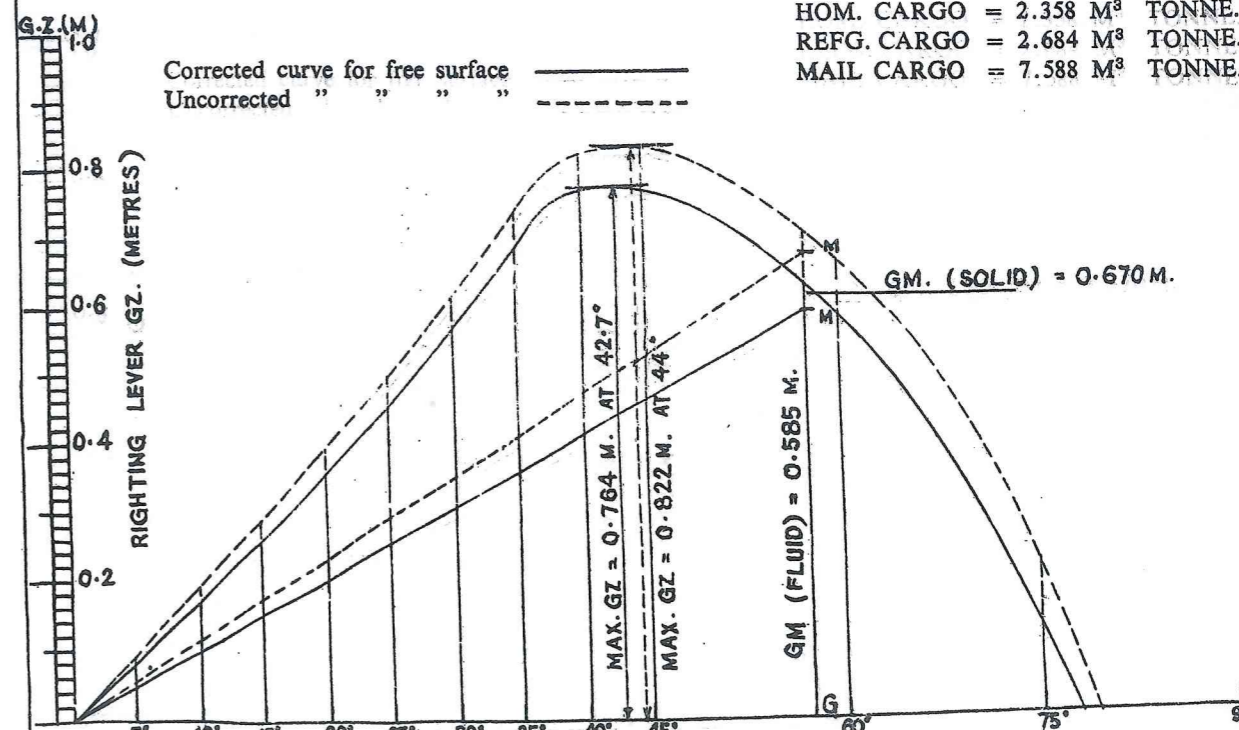
K. M. .... = 8.240 METRES.  
K. G. .... = 7.570 "  
G. M. (Solid) .... = 0.670 "  
F. S CORRECTION..... = - 0.085 "  
CORRECTED G. M. .... = + 0.585 METRES.  
(Fluid)

| θ.                        | 5°    | 10°   | 15°   | 20°   | 25°   | 30°   | 35°                  | 40°   |
|---------------------------|-------|-------|-------|-------|-------|-------|----------------------|-------|
| SIN θ                     | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574                | 0.643 |
| LEVER FROM BASE LINE (KN) | 0.759 | 1.500 | 2.223 | 2.969 | 3.687 | 4.393 | 5.072                | 5.683 |
| - K. G. SIN θ.            | 0.666 | 1.332 | 1.983 | 2.618 | 3.238 | 3.828 | 4.394                | 4.922 |
| G. Z. = (KN-KG SIN θ.)    | 0.093 | 0.168 | 0.240 | 0.351 | 0.449 | 0.565 | 0.678                | 0.761 |
| SIMPSON MULTIPLIERS.      | 4     | 2     | 4     | 2     | 4     | 1     | SUM.                 |       |
| PRODUCT.                  | 0.372 | 0.336 | 0.960 | 0.702 | 1.796 | 0.565 | 4.731                |       |
|                           |       |       |       |       |       |       | SIMPSON MULTIPLIERS. |       |
|                           |       |       |       |       |       |       | 1                    | 4     |
|                           |       |       |       |       |       |       | 0.565                | 2.712 |
|                           |       |       |       |       |       |       | 1                    | SUM.  |
|                           |       |       |       |       |       |       | 0.761                | 4.038 |

AREA UNDER G. Z. CURVE UPTO 30° = 0.0291 x 4.731 = 0.138 M-RAD.  
BETWEEN 30° AND 40° = 0.0291 x 4.038 = 0.118 M-RAD.  
TOTAL AREA TO 40° = 0.256 M-RAD.

STOW. RATE OF CARGO.

HOM. CARGO = 2.358 M<sup>3</sup> TONNE.  
REFG. CARGO = 2.684 M<sup>3</sup> TONNE.  
MAIL CARGO = 7.588 M<sup>3</sup> TONNE.





CONDITION NO. 11 - ARRIVAL  
CALCULATION OF DISPLACEMENT, K.G. & L.C.G. CONDITION.

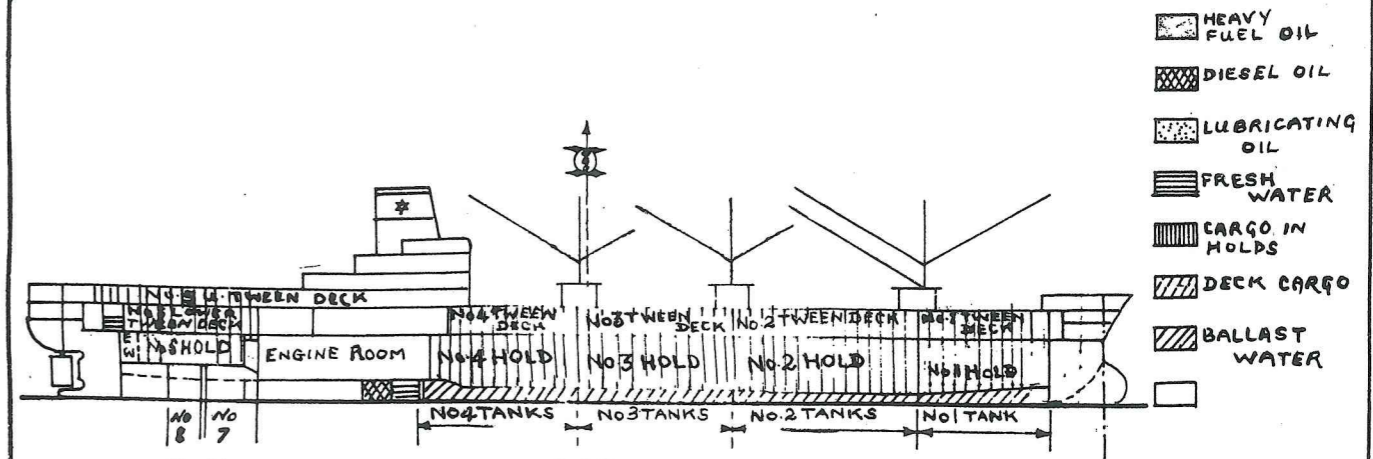
| ITEMS OF DISPLACEMENT.          | CON-TENT.  | WEIGHT TONNES. | K.G. M. | V. MO-MENTS M-T. | L.C.G. (M) FORD (A.P.) | L. MO-MENTS M-T. | Free surface M-T. |
|---------------------------------|------------|----------------|---------|------------------|------------------------|------------------|-------------------|
| FORE PEAK TANK.                 | —          | —              | —       | —                | —                      | —                | —                 |
| NO. 1 D. B. TANK.               | —          | —              | —       | —                | —                      | —                | —                 |
| NO. 2 D. B. TANKS. P & S.       | W.B.       | 414.9          | 0.65    | 270              | 102.20                 | 42403            | —                 |
| NO. 3 D. B. TANKS. P, S & C.    | W.B.       | 442.5          | 0.64    | 283              | 80.63                  | 35679            | 1210              |
| NO. 4 D. B. TANKS. P & S.       | W.B.       | 261.2          | 0.68    | 178              | 58.14                  | 15186            | —                 |
| NO. 4 D. B. TANKS. C.           | —          | —              | —       | —                | —                      | —                | —                 |
| NO. 5 D. B. TANK. P.            | D.O.       | 17.7           | 0.21    | 4                | 38.24                  | 677              | 152               |
| NO. 5 D. B. TANK. S.            | H.F.O.     | 38.0           | 0.64    | 24               | 39.73                  | 1510             | 90                |
| NO. 6 D. B. TANKS. P & S.       | —          | —              | —       | —                | —                      | —                | —                 |
| F.W. FOR ENGINES. S & C         | F.W.       | 20.7           | 0.87    | 18               | 42.46                  | 879              | 21                |
| HFO. SETTLG. & SER. TKS. P & S. | H.F.O.     | 98.4           | 5.69    | 560              | 25.06                  | 2466             | 28                |
| D.O. SETTLG. & SER. TANKS.      | D.O.       | 10.9           | 6.61    | 72               | 27.89                  | 304              | 4                 |
| L.O. STORAGE & SETTLG. TANKS.   | L.O.       | 7.4            | 6.46    | 48               | 32.75                  | 242              | 5                 |
| NO. 7 TANKS. P & S.             | —          | —              | —       | —                | —                      | —                | —                 |
| NO. 8 TANKS. P & S.             | —          | —              | —       | —                | —                      | —                | —                 |
| AFT PEAK TANK.                  | —          | —              | —       | —                | —                      | —                | —                 |
| DRINKING WATER TANKS. S.        | F.W.       | 23.1           | 9.57    | 221              | 5.80                   | 134              | 42                |
| SMALL TANKS IN ENGINE ROOM.     | —          | 9.3            | 6.83    | 64               | 33.38                  | 310              | —                 |
| NO. 1 HOLD.                     | Hom. cargo | 529.3          | 5.59    | 2959             | 123.52                 | 65379            | —                 |
| NO. 2 HOLD.                     | -do-       | 1400.4         | 4.98    | 6974             | 103.14                 | 144437           | —                 |
| NO. 3 HOLD.                     | -do-       | 1223.4         | 5.00    | 6117             | 80.63                  | 98643            | —                 |
| NO. 4 HOLD.                     | -do-       | 1374.0         | 4.99    | 6856             | 58.66                  | 80599            | —                 |
| NO. 5 HOLD.                     | -do-       | 267.3          | 6.91    | 1847             | 17.31                  | 4627             | —                 |
| NO. 1 TWEEN DECK.               | -do-       | 435.9          | 11.17   | 4869             | 124.67                 | 54344            | —                 |
| NO. 2 TWEEN DECK.               | -do-       | 723.5          | 10.72   | 7756             | 103.91                 | 75179            | —                 |
| NO. 3 TWEEN DECK.               | -do-       | 567.7          | 10.37   | 5887             | 80.79                  | 45864            | —                 |
| NO. 4 TWEEN DECK.               | -do-       | 202.5          | 10.42   | 2110             | 57.68                  | 11680            | —                 |
| NO. 5 TWEEN DECK.               | -do-       | 457.8          | 10.69   | 4894             | 17.24                  | 7892             | —                 |
| NO. 5 POOP DECK.                | -do-       | 347.1          | 13.76   | 4776             | 14.78                  | 5130             | —                 |
| Cyl. oil tank                   | Cyl. oil   | 1.0            | 6.80    | 7                | 31.44                  | 31               | —                 |
| REFRIGERATED CARGO.             | —          | 235.0          | 10.36   | 2435             | 60.17                  | 14140            | —                 |
| MAIL CARGO.                     | —          | 5.1            | 14.81   | 76               | 135.01                 | 689              | —                 |
| DECK CARGO. Locomotives         | —          | 760.0          | 13.83   | 10510            | 84.04                  | 63870            | —                 |
| CREW AND EFFECTS.               | —          | 10.9           | 14.47   | 158              | 38.28                  | 417              | —                 |
| STORES, SPARES & PROVISIONS.    | —          | 75.4           | 11.70   | 882              | 64.78                  | 4884             | —                 |
| DEAD WEIGHT.                    | —          | 9960.4         | 7.114   | 70855            | 78.069                 | 777595           | —                 |
| LIGHT SHIP.                     | —          | 5499.8         | 8.836   | 48596            | 60.084                 | 330449           | —                 |
| DISPLACEMENT.                   | —          | 15460.2        | 7.726   | 119451           | 71.671                 | 1108044          | 1552              |

TRIM AND DRAUGHTS.

|                  |   |         |        |                   |   |       |    |
|------------------|---|---------|--------|-------------------|---|-------|----|
| DISPLACEMENT.    | = | 15460.2 | TONNES | TRIM. (by Stern)  | = | 0.846 | M. |
| L.C.G. FROM A.P. | = | 71.671  | M.     | IMMERSION AT A.P. | = | 0.422 | M. |
| L.C.B. FROM A.P. | = | 72.713  | M.     | EMERSION AT F.P.  | = | 0.424 | M. |
| L.C.F. FROM A.P. | = | 49.88   | %      | MEAN DRAUGHT.     | = | 7.500 | M. |
| M.C.T. 1 CM.     | = | 190.4   | M-T.   | DRAUGHT AT A.P.   | = | 7.922 | M. |
| TRIMMING MOMENT. | = | 16110   | M-T.   | DRAUGHT AT F.P.   | = | 7.076 | M. |

CONDITION NO. 11.

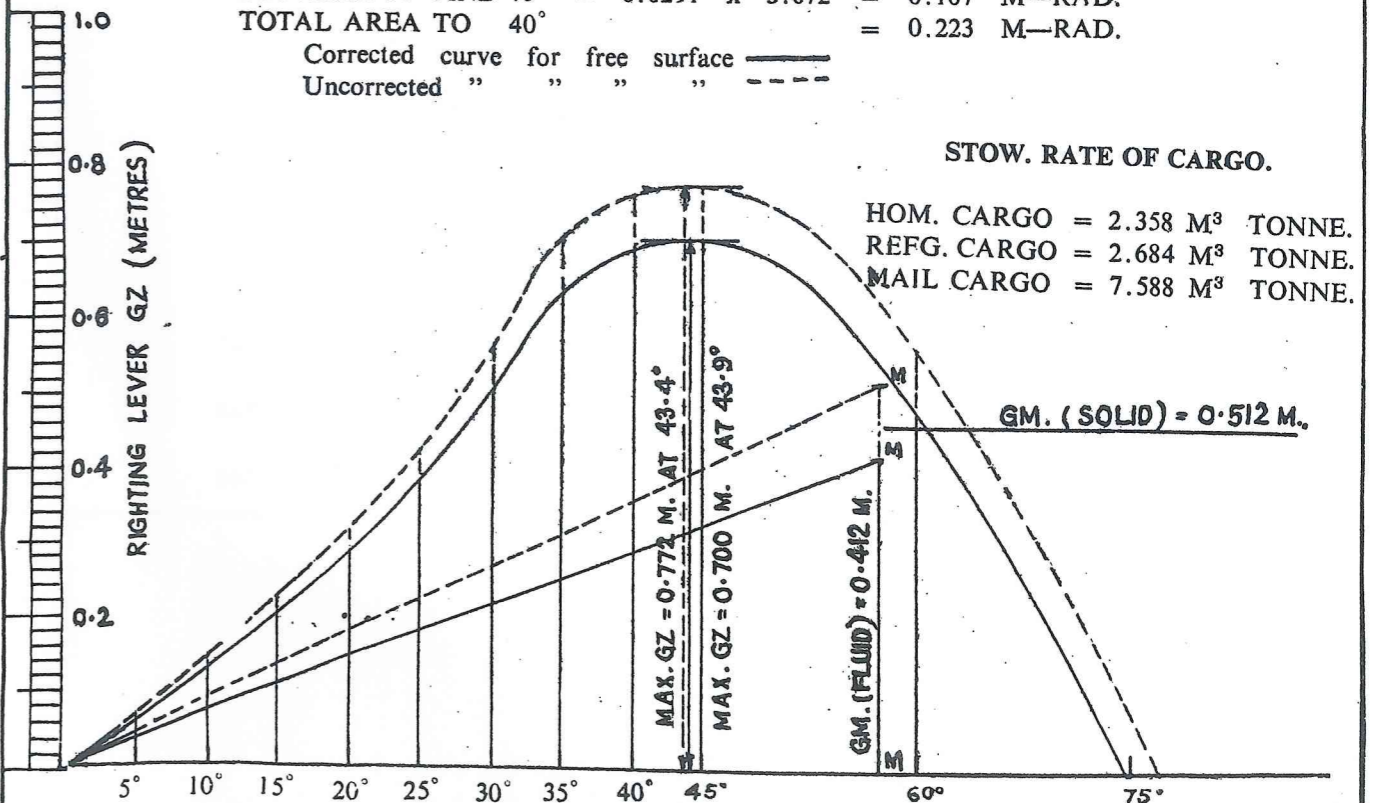
SERVICE CONDITION-ARRIVAL SHIP WITH  
HOMOGENEOUS CARGO IN ALL HOLDS AND TWEEN  
DECKS AND LOCOMOTIVES ON UPPER DECK.



K. M. .... = 8.238 METRES.  
K. G. .... = 7.726 "  
G. M. (Solid) .... = 0.512 "  
F. S. CORRECTION .... = - 0.100 "  
CORRECTED G. M. .... = + 0.412 METRES.  
(Fluid)

| θ.                        | 5°    | 10°   | 15°   | 20°   | 25°   | 30°   | 35°   | 40°   |       |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| SIN θ.                    | 0.087 | 0.174 | 0.259 | 0.342 | 0.423 | 0.500 | 0.574 | 0.643 |       |
| LEVER FROM BASE LINE (KN) | 0.757 | 1.500 | 2.220 | 2.965 | 3.700 | 4.417 | 5.110 | 5.728 |       |
| - K. G. SIN θ.            | 0.681 | 1.362 | 2.027 | 2.676 | 3.310 | 3.913 | 4.492 | 5.032 |       |
| G. Z. = (KN-KG SIN θ)     | 0.076 | 0.138 | 0.193 | 0.289 | 0.390 | 0.504 | 0.618 | 0.695 |       |
| SIMPSON MULTIPLIERS.      | 4     | 2     | 4     | 2     | 4     | 1     | SUM.  |       |       |
| PRODUCT.                  | 0.304 | 0.276 | 0.772 | 0.578 | 1.560 | 0.504 | 3.994 |       |       |
| SIMPSON MULTIPLIERS.      |       |       |       |       |       | 1     | 4     | 1     | SUM.  |
|                           |       |       |       |       |       | 0.504 | 2.472 | 0.696 | 3.672 |

AREA UNDER G. Z. CURVE UPTO 30° = 0.0291 x 3.994 = 0.116 M-RAD.  
BETWEEN 30° AND 40° = 0.0291 x 3.672 = 0.107 M-RAD.  
TOTAL AREA TO 40° = 0.223 M-RAD.



STOW. RATE OF CARGO.

HOM. CARGO = 2.358 M<sup>3</sup> TONNE.  
REFG. CARGO = 2.684 M<sup>3</sup> TONNE.  
MAIL CARGO = 7.588 M<sup>3</sup> TONNE.



TABLE 'A'  
CORRECTION TO AFTER DRAFT TO OBTAIN HYDROSTATIC DRAFT

| Pos. of LCF. From A P | 69    | 70    | 71    | 72    | 73    | 74    |
|-----------------------|-------|-------|-------|-------|-------|-------|
| Trim (m)              |       |       |       |       |       |       |
| 0.20                  | .096  | .098  | .099  | .100  | .102  | .103  |
| 40                    | .193  | .195  | .198  | .201  | .204  | .207  |
| 60                    | .289  | .293  | .298  | .302  | .306  | .310  |
| 80                    | .386  | .391  | .397  | .402  | .408  | .414  |
| 1.00                  | .482  | .489  | .496  | .503  | .510  | .517  |
| 20                    | .578  | .587  | .595  | .604  | .612  | .620  |
| 40                    | .675  | .685  | .694  | .704  | .714  | .724  |
| 60                    | .771  | .782  | .794  | .805  | .816  | .827  |
| 80                    | .868  | .880  | .893  | .905  | .918  | .930  |
| 2.00                  | .964  | .978  | .992  | 1.006 | 1.020 | 1.034 |
| 20                    | 1.060 | 1.076 | 1.091 | 1.106 | 1.122 | 1.137 |
| 40                    | 1.157 | 1.174 | 1.190 | 1.207 | 1.224 | 1.241 |
| 60                    | 1.253 | 1.271 | 1.289 | 1.308 | 1.326 | 1.344 |
| 80                    | 1.350 | 1.369 | 1.389 | 1.408 | 1.428 | 1.447 |
| 3.00                  | 1.446 | 1.467 | 1.488 | 1.509 | 1.530 | 1.551 |
| 20                    | 1.542 | 1.565 | 1.587 | 1.609 | 1.632 | 1.654 |
| 40                    | 1.639 | 1.662 | 1.686 | 1.710 | 1.734 | 1.757 |
| 60                    | 1.735 | 1.760 | 1.785 | 1.811 | 1.836 | 1.860 |
| 80                    | 1.832 | 1.858 | 1.885 | 1.911 | 1.938 | 1.964 |
| 4.00                  | 1.928 | 1.956 | 1.984 | 2.012 | 2.040 | 2.068 |
| 20                    | 2.024 | 2.054 | 2.083 | 2.112 | 2.142 | 2.171 |
| 40                    | 2.121 | 2.151 | 2.182 | 2.213 | 2.244 | 2.274 |
| 60                    | 2.217 | 2.249 | 2.281 | 2.313 | 2.346 | 2.378 |

NOTES TO CALCULATE TRIM OF VESSEL AFTER LOADING/DISCHARGING/SHIFTING

- For a vessel with no trim, arithmetical mean draft is the same as the Hydrostatic draft. For a vessel which is trimmed, obtain the arithmetical mean draft. Determine the position of LCF from AP, for this mean draft.
- Calculate the hydrostatic draft as below:—  
 Hydro. draft = Draft Aft. - correction from table 'A'.  
 Note:— Correction is (-ve when trimmed by stern)  
 (+ve when trimmed by head)
- From the Hydrostatic tables, determine against the hydrostatic draft the corresponding displacement (if not given).
- List the various weights involved in arriving at the final displacement, viz original displacement, weights loaded, discharged or shifted together with their Lcf's. Calculate the final longitudinal moment and final displacement.
- Find the LCG from AP as follows:—  

$$\text{LCG from AP} = \frac{\text{Final long moments}}{\text{Final displacement}}$$
- Determine against final displacement, the values of hydrostatic draft, MCTC, LCB and LCF.
- Total trim "t" (metre) =  $\frac{\text{LCB} - \text{LCG}}{\text{MCTC} \times 100} \times \text{Displacement}$
- Trim aft 'ta' (metre) =  $\frac{'t' \times \text{LCF}}{\text{LBP}}$
- Trim forward 'tf' (metre) = "t" - 'ta'  
 Draft aft = Hydrostatic draft - 'ta'  
 Draft fwd = Hydrostatic draft - 'tf'

