

## Enclosure 2.4.4.51

17. 10. 1979

|                |   |              |             |            |
|----------------|---|--------------|-------------|------------|
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|                |   |              |             |            |
| Nr.            | Art. der Änderung   | Datum        | Name        |            |
| 74016<br>1.200 | Jos. L. Meyer Papenburg (Ems)<br>Schiffswerft, Maschinenfabrik, Dockbetrieb |              |             |            |
| Datum:         | EVACUATION PLAN   |              |             |            |
| 7.10.79        |   |              |             |            |
| Geparkt:       | Schiffs Nr.   | Seafions Nr. | Zeichn. Nr. | Archiv Nr. |
|                | 590   |              | 021.14      | G.1        |



## Enclosure 2.4.4.52

20. 2. 1980

| Nr. | Art der Änderung:   | Datum               | Name:  |
|-----|---|---------------------|--|
| 1   | Jos. L. Meyer Papenburg (Ems)<br>Schiffswerft, Maschinenfabrik, Dockbetrieb | 11/00               |  |
| 2   | LATERNENPLAN<br>SIGNAL-LIGHTS   | 20.2.80             | 23.80<br>Die Schiffsprüfstelle für<br>Sicherheit und Technik |
| 3   | Gewicht:  | Schiffs Nr.:<br>590 | Seitens Nr.:<br>81/3   |
|     |   |                     | Archiv Nr.:<br>G.1   |

Mitte 390/79/377

Mitte 390/79/377

|   |  |
|---|--|
| Jos. L. Meyer, Papenburg-Ems  |  |
| Schiffswerft, Maschinenfabrik, Dockbetrieb  |  |
| Anl. 6.   |  |
| YARD NO. 590  |  |
| MS VIKING SALLY   |  |
| <u>TRIM AND STABILITY BOOKLET</u>   |  |
| <u>Owner:</u> Rederiaktiebolaget SALLY<br>Strandvägen 7<br>SF-22100 Mariehamn   |  |
| <u>Builders:</u> Schiffswerft JOS. L. MEYER<br>Industriegebiet Süd<br>D-2990 Papenburg/FMS  |  |
|  <div style="display: flex; align-items: center;"> <span style="margin-right: 10px;">APPROVED WITH<br/>REMARKS NOTED</span> <div style="border: 1px solid black; padding: 2px 10px; background-color: white;">           BUREAU OF SHIPS, 11.2.1980<br/> <i>[Signature]</i> </div> </div> |  |

**Enclosure 2.4.4.54**

**The German Group of Experts  
investigating the sinking of M/V "ESTONIA"**  
c/o AHLERS & VOGEL · Scharlort 1 D-20459 Hamburg · Telephone 49-40-371075

Memo for Dr. Holtappels

re: 2nd Meeting with F.B.N. on 27.10.95

- Attendants:
    - Muttilainen - Deputy General Manager
    - Valkonen - Head of Maritime Dept.
    - Makkonen - Head of Legal Dept.
    - Fabritius - Naval Architect employed by F.B.N.
    - H. Gahmberg - Lawyer Bützow & Co., Helsinki (HG)
    - Dr. Holtappels -
    - Werner Hummel (WH)
  - Up-date by Dr. Holtappels on legal situation.
  - HG: It was agreed to have a presentation of the facts.
  - Dr. Holtappels
    - : We want an open discussion about the situation in 1980 as to issuance of PSSC:
      - a) Why no Exemption Certificate?
      - b) Why not reported to IMO?
    - : What does F.B.N. know about "Mariella" and "Viking Saga" incidents?
    - : What is the F.B.N. opinion on the IHK?
  - (Dr. Holtappels immediately submits his own opinion, viz. that IHK does not want to put the facts on the table) and also mentions the meeting with the EU Commission which is considering to constitute its own commission).

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2nd Meeting FBN on 27.10.95

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- Presentation of investigation results by WH and subsequent discussion

- **Valkonen**

: F.B.N. has all the right to know the procedure of the IHK and this was expressed in writing to Kari Lethola together with copies of documents relating to "Viking Sally", "Silja Star", "Wasa King" (3-5 cm thick).

: F.B.N. had no official knowledge of "Mariella" incident and have up-to-day not heard from "Viking Saga". They later found out that the course went over shallow water and right there she was struck. It has been established that around this shoal the waves rise tremendously under SW-ly wind conditions.

As a consequence of the "Estonia" casualty they have issued a navigation warning to the effect that shoals might create enormous wave height and steepness. Soundings, however, subsequently revealed that the shoal effect did not play a role in the "Estonia" casualty.

- It turned out that the naval architect Fabritius had been working with Wärtsilä Shipyard in Turku - the builders of "Mariella" - at that time and knows lots of details about damage, repairs, etc. He stated that the vessel did not return to Helsinki - as we were told earlier - but proceeded to Stockholm at 3 kn, where the visor was temporarily repaired before next sailing.
- Upon presentation of the correspondence between von Tell AB/F.B.N. in connection with newbuilding "Viking Sally" and the F.B.N. requirements for drawings, etc. Mr. Valkonen confirmed that the reply of F.B.N. demonstrated exactly the attitude of those years. At that time there were 3 men in the technical department, who were basically busy with their own (F.B.N.) vessels. Valkonen was then head of the inspection department.

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They never calculated required strength of locking devices, they had no means to do so at that time, it was part of the class responsibility and also of the yard.

- Valkonen confirmed that the bow ramp was the collision bulkhead in "Viking Sally".

F.B.N. 1980

| <u>Technical Bureau</u> | <u>Inspection Bureau</u> |
|-------------------------|--------------------------|
| Edelmann                | Valkonen                 |
| Haateinen               | Jan Jansson              |
| Wibeck                  |                          |

- PSSC was at first issued temporarily for voyage Yard to Mariehamn, and thereafter the vessel got a restricted PSSC because not all passenger cabins were ready. The certificates were issued by his office and then submitted to the General Manager - then Mutttilainen - for approval.

- He and Mutttilainen signed an agreement to the effect that the trading area of "Viking Sally" was restricted to "not more than 20 nm from the nearest land" until all outstanding work would have been completed.
- When the vessel came the first time to Turku he and Gunnar Peper, their local surveyor from Kotka (now retired), had a severe car accident on the way to Turku, whereby both were injured. Finally in Turku they marked on a respective drawing all parts not to be used by passengers and limited the number of passengers to 700 stating that the 20 nm limit was valid until the vessel was totally completed. At a meeting on 19.7.80 it was decided that the vessel was now completed and the first real PSSC was issued, however, restricted to "Kustfart mellan Finland och Sverige" which related to manning requirements only, not to structural parts. The same PSSC was issued in 1982 and in 1983. Thereafter the term "Kustfart" disappeared.

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- Valkonen stated that they were not aware that "Viking Sally" did not comply with SOLAS 1974, because all structural parts are - in their view - based on the 'Copenhagen Convention 1924' the responsibility of the class. According to Valkonen the recognised classification societies - DnV, LR, ABS, GL, but also BV - have to approve all structural matters including the SOLAS requirements as otherwise the Maritime Authorities would be forced to have own staff and equipment available to be able to carry out necessary calculations and inspections which the classification societies have anyway.
- Valkonen drew attention to the "Finnhansa" incident when half of the sliding doors were lost in heavy weather and to the "Fennia", which was built in Sweden 1964 with bow ramp - collision bulkhead and ever since has been sailing in unchanged condition. He also pointed out that the bow ramp is a very strong part because 40-ts trucks can drive over it.
- "Viking 4" / "Earl of Granville" conversion discussed.
- F.B.N. was not informed by owners and/or BV that "Wasa King" would be respectively was sold. They got if from the registrar after she was sold and renamed "Estonia". There have not been any discussions whatsoever between F.B.N. and BV concerning the take-over, also not concerning the new role of BV representing the flag state authority a/o in SOLAS matters.
- F.B.N. also carries out port-state-inspections onboard of Estonian vessels when in Finnish ports and not seldom have they found deficiencies onboard

vessels which had just passed a special survey of the BV surveyor.

Upon being confronted with the remarks, which the BV plan approver Desouza had made on drawing 1103, Valkonen stated: It is out of the question that they could ever have been able to calculate strength of locking devices or the like and they have to rely on the Copenhagen Convention.

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- They promised to check the drawings they have for possible remarks.
- Jukka Häkämies is attending the meetings of the Finnish Commission and also attends the full Commission meetings at Tallinn. He keeps the information he obtains confidential.
- Valkonen informs about rumours saying that the locking devices were constructed on basis of wrong drawings and therefore were under-dimensioned. WH explained actual situation based on recently taken statements from yard workers.
- Valkonen confirmed that due to the so-called "pumping effect" the water quantity inside the visor was continuously increasing due to the up-and-down movement of the bow in headseas and that model tests had confirmed that this effect was much larger with smaller openings compared to larger holes.

Werner Hummel



|  |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
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| <b>MATKUSTAJA-ALUKSEN TURVALLISUUSKIRJA<br/>SÄKERHETSCERTIFIKAT FÖR PASSAGERARFARTYG</b>   |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| <b>SUOMI</b><br><b>FINLAND</b>   |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| <p>Kansainvälisellä matkalle,<br/>lyhyelle kansainväliselle matkalle,<br/>för en internationell resa.</p> <p>Annettu ihmishengen turvallisuudesta merellä vuonna 1960 tehdyn kansainvälisen yleissopimuksen määritysten mukaisesti<br/>Utfärdat enligt bestämmelserna i internationella konventionen om säkerhet för människoliv till sjöss, 1960</p>  |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| <b>Enclosure 2.4.4.55</b>  |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| Aluksen nimi<br>Fartygets namn   | Tunnus-<br>kirjaimet<br>Igenkännings-<br>bekräftever | Kolpalkka<br>Hemort  | Bruttovägoitus<br>Bruttodräktighet | Tiedot III luun 27 sijainnista<br>nrl 7 kohdan mukaan<br>Detaljer berörfards even-<br>tuella resor, tillfina enl.<br>kapitel III, regel 27 cl 7 | Kölinlaskemispäivä<br>Datum,<br>då kölen sträcktes |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| <b>VIKING_SALLY</b>  | <b>OYKJ</b>  | <b>Mariehamn</b>     | <b>15566,89</b>                    |   | <b>1979</b>  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| <p>Minä, allekirjoittanut, todistan:</p> <ol style="list-style-type: none"> <li>I. Etta kysymyksessä oleva alus on asiamukaisesti kattavasti edellä mainitun sopimuksen määritysten mukaisesti.</li> <li>II. Etta kattauksessa todettu aluksen liitytään sanottuna sopimuksen liittyviin sääntöjen vastimukset, sikillä kuin kysymyksessä on:             <ol style="list-style-type: none"> <li>1. aluksen rakenne, pää- ja apukäytät ja muut paineestat sekä koneisto;</li> <li>2. vedenpiiriä varten osatolimiten järjestely ja yksityiskohtat;</li> <li>3. seuraavat osatolimitatilivarat;</li> </ol> </li> </ol>  |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| <p>Jag, underskriven, bestryker:</p> <ol style="list-style-type: none"> <li>I. Att ovan angivna fartyg undergått vederbörig besiktning enligt bestämmelserna i ovan nämnda konvention.</li> <li>II. Att besiktningen utvisade, att fartyget uppfyllde fordringarna i de regler, som är bifogade nämnda konvention, i vad avser:             <ol style="list-style-type: none"> <li>1. konstruktionen, huvud- och hjälplagnpannor och andra tryckkärl samt maskineri;</li> <li>2. anordning och detaljer av den vattenlära rumsindelningen;</li> <li>3. följande indelningar/vattenlinjer:</li> </ol> </li> </ol>   |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="padding: 2px;">Alukselle määritetyt ja sen kylkoon pitävien keskikohdalle määritetyt vedenlära-/vattentilavat<br/>keskikohdille luontevaan tilaan</td> <td colspan="4" style="padding: 2px;">Varalaita<br/>Frilörd</td> <td colspan="4" style="padding: 2px;">Käytettävä milloin matkustajia kuljetetaan seuraavissa<br/>vaihtoehtoissa: matkailua käytettäessä ilman<br/>matkustajia ja matkailua käytettäessä ilman<br/>matkustajia ja vähintään 50% matkustajia</td> </tr> <tr> <td colspan="2" style="padding: 2px;">För fartyget fastställda och märktes<br/>öf fartygsidorna utmärkta indelningar<br/>vattenlinjer (Kap. II regd 11)</td> <td colspan="4" style="padding: 2px;"></td> <td colspan="4" style="padding: 2px;"></td> </tr> <tr> <td style="width: 15%;">C. 1</td> <td style="width: 15%;">2062 mm</td> <td colspan="4"></td> <td colspan="4"></td> </tr> <tr> <td>C. 2</td> <td></td> <td colspan="4"></td> <td colspan="4"></td> </tr> <tr> <td>C. 3</td> <td></td> <td colspan="4"></td> <td colspan="4"></td> </tr> <tr> <td colspan="6" style="text-align: center;">1230</td> <td colspan="4"></td> </tr> </table> |  |                      |                                    |   |  | Alukselle määritetyt ja sen kylkoon pitävien keskikohdalle määritetyt vedenlära-/vattentilavat<br>keskikohdille luontevaan tilaan   |  | Varalaita<br>Frilörd |  |  |  | Käytettävä milloin matkustajia kuljetetaan seuraavissa<br>vaihtoehtoissa: matkailua käytettäessä ilman<br>matkustajia ja matkailua käytettäessä ilman<br>matkustajia ja vähintään 50% matkustajia |  |  |  | För fartyget fastställda och märktes<br>öf fartygsidorna utmärkta indelningar<br>vattenlinjer (Kap. II regd 11) |  |  |  |  |  |  |  |  |  | C. 1 | 2062 mm |  |  |  |  |  |  |  |  | C. 2 |  |  |  |  |  |  |  |  |  | C. 3 |  |  |  |  |  |  |  |  |  | 1230 |  |  |  |  |  |  |  |  |  |
| Alukselle määritetyt ja sen kylkoon pitävien keskikohdalle määritetyt vedenlära-/vattentilavat<br>keskikohdille luontevaan tilaan  |  | Varalaita<br>Frilörd |                                    |   |  | Käytettävä milloin matkustajia kuljetetaan seuraavissa<br>vaihtoehtoissa: matkailua käytettäessä ilman<br>matkustajia ja matkailua käytettäessä ilman<br>matkustajia ja vähintään 50% matkustajia |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| För fartyget fastställda och märktes<br>öf fartygsidorna utmärkta indelningar<br>vattenlinjer (Kap. II regd 11)  |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| C. 1   | 2062 mm  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| C. 2   |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| C. 3   |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| 1230   |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| <p>III. Etta pelastusvenälaita oli riittävästi enintään ... henkilös varten, nimittäin</p> <p>18. pelastusvenettä (niihin luetutina ... 18 ... motoripelastusvenettä), joihin mahtuu ... 692 ... henkilöä, ja ... radiosähkö-<br/>tydäiteiläjä valonheitimellä varustettua moottoripelastusvenettä (mitkä sisältävät edellä mainittuun pelastusveneiden kokonaismäärään), joista veneksi tulee olla ... 390 ... hyväksytty pelastusvenemiesti;</p> <p>12. pelastusauttaa, joita varren vaaditaan hyväksytty vesilleskulaikheet ja joille mahtuu ... 1275 ... henkilöä; ja</p> <p>51. pelastusauttaa, joita varren ei vaudita hyväksytty vesilleskulaikheet ja joille mahtuu ... 1275 ... henkilöä;</p>   |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |
| <p>III. Att livräddningsredskopen varo tillräckliga för högst ... personer, nämligen</p> <p>10. livbilar (där inskänade ... 10 ... motorlivbilar) tillräckliga för ... 692 ... personer, och ... motorlivbåtar försedda med<br/>radiotelegrafinstallation och strålkastare (infäknade i det ovan angivna sammanlagda antalet livbilar) åvensom ... 300 ... motor-<br/>livbåtar utrustade endast med strålkastare (också infäknade i ovan angivna sammanlagda antalet livbåtar), förförande ...<br/>godkända livbåtmän;</p> <p>12. livbåtar, för vilka fordras godkända sjösättningсанordningar, tillräckliga för ... 300 ... personer; och</p> <p>51. livbåtar, för vilka godkända sjösättningсанordningar icke fordras, tillräckliga för ... 1275 ... personer;</p>   |  |                      |                                    |   |  |   |  |                      |  |  |  |   |  |  |  |   |  |  |  |  |  |  |  |  |  |      |         |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |

6 kulumavälinettä, jotka kykenevät kannattamaan ..... 120 henkilöitä;  
 18 pelastusengasta;  
 227 pelastusliiviä.  
 6 flytredskap, tillräckliga för ..... personer;  
 12 livbojar;  
 2293 livrästar.

- IV. Ett pelastusveneet ja pelastusaluit oli varustettu sääntöjen määrysten mukaisesti.  
 V. Että pelastusveneellä määrysten mukainen muoranheittoala sekä pelastusveneiden ja pelastuslaitojen siirrettävä radiolaite.  
 VI. Että alus täytti radiosähkötydälteinä koskevat sääntöjen vaatimukset seuraavasti:  
 VII. Att livbåtar och livflottarna varo utrustade enligt bestämmelserna i dessa regler.  
 VIII. Att fartyget var försedd med linkningsapparat och bärbar radioapparat för livbåtar och livflottar enligt bestämmelserna i dessa regler.  
 IX. Att fartyget uppfyllde fordringarna i dessa regler i vad avser radiotelegrafinstallationer, som följer:

|   | Sääntöjen vaatimukset<br>Fordringar enligt reglerna                 | Todellisuudessa<br>I verkligheten   |
|---|---|---|
| Radiosähkötytäjän kuuntelutunten määrä                                  | HS  | HS  |
| Lysningstimer för radiotelegrafist                                      | 1   | 1   |
| Radiosähkötytäjien lukumäärä  | Antal radiotelegrafister  | 1   |
| Onko automaattinen hälytin  | Finnes automatlarm  | 1   |
| Onko pääradioalaitteet  | Finnes huvudinstallation  | 1   |
| Onko vararadioalaitteet   | Finnes reservinstallation   | erilliset<br>separata   |
| Onko pääradioalaitteet ja vararadioalaitteet erilliset vai yhdessä?     | Onko pääradioalaitteet ja vararadioalaitteet erilliset vai yhdessä? | erilliset<br>separata   |
| Ara huvudsändare och reservändare elektriskt separata eller kombinerade | 1   | 1   |
| Onko radioasennustimilaitteet   | Finnes radiopositioner  | Ihyillä kansainvälisillä matkoilla 1100<br>Tällaiset annat passagare 1100 |
| Salitut matkustajamatkästä  | Tällaiset annat passagare   | För kort internationell resa  |

- VII. Ett mötter pelastusveneiden radiosähkötydältein ja pelastusveneiden ja pelastusaluitojen siirrettävä radiolaite, milloin sellainen on, toimivat sääntöjen määrysten mukaisesti.  
 VIII. Että alus täytti tulipalon havaitsemie ja sammuusulaitteita koskevat sääntöjen vaatimukset ja että siinä oli valot ja merkkikuvio, luotsikkia sekä laitteet sini- ja härämerkkien antamista varten näiden sääntöjen määrysten ja kansainvälisen meriteiden mäntöjen mukaisesti.  
 IX. Että alus kaikissa muissa suhteissa täytti sääntöjen vaatimukset, mikäli ne ovat silien sovellettavissa.  
 X. Att radiotelegrafinstallationer i motordrivna båtar och bärbar radioapparat för livbåtar och livflottar, om sådana finns, fungerade i överensstämme med föreskrifterna i dessa regler.  
 XI. Att fartyget uppfyllde fordringarna i vad avser anordningar för uppkläckande och släckning av brand samt var försedd med ljus och signalfigurer, lösledgåre åvensom med anordningar för avgivande av ljussignaler och nödsignaler enligt bestämmelserna i dessa regler och i de internationella sjövägreglerna.  
 XII. Att fartyget i alla övriga hänseenden uppfyllde fordringarna i dessa regler, i den mån de är tillämpliga å fartyget.

Tämä todistuskirja on annettu Suomen hallituksen puolesta.  
 Denna certifikat är utfärdat på finska regeringens vägnar,  
 21 päivän heinäkuuta/juli 86  
 Todistuskirja on voimassa ..... 19..... saakka.  
 Certifikatet gäller intill den  
 Annettu Helsingissä 27 ..... päivän ..... juni/kesä ..... kuuta 19 .....  
 Utfärdat i Helsingfors den

Allkokoontunut ilmoittaa olevansa mainittujen hallituksen sallinutkaisesta valtuuttama antamaan tähän todistuskirjan.  
 Undertecknad förklarar sig vara en nämnd regering behörigen bemyndigad att utfärdta detta certifikat.

10 -  
 Leima ..... mk.  
 Stämpel .....  
 HD Nr: ..... Merenkuluntarkastaja ..... Jen-Janson .....  
 HD Nr: ..... Sjöfartsinspektör .....  
 Allkokoontunut ilmoittaa olevansa mainittujen hallituksen sallinutkaisesta valtuuttama antamaan tähän todistuskirjan.  
 Undertecknad förklarar sig vara en nämnd regering behörigen bemyndigad att utfärdta detta certifikat.

|    | <b>PASSENGER SHIP SAFETY CERTIFICATE</b> |  |               |   |  |   |                               |  |               |   |                             |              |      |          |          |  |      |
|---|--|--|---------------|---|--|---|-------------------------------|--|---------------|---|-----------------------------|--------------|------|----------|----------|--|------|
|   |  |  |               |   | FINLAND  |   |                               |  |               |   |                             |              |      |          |          |  |      |
|   |  |  |               |   | <b>Enclosure 2.4.4.56</b>  |   |                               |  |               |   |                             |              |      |          |          |  |      |
|   |  |  |               |   | for <del>369</del><br>a short international voyage.  |   |                               |  |               |   |                             |              |      |          |          |  |      |
|   |  |  |               |   | Issued under the provisions of the<br>International Convention for the Safety of Life at Sea, 1960 |   |                               |  |               |   |                             |              |      |          |          |  |      |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Name of Ship</th> <th>Distinctive Number or Letters</th> <th>Port of Registry</th> <th>Gross Tonnage</th> <th>Particulars of voyages, if any, mentioned under Regulation 27 (c) (VIII) of Chapter III</th> <th>Date on which keel was laid</th> </tr> </thead> <tbody> <tr> <td>VIKING SALLY</td> <td>OIKN</td> <td>Marihamn</td> <td>15566,88</td> <td></td> <td>1979</td> </tr> </tbody> </table>   |  |  |               |   |  | Name of Ship  | Distinctive Number or Letters | Port of Registry   | Gross Tonnage | Particulars of voyages, if any, mentioned under Regulation 27 (c) (VIII) of Chapter III | Date on which keel was laid | VIKING SALLY | OIKN | Marihamn | 15566,88 |  | 1979 |
| Name of Ship  | Distinctive Number or Letters            | Port of Registry   | Gross Tonnage | Particulars of voyages, if any, mentioned under Regulation 27 (c) (VIII) of Chapter III | Date on which keel was laid  |   |                               |  |               |   |                             |              |      |          |          |  |      |
| VIKING SALLY  | OIKN                                     | Marihamn   | 15566,88      |   | 1979   |   |                               |  |               |   |                             |              |      |          |          |  |      |
| <p>I, the undersigned certify:</p> <ol style="list-style-type: none"> <li>I. That the above-mentioned ship has been duly surveyed in accordance with the provisions of the Convention referred to above.</li> <li>II. That the survey showed that the ship complied with the requirements of the Regulations annexed to the said Convention as regards:             <ol style="list-style-type: none"> <li>the structure, main and auxiliary boilers and other pressure vessels and machinery;</li> <li>the watertight subdivision arrangements and details;</li> <li>the following subdivision loadlines:</li> </ol> </li> </ol>   |  |  |               |   |  |   |                               |  |               |   |                             |              |      |          |          |  |      |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Subdivision loadlines assigned and marked on the ship's side of amidships (Regulation 11 of Chapter II)</th> <th style="width: 25%;">Freeboard</th> <th style="width: 50%;">To apply when the spaces in which Passengers are carried include the following alternative spaces:</th> </tr> </thead> <tbody> <tr> <td>C. 1</td> <td>2052 mm</td> <td></td> </tr> <tr> <td>C. 2</td> <td></td> <td></td> </tr> <tr> <td>C. 3</td> <td></td> <td></td> </tr> </tbody> </table>  |  |  |               |   |  | Subdivision loadlines assigned and marked on the ship's side of amidships (Regulation 11 of Chapter II) | Freeboard                     | To apply when the spaces in which Passengers are carried include the following alternative spaces: | C. 1          | 2052 mm   |                             | C. 2         |      |          | C. 3     |  |      |
| Subdivision loadlines assigned and marked on the ship's side of amidships (Regulation 11 of Chapter II)   | Freeboard                                | To apply when the spaces in which Passengers are carried include the following alternative spaces: |               |   |  |   |                               |  |               |   |                             |              |      |          |          |  |      |
| C. 1  | 2052 mm                                  |  |               |   |  |   |                               |  |               |   |                             |              |      |          |          |  |      |
| C. 2  |  |  |               |   |  |   |                               |  |               |   |                             |              |      |          |          |  |      |
| C. 3  |  |  |               |   |  |   |                               |  |               |   |                             |              |      |          |          |  |      |
| <p>III. That the life-saving appliances provide for a total number of <b>1280</b> persons and no more, viz.:</p> <p>10 lifeboats (including <b>10</b> motor lifeboats) capable of accommodating <b>692</b> persons, and <b>—</b> motor lifeboats fitted with radiotelegraph installation and searchlight (included in the total lifeboats shown above) and <b>—</b> motor lifeboats fitted with searchlight only (also included in the total lifeboats shown above), requiring <b>—</b> certificated lifeboatmen;</p> <p><b>12</b> liferafts, for which approved launching devices are required, capable of accommodating <b>300</b> persons; and <b>51</b> liferafts, for which approved launching devices are not required, capable of accommodating <b>1275</b> persons;</p> <p><b>6</b> buoyant apparatus capable of supporting <b>120</b> persons;</p> <p><b>18</b> lifebuoys;</p> <p><b>2298</b> lifejackets.</p> |  |  |               |   |  |   |                               |  |               |   |                             |              |      |          |          |  |      |

- IV. That the lifeboats and liferafts were equipped in accordance with the provisions of the Regulations.  
 V. That the ship was provided with a line-throwing appliance and portable radio apparatus for survival craft in accordance with the provisions of the Regulations.  
 VI. That the ship complied with the requirements of the Regulations as regards radiotelegraph installations, viz.:.

|  | Requirements of Regulations      | Actual provision |
|--|----------------------------------|------------------|
| Hours of listening by operator .....   | 118                              | 118              |
| Number of operators .....  | 1                                | 1                |
| Whether auto alarm fitted .....  | 1                                | 1                |
| Whether main installation fitted .....   | 1                                | 1                |
| Whether reserve installation fitted .....                                      | separated                        | separated        |
| Whether main and reserve transmitters electrically separated or combined ..... | 1                                | 1                |
| Whether direction-finder fitted .....  | for a short international voyage | 1100             |
| Number of passengers for which certificated .....                              |                                  |                  |

- VII. That the functioning of the radiotelegraph installations for motor lifeboats and/or the portable radio apparatus for survival craft, if provided, complied with the provisions of the Regulations.  
 VIII. That the ship complied with the requirements of the Regulations as regards fire-detecting and fire-extinguishing appliances and was provided with navigation lights and shapes, pilot ladder, and means of making sound signals and distress signals, in accordance with the provisions of the Regulations and also the International Collision Regulations.  
 IX. That in all other respects the ship complied with the requirements of the Regulations, so far as these requirements apply thereto.

This certificate is issued under the authority of the Finnish Government.

21st July 1980  
 It will remain in force until the ..... day of ..... 19.....  
 Issued at Helsinki the ..... 27th day of June 1980

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

Inspector of Navigation  
 Jan Janson

Stamp ..... mk.  
 ID No:.....

|  <b>MATKUSTAJA-ALUKSEN TURVALLISUUSKIRJA</b><br><b>SÄKERHETSCERTIFIKAT FÖR PASSAGERARFARTYG</b>   | <b>SUOMI</b><br><b>FINLAND</b>                 |   |   |   |   |   |   |              |      |  |          |  |      |
|---|--|---|---|---|---|---|---|--------------|------|--|----------|--|------|
| <b>Enclosure 2.4.4.57</b>   |  |   |   |   |   |   |   |              |      |  |          |  |      |
| <p>Käytä tämäkseni matkalle.<br/>Tyytymme kansainväliselle matkalle.</p> <p>För<br/>kort internationell resa.</p> <p>Annettu ihmishengen turvallisuudesta merellä vuonna 1960 tehdyn kansainvälisen yleissopimuksen määrysten mukaisesti<br/>Utlärdet enligt bestämmelserna i internationella konventionen om säkerhet för människor i till sjöss, 1960</p>   |  |   |   |   |   |   |   |              |      |  |          |  |      |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Aluksen nimi<br/>Partytgets namn</th> <th style="width: 15%;">Tunnus-<br/>koodin-<br/>lämäntings-<br/>bokstäver</th> <th style="width: 15%;">Koripaikka<br/>Hamnen</th> <th style="width: 15%;">Brutto-voimansumma<br/>Bruttodräktighets-<br/>summa</th> <th style="width: 15%;">Tiedot III luvan 27 säännöistä ja kohdan mukaan<br/>detaljer om lastens förflyttning<br/>Detaljer beträffande even-<br/>tualna resor, tillstånd enl.<br/>kapitel III, regel 27 c)</th> <th style="width: 15%;">Kölinskeimpäivä<br/>Datum,<br/>då kölen sträcktes</th> </tr> </thead> <tbody> <tr> <td>VIKING SALLY</td> <td>OTMA</td> <td>Västervik<br/>Varbergs hamn<br/>Varbergs hamn</td> <td>15556,95</td> <td></td> <td>1575</td> </tr> </tbody> </table>   |  | Aluksen nimi<br>Partytgets namn   | Tunnus-<br>koodin-<br>lämäntings-<br>bokstäver    | Koripaikka<br>Hamnen  | Brutto-voimansumma<br>Bruttodräktighets-<br>summa | Tiedot III luvan 27 säännöistä ja kohdan mukaan<br>detaljer om lastens förflyttning<br>Detaljer beträffande even-<br>tualna resor, tillstånd enl.<br>kapitel III, regel 27 c) | Kölinskeimpäivä<br>Datum,<br>då kölen sträcktes | VIKING SALLY | OTMA | Västervik<br>Varbergs hamn<br>Varbergs hamn                                  | 15556,95 |  | 1575 |
| Aluksen nimi<br>Partytgets namn   | Tunnus-<br>koodin-<br>lämäntings-<br>bokstäver | Koripaikka<br>Hamnen  | Brutto-voimansumma<br>Bruttodräktighets-<br>summa | Tiedot III luvan 27 säännöistä ja kohdan mukaan<br>detaljer om lastens förflyttning<br>Detaljer beträffande even-<br>tualna resor, tillstånd enl.<br>kapitel III, regel 27 c)   | Kölinskeimpäivä<br>Datum,<br>då kölen sträcktes   |   |   |              |      |  |          |  |      |
| VIKING SALLY  | OTMA   | Västervik<br>Varbergs hamn<br>Varbergs hamn   | 15556,95  |   | 1575  |   |   |              |      |  |          |  |      |
| <p>Mieli, allekirjoittanut, todistan:</p> <ol style="list-style-type: none"> <li>I. Että kysymyksessä oleva alus on asennuskäestä kattavasti edellä mainitun sopimuksen määrysten mukaisesti.</li> <li>II. Että kattauksessa todettu aluksen tyytävin sanoituu sopimuksen liittyviin sääntöjen vaatimukset, sikäli kuin kysymyksessä on:             <ol style="list-style-type: none"> <li>1. aluksen rakenne, pää- ja apukotilat ja muut paineistat sekä koneisto;</li> <li>2. vedenpäivän osoitoinsten järgestely ja yksityiskohtat;</li> <li>3. seuraavat osastointiläisivät:</li> </ol> </li> </ol>  |  |   |   |   |   |   |   |              |      |  |          |  |      |
| <p>Jag, underskricknad, bestyrker:</p> <ol style="list-style-type: none"> <li>I. Att ovan angivna fartyg undergått vederbörlig besiktning enligt bestämmelserna i ovannämnda konvention.</li> <li>II. Att besiktningen utvisade, att fartyget uppfyllde fordringarna i de regler, som är ifogade nämnda konvention, i vad avser:             <ol style="list-style-type: none"> <li>1. konstruktionen, huvud- och hjälplängpannor och andra trycksläkt samt maskineri;</li> <li>2. anordning och detaljer av den vattenläta rumsindelningen;</li> <li>3. följande indelningsvattenlinjer:</li> </ol> </li> </ol>  |  |   |   |   |   |   |   |              |      |  |          |  |      |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Alukselle määritetyt ja sen kykyeen pituuden keskikohtihallin mukaan pelastusvenälivelvolliset (luvan 11 sääntö)</td> <td style="width: 10%;">Varalaita</td> <td style="width: 60%;">Käytettävä miljoon matkustajia kuljettavaa seuravissa<br/>vaihtoehtoisista lauttoliinoja käytettävissä tiloissa<br/>För fartyget fastställda och möjdekeps<br/>ö fartygsidorna utmärkta indelnings-<br/>vattenlinjer (Kap. II regel 11)</td> </tr> <tr> <td>C. 1</td> <td>2282 m²</td> <td>Varaborda</td> </tr> <tr> <td>C. 2</td> <td></td> <td>Gäller då passagerare förflyttas i följdande, jämväl för last användbara rum</td> </tr> <tr> <td>C. 3</td> <td></td> <td></td> </tr> </table>   |  | Alukselle määritetyt ja sen kykyeen pituuden keskikohtihallin mukaan pelastusvenälivelvolliset (luvan 11 sääntö)  | Varalaita   | Käytettävä miljoon matkustajia kuljettavaa seuravissa<br>vaihtoehtoisista lauttoliinoja käytettävissä tiloissa<br>För fartyget fastställda och möjdekeps<br>ö fartygsidorna utmärkta indelnings-<br>vattenlinjer (Kap. II regel 11) | C. 1  | 2282 m²   | Varaborda                                       | C. 2         |      | Gäller då passagerare förflyttas i följdande, jämväl för last användbara rum | C. 3     |  |      |
| Alukselle määritetyt ja sen kykyeen pituuden keskikohtihallin mukaan pelastusvenälivelvolliset (luvan 11 sääntö)  | Varalaita                                      | Käytettävä miljoon matkustajia kuljettavaa seuravissa<br>vaihtoehtoisista lauttoliinoja käytettävissä tiloissa<br>För fartyget fastställda och möjdekeps<br>ö fartygsidorna utmärkta indelnings-<br>vattenlinjer (Kap. II regel 11) |   |   |   |   |   |              |      |  |          |  |      |
| C. 1  | 2282 m²  | Varaborda   |   |   |   |   |   |              |      |  |          |  |      |
| C. 2  |  | Gäller då passagerare förflyttas i följdande, jämväl för last användbara rum  |   |   |   |   |   |              |      |  |          |  |      |
| C. 3  |  |   |   |   |   |   |   |              |      |  |          |  |      |
| <p>III. Että pelastusvälineillä oli riittävästi eriäin lähes varien, nimittäin</p> <p>11 pelastusvenetyl (niihin luetuttaa 10 motortripelastusvenettä), joihin mahtuu 692 ....., henkilös, ja ..... radiesihköt<br/>vaihtoehtilla ja valonheitimellä varustettua moottoripelastusvenettä (mitkä sisältyvät edellä mainittuun pelastusveneiden kokonaismäärään) ja ..... vain valonheitimellä varustettua moottoripelastusvenettä (mitkä myös sisältyvät edellä mainittuun pelastusveneiden kokonaismäärään), joissa vesisuo tulee olla ..... hyväksytty pelastusvenemiesti;</p> <p>12 pelastuslauttaa, joita varren vaaditaan hyväksytty vesillelaikulaitteet ja joille mahtuu 300 ....., henkilös; ja</p> <p>51 pelastuslauttaa, joita varren ei vaadita hyväksytty vesillelaikulaitteita ja joille mahtuu 1275 ....., henkilös;</p> <p>godkända livblimän;</p> <p>12 livbåtar, för vilka fordras godkända sjösättninganordningar, tillräckliga för 652 ....., personer, och ..... motorlivbåtar försedda med radiotelegrafinstallation och strålkastare (insäknde i det ovan angivna sammanklagda antalet livbåtar) ävenom ..... motorlivbåtar utrustade endast med strålkastare (också insäknde i ovan angivna sammanklagda antalet livbåtar), förrande .....</p> <p>51 livbåtar, för vilka godkända sjösättninganordningar icke fordras, tillräckliga för 1275 ....., personer;</p> |  |   |   |   |   |   |   |              |      |  |          |  |      |

6. kellarimäiljeti, jotka kykenevät kannattamaan ..... 120 henkilöitä;  
 18 pelastusengasta;  
 2293 pelastustiivi, + 200 lapsille  
 6 flytteskap, tillräckliga för ..... personer;  
 18 livbojar;  
 2298 livvagnar, + 200 för barn

- IV. Ett pelastusveneet ja pelastuslautat oli varustettu sääntöjen määrysten mukaisesti.  
 V. Etti alukossa oli sääntöjen määrysten mukainen mooraineito sekä pelastusveneiden ja pelastuslautojen siirrettävä radiolaitte.  
 VI. Etti alus tyytti radiotelehdyslaitteita koskevat sääntöjen vaatimukset seuraavasti:  
 IV. Att livbåtarne och livflottarna varo utrustade enligt bestämmelserna i dessa regler.  
 V. Att fartyget var försedd med linkningsapparat och bärbar radioapparat för livbåtar och livflottar enligt bestämmelserna i dessa regler.  
 VI. Att fartyget uppfylde fordingarna i dessa regler i vad avser radiotelegrafinstallationer, som följer:

|  | Sääntöjen vaatimukset<br>Fördringar enligt reglerna | Todellisuudessa<br>I verkligheten  |
|--|---|--|
| Radiotelegrafiin kuunteluruntun määrä  | 10  | 10   |
| Lysningstider för radiotelegrafist   | 1   | 1  |
| Radiotelektäytön lukumäärä   | 1   | 1  |
| Antal radiotelegrafister   | 1   | 1  |
| Onko automaattinen hälytin   | 1   | 1  |
| Finnes autoalarm   | 1   | 1  |
| Onko pääradioaliteetit   | 1   | 1  |
| Finnes huvudinstallation   | 1   | 1  |
| Onko varoradioaliteetit  | 1   | 1  |
| Finnes reservinstallation  | ERTILLISÄT<br>GODRÄTTA                              | ERTILLISÄT<br>NÄPARÄTA   |
| Ovetko päälähetin ja varalähetin sähköisesti erilliset vai yhdistetyt<br>Åro huvudsändare och reservsändare elektriskt separata eller kom-<br>binerade | 1   | 1  |
| Onko radiosuuntimidaite  |   |  |
| Finnes radiopeliparpar   | rannikkeliikenteessä                                | 3 Suomen ja Ruotsin välillä 2000<br>Salilltu matkustajien määrä,<br>Tiläset antal passagerare i kustfart mellan Finland och Sverige : 2000 |

- VII. Etti moottoripohjustuneiden radiotelehdyslaitteet ja pelastusveneiden ja pelastuslautojen siirrettävä radiolaitte, milloin sellainen on, loiivat sääntöjen määrysten mukaisesti.  
 VIII. Etti alus täytti tulipalon havaitsemie ja sammutuslaitteita koskevat sääntöjen vaatimukset ja että siinä oli valot ja merkkikuvit, luolitikkaat sekä laitteet sijain- ja häiriömerkkien antamiseksi varten näiden sääntöjen määrysten ja kansainvälisen meritoimen sääntöjen mukaisesti.  
 IX. Etti alus kaikissa muissa suhteissa täytti sääntöjen vaatimukset, mikäli ne eivät siihen sovellettavissa.  
 VII. Att radiotelegrafinstallationer i motortulipalat och bärbar radioapparat för livbåtar och livflottar, om sådan finns, fungerade i överens-  
stämelse med föreskrifterna i dessa regler.  
 VIII. Att fartyget uppfyllde fordingarna i dessa regler i vad avser anordningar för uppläckande och släckning av brand samt var försedd med ljus och signalfigurer, luolitjärare såsom med anordningar för avgivande av ljudsignaler och nödsignaler enligt bestämmelserna i dessa regler och i de internationella sjövägsreglerna.  
 IX. Att fartyget i alla övriga hänseenden uppfyllde fordingarna i dessa regler, i den mån de är tillämpliga å fartyget.

Tämä todistuskirja on annettu Suomen hallituksen puolesta.  
 Denna certifikat är utfärdat på finnas regeringens vägnar.  
 Todistuskirja on voimassa 24-7/12/1987 kesikuuta/juni 1987 saakka.  
 Certifikatet gäller intill den 24-7/12/1987  
 Annetta Helsingissä 14 päivänä joulukuuta 1987  
 Utfärdat i Helsingfors den 14/12/1987

Allekirjoittanut ilmoittaa olevansa mainittu hallituksen asiamukaisesti valtuuttama antamaan tämän todistuskirjan.

Undertecknad försäkrar sig vara av nämnda regering behörigen bemördigad att utfärda detta certifikat.

Leima ..... 10, mk.  
 Stamp .....  
 HD No: .....  
 HD Nr: .....  
 Merekuluntarkastaja ..... Heimo Suikki  
 Sjöfartsinspektör ..... Heimo Suikki



## PASSENGER SHIP SAFETY CERTIFICATE

Enclosure 2.4.4.58

FINLAND

for ~~XX~~  
a short international voyage.

Issued under the provisions of the  
International Convention for the Safety of Life at Sea, 1960

| Name of Ship | Distinctive Number or Letters | Port of Registry | Gross Tonnage | Particulars of voyages, if any, sanctioned under Regulation 27 (c) (VII) of Chapter III | Date on which keel was laid |
|--------------|-------------------------------|------------------|---------------|---|-----------------------------|
| VIKING SALLY | CYTC                          | Helsinki         | 13'66,20      |   | 1979                        |

I, the undersigned certify:

- I. That the above-mentioned ship has been duly surveyed in accordance with the provisions of the Convention referred to above.
- II. That the survey showed that the ship complied with the requirements of the Regulations annexed to the said Convention as regards:
  1. the structure, main and auxiliary boilers and other pressure vessels and machinery;
  2. the watertight subdivision arrangements and details;
  3. the following subdivision loadlines:

| Subdivision loadlines assigned and marked on the ship's side at amidships (Regulation 11 of Chapter III) | Freeboard | To apply when the spaces in which passengers are carried include the following alternative spaces: |
|--|-----------|--|
| C. 1   | 2062 mm   |  |
| C. 2   |           |  |
| C. 3   |           |  |

2257

- III. That the life-saving appliances provide for a total number of ..... persons and no more, viz.:
 

|  |                    |                          |                          |
|--|--------------------|--------------------------|--------------------------|
| 10   | 10                 | 692                      | -                        |
| lifecrafts, (including   | motor lifecrafts)  | capable of accommodating | persons, and             |
| .....  | .....              | .....                    | .....                    |
| fitted with radiotelegraph installation and searchlight (included in the total lifecrafts shown above) and   | .....              | .....                    | .....                    |
| motor lifecrafts fitted with searchlight only (also included in the total lifecrafts shown above), requiring | .....              | .....                    | certified lifecraftsmen; |
| 12   |                    | 200                      |                          |
| lifecrafts, for which approved launching devices are required, capable of accommodating                      | .....              | .....                    | persons; and             |
| 51   |                    | 1275                     |                          |
| lifecrafts, for which approved launching devices are not required, capable of accommodating                  | .....              | .....                    | persons;                 |
| 6  |                    | 120                      |                          |
| buoyant apparatus capable of supporting  | .....              | .....                    | persons;                 |
| 18   |                    |                          |                          |
| lifebuoys;   |                    |                          |                          |
| 2298   | + 200 for children |                          |                          |
| lifejackets.   |                    |                          |                          |

- IV. That the lifeboats and liferafts were equipped in accordance with the provisions of the Regulations.
- V. That the ship was provided with a line-throwing appliance and portable radio apparatus for survival craft in accordance with the provisions of the Regulations.
- VI. That the ship complied with the requirements of the Regulations as regards radiotelegraph installations, viz.:

|   | Requirements of Regulations                                 | Actual provision |
|---|---|------------------|
| Hours of listening by operator.....   | 16  | 16               |
| Number of operators .....   | 1   | 1                |
| Whether auto alarm fitted .....   | 1   | 1                |
| Whether main installation fitted .....  | 1   | 1                |
| Whether reserve installation fitted.....                                      | 1   | 1                |
| Whether main and reserve transmitters electrically separated or combined..... | separated   | separated        |
| Whether direction-finder fitted .....   | 1   | 1                |
| Number of passengers for which certificated.....                              | For a short international voyage between Finland and Sweden | 3000             |

VII. That the functioning of the radiotelegraph installations for motor lifeboats and/or the portable radio apparatus for survival craft, if provided, complied with the provisions of the Regulations.

VIII. That the ship complied with the requirements of the Regulations as regards fire-detecting and fire-extinguishing appliances and was provided with navigation lights and shapes, pilot ladder, and means of making sound signals and distress signals, in accordance with the provisions of the Regulations and also the International Collision Regulations.

IX. That in all other respects the ship complied with the requirements of the Regulations, so far as these requirements apply thereto.

This certificate is issued under the authority of the Finnish Government.

On the 20th day of July 1981  
It will remain in force until the 20th day of July 1993  
Issued at Helsinki the 4th day of July 1981

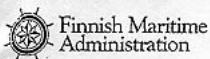
The undersigned declares that he is duly authorised by the said Government to issue this certificate.

Inspector of Navigation

*T.R.*  
Heimo Sutikki

Stamp ..... mk.

HD No. ....



27 June 1995

03. Juli 1995

Enclosure 2.4.4.59

Dr. Peter Holtappels  
 Ahlers & Vogel  
 Schaarstor 1  
 20459 Hamburg  
 Germany

Dear Sir,

Referring to our discussions on 21 June 1995 I send a few certificate copies concerning Viking Sally.

The first certificate for short international voyage had a validity of one month in order to permit sailing from Germany to Finland. The following full period certificates have a note under para VI (number of passengers) 'for short international voyage between Finland and Sweden'. The opposite side of the certificate, which is in the official language of the flag state, says 'i kustfart mellan Finland och Sverige'. 'Kustfart' was definition as not south of latitude N 59 deg 30 min.

In 1983 we got a new decree on surveys of ships, where coastal traffic was limited to the domestic waters only. After that the certificates state 'på korta internationella resor mellan Finland och Sverige'. The change does not mean that a new traffic area was constituted.

After 1984 the certificates remain unchanged except the reference to the radiotelegraphy exemption and the change of the name of the ship to 'Wasa King'.

Yours Sincerely,

Head of Division

Jukka Häkämies

| Visiting Address<br>Vuorimiehenkatu 1<br>00140 Helsinki<br>Finland | Mailing Address<br>P.O. Box 158<br>SF - 00141 Helsinki<br>Finland | Telephone<br>+ 358 0 18081 | Fax<br>+ 358 0 1808355 | Telcs<br>121 471 mkh sf | Postal Cheque<br>Account<br>1801-4 |
|--|---|----------------------------|------------------------|-------------------------|------------------------------------|
|--|---|----------------------------|------------------------|-------------------------|------------------------------------|

**Enclosure 2.4.5.60**Statement

Lars Karlsson, born 11.9.43 states :

I obtained the Chief Engineers License in May 1965 at the Technical School in Mariehamn/Aland Islands. My time with AB Sally commenced during the summer vacation in 1963 when I sailed as 3rd engineer on a tanker. After obtaining the license I sailed on cargo vessels and tankers of AB Sally; since 1969 as Chief Engineer. In August 1970 I became 1st engineer onboard of "Viking 1" and from summer 1971 I was again chief engineer and remained in that position ever since on Viking 3, 4, 5, and finally on "Viking Sally".

For "Viking Sally" I was newbuilding supervisor as I had been already for "Viking 3, 4, 5". As I knew the yard - and classification people already from these 3 newbuildings and also speak some German - I was nominated "coordinator" of owners' supervisors.

Three days after signing of the contract I came to Papenburg together with Capt. Brunström (was relieved after 5 weeks by Lars Mäkki), 1st engineer Stig Strömberg and electrician Lars Sjögren. At the beginning I had only 1 small Ga-plan. Deck and Engine specification were shown to me.

Due to pressure of time we had to make a lot of compromises. In my opinion and experience the Meyer Werft was the only yard in Europe able to do such a job because of so little bureaucracy. This has, in my opinion, nothing to do with the catastrophe. Meyer Werft has very much experience. They have built all ships very strong, i.e. they were usually heavy. It is a well known fact that Meyer ships were stronger and behaved better in ice compared to e.g. Wärtsila ships.

Statement Lars Karlsson

2

With my team of supervisors I checked everything including, and in particular, weldings in close cooperation with BV surveyor Lohmann and his colleague. As far as I remember Lohmann was more active on Viking 1-5, whilst on "Viking Sally" he was the boss and the other one did the routine work. Anyway Lohmann was always present when major items, such as ramp and visor, were presented by the yard and tested.

My best contacts were Mr. Motikat and Mr. Wahnes. F.B.N representatives came from time to time, however, all paperwork was done by the Sally office in Mariehamn directly with F.B.N. Helsinki.

I did some inspections with F.B.N. representatives in Papenburg, e.g.

- stairways, lifts;
- boats, liferafts, etc.
- fire doors, fire-fighting equipment, etc.

Chief officer Lindström came about 3 months before delivery.

I also inspected visor/ramp etc. I checked the visor during building together with the 1st engineer. It was very hectic during the last days before launching because there were delays in delivery of equipment from Sweden due to a strike in this country. After launching the visor was lifted ashore again. It was before only welded to the vessel by steel-bars. At present I do not remember details of the bearing/bushing system of visor hinges.

In 1987 the upper bearing of the port side lifting cylinder was changed by MacGregor, Turku during normal operation. They started in the evening and finished next morning. The change of this bearing became necessary because during opening operations there was a squeaking noise which was reported to me by the deck officer on watch.

Statement Lars Karlsson

3

Probably in 1986 we experienced twice that the Nirosta bolt of one of the visor hinges, I believe the port side, broke the securing plate screws and moved out by ca. 1 cm. This was noted by the deck officer being on forecastle deck for berthing because he found the broken off screws. The bolt was hammered back into position, the screw holes in the steel bushing drilled out and the securing plate refitted. If it would have happened again we would have investigated the cause, however, during my time, it did not occur again.

We never had greasing problems. Once per month grease was pressed into the bolts.

We never welded at the lifting cylinders or visor hinges. I have never seen the bolts out.

After every stormy cruise I inspected all the parts in the bow area. Four times a year I inspected in detail all safety relevant parts. This included visual inspection of the visor hinges, its weldings, etc. and also the inside of the visor including locking devices and its welding seams.

During one such inspection I found cracks in way of the foundations of the hydraulic cylinders for the ramp bolts which were of fatigue nature and not due to overload. We welded strengthening plates to the foundations to stop the crack development.

I never found such cracks in way of Atlantic lock or side locks.

The rubber packings of the visor were changed once a year. The packings were mainly damaged on A-deck and 1 m upwards front bulkheads because the final movement before closure is backwards - not downwards - which destroys the packings due to the rubbing effect. Therefore we have put grease (same as used for the hinges) on the packings and it became better.

Statement Lars Karlsson

4

At some time, probably after the strong ice winter 1985/86, we increasingly had problems with electrical failures, short circuits, etc. caused by the sensors for the indicator lights of the Atlantic lock. So I checked with other vessels, e.g. "Viking Song" and "Viking Saga" and also the market, and finally bought rather expensive magnetic limit switches which were installed by electrician Sjögren instead of the mechanical sensors, and we never had problems again. I have been many times with B.V. surveyor Lars Olaf Ålander inside the closed visor when water or light tests were made during loadline survey. I believe that at the same time also the indicator lights were checked.

I have made at least 1000 cruises and more than 100 times reduced the engine output by myself in the engine room when I considered it necessary in heavy weather. Last time was in July 1991 when the vessel was already sailing as "Wasa King" between Waasa and Umeå/Sundsvall when we arrived once 1 ½ hours late and another time 2 ½ hours late, both due to bad weather and the fact that I had reduced the engine output.

It has to be remembered that "Viking Sally" has been built for the archipelago, not for open sea. This refers in particular to the flare of her bow. In heavy seas the bow is shaking strongly sideways. This is created by the recess in the shell plating aft of the visor which results in a very strong setting-in. When the vessel is proceeding against headseas the pressure on the visor is in the aft direction. (Force direction is aft.)

We were all the time running in a very tight schedule with all 4 main engines at 90% output.

Reduction of speed in heavy headseas is not only a question of reduction of stress on vessel's and visor's structure and fixing points, but also the comfort of passengers has to be taken into account. We never had complaints to the best of my knowledge.

Statement Lars Karlsson

5

Officers and engineers have their accommodation directly in front of the superstructure overlooking the forecastle deck including the visor and I feel it difficult to believe that on the night of the catastrophe none of them looked out of their windows. I have sailed on "Viking 5" for 5 years between Helsinki and Stockholm and met quite some heavy weather.

In the engine control room (ECR) there were 2 output regulators for the main engines which were normally at 90%. Output could by these regulators be changed from ECR without any pitch change from the bridge.

The engines could be run on "Combinator" or on "Constant Revolutions". In all my 12 years onboard, however, it was always "Combinator" except during yard trials in 1980.

If the main engines are on "Combinator" and pitch of the propellers is reduced the revolutions are being reduced automatically. In other words, if the revolutions have not been reduced also the pitch cannot have been reduced from the bridge.

The bow ramp was considered to be the collision bulkhead same as on all the predecessors built by Meyer Werft, but also the same as on e.g. Turella, Rosella, Viking Song, Viking Saga, and many other ferries.

All 3 hydraulic pumps broke down one after the other (normal pressure 185 bar) which was apparently not enough. We built in stronger pumps and operated them at 240 bar pressure. The 2 big pumps could produce 400 bar pressure whilst the smaller one could produce 280 bar.

In winter we had problems to open the visor.

It is easy to increase the pressure by just turning a wheel at the hydraulic pump (axial piston pump - make: Vickers). There was a lock nut to regulate the pressure.

Statement Lars Karlsson

6

In case of difficulties to open the visor, e.g. due to being frozen fast, it is the easiest thing to increase the hydraulic pressure.

Although impossible due to the electrical system the visor can be closed if the ramp is open when the valves are operated manually. In case the rails of the ramp should be deformed this is due to the lowered down visor for working purposes.

The observation of pilot Stenhammar, i.e. that the crew was opening and quickly closing the visor in short intervals (to make it fit over the pyramide most likely) is difficult to believe. There were valves directly at the lifting cylinders by means of which the speed of the oil flow could be regulated. This must be absolutely identical at both sides otherwise one side will open or close faster than the other side and the visor will get out of alignment. These regulating valves are fitted at the outside of the lifting cylinders at the lower side (B-deck).

When the vessel was sailing between Turku - Stockholm there had to be 2 officers + 1 AB on the bridge. When she was shifted to the Waasa/Umeå trade, owners wanted to save 1 officer which was accepted by F.B.N. under the condition that the control panel for the indicator lights for visor and bow ramp was moved to the large operation panel in front of the bridge where the lights could be seen from the seats of master and watch officer. This was done some time in 1991.

The light on the steering aid on the forecastle was mostly out.

To my knowledge the manual sidelocks were never used. They were more for open sea, Atlantic or the like. I have no particular memory about any play between bolts and hinges of Atlantic lock and/or sidelocks.

Opening/closing of visor was always and only done by Chiefmate and boatswain together.

I do not know whether ever the visor was opened with still closed locking devices respectively closed with already closed locking devices.

Upon being shown some underwater pictures from the damaged hinge remains I am of the opinion that the rust on the Nirosta bolt could have been caused by the disappearance of the bronze bushing, i.e. steel bushing in contact with Nirosta bolt. Also in case of bad greasing a bronze bushing will disappear more quickly.

On cardeck there were 4 cameras installed i.e. 1 forward to the forward ramp, 2 at the sides and 1 looking aft to the stern ramp. The cameras could be moved and had also zoom ability.

Monitors were on the bridge (located at port side of the entrance to the chart room) and in the ECR above the instrument panel. The camera picture shown on the monitor could be changed to another camera either manually or automatically. The monitors on bridge and in ECR were showing the same picture. The main monitor with operating sticks was in the ECR, i.e. the bridge could not change to another camera.

After the "Estonia" catastrophe I have heard from a former colleague engineer who had trained "Estonia's" engineers after they had taken over the vessel that they had problems with water in the visor which caused short circuits in the no more watertight magnetic switches for the indicator lights of the Atlantic lock. As the electrical system for these switches and the indicator lights are switched to the same fuse also securing the controls for all hydraulic installations on the cardeck, i.e. ramps, visor, movable decks, etc, such a short circuit caused a general black-out on the cardeck. Thus if the fuse (located on 9th deck) is out you have no power and the cause has to be removed if such a problem occurs frequently, which it apparently did.

Statement Lars Karlsson

8

Consequently they removed the magnetic limit switches from the plate near the Atlantic lock and there was only the indicator light for open/closed visor left active. (It is unknown what happened to the sidelock indicators.)

We never had problems with hydraulic power in the aft, only forward. There were 3 hydraulic pumps port side forward, 3 starboard aft. One of the aft pumps got power from the emergency generator (when in operation).

The 30.4.90 was the last day as "Viking Sally". On 7.5.90 she commenced sailing as "Silja Star". She kept this name only for ½ year and then became "Wasa King". I left the vessel on 30.3.92, but returned in November 1992 for one week upon instructions of Ulf Hobro, Nordström & Thulin. I checked the inventory of the engine department, the maintenance - and spare part - computer system and took a copy of the computer program.

Finally I would like to mention that a vessel sailing for 20 months at full speed in the Baltic will have a lot of cracks everywhere.

The electricians sailing with me were Sjögren and Mårtensen.

Mariehamn, 15.10.95

.....

Lars Karlsson



**Enclosure 2.4.5.61**

**Jos. L. Meyer**  
Schiffswerft - Maschinenfabrik  
**2990 Papenburg 1**  
Postfach 1120

DELIVERY - CERTIFICATE

this is to certify, that on this 29th day of June, 1980,  
at 13<sup>30</sup> hours local time,

the shipyard Jos. L. Meyer of Papenburg,  
Federal Republic of Germany,

has delivered at the port of Emden, Federal Republic of Germany,  
to the

Rederiaktiebolaget Sally,  
Mariehamn/Pinland,

### **the Car/Passenger Ferry**

"VIKING SALLY"

(Newbuilding S. 590)

as per terms and conditions of the contract signed in Mariehamn/  
Finland, on 11th September, 1980.

On behalf of the Purchaser:

On behalf of the Builder:

Rederiaktiebolaget Sally,  
Mariehamn/Finland

Jos. L. Meyer  
Shipyard  
Papenburg 1  
Federal Republic of Germany

Papenburg, 29th June, 1930

**Jos. L. Meyer**

Schiffswerft - Maschinenfabrik  
2990 Papenburg 1  
Postfach 1120

Jos. L. Meyer Schiffswerft as Builders, on the one part, and Rederiaktiebolaget Sally as Owners, on the other part, have at the delivery of the vessel "VIKING SALLY" on this day agreed on the following points:

1. The extra and minor costs have been finally settled as far as the scope of delivery is concerned. The deadweight according to contract will be 2740 t.
2. The uncompleted work on the vessel will be completed by the Builders at their cost as soon as it is practically possible according to contract, specification, drawings and subsequent agreements between the parties.
3. The question of penalties or premiums for speed and deadweight of the vessel will be settled according to the relevant clauses in the contract when results of the speed trials can be presented and the light weight of the vessel has been determined upon completion of the deliveries of specified inventories etc.
4. This agreement does not affect the scope of the contract in any respect not mentioned here or the scope of the guaranteee.

Emden on the 29th day of June, 1980.

*[Signature]* Rederiaktiebolaget Sally

*[Signature]*  
Jos. L. Meyer  
as Builders

*[Signature]* Sven-Erik Johansson  
for the Owners

TOOQ

SAEGER WERFT 06.07.1980 10:30 ET 449 91300

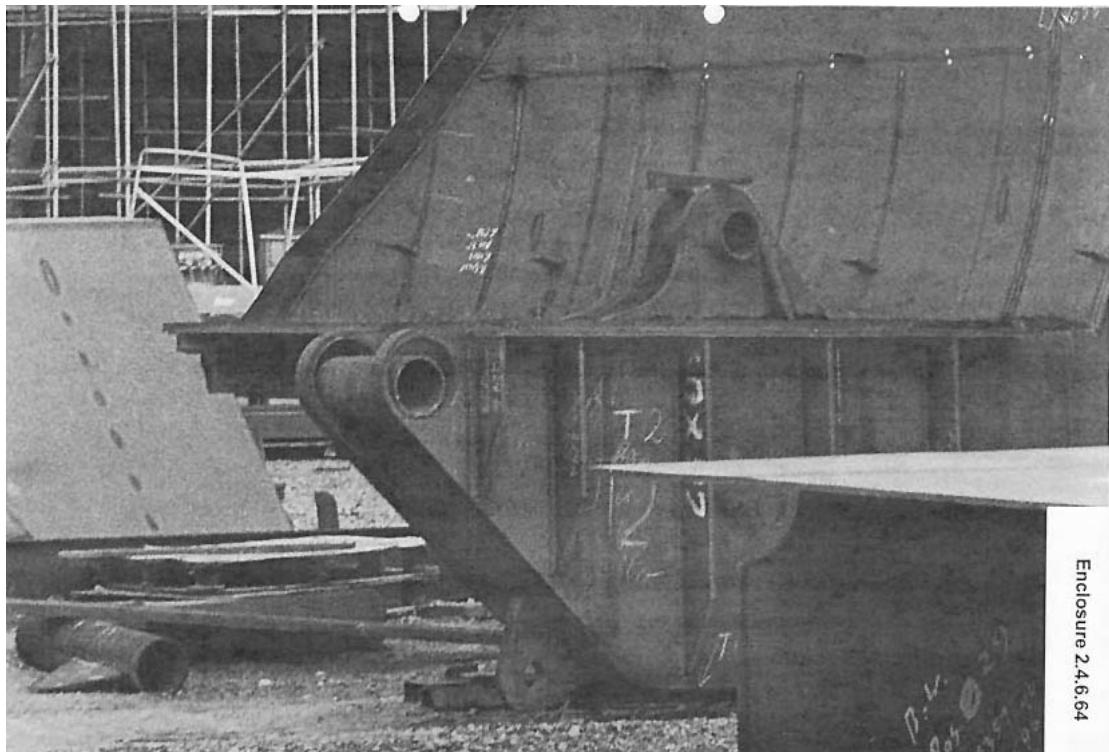
## Enclosure 2.4.5.62

|   |  |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
|---|--|-----------------|----------|---------|---------|-----------------|--------|------------|---------|---------|------------|--------------------------------|-----------|-------|----------|------------|--|
| <b>Jos. L. Meyer, Papenburg-Ems</b><br>Schiffswerft, Maschinenfabrik, Dockbetriebe  |  |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| Car and Passenger Ferry "VIKING SALLY"<br>S. 590  |  |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| Handing-Over Report   |  |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| <p>The car and passenger ferry "VIKING SALLY" will be handed over to the owner company AB SALLY, Mariehamn, by shipyard JOS. L. MEYER, Papenburg, on 29th June, 1980. The vessel will sail for the VIKING-LINE between Finland and Sweden, also serving the Åland Islands. The VIKING-LINE is operated by the Finnish owner AB SALLY, the Swedish owner AB SLITE and the Finnish owner company SF-LINE.</p> <p>From 1970 to 1974, JOS. L. MEYER already delivered 6 car and passenger ferries to the VIKING-LINE, 4 of this series for owner AB SALLY and 2 for AB SLITE. Moreover the "DIANA II" was handed over to owner AB SLITE on June, 1979.</p> <p>The confidence in the shipyard created by the good cooperation was the decisive criteria for the owner to conclude the contract for this modern and high-sophisticated vessel. Despite keen and in some cases government-subsidized competition the yard could book this order as a result of short delivery terms, an interesting design worked out by yard's engineers and high flexibility in meeting the owner's requirements.</p> <p>On request of the Owners the ship was delivered on 29th June in order to be able to put the vessel into service within the scheduled time although some areas of the accommodation were not completed. The time for the voyage from Papenburg to Mariehamn as well as for the outfitting of the ship by the owner should be used to complete the unfinished areas. The yard agreed to this solution although they would have had the right due to the late supplies of the materials from Sweden and Finland on account of the strike situation in these countries to keep the ship at the outfitting quay of the yard for some more time.</p> <p>The owner's decision to order this vessel in Papenburg was in principle dependent on the very short construction and building period of approx. 9 months. In case of the 7 previous newbuildings JOS. L. MEYER showed their ability to strictly observe the delivery times stipulated by contract.</p> <p>The main data of the vessel are as follows:</p> <table> <tbody> <tr> <td>Length over all</td> <td>155.40 m</td> </tr> <tr> <td>Breadth</td> <td>24.20 m</td> </tr> <tr> <td>Draught, loaded</td> <td>5.55 m</td> </tr> <tr> <td>Deadweight</td> <td>2,800 t</td> </tr> <tr> <td>Tonnage</td> <td>15,500 GRT</td> </tr> <tr> <td>4 main engines (6,000 HP each)</td> <td>24,000 HP</td> </tr> <tr> <td>Speed</td> <td>21.20 kn</td> </tr> <tr> <td>Capacities</td> <td>           2,000 passengers<br/>           1,186 cabin places<br/>           110 officers and crews<br/>           1,650 seats in restaurants,<br/>           bars, clubs, etc.<br/>           52 lorries w. trailers (18 m)<br/>           or 460 passenger cars         </td> </tr> </tbody> </table> |  | Length over all | 155.40 m | Breadth | 24.20 m | Draught, loaded | 5.55 m | Deadweight | 2,800 t | Tonnage | 15,500 GRT | 4 main engines (6,000 HP each) | 24,000 HP | Speed | 21.20 kn | Capacities | 2,000 passengers<br>1,186 cabin places<br>110 officers and crews<br>1,650 seats in restaurants,<br>bars, clubs, etc.<br>52 lorries w. trailers (18 m)<br>or 460 passenger cars |
| Length over all   | 155.40 m   |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| Breadth   | 24.20 m  |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| Draught, loaded   | 5.55 m   |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| Deadweight  | 2,800 t  |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| Tonnage   | 15,500 GRT   |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| 4 main engines (6,000 HP each)  | 24,000 HP  |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| Speed   | 21.20 kn   |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |
| Capacities  | 2,000 passengers<br>1,186 cabin places<br>110 officers and crews<br>1,650 seats in restaurants,<br>bars, clubs, etc.<br>52 lorries w. trailers (18 m)<br>or 460 passenger cars |                 |          |         |         |                 |        |            |         |         |            |                                |           |       |          |            |  |

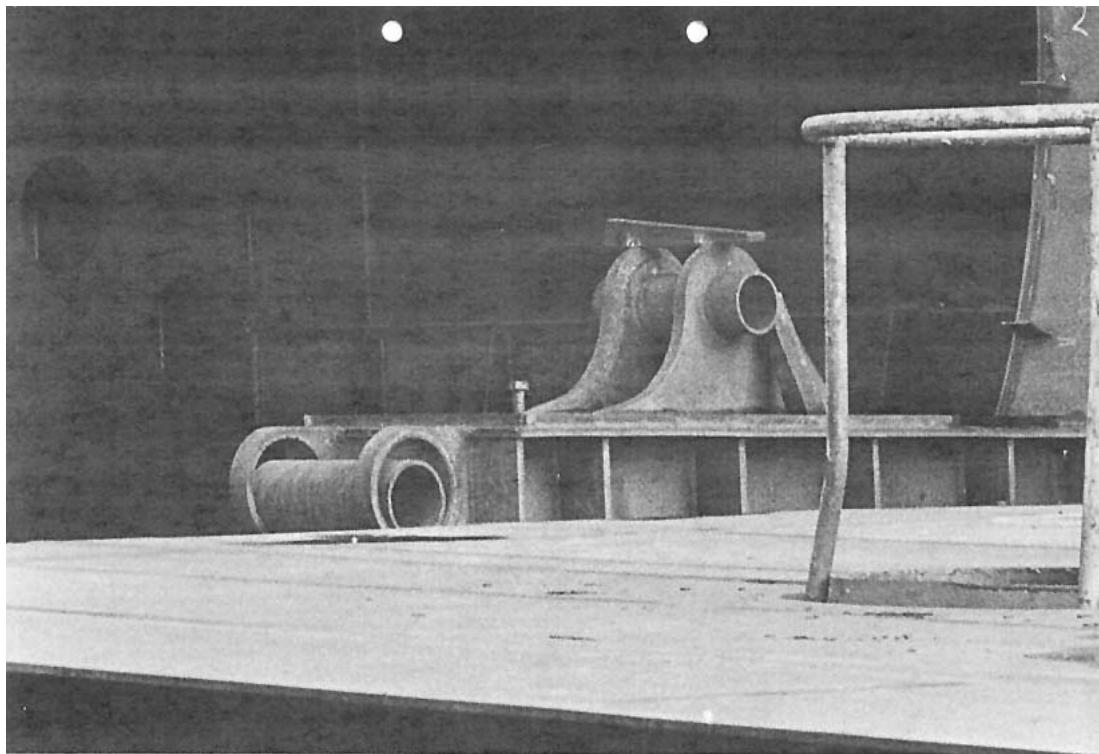
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|   |  |
|---|--|
| <b>Jos. L. Meyer, Papenburg-Ems</b><br><small>Schiffswerft, Maschinenfabrik, Dockvertrieb</small>   |  |
| - 2 -   |  |
| <p>The following facts may give an idea of the expenditure of work involved in the construction of such a big ferry:</p> <ul style="list-style-type: none"> <li>- About 280 km cables were laid out, i.e. 1.6 km cable/m of ship.</li> <li>- About 30,000 m<sup>2</sup> areas were insulated, as much as 6 football fields or a small farm.</li> <li>- 460 passenger cars can be transported on this vessel, i.e. a 2.1 km long line of cars.</li> <li>- 1,300 beds and more than 1500 doors were installed.</li> <li>- In addition to a main engine output of 17,600 kW, a generator capacity of 4,416 kW was provided - enough to supply a town with about 8,000 inhabitants.</li> </ul> <p>To sum up it can be said that this ship is hotel, basement garage, power plant, means of transportation, canalisation, supermarket and place of entertainment in one.</p> |  |





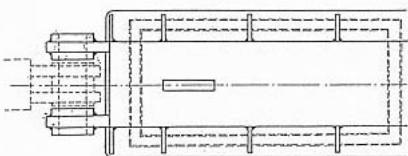
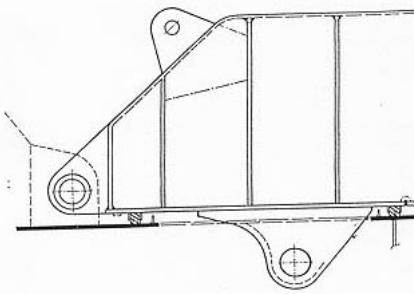
Enclosure 2.4.6.64





Enclosure 2.4.6.6c

Enclosure 2.4.6.6b

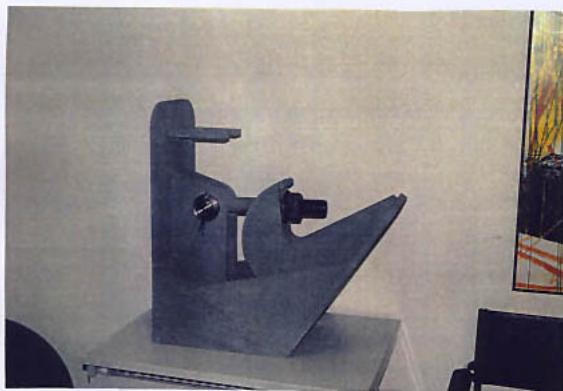


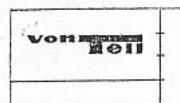
Arrangement of deck hinges



Enclosure 2.6.2.67

Enclosure 2.6.2.68





## Enclosure 2.6.2.69

6:19

II. BOW VISOR1) Construction

The visor has a weight of abt 54,5 tons and forms the W.T. front closure of the ship. The bow visor is pivoted at the upper deck. It opens in upward direction.

2) Maintenance

Under circumstances when temperature reaches 0° C or below check that the limit switches and other equipment on weather deck are not getting covered with ice. See also item I pos. 2).

All piston-rods and cylinders should be covered during painting. Dry paint spirts upon the surface of the piston-rod would spoil the cylinder packings within short time, what means undesirable leakages.

Check all hoses, hose connections and pipe connections to prevent leakages. Damaged components should be replaced if necessary in order to avoid interruption.

The hose connections should be painted, but not the hydraulic hoses.

The rubber packings should be treated with Tellin or similar mixture containing graphite and tallow in order to reduce the wear of the rubber. When a defect rubber packing is going to be replaced the packing channel has to be sufficiently cleaned before the new packing is fitted with glue. von Tell UK 2 glue or glue of the same quality has to be used.

3) Locking device (25)

In closed position the visor is locked by locking pins which are operated by one hydraulic cylinder (12) each. As a reserve the visor can also be locked by two manually operated locking devices. There is also one hydraulic operated "atlantic locking device" (12).

In open position the bow visor is locked by 2 locking pins which are hydraulic operated with one hydraulic cylinder (12) each.

In closed position the rubber packing is compressed by the sole weight of the bow visor. The rubber packing is fixed with bolts.

|  |             |      |
|--|-------------|------|
| <b>wonnen</b>  | <b>Seil</b> |      |
|  |             | 7:19 |
| <p><b>4) Operation</b></p> <p>For the operation of the bow visor a hand-operated electrical valve (pos 17) is used which is guiding an operating valve (19). An electrical blocking is built in to prevent faulty operation between bow visor and bow ramp.</p> <p>The very operation of the visor is performed by two hydraulic cylinder (2) with spherical bearings. Two ice-breaking cylinders (8) assist the opening process when the visor starts opening. When the locking devices of the bow visor are released the ice-breaking- and operating cylinders are put under pressure and the visor will open. When the visor is fully opened it will be locked.</p> <p>When lowering the bow visor the top of the cylinder will be put under pressure. In the bottom of the cylinder a valve (15) is fitted which is controlling the lowering. When a pressure arises in the cylinder which is higher than the adjusting pressure of the valve. The lowering speed is adjustable by throttle non-return valves (39) and they should also be so adjusted that the cylinders get the same timing.</p> |             |      |
| <p><b>5) Control</b></p> <p><u>Opening of the bow visor</u></p> <ol style="list-style-type: none"> <li>1) Start both of the pumps.</li> <li>2) Open the atlantic locking device and the cleats.<br/>Put the control levers (one by one) in position UPPNA until red lamp indicates <u>UPPEN</u>.<br/>If the manual locking device has been used this has to be opened.</li> <li>3) Check that the lamp for the locking devices indicates <u>UPPEN</u>. If not, open up the locking devices which are locked.</li> <li>4) Open the bow visor. The control lever will be in position UPP until green lamp indicates <u>UPPE</u>.</li> <li>5) Close the locking device. The control lever will be in position LASA until green lamp indicates <u>LAST</u>.</li> <li>6) Lower the bow visor and let it rest on the locking device in order to release the hydraulic pressure in the operating cylinder.</li> <li>7) Switch off the pumps.</li> </ol>   |             |      |

8:19

Closing of the bow visor

(Check that the bow ramp is closed and locked.)

- 1) Start the pumps.
- 2) Check that red lamp indicates OPEN for cleats and the atlantic locking device. If not, open up the cleats and the atlantic locking device.
- 3) Open up the bow visor. (The load on the locking device is released.)
- 4) Open up the locking device. Put the control lever on OPEN until red lamp indicates OPEN.
- 5) Close the bow visor. The control lever will be in position CLOSE until green lamp indicates CLOSE.
- 6) Lock the cleats. The control lever will be in position CLOSE until green lamp indicates CLOSE.
- 7) If the atlantic locking device is going to be used this should also be locked.
- 8) Switch off the pumps.

III. BOW RAMP1) Construction

Dimensions: L = 8225 mm  
 B = 5500 mm between the tracks

Weight: abt 12,1 tons

The fore-end part of the ramp is provided with 8 sloping flaps, which automatically extend when the ramp is opening. Each sloping flap is working independently

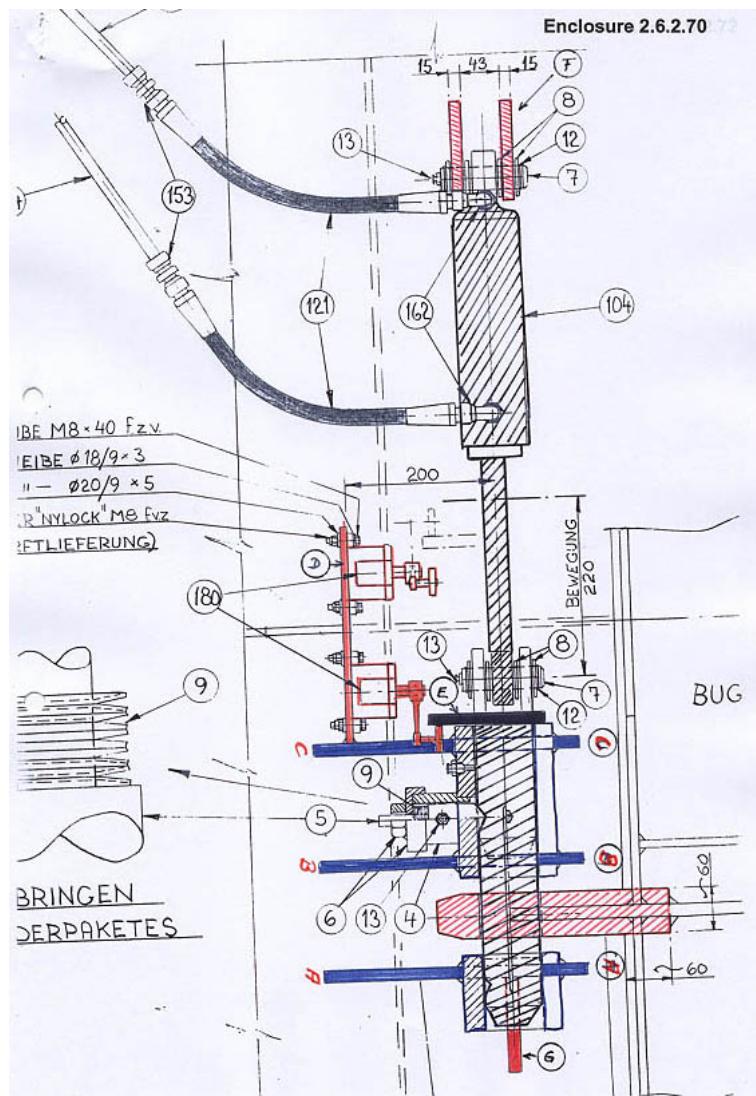
from the others in order to compensate for the heeling of the ship (2 degrees max.)

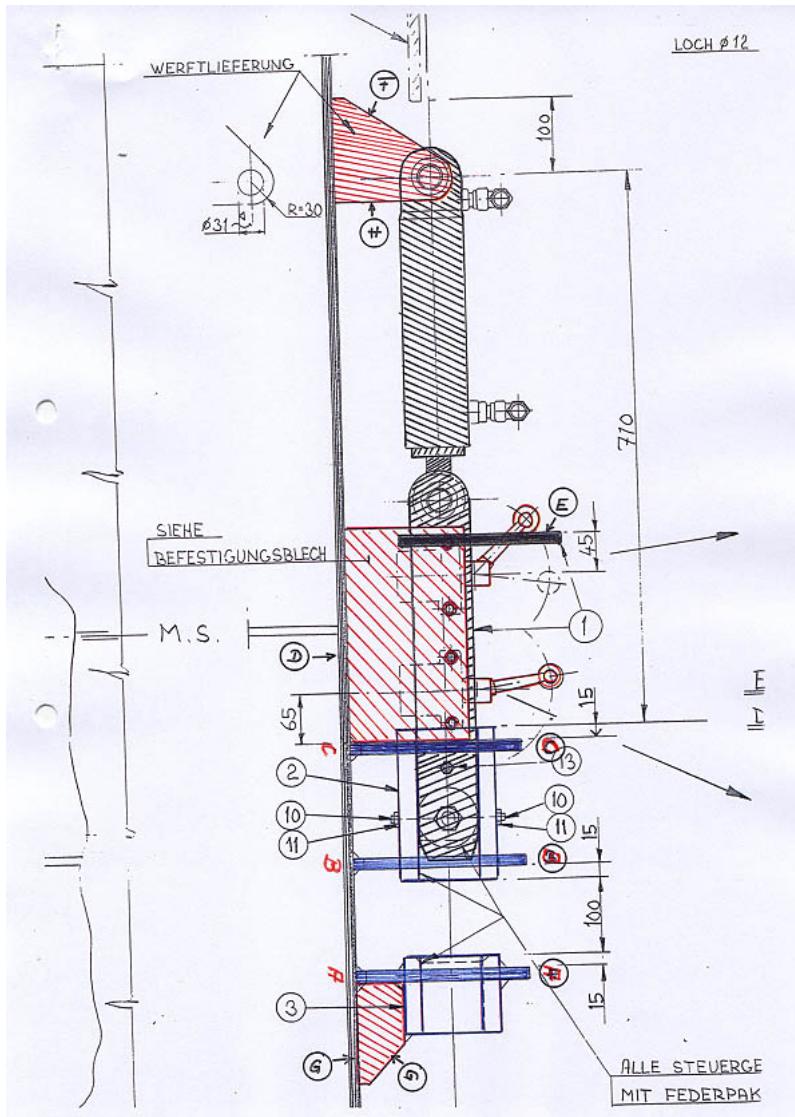
The ramp is pivoted to the ship with 4 hinges. The two outer hinges are provided with spherical bearings and the two inner with bronze bushes. The axles are of stainless steel.

The ramp is equipped with fastenings for preventer stays.

2) Maintenance

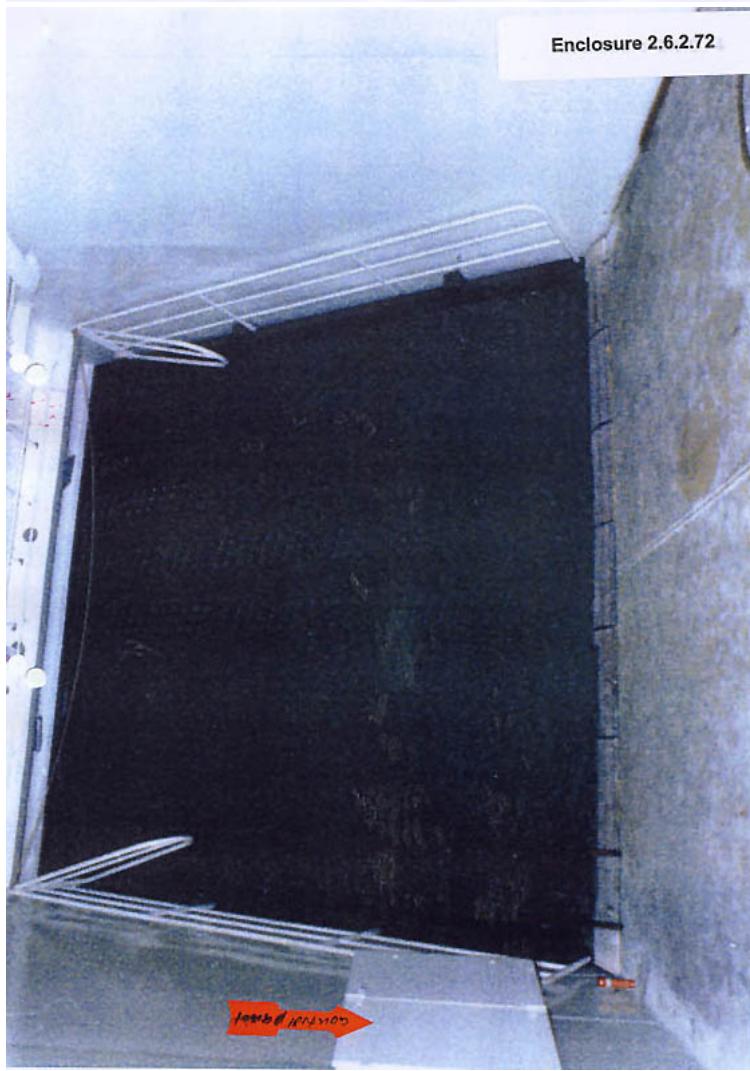
See item I. pos. 2).



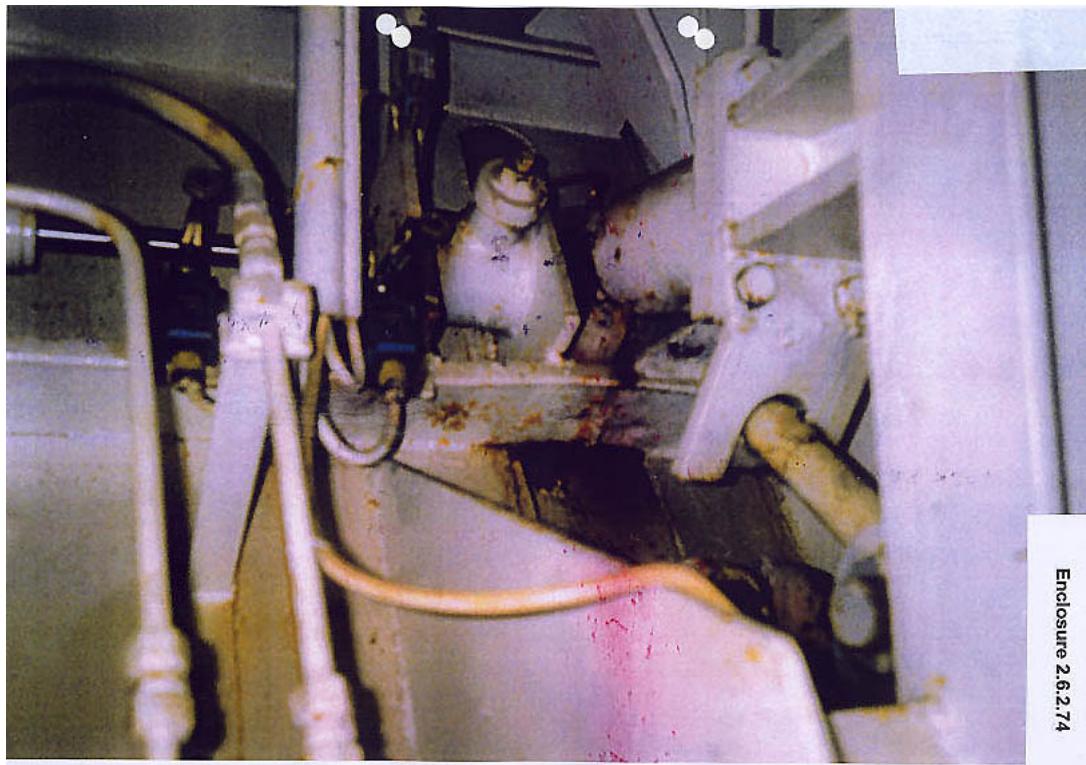




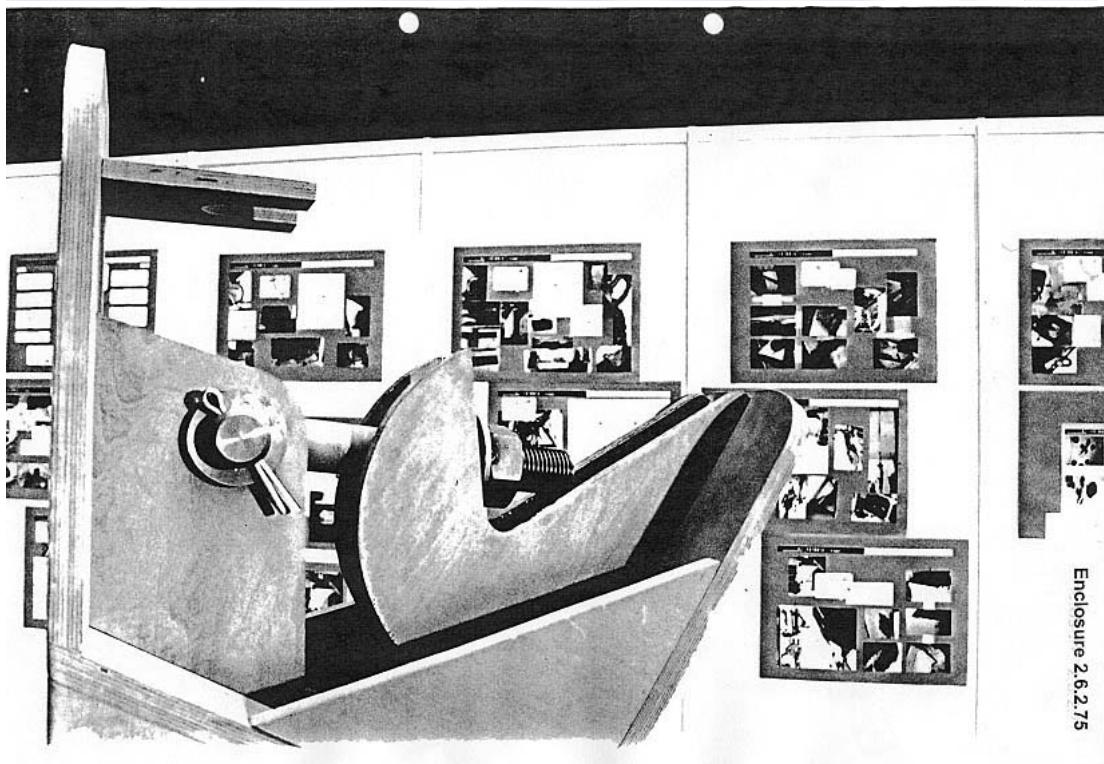
Enclosure 2.6.2.71



Enclosure 2.6.2.72

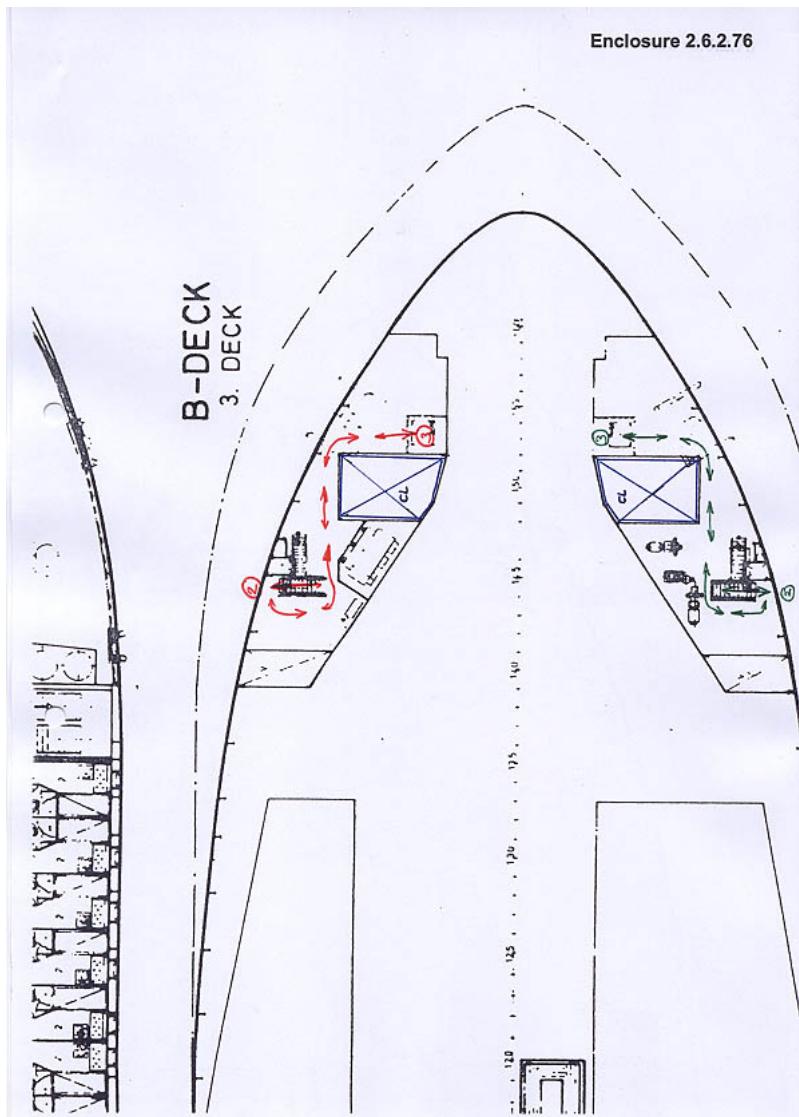


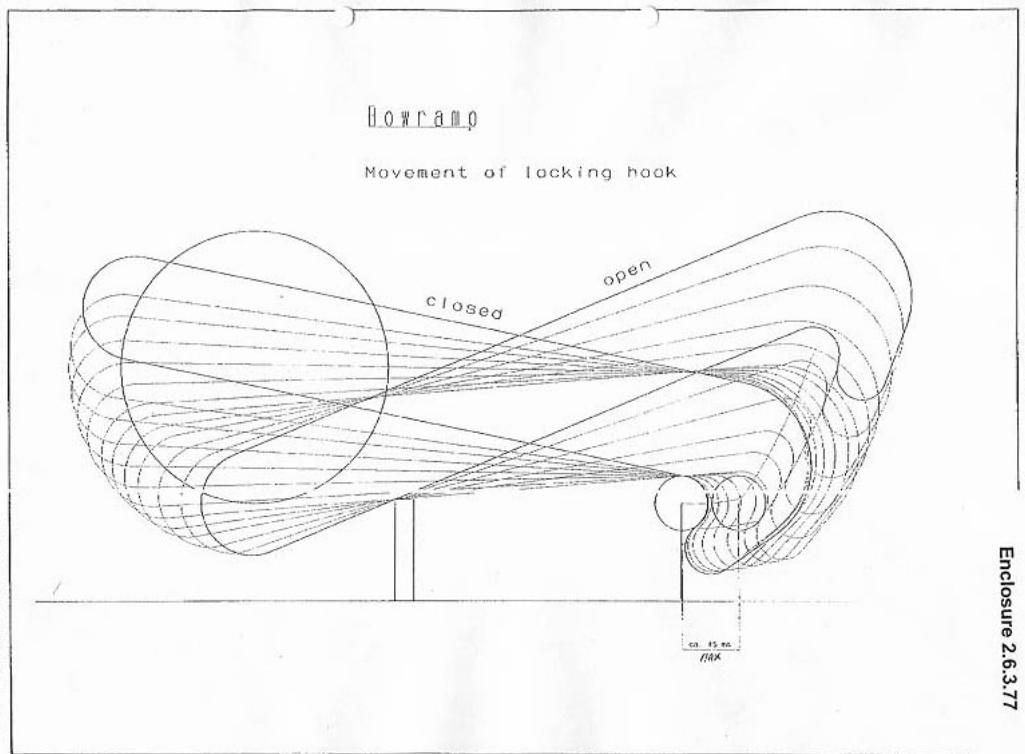
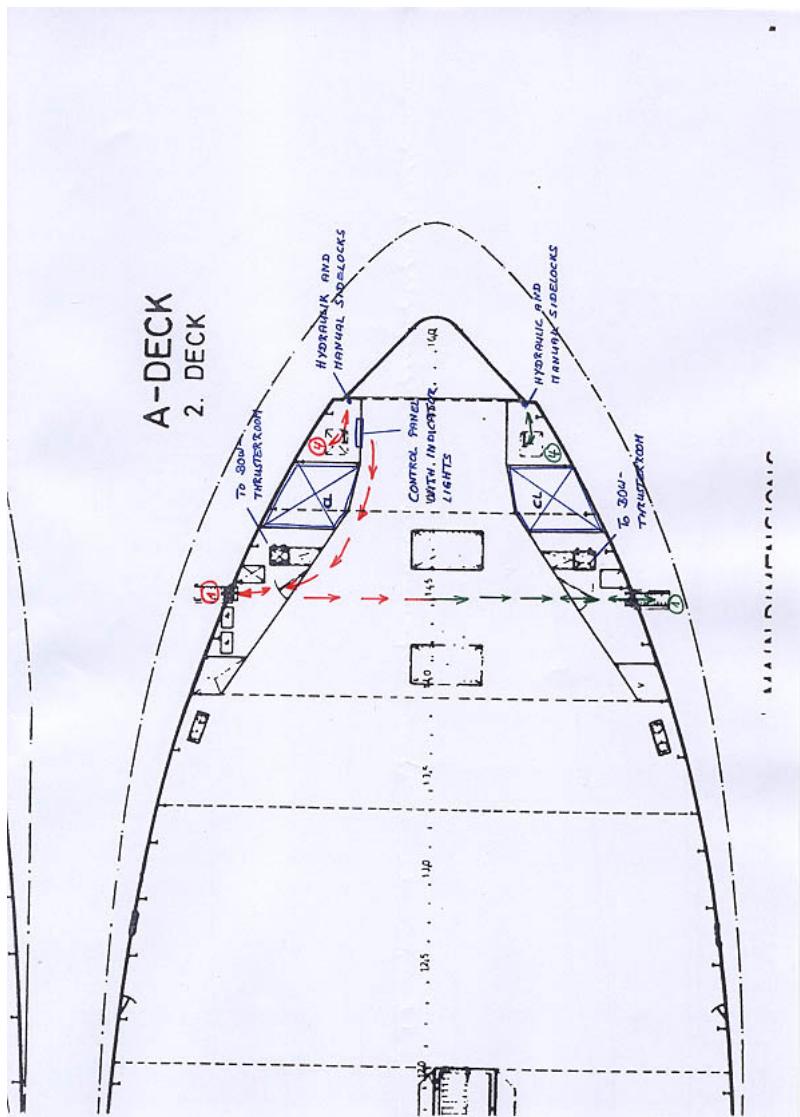
Enclosure 2.6.2.74



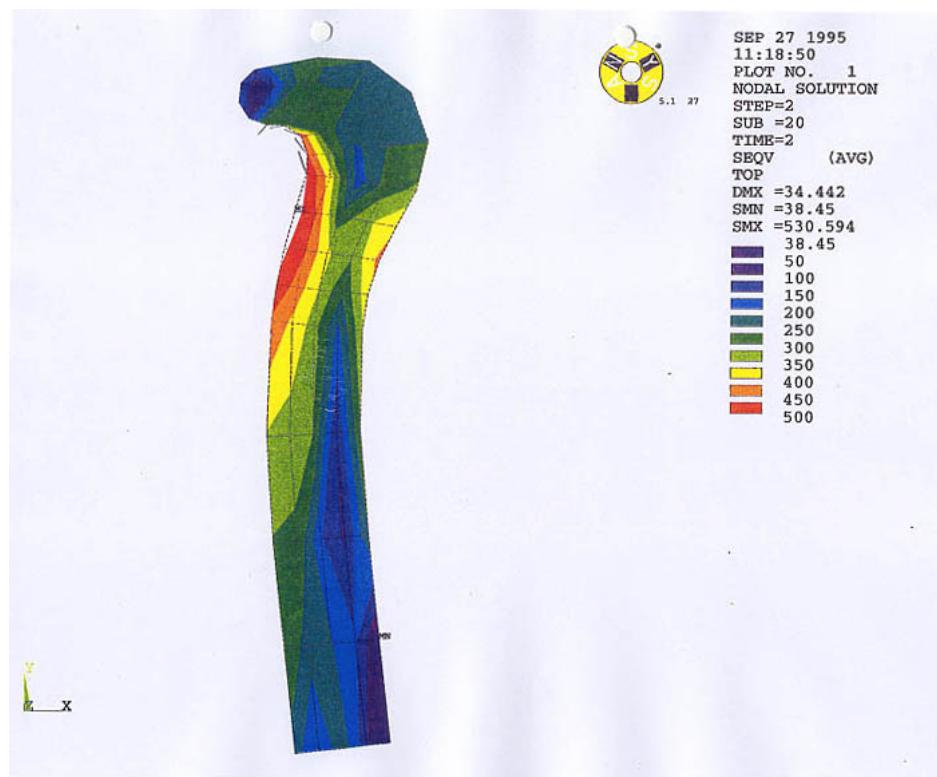
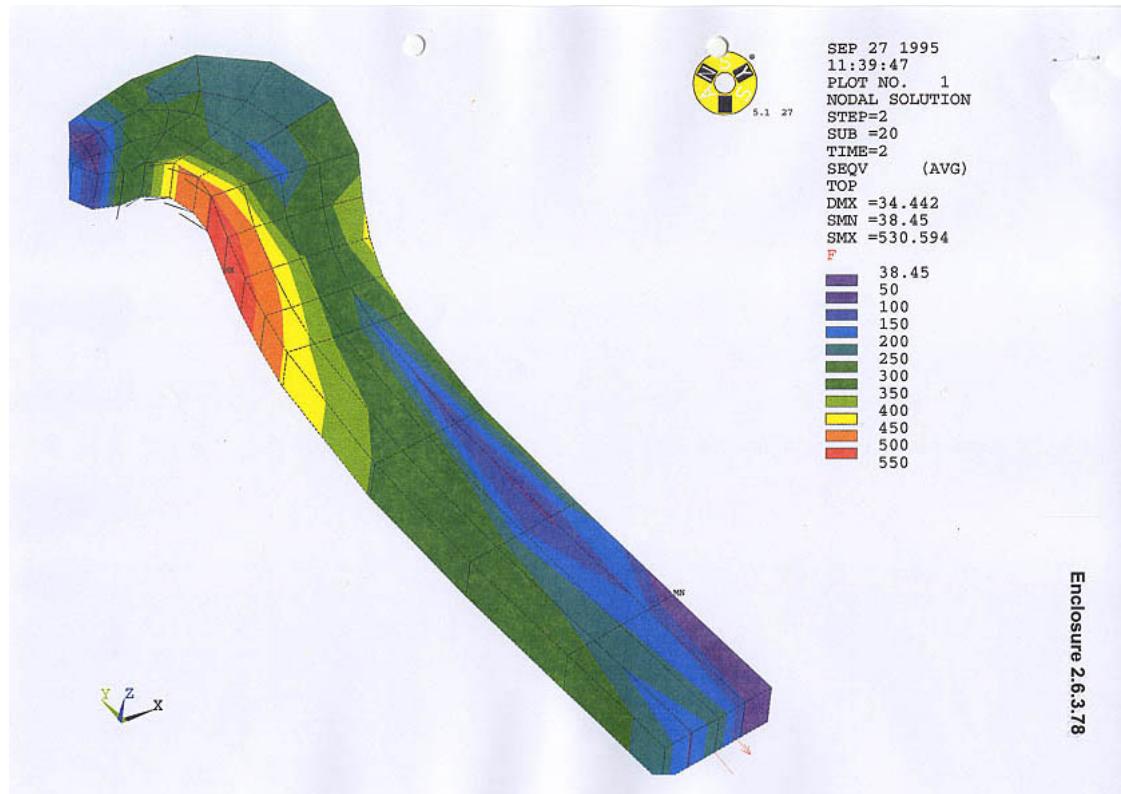
Enclosure 2.6.2.75

## Enclosure 2.6.2.76

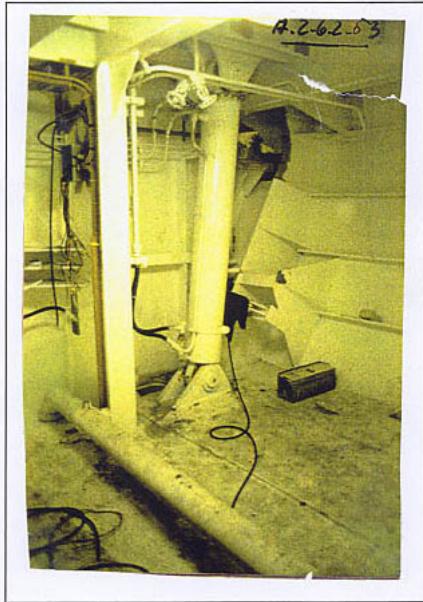




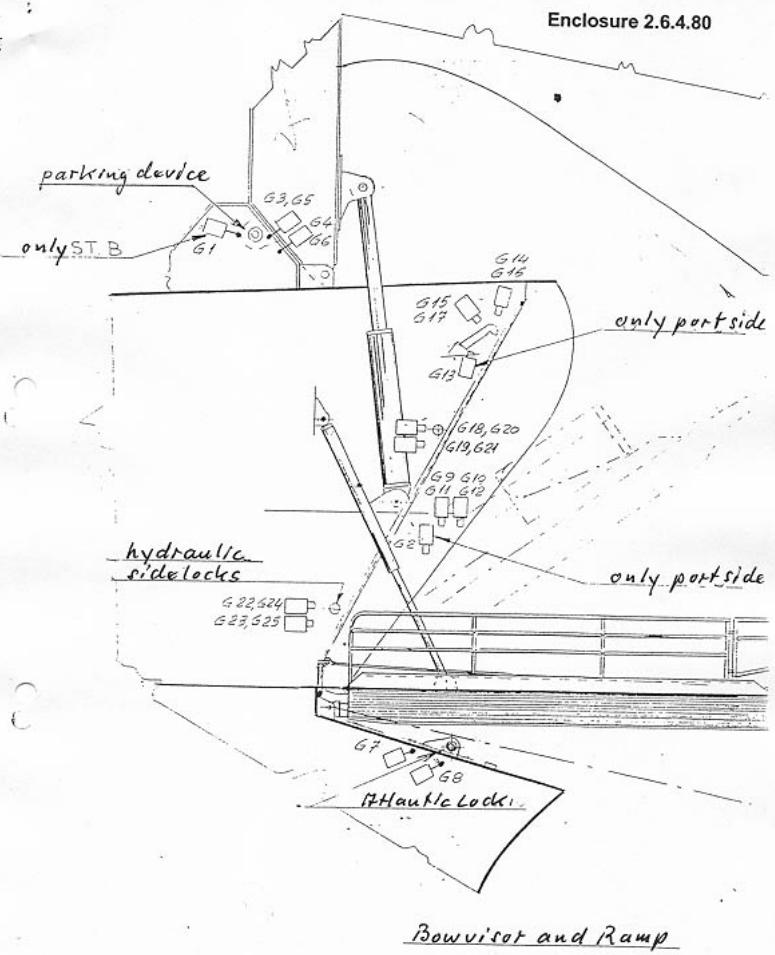
Enclosure 2.6.3.77



Enclosure 2.6.4.79



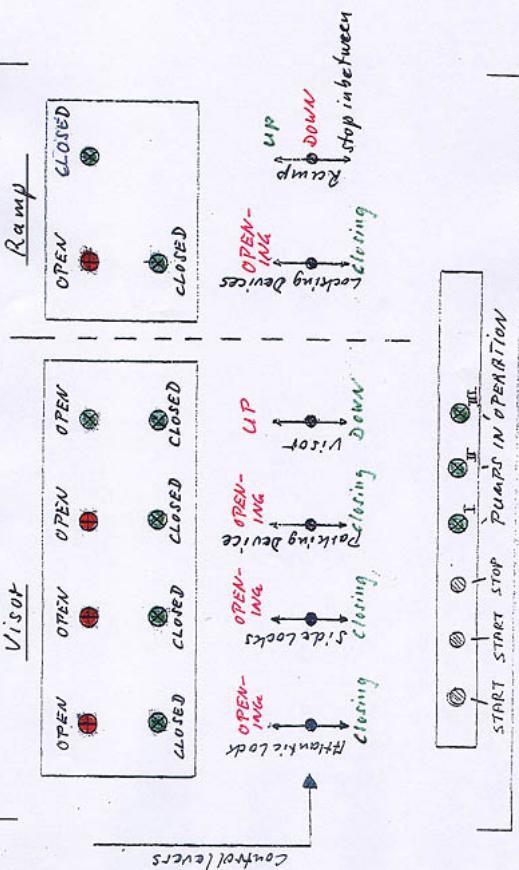
Enclosure 2.6.4.80



Part of drawing  
49111 - 521

Enclosure 2.6.4.810

1. Control panel on Card X  
 (visor and ramp and locking devices properly closed,  
 servers and indicator lights in order  
 Condition on open delivery in June 1980)



**Enclosure 3.2.3.82**

INTERNATIONAL MARITIME ORGANIZATION

## Chapter V

**Safety of navigation**

(d) Forecasts, warnings, synoptic and other meteorological reports intended for ships shall be issued and disseminated by the national service in the best position to serve various zones and areas, in accordance with mutual arrangements made by the Contracting Governments concerned.

**Regulation 5**  
*Ice patrol service*

(a) The Contracting Governments undertake to continue an ice patrol and a service for study and observation of ice conditions in the North Atlantic. During the whole of the ice season the south-eastern, southern and south-western limits of the regions of icebergs in the vicinity of the Grand Banks of Newfoundland shall be guarded for the purpose of informing passing ships of the extent of this dangerous region; for the study of ice conditions in general; and for the purpose of affording assistance to ships and crews requiring aid within the limits of operation of the patrol ships. During the rest of the year the study and observation of ice conditions shall be maintained as advisable.

(b) Ships and aircraft used for the ice patrol service and the study and observation of ice conditions may be assigned other duties by the managing Government, provided that such other duties do not interfere with the primary purpose or increase the cost of this service.

**Regulation 6**  
*Ice patrol: Management and cost*

(a) The Government of the United States of America agrees to continue the management of the ice patrol service and the study and observation of ice conditions, including the dissemination of information received therefrom. The Contracting Governments specially interested in these services undertake to contribute to the expense of maintaining and operating these services; each contribution to be based upon the total gross tonnage of the vessels of each contributing Government passing through the regions of icebergs guarded by the ice patrol; in particular, each Contracting Government specially interested undertakes to contribute annually to the expense of maintaining and operating these services a sum determined by the ratio which the total gross tonnage of that Contracting Government's vessels passing during the ice season through the regions of icebergs guarded by the ice patrol bears to the combined total gross tonnage

season through the regions of icebergs guarded by the ice patrol. Non-contracting Governments specially interested may contribute to the expense of maintaining and operating these services on the same basis. The managing Government will furnish annually to each contributing Government a statement of the total cost of maintaining and operating the ice patrol and of the proportionate share of each contributing Government.

(b) Each of the contributing Governments has the right to alter or discontinue its contribution, and other interested Governments may undertake to contribute to the expense. The contributing Government which avails itself of this right will continue to be responsible for its current contribution up to 1 September following the date of giving notice of intention to alter or discontinue its contribution. To take advantage of the said right it must give notice to the managing Government at least six months before the said 1 September.

(c) If, at any time, the United States Government should desire to discontinue these services, or if one of the contributing Governments should express a wish to relinquish responsibility for its pecuniary contribution, or to have its contribution altered, or another Contracting Government should desire to undertake to contribute to the expense, the contributing Governments shall settle the question in accordance with their mutual interests.

(d) The contributing Governments shall have the right by common consent to make from time to time such alterations in the provisions of this regulation and of regulation 5 of this chapter as appear desirable.

(e) Where this regulation provides that a measure may be taken after agreement among the contributing Governments, proposals made by any Contracting Government for effecting such a measure shall be communicated to the managing Government which shall approach the other contributing Governments with a view to ascertaining whether they accept such proposals, and the results of the enquiries thus made shall be sent to the other contributing Governments and the Contracting Government making the proposals. In particular, the arrangements relating to contributions to the cost of the services shall be reviewed by the contributing Governments at intervals not exceeding three years. The managing Government shall initiate the action necessary to this end.

**Regulation 7**  
*Speed near ice*

When ice is reported on or near his course the master of every ship at night is bound to proceed at a moderate speed or to alter his course

## Enclosure 3.3.83

**The German Group of Experts  
investigating the sinking of M/V "ESTONIA"**  
c/o AHLERS & VOGEL · Schaeffler 1 D-20459 Hamburg · Telephone 49-40-371075

Memo for Dr. Holtappels

re: Interview of Juhani Luttunen, ex boatswain of "Viking Sally", "Silja Star" and  
"Wasa King" from June 1980 to November 1992 on 6.9.96

1. Luttunen had killed another ex crew member of "Viking Sally", etc., the engine repairman Christer Koivisto, by shooting him twice into the head onboard M.V. "Fennia" on the 12th June of this year whilst in the port of Wasa. This is why the interview took place in the prison of Wasa where Luttunen has been ever since. The interview, in the course of which also the underwater videos concerning the Atlantic lock area were viewed, took 4 hours. Participants were

Daniel Allén - lawyer of Luttunen  
Henrik Gahmberg - Bützow & Co., Helsinki  
the Undersigned.

2. Christer Koivisto had been an engine repairman and 'ombudsman' (union representative) from the take-over of "Viking Sally" in Papenburg until June 1993 when the vessel was "Estonia", whilst Luttunen had been boatswain from the take-over in June 1980 to November 1992 when the vessel was "Wasa King". According to L., Koivisto had a very dominant/convincing personality, and we got the impression that there had been a certain rivalry between the two over the years. The exact times of Luttunen, Koivisto as well as of Göran Lindström and Bo Wesander, nominated by Luttunen as witnesses, can be taken from the attached copy of the crew register of the Finnish Board of Navigation.

3. L. is believed to be schizophrenic and/or paranoid and will undergo mental examination shortly. During the interview, however, he made a completely normal impression on us, very calm and concentrated, only once did he become slightly excited, viz. when we could confirm that the visor lug possibly showed indications of manipulation which could not be explained by normal wear and tear, and elongation/stretching in service.
4. L. explained in detail:
  - his function as boatswain in connection with operating visor/bow ramp, i.e. standing at the control panel, he explained the different handles and also the indicator lights, remembered clearly the 2 hooks and 4 bolts of the bow ramp as well as
  - the sidelocks, the Atlantic lock, and also explained that they had never engaged the manual sidelocks.
  - At some time in 1982 they realized that the visor was no more closing properly because it was in a misaligned condition athwartships, he believes that the starboard corner was standing a bit up. It was for this reason that the Atlantic lock bolt could no longer move through the visor lug. The matter was discussed with the engine people and it was considered what could be done. Engine repairman Koivisto considered himself to be the visor expert and offered to rectify the Atlantic lock to the effect that the bolt would fit again. L. believes that Koivisto was even called back from vacation to do the modification.
  - In the presence of L. and Göran Lindström Koivisto cut off the upper part of the lugs of the Atlantic lock and took off the bushings. Thereafter he welded extended parts on the lug remains and the holes in the lugs now looked like an ellipse (see drawing attached an enclosure no. 2), the bushings did not fit any more and were left out as still the bolt would not go smoothly through the visor lug, which was extending apparently too much aft or too much forward. In any event Koivisto cut something off

the inside of the visor lug, whereby L. is of the opinion it was from the forward part (see drawing attached as enclosure no. 3). After the repairs were completed by Koivisto L. together with Lindström looked at the result and realized at once that it was impossible. They decided to contact the inspector from shore, he does not recall the name, is however sure that it was not Röblom (whom he knows). He is very careful with names since Lindström and Wesander, whom he had called as witnesses, had testified that they did not remember. It was their intention to call in the inspector who normally inspected the visor.

Somebody came and realized the poor modification. About one week later Swedish speaking people came from the company von Tell AB, totally cut off all 3 lugs of the Atlantic lock and welded new ones to the A-Deck with bushings inserted. He believes also that it was then realized that there was something wrong with the hydraulic, which was adjusted. The visor lug remained - as far as he remembers - unchanged, i.e. should still be the original.

When the repairs were completed the von Tell people expressly prohibited Koivisto or anybody else from board to ever manipulate the Atlantic lock again.

5. We have promised to send photos of bolts and lugs from the Atlantic lock as well as from the visor lug and will also attach photos from the poorly welded fundamant of the port actuator and the hinges, although he has already said that he does not remember anything in this respect.
6. The information from Luttunen will be cross-checked with von Tell and some people in Mariehamn.
7. According to L. Koivisto has repeated the poor modification of the Atlantic lock again on "Estonia" which might have caused the catastrophe.

8. L. has spoken several times to T. Karppinen before and after the murder, the first time in December 1995 when he visited the Finnish Commission on his own initiative. According to Karppinen, however, he did not express himself very clearly at the beginning and spoke more in a coded manner, which was confirmed by L. when we asked him respectively.
9. In summary it has to be concluded that in case it can be proved that L. is right the 3 lugs at vessel's side are not original which would explain the good looking but too thin welds at centre and port lugs, whilst the starboard lug had subsequently been repair welded. It would also explain the longer support bracket at the starboard lug when comparing it with the drawing.

Hamburg, 09.09.96

Werner Hummel

Encl.

4/7/2021

evacuation plan 1

SHIP CONSULTING LTD OY

20.01.1991

Enclosure 3.4.86

WASA KING

TRIM AND STABILITY  
BOOKLET

Approved by T-Bd  
Esko Lehto  
23.1.91

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## SHIP CONSULTING

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## Appendix

Damage stability diagram 6891.01-1115.600  
Hydrostatic particulars 6891.06-171.120  
Stability Cross Curves values 6891.01-171.200  
Report of inclining experiment 11.01 1991

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1

## GENERAL PARTICULARS

SHIP'S NAME : WASA KING ex Silja Star ex Viking Sally

SIGNAL LETTERS : OIKW

PORT OF REGISTRY :

OWNERS NAME :

BUILDERS NAME  
AND ADDRESS : Jos. L. Meyer, Papenburg-Ems

SHIP'S NUMBER : 590

DATE OF KEEL LAID :

|                   |                      |          |
|-------------------|----------------------|----------|
| MAIN DIMENSIONS : | Length over all      | 157.02 m |
|                   | Length between perp. | 137.40 m |
|                   | Breadth mld          | 24.20 m  |
|                   | Depth to A deck      | 7.65 m   |
|                   | Draught              | 5.567 m  |

BLOCK COEFFICIENT : 0.681

DISPLACEMENT (1.025 t/m<sup>3</sup>) : T = 5.567 M 12708 T

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2

## GENERAL

This Trim and Stability Booklet is based on Maierform's Hydrostatic Particulars 6891.06-171.120, Cross Stability Curves Values 6891.01-171.200 and Damage Stability Diagram 6891.01-115.600 and Inclining experiment 11.01. 1991.

The difference of Light Ship Weight between the two inclining experiments was 313 t. The largest parts in additional weights were 'Duck tail' and additional insulation between passenger cabins.

The Duck tail's volume and effect to KM is not included in hydrostatic particulars. (Reduced trim and give more stability). During inclining experiment the Duck tail was over water surface all the time.

In loading cases 4 and 5 there has been shown stability curve and GM-values in various numbers of passengers. In loading cases 6, 7 and 8 there has been shown GM-values in various numbers of trailers.

The damage stability diagram has been calculated with the following criterions:

- GM at least 0.05 m
- Max. heel in unsymmetrical cases not more than 7°
- Margin line not immersed in the final stage of flooding.

The following tanks and spaces are connected with cross-flooding ducts:

- Heeling tanks (Tank 13 and 14)
- Sauna fr 110 - 120 from CL-side P & S
- Fresh water tanks fr 120 - 132 P & S

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WASA KING

20.01.1991

3

## COMBINATION TABLE FOR LOADING CASES

| CASE NO | LOADING CONDITION                      | HFO | FW  | PASS | CARGO | WB  | DWT  | MEAN DRAUGHT | TRIM  | GM'  | GM <sub>SEQ</sub> |
|---------|--|-----|-----|------|-------|-----|------|--------------|-------|------|-------------------|
|         |  | T   | T   | T    | T     | T   | T    | M            | M     | M    | M                 |
| 1       | LIGHT SHIP                             | -   | -   | -    | -     | -   | -    | 4.47         | -2.28 | 0.44 | -                 |
| 2       | BALLAST CONDITION AT DEPARTURE         | 807 | 644 | -    | -     | 479 | 2307 | 5.33         | -0.64 | 1.51 | 0.64              |
| 3       | BALLAST CONDITION AT ARRIVAL           | 94  | 68  | -    | -     | 993 | 1248 | 4.95         | -0.50 | 1.04 | 0.92              |
| 4       | FULL BUNKERS +2000 PASS. AT DEPARTURE  | 807 | 644 | 200  | -     | 479 | 2607 | 5.44         | -0.51 | 1.49 | 0.62              |
| 5       | FULL BUNKERS +2000 PASSENG. AT ARRIVAL | 94  | 68  | 200  | -     | 993 | 1555 | 5.06         | -0.42 | 0.96 | 0.83              |
| 6       | 47 TRAILER & 2000 PASS. AT DEPARTURE   | 417 | 287 | 200  | 1692  | -   | 2975 | 5.57         | -0.84 | 1.14 | 0.66              |
| 7       | 47 TRAILER & 2000 PASS. 50 % B & S     | 208 | 137 | 200  | 1692  | 176 | 2658 | 5.46         | -0.75 | 0.84 | 0.63              |
| 8       | 47 TRAILER & 2000 PASS. AT ARRIVAL     | 42  | 38  | 200  | 1692  | 567 | 2694 | 5.47         | -0.12 | 0.85 | 0.63              |

w

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WASA KING

20.01.1991

4

## LOAD CASE 1

## LIGHT SHIP

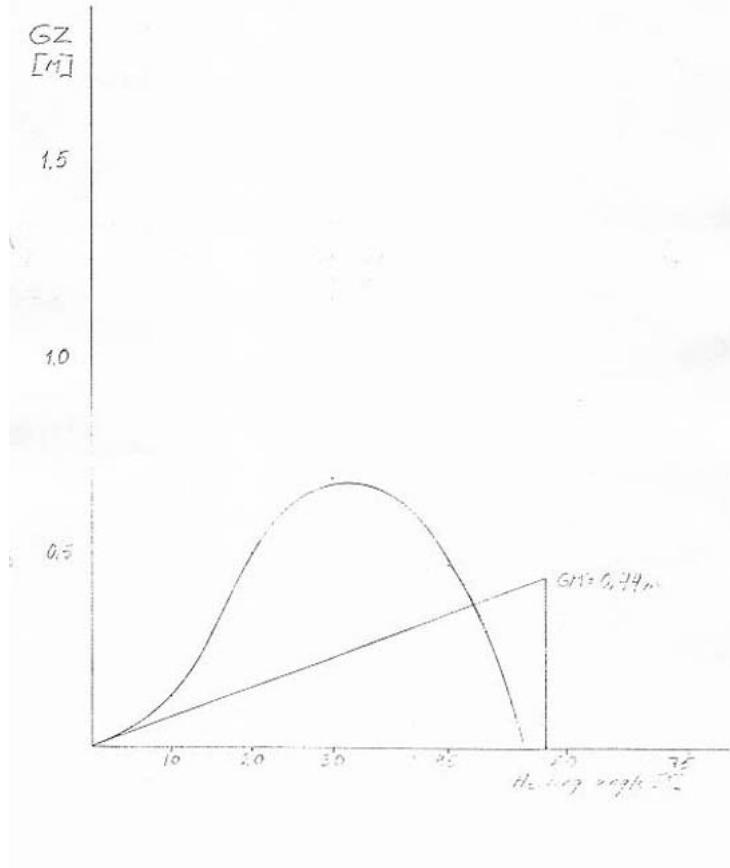
|                   | Weight<br>t | VCG<br>from<br>BL<br>m | Mom<br>tm | LCG<br>from<br>$A_{pp}$<br>m | Mom<br>tm | Free<br>surf<br>tm |
|-------------------|-------------|------------------------|-----------|------------------------------|-----------|--------------------|
| Light ship weight | 9733        | 11.56                  | 112513    | 60.76                        | 591377    | -                  |
| Dead weight       |             | "                      |           |                              |           |                    |
| Displacement      | 9733        | 11.56                  | 112513    | 60.76                        | 591377    |                    |

|              |         |     |         |
|--------------|---------|-----|---------|
| Mean draught | 4.47 m  | KM  | 12.00 m |
| Trim         | -2.28 m | KG  | 11.56 m |
| Draught aft  | 5.41 m  | GM  | 0.44 m  |
| Draught forw | 3.13 m  | MM' | 0.00 m  |
|              |         | GM' | 0.44 m  |

## Calculation of curve of statical stability

| Heeling | 10°    | 20°    | 30°    | 45°    | 60°    | 75°    |
|---------|--------|--------|--------|--------|--------|--------|
| sin     | 0.1736 | 0.3420 | 0.5000 | 0.7071 | 0.8660 | 0.9659 |
| KN      | 2.14   | 4.45   | 6.47   | 8.64   | 9.53   | 9.13   |
| KG'*sin | 2.01   | 3.95   | 5.78   | 8.17   | 10.01  | 11.17  |
| GZ      | 0.13   | 0.50   | 0.69   | 0.47   | -0.48  | -2.04  |

|                                  |                           |                              |
|----------------------------------|---------------------------|------------------------------|
| Ship Consulting<br>Turku Finland | LOAD CASE 1<br>LIGHT SHIP | WASH KING<br>20.01.1991/VR1] |
|----------------------------------|---------------------------|------------------------------|



SHIP CONSULTING

WASA KING

20.01.1991

6

## LOAD CASE 2

## BALLAST CONDITION AT DEPARTURE

|                      | Weight<br>t | VCG<br>from<br>BL<br>m | Mom<br>tm | LCG<br>from<br>$A_{pp}$<br>m | Mom<br>tm | Free<br>surf<br>tm |
|----------------------|-------------|------------------------|-----------|------------------------------|-----------|--------------------|
| Light ship weight    | 9733        | 11.56                  | 112513    | 60.76                        | 591377    |                    |
| Crew + effects       | 20          | 22.00                  |           | 55.00                        |           |                    |
| Provisions + stores  | 20          | 10.00                  |           | 46.00                        |           |                    |
| Heavy Fuel Oil       |             |                        |           |                              |           |                    |
| DB tank 9            | 69          | 0.60                   |           | 86.60                        |           |                    |
| H tank 10            | 162         | 2.70                   |           | 74.20                        |           |                    |
| H tank 11            | 162         | 2.70                   |           | 74.20                        |           |                    |
| DB tank 15           | 127         | 0.60                   |           | 72.20                        | 434       |                    |
| DB tank 16           | 127         | 0.60                   |           | 72.20                        | 434       |                    |
| DB tank 19           | 66          | 0.51                   |           | 58.30                        |           |                    |
| Day tank 36          | 24          | 2.82                   |           | 36.23                        |           |                    |
| Day tank 37          | 18          | 2.81                   |           | 36.62                        |           |                    |
| Settling tank 38     | 30          | 2.90                   |           | 32.20                        |           |                    |
| Settling tank 39     | 22          | 2.86                   |           | 33.84                        |           |                    |
| Total of HFO         | 807         | 1.70                   |           | 68.70                        | 868       |                    |
| Diesel Oil           |             |                        |           |                              |           |                    |
| DB tank 8            | 65          | 0.60                   |           | 86.60                        |           |                    |
| DB tank 18           | 60          | 0.51                   |           | 58.30                        |           |                    |
| DB tank 20           | 18          | 0.57                   |           | 59.87                        |           |                    |
| DB tank 47           | 39          | 0.65                   |           | 26.62                        | 248       |                    |
| DB tank 48           | 41          | 0.65                   |           | 26.51                        | 249       |                    |
| Day tank 41          | 13          | 2.91                   |           | 31.03                        |           |                    |
| Total of DO          | 236         | 0.72                   |           | 53.95                        | 497       |                    |
| Lubric. Oil          |             |                        |           |                              |           |                    |
| Thermal oil tank 24  | 16          | 0.67                   |           | 45.78                        |           |                    |
| Lubr oil tank 25     | 13          | 0.55                   |           | 45.40                        |           |                    |
| Lube oil tank 26     | 13          | 0.55                   |           | 45.40                        |           |                    |
| Lube oil tank 27     | 13          | 0.55                   |           | 45.40                        |           |                    |
| Lube oil tank 28     | 13          | 0.55                   |           | 45.40                        |           |                    |
| Lube oil supply t 30 | 10          | 0.55                   |           | 50.15                        |           |                    |
| Lubr oil tank 32     | 12          | 0.55                   |           | 44.57                        |           |                    |
| Kamewa tank 50       | 2           | 0.60                   |           | 24.60                        |           |                    |
| Kamewa tank 51       | 2           | 0.60                   |           | 23.40                        |           |                    |
| Kamewa tank 52       | 2           | 0.60                   |           | 23.40                        |           |                    |
| Stern tube oil 55a   | 5           | 0.71                   |           | 15.06                        |           |                    |
| Total of LO          | 101         | 0.58                   |           | 43.05                        |           |                    |

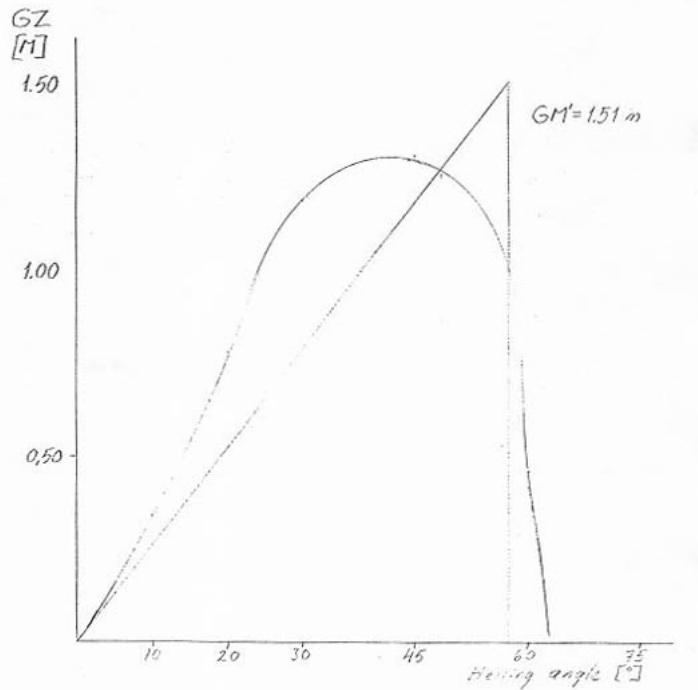
| SHIP CONSULTING      | WASA KING    | 20.01.1991  | 7                               |
|----------------------|--------------|-------------|---------------------------------|
| <b>Fresh Water</b>   |              |             |                                 |
| Tank 4a              | 75           | 2.79        | 114.25                          |
| Tank 4b              | 75           | 2.79        | 114.25                          |
| Tank 5               | 145          | 2.79        | 113.65                          |
| Tank 56              | 156          | 3.07        | 9.46 353                        |
| Tank 57              | 156          | 3.07        | 9.46 353                        |
| Circulating tank 17  | 18           | 0.60        | 58.30                           |
| Cool water tank 22   | 3            | 0.57        | 55.40                           |
| Cool water tank 29   | 16           | 0.67        | 45.80                           |
| Total of FW          | 644          | 2.80        | 59.82 706                       |
| <b>Water Ballast</b> |              |             |                                 |
| Fore peak tank 1     | 176          | 4.45        | 133.92                          |
| Trim tank 2          | 303          | 4.69        | 121.40 2260                     |
| Total of WB          | 479          | 4.60        | 126.00 2260                     |
| <b>Dead weight</b>   | <b>2307</b>  | <b>2.71</b> | <b>6247 75.17 173419 4331</b>   |
| <b>Displacement</b>  | <b>12040</b> | <b>9.86</b> | <b>118760 63.52 764796 4331</b> |

|              |         |     |         |
|--------------|---------|-----|---------|
| Mean draught | 5.33 m  | KM  | 11.73 m |
| Trim         | -0.64 m | KG  | 9.86 m  |
| Draught aft  | 5.65 m  | GM  | 1.87 m  |
| Draught forw | 5.01 m  | MM' | 0.36 m  |
|              |         | GM' | 1.51 m  |

Calculation of curve of statical stability

|         | 10°    | 20°    | 30°    | 45°    | 60°    | 75°    |
|---------|--------|--------|--------|--------|--------|--------|
| sin     | 0.1736 | 0.3420 | 0.5000 | 0.7071 | 0.8660 | 0.9659 |
| KN      | 2.11   | 4.28   | 6.30   | 8.54   | 9.31   | 8.95   |
| KG'*sin | 1.77   | 3.50   | 5.11   | 7.23   | 8.85   | 9.87   |
| GZ      | 0.34   | 0.78   | 1.19   | 1.31   | 0.46   | -0.92  |

|                                  |                                     |                             |
|----------------------------------|-------------------------------------|-----------------------------|
| Ship Consulting<br>Turku Finland | LOAD CASE 2<br>BALLAST AT DEPARTURE | WASA KING<br>20.01.1991/vmj |
|----------------------------------|-------------------------------------|-----------------------------|



SHIP CONSULTING

WASA KING

20.01.1991

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## LOAD CASE 3

## BALLAST CONDITION AT ARRIVAL

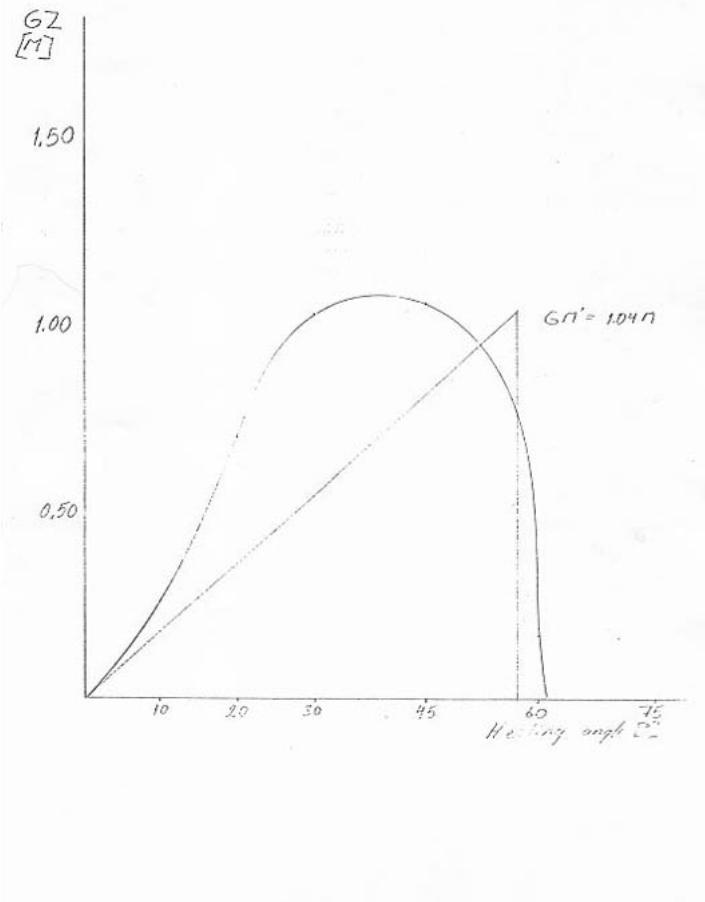
|                      | Weight<br>t | VCG<br>from<br>BL<br>m | Mom<br>tm | LCG<br>from<br>$A_{pp}$<br>m | Mom<br>tm | Free<br>surf<br>tm |
|----------------------|-------------|------------------------|-----------|------------------------------|-----------|--------------------|
| Light ship weight    | 9733        | 11.56                  | 112513    | 60.76                        | 591377    |                    |
| Crew + effects       | 20          | 22.00                  |           | 55.00                        |           |                    |
| Provisions + stores  | 15          | 10.00                  |           | 46.00                        |           |                    |
| Heavy Fuel Oil       |             |                        |           |                              |           |                    |
| Day tank 36          | 24          | 2.82                   |           | 36.23                        |           |                    |
| Day tank 37          | 18          | 2.81                   |           | 36.62                        |           |                    |
| Settling tank 38     | 30          | 2.90                   |           | 32.20                        |           |                    |
| Settling tank 39     | 22          | 2.86                   |           | 33.84                        |           |                    |
| Total of HFO         | 94          | 2.85                   |           | 34.46                        |           | 105                |
| Diesel Oil           |             |                        |           |                              |           |                    |
| DB tank 20           | 11          | 0.57                   |           | 59.87                        |           |                    |
| Day tank 41          | 13          | 2.91                   |           | 31.03                        |           |                    |
| Total of DO          | 24          | 1.74                   |           | 45.45                        |           | 39                 |
| Lubric. Oil          |             |                        |           |                              |           |                    |
| Lube oil tank 25     | 6           | 0.55                   |           | 45.40                        |           |                    |
| Lube oil tank 26     | 6           | 0.55                   |           | 45.40                        |           |                    |
| Lube oil tank 27     | 6           | 0.55                   |           | 45.40                        |           |                    |
| Lube oil tank 28     | 6           | 0.55                   |           | 45.40                        |           |                    |
| Lube oil supply t 30 | 5           | 0.55                   |           | 50.15                        |           |                    |
| Kamewa tank 50       | 1           | 0.60                   |           | 24.60                        |           |                    |
| Kamewa tank 51       | 1           | 0.60                   |           | 23.40                        |           |                    |
| Kamewa tank 52       | 1           | 0.60                   |           | 23.40                        |           |                    |
| Stern tube oil 55a   | 2           | 0.71                   |           | 15.06                        |           |                    |
| Total of LO          | 34          | 0.56                   |           | 42.41                        |           |                    |
| Fresh Water          |             |                        |           |                              |           |                    |
| Tank 5               | 45          | 2.79                   |           | 113.65                       |           |                    |
| Circulating tank 17  | 10          | 0.60                   |           | 58.30                        |           |                    |
| Cool water tank 22   | 3           | 0.57                   |           | 55.40                        |           |                    |
| Cool water tank 29   | 10          | 0.67                   |           | 45.80                        |           |                    |
| Total of FW          | 68          | 2.06                   |           | 92.96                        |           | 166                |
| Water Ballast        |             |                        |           |                              |           |                    |
| Fore peak tank 1     | 176         | 4.45                   |           | 133.92                       |           |                    |
| Trim tank 2          | 303         | 4.69                   |           | 121.40                       |           |                    |
| DB tank 6            | 88          | 0.64                   |           | 104.84                       |           |                    |
| Heeling tank 13      | 183         | 2.63                   |           | 77.53                        |           |                    |
| Heeling tank 14      | 183         | 2.63                   |           | 77.53                        |           |                    |
| DB tank 54           | 60          | 0.66                   |           | 19.14                        |           |                    |
| Total of WB          | 993         | 3.29                   |           | 99.80                        |           |                    |

|                 |           |            |         |       |        |     |
|-----------------|-----------|------------|---------|-------|--------|-----|
| SHIP CONSULTING | WASA KING | 20.01.1991 | 10      |       |        |     |
| Dead weight     | 1248      | 3.46       | 4322    | 90.54 | 112988 | 310 |
| Displacement    | 10981     | 10.64      | 116835  | 64.14 | 704365 | 310 |
| Mean draught    | 4.95 m    | KM         | 11.71 m |       |        |     |
| Trim            | -0.50 m   | KG         | 10.64 m |       |        |     |
| Draught aft     | 5.20 m    | GM         | 1.07 m  |       |        |     |
| Draught forw    | 4.70 m    | MM'        | 0.03 m  |       |        |     |
|                 |           | GM'        | 1.04 m  |       |        |     |

Calculation of curve of statical stability

|         |        |        |        |        |        |        |
|---------|--------|--------|--------|--------|--------|--------|
| Heeling | 10°    | 20°    | 30°    | 45°    | 60°    | 75°    |
| sin     | 0.1736 | 0.3420 | 0.5000 | 0.7071 | 0.8660 | 0.9659 |
| KN      | 2.11   | 4.35   | 6.37   | 8.60   | 9.41   | 9.03   |
| KG'*sin | 1.85   | 3.65   | 5.34   | 7.54   | 9.24   | 10.31  |
| GZ      | 0.26   | 0.70   | 1.03   | 1.06   | 0.17   | -1.28  |

|                                  |                                   |                             |
|----------------------------------|-----------------------------------|-----------------------------|
| Ship Consulting<br>Turku Finland | LOAD CASE 3<br>BALLAST AT ARRIVAL | WASH LINE<br>20.01.1991/VMJ |
|----------------------------------|-----------------------------------|-----------------------------|



SHIP CONSULTING

WASA KING

20.01.1991

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## LOAD CASE 4

SHIP WITH FULL BUNKERS &amp; STORES + 2000 PASSENGER AT DEPARTURE

|                      | Weight<br>t | VCG<br>m | Mom<br>tm | LCG<br>$A_{pp}$<br>m | Mom<br>tm | Free<br>surf<br>tm |
|----------------------|-------------|----------|-----------|----------------------|-----------|--------------------|
| Light ship weight    | 9733        | 11.56    | 112513    | 60.76                | 591377    |                    |
| Crew + effects       | 20          | 22.00    |           | 55.00                |           |                    |
| Provisions + stores  | 80          | 10.00    |           | 46.00                |           |                    |
| Heavy Fuel Oil       |             |          |           |                      |           |                    |
| DB tank 9            | 69          | 0.60     |           | 86.60                |           |                    |
| H tank 10            | 162         | 2.70     |           | 74.20                |           |                    |
| H tank 11            | 162         | 2.70     |           | 74.20                |           |                    |
| DB tank 15           | 127         | 0.60     |           | 72.20                | 434       |                    |
| DB tank 16           | 127         | 0.60     |           | 72.20                | 434       |                    |
| DB tank 19           | 66          | 0.51     |           | 58.30                |           |                    |
| Day tank 36          | 24          | 2.82     |           | 36.23                |           |                    |
| Day tank 37          | 18          | 2.81     |           | 36.62                |           |                    |
| Settling tank 38     | 30          | 2.90     |           | 32.20                |           |                    |
| Settling tank 39     | 22          | 2.86     |           | 33.84                |           |                    |
| Total of HFO         | 807         | 1.70     |           | 68.70                | 868       |                    |
| Diesel Oil           |             |          |           |                      |           |                    |
| DB tank 8            | 65          | 0.60     |           | 86.60                |           |                    |
| DB tank 18           | 60          | 0.51     |           | 58.30                |           |                    |
| DB tank 20           | 18          | 0.57     |           | 59.87                |           |                    |
| DB tank 47           | 39          | 0.65     |           | 26.62                | 248       |                    |
| DB tank 48           | 41          | 0.65     |           | 26.51                | 249       |                    |
| Day tank 41          | 13          | 2.91     |           | 31.03                |           |                    |
| Total of DO          | 236         | 0.72     |           | 53.95                | 497       |                    |
| Lubric. Oil          |             |          |           |                      |           |                    |
| Thermal oil tank 24  | 16          | 0.67     |           | 45.78                |           |                    |
| Lubr oil tank 25     | 13          | 0.55     |           | 45.40                |           |                    |
| Lubr oil tank 26     | 13          | 0.55     |           | 45.40                |           |                    |
| Lubr oil tank 27     | 13          | 0.55     |           | 45.40                |           |                    |
| Lubr oil tank 28     | 13          | 0.55     |           | 45.40                |           |                    |
| Lubr oil supply t 30 | 10          | 0.55     |           | 50.15                |           |                    |
| Lubr oil tank 32     | 12          | 0.55     |           | 44.57                |           |                    |
| Kamewa tank 50       | 2           | 0.60     |           | 24.60                |           |                    |
| Kamewa tank 51       | 2           | 0.60     |           | 23.40                |           |                    |
| Kamewa tank 52       | 2           | 0.60     |           | 23.40                |           |                    |
| Stern tube oil 55a   | 5           | 0.71     |           | 15.06                |           |                    |
| Total of LO          | 101         | 0.58     |           | 43.05                |           |                    |

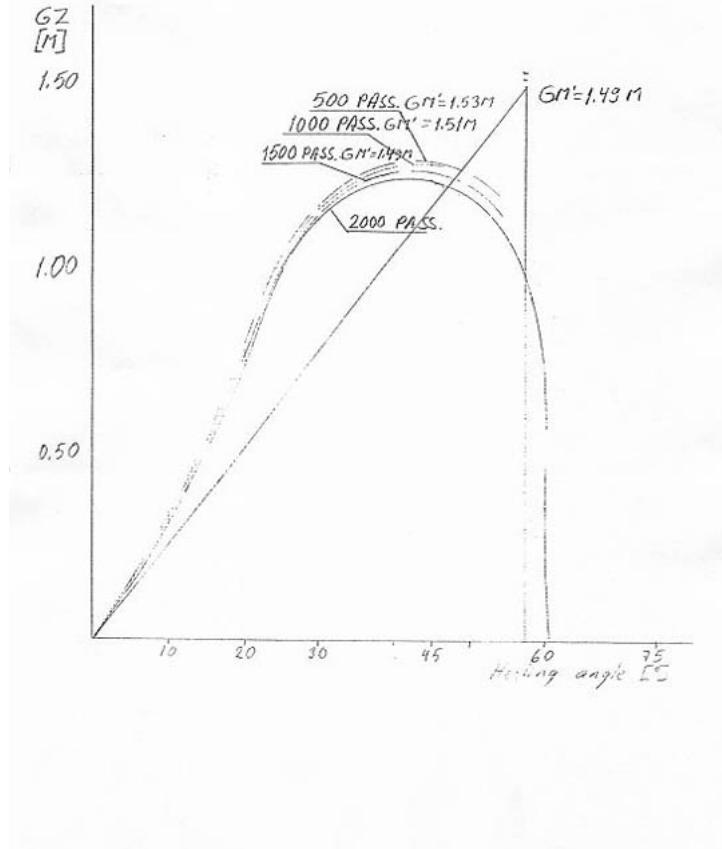
| SHIP CONSULTING      | WASA KING | 20.01.1991 | 13                       |
|----------------------|-----------|------------|--------------------------|
| <b>Fresh Water</b>   |           |            |                          |
| Tank 4a              | 75        | 2.79       | 114.25                   |
| Tank 4b              | 75        | 2.79       | 114.25                   |
| Tank 5               | 145       | 2.79       | 113.65                   |
| Tank 56              | 156       | 3.07       | 9.46                     |
| Tank 57              | 156       | 3.07       | 9.46                     |
| Circulating tank 17  | 18        | 0.60       | 58.30                    |
| Cool water tank 22   | 3         | 0.57       | 55.40                    |
| Cool water tank 29   | 16        | 0.67       | 45.80                    |
| Total of FW          | 644       | 2.80       | 59.82                    |
|                      |           |            | 706                      |
| <b>Water Ballast</b> |           |            |                          |
| Fore peak tank 1     | 176       | 4.45       | 133.92                   |
| Trim tank 2          | 303       | 4.69       | 121.40                   |
| Total of WB          | 479       | 4.60       | 126.00                   |
|                      |           |            | 2260                     |
| 2000 PASSENGER+LUGG  | 200       | 16.40      | 71.50                    |
| Swimming pool        | 40        | 2.00       | 97.50                    |
| Dead weight          | 2607      | 3.92       | 10207 74.56 194379 4331  |
| Displacement         | 12340     | 9.94       | 122720 63.68 785756 4331 |

|              |         |     |         |
|--------------|---------|-----|---------|
| Mean draught | 5.44 m  | KM  | 11.78 m |
| Trim         | -0.51 m | KG  | 9.94 m  |
| Draught aft  | 5.70 m  | GM  | 1.84 m  |
| Draught forw | 5.19 m  | MM' | 0.35 m  |
|              |         | GM' | 1.49 m  |

**Calculation of curve of statical stability**

|          |        |        |        |        |        |        |
|----------|--------|--------|--------|--------|--------|--------|
| Heeling  | 10°    | 20°    | 30°    | 45°    | 60°    | 75°    |
| sin      | 0.1736 | 0.3420 | 0.5000 | 0.7071 | 0.8660 | 0.9659 |
| KN       | 2.11   | 4.27   | 6.28   | 8.52   | 9.27   | 8.92   |
| KG * sin | 1.79   | 3.52   | 5.15   | 7.28   | 8.91   | 9.94   |
| GZ       | 0.32   | 0.75   | 1.13   | 1.24   | 0.36   | -1.02  |

|                                  |  |                              |
|----------------------------------|--|------------------------------|
| Ship Consulting<br>Turku Finland | LOAD CASE 4<br>FULL BUNKERS + 2000 PASS.<br>AT DEPARTURE | WASA KING<br>20.01. 1991/WM1 |
|----------------------------------|--|------------------------------|



SHIP CONSULTING

WASA KING

20.01.1991

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## LOAD CASE 5

SHIP WITH FULL BUNKERS AND STORES + 2000 PASSENGERS AT ARRIVAL

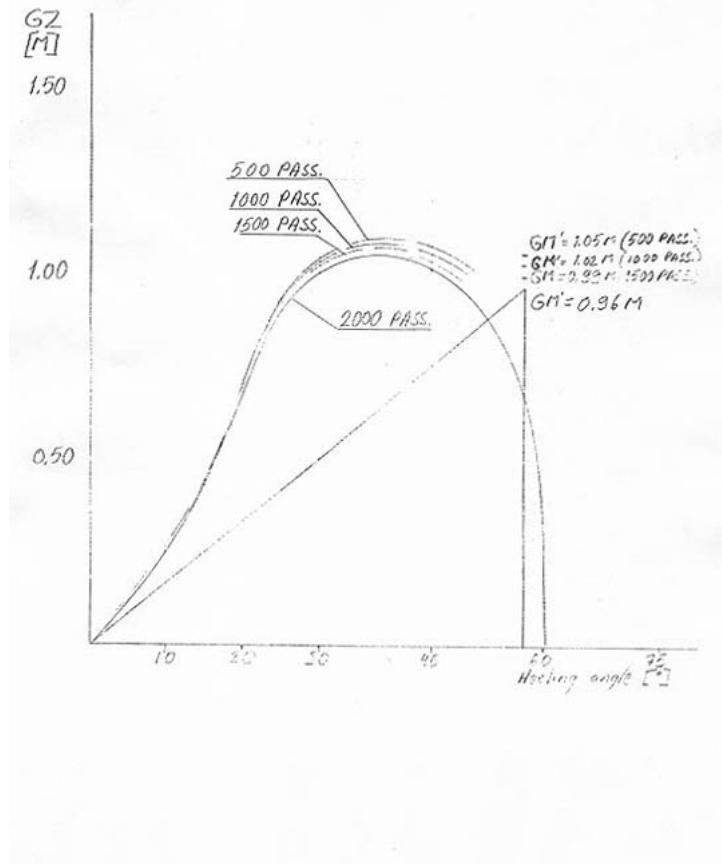
|                      | Weight<br>t | VCG<br>from<br>BL<br>m | Mom<br>tm | LCG<br>from<br>A <sub>pp</sub><br>m | Mom<br>tm | Free<br>surf<br>tm |
|----------------------|-------------|------------------------|-----------|-------------------------------------|-----------|--------------------|
| Light ship weight    | 9733        | 11.56                  | 112513    | 60.76                               | 591377    | -                  |
| Crew + effects       | 20          | 22.00                  |           | 55.00                               |           |                    |
| Provision + stores   | 60          | 10.00                  |           | 46.00                               |           |                    |
| Heavy Fuel Oil       |             |                        |           |                                     |           |                    |
| Day tank 36          | 24          | 2.82                   |           | 36.23                               |           |                    |
| Day tank 37          | 18          | 2.81                   |           | 36.62                               |           |                    |
| Settling tank 38     | 30          | 2.90                   |           | 32.20                               |           |                    |
| Settling tank 39     | 22          | 2.86                   |           | 33.84                               |           |                    |
| Total of HFO         | 94          | 2.85                   |           | 34.46                               |           | 105                |
| Diesel Oil           |             |                        |           |                                     |           |                    |
| DB tank 20           | 11          | 0.57                   |           | 59.87                               |           |                    |
| Day tank 41          | 13          | 2.91                   |           | 31.03                               |           |                    |
| Total of DO          | 24          | 1.74                   |           | 45.45                               |           | 39                 |
| Lubric. Oil          |             |                        |           |                                     |           |                    |
| Lubr oil tank 25     | 6           | 0.55                   |           | 45.40                               |           |                    |
| Lubr oil tank 26     | 6           | 0.55                   |           | 45.40                               |           |                    |
| Lubr oil tank 27     | 6           | 0.55                   |           | 45.40                               |           |                    |
| Lubr oil tank 28     | 6           | 0.55                   |           | 45.40                               |           |                    |
| Lubr oil supply t 30 | 5           | 0.55                   |           | 50.15                               |           |                    |
| Kamewa tank 50       | 1           | 0.60                   |           | 24.60                               |           |                    |
| Kamewa tank 51       | 1           | 0.60                   |           | 23.40                               |           |                    |
| Kamewa tank 52       | 1           | 0.60                   |           | 23.40                               |           |                    |
| Stern tube oil 55a   | 2           | 0.71                   |           | 15.06                               |           |                    |
| Total of LO          | 34          | 0.56                   |           | 42.41                               |           |                    |
| Fresh Water          |             |                        |           |                                     |           |                    |
| Tank 5               | 45          | 2.79                   |           | 113.65                              |           |                    |
| Circulating tank 17  | 10          | 0.60                   |           | 58.30                               |           |                    |
| Cool water tank 22   | 3           | 0.57                   |           | 55.40                               |           |                    |
| Cool water tank 29   | 10          | 0.67                   |           | 45.80                               |           |                    |
| Total of FW          | 68          | 2.06                   |           | 92.96                               |           | 166                |
| Bilge water 33       | 22          | 0.55                   |           | 35.83                               |           |                    |

| SHIP CONSULTING     | WASA KING | 20.01.1991 | 16                      |
|---------------------|-----------|------------|-------------------------|
| Water Ballast       |           |            |                         |
| Fore peak tank 1    | 176       | 4.45       | 133.92                  |
| Trim tank 2         | 303       | 4.69       | 121.40                  |
| DB tank 6           | 88        | 0.64       | 104.84                  |
| Heeling tank 13     | 183       | 2.63       | 77.53                   |
| Heeling tank 14     | 183       | 2.63       | 77.53                   |
| DB tank 54          | 60        | 0.66       | 19.14                   |
| Total of WB         | 993       | 3.29       | 99.80                   |
| 2000 passenger+lugg | 200       | 16.40      | 71.50                   |
| Swimming pool       | 40        | 2.00       | 97.50                   |
| Dead weight         | 1555      | 5.23       | 8132 85.72 133294 470   |
| Displacement        | 11288     | 10.69      | 120646 64.20 724671 470 |
| Mean draught        | 5.06 m    | KM         | 11.69 m                 |
| Trim                | -0.42 m   | KG         | 10.69 m                 |
| Draught aft         | 5.27 m    | GM         | 1.00 m                  |
| Draught forw        | 4.85 m    | MM'        | 0.04 m                  |
|                     |           | GM'        | 0.96 m                  |

Calculation of curve of statical stability

|         | 10°    | 20°    | 30°    | 45°    | 60°    | 75°    |
|---------|--------|--------|--------|--------|--------|--------|
| sin     | 0.1736 | 0.3420 | 0.5000 | 0.7071 | 0.8660 | 0.9659 |
| KN      | 2.11   | 4.35   | 6.37   | 8.60   | 9.41   | 9.03   |
| KG'*sin | 1.86   | 3.67   | 5.37   | 7.59   | 9.29   | 10.36  |
| GZ      | 0.25   | 0.68   | 1.00   | 1.01   | 0.12   | -1.33  |

|                                  |   |                             |
|----------------------------------|---|-----------------------------|
| Ship Consulting<br>Turku Finland | LHD CASE 5<br>FULL BUNKER +2000 PASS.<br>AT ARRIVAL | WASH KING<br>20.01.1991/VM7 |
|----------------------------------|---|-----------------------------|



SHIP CONSULTING WASA KING 20.01.1991 18

## LOAD CASE 6

FULLY LOADED TO DRAUGHT 5.567 47 TRAILERS AND 2000 PASSENGERS AT  
DEPARTURE

|                      | Weight<br>t | VCG<br>from<br>BL<br>m | Mom<br>tm | LCG<br>from<br>$A_{pp}$<br>m | Mom<br>tm | Free<br>surf<br>tm |
|----------------------|-------------|------------------------|-----------|------------------------------|-----------|--------------------|
| Light ship weight    | 9733        | 11.56                  | 112513    | 60.76                        | 591377    |                    |
| Crew + effects       | 20          | 22.00                  |           | 55.00                        |           |                    |
| Provisions + stores  | 80          | 10.00                  |           | 46.00                        |           |                    |
| Heavy Fuel Oil       |             |                        |           |                              |           |                    |
| DB tank 9            | 69          | 0.60                   |           | 86.60                        |           |                    |
| DB tank 15           | 127         | 0.60                   |           | 72.20                        | 434       |                    |
| DB tank 16           | 127         | 0.60                   |           | 72.20                        |           |                    |
| Day tank 36          | 24          | 2.82                   |           | 36.23                        |           |                    |
| Day tank 37          | 18          | 2.81                   |           | 36.62                        |           |                    |
| Settling tank 38     | 30          | 2.90                   |           | 32.20                        |           |                    |
| Settling tank 39     | 22          | 2.86                   |           | 33.84                        |           |                    |
| Total of HFO         | 417         | 1.11                   |           | 66.08                        | 868       |                    |
| Diesel Oil           |             |                        |           |                              |           |                    |
| DB tank 8            | 65          | 0.60                   |           | 86.60                        |           |                    |
| DB tank 18           | 60          | 0.51                   |           | 58.30                        | 245       |                    |
| Day tank 41          | 13          | 2.91                   |           | 31.03                        |           |                    |
| Total of DO          | 138         | 0.78                   |           | 69.06                        | 245       |                    |
| Lubric. Oil          |             |                        |           |                              |           |                    |
| Thermal oil tank 24  | 16          | 0.67                   |           | 45.78                        |           |                    |
| Lubr oil tank 25     | 13          | 0.55                   |           | 45.40                        |           |                    |
| Lubr oil tank 26     | 13          | 0.55                   |           | 45.40                        |           |                    |
| Lubr oil tank 27     | 13          | 0.55                   |           | 45.40                        |           |                    |
| Lubr oil tank 28     | 13          | 0.55                   |           | 45.40                        |           |                    |
| Lubr oil supply t 30 | 10          | 0.55                   |           | 50.15                        |           |                    |
| Lubr oil tank 32     | 12          | 0.55                   |           | 44.57                        |           |                    |
| Kamewa tank 50       | 2           | 0.60                   |           | 24.60                        |           |                    |
| Kamewa tank 51       | 2           | 0.60                   |           | 23.40                        |           |                    |
| Kamewa tank 52       | 2           | 0.60                   |           | 23.40                        |           |                    |
| Stern tube oil 55a   | 5           | 0.71                   |           | 15.06                        |           |                    |
| Total of LO          | 101         | 0.58                   |           | 43.05                        |           |                    |

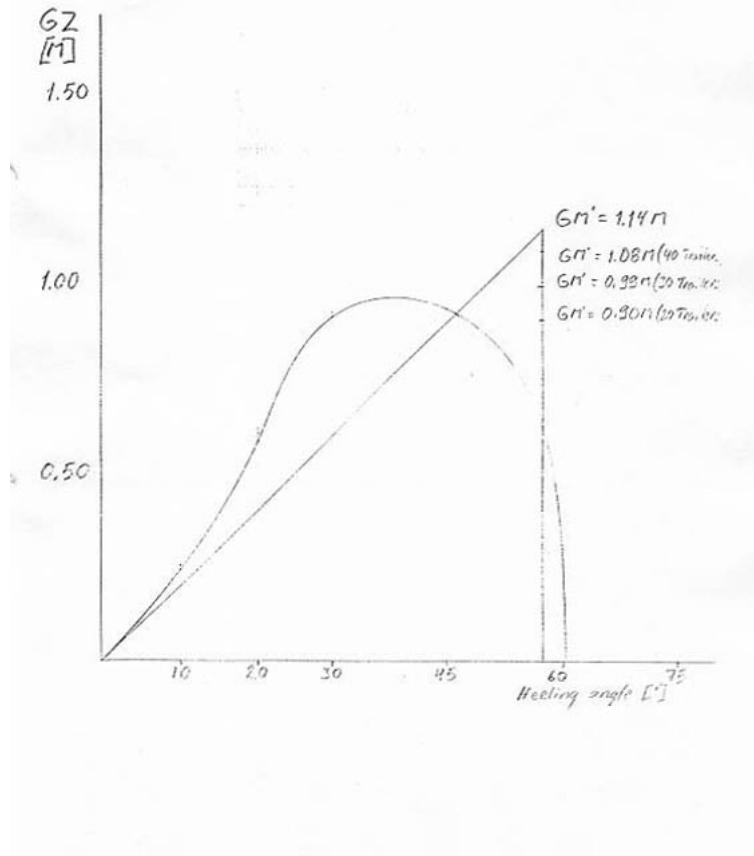
|                     |           |            |                          |
|---------------------|-----------|------------|--------------------------|
| SHIP CONSULTING     | WASA KING | 20.01.1991 | 19                       |
| <b>Fresh Water</b>  |           |            |                          |
| Tank 4a             | 75        | 2.79       | 114.25                   |
| Tank 4b             | 75        | 2.79       | 114.25                   |
| Tank 5              | 100       | 2.79       | 113.65                   |
| Circulating tank 17 | 18        | 0.60       | 58.30                    |
| Cool water tank 22  | 3         | 0.57       | 55.40                    |
| Cool water tank 29  | 16        | 0.67       | 45.80                    |
| Total of FW         | 287       | 2.51       | 106.10                   |
| 2000 PASSENGER+LUGG | 200       | 16.40      | 71.50                    |
| Swimming pool       | 40        | 2.00       | 97.50                    |
| 47 trailers a' 36 t | 1692      | 9.50       | 66.50                    |
| <b>Dead weight</b>  | 2975      | 7.40       | 22022 69.71 207381 1251  |
| <b>Displacement</b> | 12708     | 10.59      | 134536 62.85 798758 1251 |

|              |         |     |         |
|--------------|---------|-----|---------|
| Mean draught | 5.57 m  | KM  | 11.83 m |
| Trim         | -0.84 m | KG  | 10.59 m |
| Draught aft  | 5.99 m  | GM  | 1.24 m  |
| Draught forw | 5.15 m  | MM' | 0.10 m  |
|              |         | GM' | 1.14 m  |

**Calculation of curve of statical stability**

|          |        |        |        |        |        |        |
|----------|--------|--------|--------|--------|--------|--------|
| Heeling  | 10°    | 20°    | 30°    | 45°    | 60°    | 75°    |
| sin      | 0.1736 | 0.3420 | 0.5000 | 0.7071 | 0.8660 | 0.9659 |
| KN       | 2.11   | 4.24   | 6.26   | 8.49   | 9.22   | 8.89   |
| KG * sin | 1.86   | 3.66   | 5.35   | 7.56   | 9.26   | 10.33  |
| GZ       | 0.25   | 0.58   | 0.91   | 0.93   | -0.04  | -1.44  |

|                                  |  |                               |
|----------------------------------|--|-------------------------------|
| Ship Consulting<br>Turku Finland | LOAD CASE 6<br>FULLY LOADED TO DRAUGHT<br>5.567 m AT DEPARTURE | WASH KING<br>20.01 1991/VI/17 |
|----------------------------------|--|-------------------------------|



SHIP CONSULTING

WASA KING

20.01.1991

21

## LOAD CASE 7

AS CASE 6 BUT 50 % OF BUNKERS AND STORES

|                      | Weight<br>t | VCG<br>from<br>BL<br>m | Mom<br>tm | LCG<br>from<br>$\lambda_{LP}$<br>m | Mom<br>tm | Free<br>surf<br>tm |
|----------------------|-------------|------------------------|-----------|------------------------------------|-----------|--------------------|
| Light ship weight    | 9733        | 11.56                  | 112513    | 60.76                              | 591377    |                    |
| Crew + effects       | 20          | 22.00                  |           | 55.00                              |           |                    |
| Provisions + stores  | 65          | 10.00                  |           | 46.00                              |           |                    |
| Heavy Fuel Oil       |             |                        |           |                                    |           |                    |
| DB tank 9            | 69          | 0.60                   |           | 86.60                              |           |                    |
| DB tank 16           | 45          | 0.60                   |           | 72.20                              | 434       |                    |
| Day tank 36          | 24          | 2.82                   |           | 36.23                              |           |                    |
| Day tank 37          | 18          | 2.81                   |           | 36.62                              |           |                    |
| Settling tank 38     | 30          | 2.90                   |           | 32.20                              |           |                    |
| Settling tank 39     | 22          | 2.86                   |           | 33.84                              |           |                    |
| Total of HFO         | 208         | 1.62                   |           | 58.76                              | 434       |                    |
| Diesel Oil           |             |                        |           |                                    |           |                    |
| DB tank 8            | 56          | 0.60                   |           | 86.60                              | 236       |                    |
| Day tank 41          | 13          | 2.91                   |           | 31.03                              |           |                    |
| Total of DO          | 69          | 1.04                   |           | 76.13                              | 236       |                    |
| Lubric. Oil          |             |                        |           |                                    |           |                    |
| Thermal oil tank 24  | 8           | 0.67                   |           | 45.78                              |           |                    |
| Lubr oil tank 25     | 6           | 0.55                   |           | 45.40                              |           |                    |
| Lubr oil tank 26     | 6           | 0.55                   |           | 45.40                              |           |                    |
| Lubr oil tank 27     | 6           | 0.55                   |           | 45.40                              |           |                    |
| Lubr oil tank 28     | 6           | 0.55                   |           | 45.40                              |           |                    |
| Lubr oil supply t 30 | 10          | 0.55                   |           | 50.15                              |           |                    |
| Kamewa tank 50       | 2           | 0.60                   |           | 24.60                              |           |                    |
| Kamewa tank 51       | 2           | 0.60                   |           | 23.40                              |           |                    |
| Kamewa tank 52       | 2           | 0.60                   |           | 23.40                              |           |                    |
| Stern tube oil 55a   | 3           | 0.71                   |           | 15.06                              |           |                    |
| Total of LO          | 51          | 0.58                   |           | 42.07                              |           |                    |

SHIP CONSULTING WASA KING 20.01.1991 22

Fresh Water  
 Tank 5 100 2.79 113.65 138  
 Circulating tank 17 18 0.60 58.30  
 Cool water tank 22 3 0.57 55.40  
 Cool water tank 29 16 0.67 45.80  
 Total of FW 137 2.21 97.18 138

2000 PASSENGER+LUGG 200 16.40 71.50  
 Swimming pool 40 2.00 97.50 160  
 47 trailers a' 36 t 1692 9.50 66.50

Water Ballast  
 Fore peak tank 1 176 4.45 133.92

Dead weight 2658 8.29 22047 71.98 191311 968

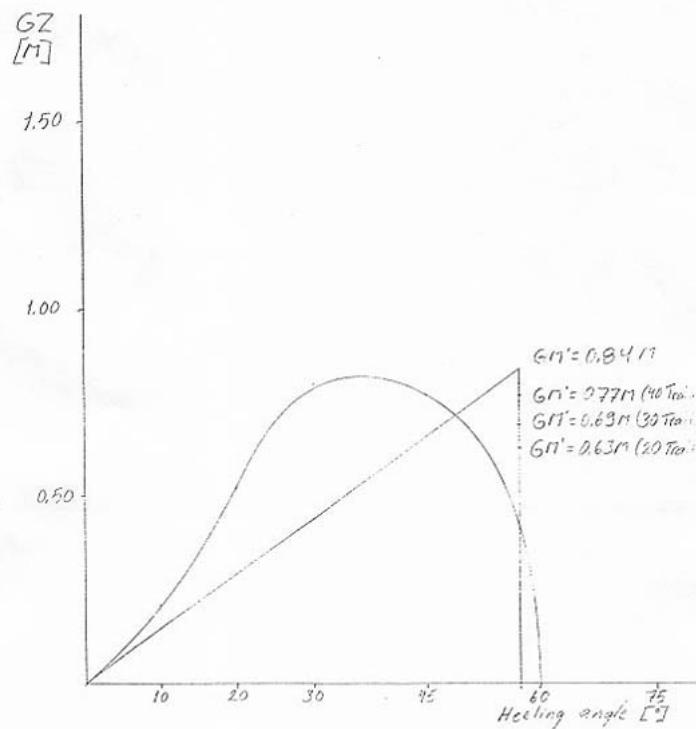
Displacement 12391 10.86 134560 63.17 782688 968

|              |         |     |         |
|--------------|---------|-----|---------|
| Mean draught | 5.46 m  | KM  | 11.78 m |
| Trim         | -0.75 m | KG  | 10.86 m |
| Draught aft  | 5.84 m  | GM  | 0.92 m  |
| Draught forw | 5.09 m  | MM' | 0.08 m  |
|              |         | GM' | 0.84 m  |

Calculation of curve of statical stability

|         |        |        |        |        |        |        |
|---------|--------|--------|--------|--------|--------|--------|
| Heeling | 10°    | 20°    | 30°    | 45°    | 60°    | 75°    |
| sin     | 0.1736 | 0.3420 | 0.5000 | 0.7071 | 0.8660 | 0.9659 |
| KN      | 2.11   | 4.26   | 6.27   | 8.51   | 9.27   | 8.92   |
| KG'*sin | 1.90   | 3.74   | 5.47   | 7.74   | 9.47   | 10.57  |
| GZ      | 0.21   | 0.52   | 0.80   | 0.77   | -0.20  | -1.65  |

|                                  |  |                             |
|----------------------------------|--|-----------------------------|
| Ship Consulting<br>Turku Finland | LOAD CASE 7<br>FULLY LOADED TO DRAUGHT<br>5.567M BUT 50% BUNKERS | WASA KING<br>20.01 1991/VMJ |
|----------------------------------|--|-----------------------------|



SHIP CONSULTING

WASA KING

20.01.1991

24

## LOAD CASE 8

AS CASE 6 BUT 10 % OF BUNKERS AND STORES AT ARRIVAL

|                      | Weight<br>t | VCG<br>from<br>BL<br>m | Mom<br>tm | LCG<br>from<br>$A_{pp}$<br>m | Mom<br>tm | Free<br>surf<br>tm |
|----------------------|-------------|------------------------|-----------|------------------------------|-----------|--------------------|
| Light ship weight    | 9733        | 11.56                  | 112513    | 60.76                        | 591377    |                    |
| Crew + effects       | 20          | 22.00                  |           | 55.00                        |           |                    |
| Provision + stores   | 60          | 10.00                  |           | 46.00                        |           |                    |
| Heavy Fuel Oil       |             |                        |           |                              |           |                    |
| Day tank 36          | 24          | 2.82                   |           | 36.23                        |           |                    |
| Day tank 37          | 18          | 2.81                   |           | 36.62                        |           |                    |
| Total of HFO         | 42          | 2.82                   |           | 36.40                        | 105       |                    |
| Diesel Oil           |             |                        |           |                              |           |                    |
| Day tank 41          | 13          | 2.91                   |           | 31.03                        |           |                    |
| Total of DO          | 13          | 2.91                   |           | 31.03                        | 39        |                    |
| Lubric. Oil          |             |                        |           |                              |           |                    |
| Lubr oil tank 25     | 6           | 0.55                   |           | 45.40                        |           |                    |
| Lubr oil tank 26     | 6           | 0.55                   |           | 45.40                        |           |                    |
| Lubr oil tank 27     | 6           | 0.55                   |           | 45.40                        |           |                    |
| Lubr oil tank 28     | 6           | 0.55                   |           | 45.40                        |           |                    |
| Lubr oil supply t 30 | 5           | 0.55                   |           | 50.15                        |           |                    |
| Kamewa tank 50       | 1           | 0.60                   |           | 24.60                        |           |                    |
| Kamewa tank 51       | 1           | 0.60                   |           | 23.40                        |           |                    |
| Kamewa tank 52       | 1           | 0.60                   |           | 23.40                        |           |                    |
| Stern tube oil 55a   | 2           | 0.71                   |           | 15.06                        |           |                    |
| Total of LO          | 34          | 0.56                   |           | 42.41                        |           |                    |
| Fresh Water          |             |                        |           |                              |           |                    |
| Tank 5               | 15          | 2.79                   |           | 113.65                       |           |                    |
| Circulating tank 17  | 10          | 0.60                   |           | 58.30                        |           |                    |
| Cool water tank 22   | 3           | 0.57                   |           | 55.40                        |           |                    |
| Cool water tank 29   | 10          | 0.67                   |           | 45.80                        |           |                    |
| Total of FW          | 38          | 1.48                   |           | 76.63                        | 166       |                    |
| Bilge water 33       | 22          | 0.55                   |           | 35.83                        |           |                    |

SHIP CONSULTING

WASA KING

20.01.1991

25

|                     |      |       |  |        |     |  |
|---------------------|------|-------|--|--------|-----|--|
| Water Ballast       |      |       |  |        |     |  |
| Fore peak tank 1    | 176  | 4.45  |  | 133.92 |     |  |
| Trim tank 2         | 303  | 4.69  |  | 121.40 |     |  |
| DB tank 6           | 88   | 0.64  |  | 104.84 |     |  |
| Total of WB         | 567  | 3.99  |  | 122.72 |     |  |
| 2000 passenger+lugg | 200  | 16.40 |  | 71.50  |     |  |
| Swimming pool       | 40   | 2.00  |  | 97.50  | 160 |  |
| 47 trailers a' 36 t | 1692 | 9.50  |  | 66.50  |     |  |

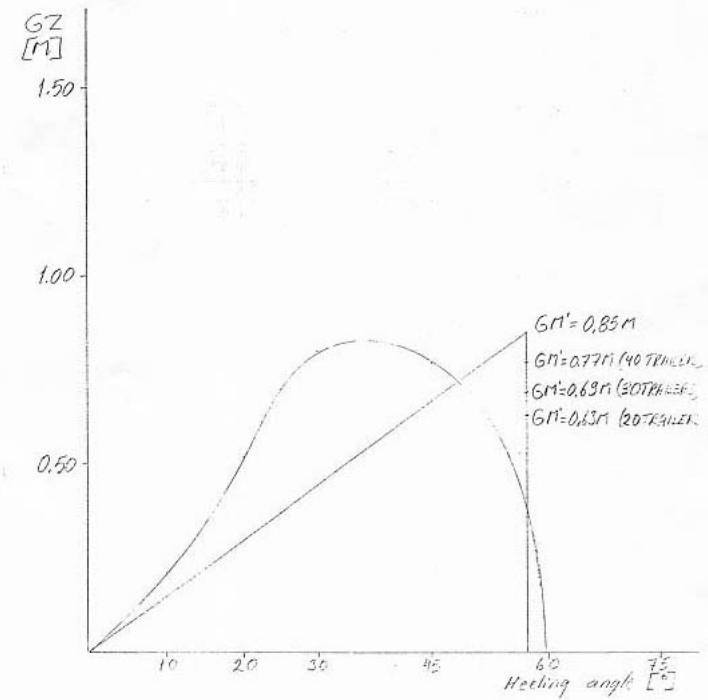
|              |       |       |        |       |        |     |
|--------------|-------|-------|--------|-------|--------|-----|
| Dead weight  | 2694  | 8.52  | 22959  | 77.87 | 209790 | 470 |
| Displacement | 12427 | 10.90 | 135473 | 64.47 | 801167 | 470 |

|              |         |     |         |
|--------------|---------|-----|---------|
| Mean draught | 5.47 m  | KM  | 11.79 m |
| Trim         | -0.12 m | KG  | 10.90 m |
| Draught aft  | 5.53 m  | GM  | 0.89 m  |
| Draught forw | 4.41 m  | MM' | 0.04 m  |
|              |         | GM' | 0.85 m  |

## Calculation of curve of statical stability

| Heeling | 10°    | 20°    | 30°    | 45°    | 60°    | 75°    |
|---------|--------|--------|--------|--------|--------|--------|
| sin     | 0.1736 | 0.3420 | 0.5000 | 0.7071 | 0.8660 | 0.9659 |
| KN      | 2.11   | 4.26   | 6.27   | 8.51   | 9.26   | 8.91   |
| KG'*sin | 1.90   | 3.74   | 5.47   | 7.74   | 9.47   | 10.57  |
| GZ      | 0.21   | 0.52   | 0.80   | 0.77   | -0.21  | -1.66  |

|                                  |  |                             |
|----------------------------------|--|-----------------------------|
| Ship Consulting<br>Turku Finland | LOAD CASE 8<br>FULLY LOADED TO DRAUGHT<br>5.567 M AT ARRIVAL | WASA KING<br>20.01.1991/VM7 |
|----------------------------------|--|-----------------------------|



**Jos. L. Meyer, Papenburg-Ems**  
Schiffswerft, Maschinenfabrik, Dockbetrieb

YARD NO. 590

VIKING SALLY

Information for the master of the ship

**Jos. L. Meyer, Papenburg-Ems**  
Schiffswerft, Maschinenfabrik, Dockbetrieb

YARD NO. 590

## 1. General

1.1 Type and purpose of the ship  
Car and passenger ferry

## 1.2 Short international voyage

1.3 Principal dimensions:

|                    |         |           |
|--------------------|---------|-----------|
| Length overall     | 155,40  | m         |
| Length between pp. | 137,40  | m         |
| Breadth moulded    | 24,20   | m         |
| Draught            | 5,567   | m         |
| Lightship          | 9419,67 | t 9733 t  |
| KG from basis      | 11,31   | m 11,56 m |
| LCG from AP        | 61,68   | m 60,76 m |

- 2 -

Determination of stability on board

## 1. General

With the stability blank forms 1 - 3 and 5 - 7 it is possible, to effect a stability calculation at altered loading compared with the loading conditions calculated in advance.

The documents are composed that way, that the stability calculation may be effected schematically.

The forms 1-3 include in tables all necessary basic data for the calculations which have to be done on forms 5 and 6.

After calculation has been done, it may be controlled by means of form 7, whether the ascertained stability data are sufficient.

2. Instruction for calculation of stability according to these blank forms

## 2.1. Weight- and moment calculations, Form 5

- Enter the individual weights (light ship, crew and provision, tank contents, cargo weights) into the column WEIGHT.
- Ascertainment of the c.g. above base line of the individual weights (see enclosed documents) and enter in the column OH.
- Multiplication of individual weight with the belonging to centers of gravity. Enter into column MH.
- Addition of the individual weights. Enter into column  $\Sigma G = \Theta$ .
- Addition of the vertical moments. Enter into column  $\Sigma MH = \Theta$ .
- Division of  $\Theta = \Theta = KG$ . Enter into column 5.  
KG = C.g. above baseline of the loaded vessel.

- 3 -

**BOS. L. MEYER, RAPPENBURG-EMS**  
Schiffswerft, Maschinenfabrik, Dockbetrieb

- 3 -

- g) Ascertainment of the longitudinal C.G.'s of the individual weights (see enclosed documents) and insert in column  $\Theta L$ .
- h) Multiplication of individual weight with the belonging to longitudinal c.g. Insert in column ML.
- i) Additional of the longitudinal moments. Enter into column  $\Sigma ML = \Theta'$
- k) Division of  $\Theta' = \Theta = eL$  —  
Insert in column  $\Theta$   
 $\Theta L$  = longitudinal center of gravity of the loaded vessel.

2.1.1. Explanation for ascertainment of the centers of gravity for loading and consumable tank contents

- a) Totally filled consumable tanks:  
Weight, vertical- and longitudinal moments directly to be taken from form 1
- b) Partly filled consumable tanks:  
Weight of tank contents to be ascertained, c.g. above base line to be estimated on the basis of the position of the center of gravity of the completely filled tank. Longitudinal c.g. of the totally filled tank to be taken.

- 4 -

Schiffswerft, Maschinenfabrik, Dockbetrieb

- 4 -

2.1.2. Influence of free surfaces

a) For partly filled consumable tanks the value  $i_b \times \gamma'$  of form 1 to be overtaken on form 5 in the column  $i_b \times \gamma'$

b) Addition of the values  $i_b \times \gamma'$ . Insert in the line  
 $\Sigma i_b \times \gamma' = \textcircled{4}$

c) Division of  $\frac{\textcircled{4}}{\textcircled{1}} = \Delta MG = \textcircled{7}$

Insert in the line.

$\Delta MG$  = Stability loss due to free surfaces.

2.2. Stability- and trim calculation/Form 62.2.1. Stability calculation

a) Overtake of weight of the loaded vessel from column 1 Form 5 in one of the columns ① of Form 6, depending on the spec. density of water.

$\gamma' = 1,00$  fresh water

$\gamma' = 1,025$  seawater

b) Overtake KG column ⑤ and  $\Delta MG$  column ⑦ of form 5 into form 6.

- 5 -

- 5 -

- c) In the tabulated curves sheet Form 2 the displacement ① according to Form 6 to be ascertained and the value "T" and "KM" belonging to to be inserted on Form 6. If a trim calculation shall be carried out, the belonging to values

displacement - ⑥ (of Form 2)  
Weight - ⑧<sub>L</sub> (of Form 5)  
D/MCT Values (of form 2)

will also have to be overtaken.

- d) Calculation of MG and MG' according to the scheme stated on Form 6. The values of MG' should always lie above the limit curve shown in the damage stability diagram.

e) Calculation of the leverarm curve

From Form 3 "Cross-curves(W-values)", the cross curves data available for the medium draught column ⑩ to be overtaken to Form 6 column ⑯. Calculation of the lever-arm values  $h_f$  (column ⑯) according to the scheme on form 6. The lever arm values  $h_f'$  (column ⑯) to be reduced by  $\Delta MG$  to  $h_f''$  (column ⑯) according to the scheme stated on form 6. For partly filled tanks, the lever arm values  $h_f''$  (column ⑯) to be reduced according to scheme by  $\Delta MG$  free surfaces of the consumable tanks.

f) Drawing of the lever arm curve according to e)

MG from column ⑩ and MG' on the hatched MG-line to be drawn in from the base and the final points to be connected with 0° (MG-straight line resp. MG'-straight line). The lever arm values calculated according to e)  $h_f''$  to be drawn in on the degree lines of the diagram and to be connected by a curve line. Curve line and MG-straight line must touch each other at small inclinations. The MG'-straight line states the actual available initial stability.

JOS. L. MEYER  
PAPENBURG EMS

BUILDING № 590

MAIERFORM  
6891.01-171.200

## STABILITY CROSS CURVES

## VALUES

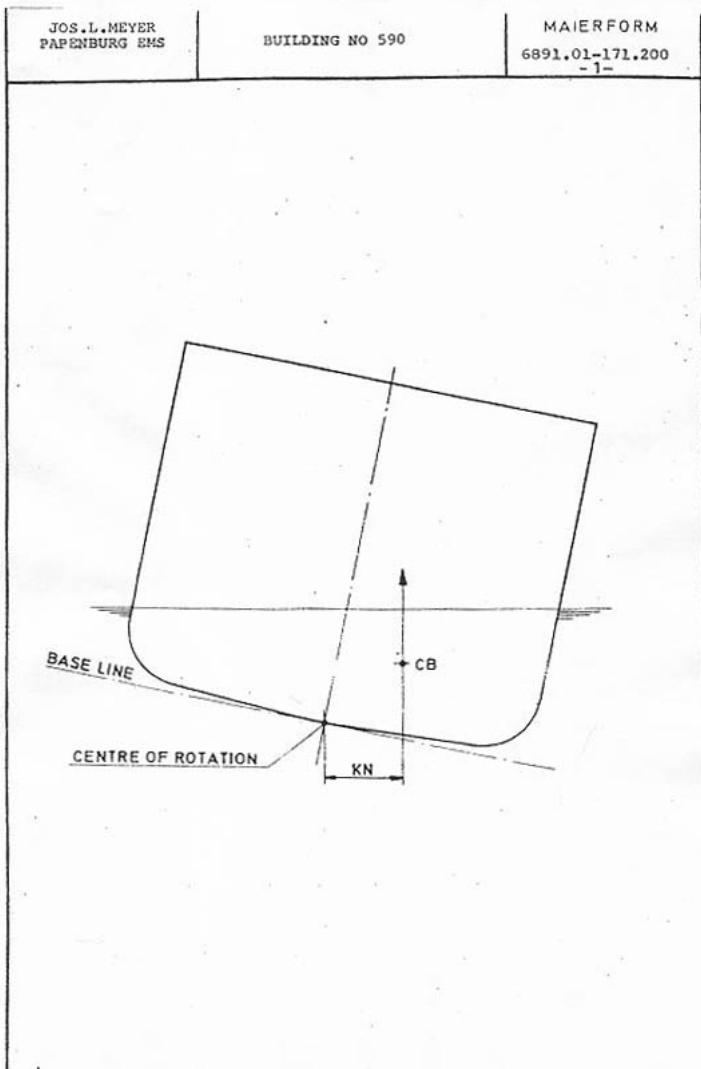
### MAIN DIMENSIONS

|                        |       |         |
|------------------------|-------|---------|
| LENGTH OVER ALL        | ----- | ÷ m     |
| LENGTH BETWEEN P.P.    | ----- | 137,40m |
| BREADTH MOULDED A-DECK | ----- | 24,20m  |
| DEPTH T.Q.A-DECK       | ----- | 7,65m   |
| DESIGN DRAUGHT         | ----- | 5,55 m  |

### REMARK:

THIS CALCULATION WAS CARRIED OUT WITH  
MAIERFORM PROGRAM -PANTOB0-  
ON COMPUTER SYSTEM CONTROL DATA CYBER 175  
IT HAS BEEN CALCULATED WITH 49 FRAMES,  
MEASURED ACCORDING TO CORRECTED LINES PLAN OF NB. № 592  
DRAWG. № 6764.51-161.100  
THE HULL HAS BEEN CONSIDERED UP TO C-DECK

BREMEN 20TH SEPT. 1979



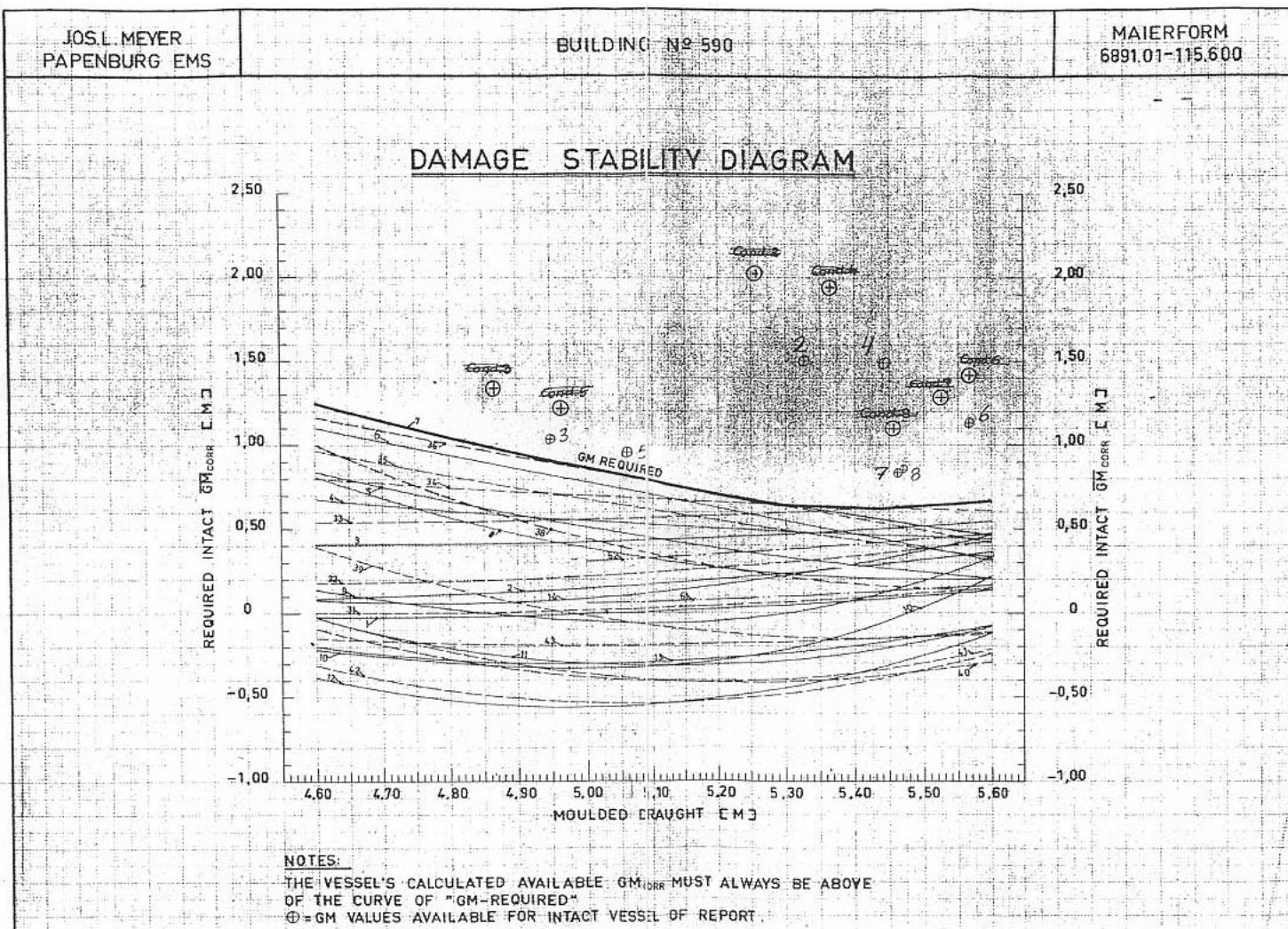
-----  
 JOS.L.MEYER - CROSS CURVES OF STABILITY -  
 PAPENBURG EMS ( KN-VALUES )  
 BUILDING NO.590 SMOOTH WATER  
 -----  
 DRAFT\* DISPL. INCLINATION (DEGREES)  
 BK \* SEA-  
 (4) \* (1) \* 10 \* 20 \* 30 \* 45 \* 60 \* 75 \*  
 -----  
 3.50 \* 7256.0 2.33° 4.73° 6.68° 8.66° 9.66° 9.31°  
 3.55 \* 7377.0 2.32° 4.71° 6.67° 8.65° 9.65° 9.30°  
 3.60 \* 7498.0 2.39° 4.70° 6.66° 8.65° 9.65° 9.30°  
 3.65 \* 7619.0 2.29° 4.68° 6.65° 8.65° 9.65° 9.29°  
 3.70 \* 7741.0 2.29° 4.66° 6.63° 8.65° 9.65° 9.24°  
 3.75 \* 7863.0 2.28° 4.65° 6.62° 8.65° 9.64° 9.27°  
 3.80 \* 7985.0 2.25° 4.63° 6.61° 8.65° 9.64° 9.26°  
 3.85 \* 8108.0 2.24° 4.62° 6.60° 8.65° 9.63° 9.25°  
 3.90 \* 8231.0 2.23° 4.60° 6.59° 8.65° 9.63° 9.24°  
 3.95 \* 8355.0 2.22° 4.59° 6.58° 8.65° 9.62° 9.23°  
 4.00 \* 8479.0 2.21° 4.57° 6.56° 8.65° 9.61° 9.22°  
 4.05 \* 8504.0 2.20° 4.56° 6.55° 8.65° 9.61° 9.21°  
 4.10 \* 8729.0 2.19° 4.54° 6.54° 8.65° 9.60° 9.20°  
 4.15 \* 8854.0 2.18° 4.53° 6.53° 8.65° 9.59° 9.19°  
 4.20 \* 8980.0 2.17° 4.52° 6.52° 8.65° 9.58° 9.18°  
 4.25 \* 9106.0 2.15° 4.50° 6.51° 8.65° 9.57° 9.18°  
 4.30 \* 9233.0 2.15° 4.49° 6.50° 8.65° 9.56° 9.17°  
 4.35 \* 9350.0 2.15° 4.48° 6.49° 8.65° 9.55° 9.16°  
 4.40 \* 9397.0 2.15° 4.47° 6.48° 8.65° 9.54° 9.15°  
 4.45 \* 9615.0 2.15° 4.45° 6.47° 8.64° 9.53° 9.13°  
 4.50 \* 9743.0 2.14° 4.44° 6.46° 8.64° 9.52° 9.12°  
 4.55 \* 9872.0 2.13° 4.43° 6.45° 8.64° 9.51° 9.11°  
 4.60 \* 10011.0 2.13° 4.42° 6.44° 8.64° 9.50° 9.10°  
 4.65 \* 10131.0 2.13° 4.41° 6.43° 8.63° 9.49° 9.09°  
 4.70 \* 10262.0 2.12° 4.40° 6.42° 8.63° 9.47° 9.08°  
 4.75 \* 10394.0 2.12° 4.39° 6.41° 8.62° 9.45° 9.07°  
 4.80 \* 10526.0 2.12° 4.38° 6.40° 8.62° 9.45° 9.06°  
 4.85 \* 10594.0 2.12° 4.37° 6.39° 8.61° 9.44° 9.05°  
 4.90 \* 10793.0 2.11° 4.36° 6.38° 8.61° 9.42° 9.04°  
 4.95 \* 10927.0 2.11° 4.35° 6.37° 8.60° 9.41° 9.03°  
 5.00 \* 11061.0 2.11° 4.34° 6.36° 8.59° 9.40° 9.02°  
 5.05 \* 11198.0 2.11° 4.33° 6.35° 8.59° 9.38° 9.00°  
 5.10 \* 11335.0 2.11° 4.32° 6.34° 8.58° 9.37° 8.99°  
 5.15 \* 11472.0 2.11° 4.31° 6.33° 8.57° 9.35° 8.98°  
 5.20 \* 11610.0 2.11° 4.30° 6.32° 8.56° 9.34° 8.97°  
 5.25 \* 11749.0 2.11° 4.29° 6.31° 8.55° 9.32° 8.96°  
 5.30 \* 11888.0 2.11° 4.28° 6.30° 8.54° 9.31° 8.95°  
 5.35 \* 12028.0 2.11° 4.27° 6.29° 8.53° 9.29° 8.93°  
 5.40 \* 12169.0 2.11° 4.27° 6.28° 8.52° 9.27° 8.92°  
 5.45 \* 12311.0 2.11° 4.26° 6.27° 8.51° 9.26° 8.91°  
 -----

-----  
 JOS.L.MEYER - CROSS CURVES OF STABILITY -  
 PAPENBURG EMS ( KN-VALUES )  
 BUILDING NO.590 SMOOTH WATER  
 -----  
 DRAFT\* DISPL. INCLINATION (DEGREES)  
 BK \* SEA-  
 (4) \* (1) \* 10 \* 20 \* 30 \* 45 \* 60 \* 75 \*  
 -----  
 5.50 \* 12455.0 2.11° 4.25° 6.26° 8.50° 9.24° 8.90°  
 5.55 \* 12599.0 2.11° 4.24° 6.26° 8.49° 9.22° 8.89°  
 5.60 \* 12744.0 2.11° 4.23° 6.25° 8.48° 9.21° 8.87°  
 5.65 \* 12889.0 2.11° 4.23° 6.24° 8.47° 9.19° 8.86°  
 5.70 \* 13035.0 2.11° 4.22° 6.23° 8.46° 9.17° 8.85°  
 5.75 \* 13182.0 2.10° 4.21° 6.22° 8.44° 9.16° 8.83°  
 5.80 \* 13330.0 2.10° 4.20° 6.21° 8.43° 9.14° 8.82°  
 5.85 \* 13478.0 2.10° 4.20° 6.21° 8.42° 9.12° 8.81°  
 5.90 \* 13627.0 2.10° 4.19° 6.20° 8.40° 9.10° 8.80°  
 5.95 \* 13776.0 2.10° 4.18° 6.19° 8.39° 9.09° 8.79°  
 6.00 \* 13926.0 2.10° 4.17° 6.18° 8.38° 9.07° 8.77°  
 6.05 \* 14077.0 2.10° 4.16° 6.17° 8.36° 9.05° 8.76°  
 6.10 \* 14229.0 2.10° 4.15° 6.16° 8.35° 9.03° 8.74°  
 6.15 \* 14381.0 2.10° 4.15° 6.16° 8.33° 9.01° 8.73°  
 6.20 \* 14534.0 2.10° 4.14° 6.15° 8.32° 9.00° 8.72°  
 6.25 \* 14688.0 2.10° 4.14° 6.14° 8.30° 8.98° 8.70°  
 6.30 \* 14842.0 2.10° 4.13° 6.13° 8.29° 8.96° 8.69°  
 6.35 \* 14997.0 2.10° 4.13° 6.12° 8.27° 8.94° 8.68°  
 6.40 \* 15153.0 2.10° 4.12° 6.11° 8.26° 8.92° 8.66°  
 -----

JOS L. MEYER - CROSS CURVES OF STABILITY -  
 PAPENBURG EMS ( KN-VALUES )  
 BUILDING NO.590 SMOOTH WATER

DRAFT DISPL. INCLINATION (DEGREES)  
 8K SEA (I) 10° 20° 30° 45° 60° 75°

| Draft | Inclination (°) | 10°   | 20°   | 30°   | 45°   | 60°   | 75°   |
|-------|-----------------|-------|-------|-------|-------|-------|-------|
| 5.50  | 12455           | 2.11° | 4.25° | 6.26° | 8.50° | 9.24° | 8.90° |
| 5.55  | 12599           | 2.11° | 4.24° | 6.26° | 8.49° | 9.22° | 8.89° |
| 5.60  | 12744           | 2.11° | 4.23° | 6.25° | 8.48° | 9.21° | 8.87° |
| 5.65  | 12889           | 2.11° | 4.23° | 6.24° | 8.47° | 9.19° | 8.86° |
| 5.70  | 13035           | 2.11° | 4.22° | 6.23° | 8.46° | 9.17° | 8.85° |
| 5.75  | 13182           | 2.10° | 4.21° | 6.22° | 8.44° | 9.16° | 8.83° |
| 5.80  | 13330           | 2.10° | 4.20° | 6.21° | 8.43° | 9.14° | 8.82° |
| 5.85  | 13478           | 2.10° | 4.20° | 6.21° | 8.42° | 9.12° | 8.81° |
| 5.90  | 13627           | 2.10° | 4.19° | 6.20° | 8.40° | 9.10° | 8.80° |
| 5.95  | 13776           | 2.10° | 4.18° | 6.19° | 8.39° | 9.09° | 8.78° |
| 6.00  | 13926           | 2.10° | 4.17° | 6.18° | 8.38° | 9.07° | 8.77° |
| 6.05  | 14077           | 2.10° | 4.16° | 6.17° | 8.36° | 9.05° | 8.76° |
| 6.10  | 14227           | 2.10° | 4.15° | 6.16° | 8.35° | 9.03° | 8.74° |
| 6.15  | 14371           | 2.10° | 4.15° | 6.16° | 8.33° | 9.01° | 8.73° |
| 6.20  | 14534           | 2.10° | 4.14° | 6.15° | 8.32° | 9.00° | 8.72° |
| 6.25  | 14688           | 2.10° | 4.14° | 6.14° | 8.30° | 8.98° | 8.70° |
| 6.30  | 14842           | 2.10° | 4.13° | 6.13° | 8.29° | 8.96° | 8.69° |
| 6.35  | 14997           | 2.10° | 4.13° | 6.12° | 8.27° | 8.94° | 8.68° |
| 6.40  | 15153           | 2.10° | 4.12° | 6.11° | 8.26° | 8.92° | 8.66° |



|                              |                 |                              |
|------------------------------|-----------------|------------------------------|
| JOS.L.MEYER<br>PAPENBURG EMS | BUILDING N° 590 | MAIERFORM<br>6891.06-171.120 |
|------------------------------|-----------------|------------------------------|

## HYDROSTATIC PARTICULARS

### MAIN DIMENSIONS:

|                    |          |
|--------------------|----------|
| LENGTH OVER ALL    | 137,40 m |
| LENGTH BETW. PP.   | 137,40 m |
| BREADTH MLD A-DECK | 24,20 m  |
| DEPTH TO A-DECK    | 7,65 m   |
| DRAUGHT            | 5,55 m   |

### REMARK:

THIS CALCULATION WAS CARRIED OUT WITH  
MAIERFORM PROGRAM - KUBLENG -  
ON COMPUTER SYSTEM CONTROL DATA CYBER 175  
IT HAS BEEN CALCULATED WITH 46 FRAMES.

MEASURED ACCORDING TO CORRECTED LINES PLAN

OF NB. № 592 DRAWG. № 6764.51-161.100

BREMEN 26<sup>TH</sup> JUNE 1980THE CORRECTED BOW THRUSTERS AND BULBOUS BOW  
HAVE BEEN CONSIDERED IN THE CALCULATION.JOS.L.MEYER  
PAPENBURG EHS

HYDROSTATIC PARTICULARS

MATERFORM GMBH  
BREMEN  
6891-06 - 171-120PAGE  
5

SPEC.GRAVITY OF SEA W. = 1.025 T/CBM

COEFF.FOR DISPL.OF HELL PL.= 1.007

TRIM = 0.000 M ON EVEN KEEL

KEEL-THICKNESS = 0.000 MM

DRAUGHTS INDICATED OR LPP/2

| DRAFT | MOULDED | DISPLACEM. | DISPLACEM. | LCB | VCB | KHT | KM(L) | WL-AREA | LCF | TM | LMI | MCT | D/MCT | TPCI | PHA | TA | AL- DEL- |
|-------|---------|------------|------------|-----|-----|-----|-------|---------|-----|----|-----|-----|-------|------|-----|----|----------|
| BK    | VOLUME  | FRESH-W.   | SEA-W.     |     |     |     |       |         |     |    | BP  |     | (BP)  | (BP) |     |    |          |

| METRES | H003 | METRIC-T. | METRIC-T. | METRES | METRE | METRES | H002 | METRES | H004 | METRES | H004 | HT/M | - | T/CM | - | - |
|--------|------|-----------|-----------|--------|-------|--------|------|--------|------|--------|------|------|---|------|---|---|
|--------|------|-----------|-----------|--------|-------|--------|------|--------|------|--------|------|------|---|------|---|---|

4.30 8999.63 9062.63 9289.19 -3.19 2.30 12.1 298.81 2461.35 -4.73 88197.7 2668554. 19421.8 .478 25.41 .772 .656

4.35 9122.99 9186.85 9416.52 -3.21 2.32 12.0 297.31 2470.60 -4.84 88730.2 2691188. 19586.5 .481 25.50 .774 .657

4.40 9246.65 9311.58 9544.37 -3.23 2.35 12.0 295.90 2480.08 -4.96 89274.8 2714409. 19755.5 .483 25.60 .777 .658

4.45 9371.16 9436.76 9672.68 -3.25 2.38 11.9 294.60 2489.81 -5.08 89832.4 2738436. 19930.4 .485 25.70 .779 .659

4.50 9495.92 9562.39 9801.45 -3.28 2.41 11.9 293.41 2499.79 -5.20 90203.3 2763347. 20111.7 .487 25.80 .782 .660

4.55 9621.15 9688.50 9930.71 -3.30 2.43 11.8 292.34 2510.06 -5.32 90998.6 2789265. 20300.3 .489 25.91 .785 .661

4.60 9746.88 9815.11 10060.49 -3.33 2.46 11.8 291.41 2520.65 -5.45 91589.1 2816362. 20497.5 .491 26.02 .787 .662

4.65 9873.12 9942.23 10190.79 -3.36 2.49 11.8 290.63 2531.58 -5.59 92205.9 2844811. 20704.6 .492 26.13 .790 .663

4.70 9999.91 10069.91 10321.65 -3.39 2.52 11.8 290.00 2542.90 -5.72 92840.2 2874778. 20922.7 .493 26.25 .793 .664

4.75 10127.27 10198.16 10453.11 -3.42 2.55 11.7 289.53 2554.62 -5.86 93493.3 2906415. 21152.9 .494 26.37 .796 .665

4.80 10255.24 10327.02 10585.20 -3.45 2.57 11.6 289.24 2566.79 -6.00 94166.8 2939851. 21396.3 .495 26.49 .799 .665

4.85 10383.85 10456.54 10717.95 -3.48 2.60 11.4 289.12 2579.41 -6.14 94862.4 2975179. 21653.4 .495 26.62 .803 .666

4.90 10513.14 10586.73 10851.40 -3.52 2.63 11.2 289.18 2592.53 -6.29 95582.8 3012559. 21925.5 .495 26.76 .806 .667

4.95 10643.15 10717.65 10985.59 -3.55 2.66 11.1 289.39 2606.09 -6.44 95327.0 3051757. 22210.7 .495 26.90 .810 .668

5.00 10773.88 10849.29 11120.53 -3.59 2.69 11.0 289.71 2620.00 -6.58 97095.9 3092329. 22506.0 .494 27.04 .814 .669

| JOS.L.MEYER<br>PAPENBURG EMS         |          | HYDROSTATIC PARTICULARS |            |        |        |        |        |         |        |          |          | MAIERFOHM GMbH<br>BREMEN |       | PAGE<br>6 |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--------------------------------------|----------|-------------------------|------------|--------|--------|--------|--------|---------|--------|----------|----------|--------------------------|-------|-----------|-----------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <hr/>                                |          |                         |            |        |        |        |        |         |        |          |          |                          |       |           |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SPEC.GRAVITY OF SEA-W. = 1.025 T/CBM |          |                         |            |        |        |        |        |         |        |          |          |                          |       |           |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| COEFF.FOR DISPL. OF STELL PL.= 1.007 |          |                         |            |        |        |        |        |         |        |          |          |                          |       |           |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TRIM = 0.000 M ON EVEN KEEL          |          |                         |            |        |        |        |        |         |        |          |          |                          |       |           |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| KEEL-THICKNESS = 0.000 MM            |          |                         |            |        |        |        |        |         |        |          |          |                          |       |           |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DRAUGHTS INDICATED FOR LPP/2         |          |                         |            |        |        |        |        |         |        |          |          |                          |       |           |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DRAFT                                | MOULDED  | DISPLACEM.              | DISPLACEM. | LCB    | VCB    | KM(T)  | KM(L)  | WL-AREA | LCF    | TMI      | LMI      | MCT                      | D/MCT | TPCI      | PHA TA    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| BK                                   | VOLUME   | FRESH-W.                | SEA-W.     |        |        |        |        |         |        |          | BP       | (DP)                     | (BP)  |           |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| METRES                               | M³       | METRIC-T.               | METRIC-T.  | METRES | METRES | METRES | METRES | M²      | METRES | M²       | M²       | MT/M                     | -     | T/CM      | -         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.00                                 | 10773.88 | 10849.29                | 11120.53   | -3.59  | 2.69   | 11.70  | 289.71 | 2620.00 | -6.58  | 97095.9  | 3092329. | 22506.0                  | .494  | 27.04     | .814 .669 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.05                                 | 10905.32 | 10981.66                | 11256.20   | -3.63  | 2.71   | 11.69  | 290.11 | 2634.29 | -6.73  | 97896.8  | 3134192. | 22810.7                  | .493  | 27.19     | .818 .670 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.10                                 | 11037.49 | 11114.75                | 11392.62   | -3.66  | 2.74   | 11.68  | 290.64 | 2649.05 | -6.89  | 98739.3  | 3177634. | 23126.9                  | .493  | 27.34     | .822 .671 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.15                                 | 11170.43 | 11248.62                | 11529.83   | -3.70  | 2.77   | 11.66  | 291.30 | 2664.35 | -7.05  | 99629.3  | 3223043. | 23457.4                  | .492  | 27.50     | .826 .672 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.20                                 | 11304.15 | 11383.28                | 11667.87   | -3.75  | 2.80   | 11.65  | 292.10 | 2680.17 | -7.22  | 100566.2 | 3270288. | 23801.2                  | .490  | 27.66     | .830 .673 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.25                                 | 11438.69 | 11518.76                | 11806.73   | -3.79  | 2.83   | 11.70  | 292.98 | 2696.38 | -7.40  | 101549.4 | 3318932. | 24155.3                  | .489  | 27.83     | .835 .674 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.30                                 | 11574.04 | 11655.06                | 11946.43   | -3.83  | 2.86   | 11.72  | 293.91 | 2712.90 | -7.57  | 102573.9 | 3366652. | 24517.1                  | .487  | 28.00     | .839 .675 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.35                                 | 11710.21 | 11792.18                | 12088.99   | -3.88  | 2.88   | 11.73  | 294.86 | 2729.63 | -7.75  | 103639.6 | 3419080. | 24884.1                  | .486  | 28.17     | .844 .677 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.40                                 | 11847.21 | 11930.14                | 12228.40   | -3.92  | 2.91   | 11.75  | 295.79 | 2746.45 | -7.92  | 104741.6 | 3469822. | 25253.4                  | .484  | 28.35     | .848 .678 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.45                                 | 11985.04 | 12068.94                | 12370.66   | -3.97  | 2.94   | 11.76  | 296.68 | 2763.24 | -8.09  | 105874.7 | 3520473. | 25622.1                  | .483  | 28.52     | .853 .679 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.50                                 | 12123.70 | 12208.56                | 12513.78   | -4.02  | 2.97   | 11.80  | 297.49 | 2779.87 | -8.25  | 107033.4 | 3570630. | 25987.1                  | .482  | 28.69     | .857 .680 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.55                                 | 12263.17 | 12349.01                | 12657.73   | -4.07  | 3.00   | 11.82  | 298.19 | 2796.24 | -8.40  | 108211.6 | 3619913. | 26345.8                  | .480  | 28.86     | .862 .681 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.60                                 | 12403.44 | 12490.27                | 12802.52   | -4.12  | 3.03   | 11.85  | 298.77 | 2812.27 | -8.53  | 109404.2 | 3668155. | 26696.9                  | .480  | 29.03     | .866 .682 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.65                                 | 12544.52 | 12632.33                | 12948.14   | -4.17  | 3.06   | 11.88  | 299.19 | 2827.82 | -8.65  | 110604.3 | 3714850. | 27036.8                  | .479  | 29.19     | .870 .683 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.70                                 | 12686.37 | 12775.17                | 13094.55   | -4.22  | 3.09   | 11.90  | 299.42 | 2842.72 | -8.75  | 111801.4 | 3759327. | 27360.5                  | .479  | 29.34     | .874 .685 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

JOS. L. HEYER  
PAPENBURG EMS

## HYDROSTATIC PARTICULARS

MAIERFORM GMBH PAGE  
BREMEN 7  
6891.06 - 171.120

SPEC.GRAVITY OF SEA-W. = 1.025 T/CBM  
 COEFF.FOR DISPL. OF SHELL PL.= 1.007  
 TRIM = 0.000 M ON EVEN KEEL  
 KEEL-THICKNESS = 0.000 MM  
 DRAUGHTS INDICATED FOR LPP/2

| DRAFT  | MOULDED  | DISPLACEM. | DISPLACEM. | LCB    | VCH    | KM(T) | KM(L)  | WL-AREA | LCP   | TM       | LMI      | HCT     | D/MCT | T/PC  | PHA  | TA   |
|--------|----------|------------|------------|--------|--------|-------|--------|---------|-------|----------|----------|---------|-------|-------|------|------|
| BK     | VOLUME   | FRESH-W.   | SEA-W.     |        |        |       |        |         |       |          |          | BP      | (BP)  | (BP)  | (BP) | (BP) |
| METRES | M**3     | METRIC-T.  | METRIC-T.  | METRES | METRES | M**2  | METRES | M**4    | M**4  | MT/M     | -        | T/CM    | -     | -     | -    | -    |
| 5.70   | 12686.37 | 12775.17   | 13094.55   | -4.22  | 3.09   | 11.90 | 299.42 | 2842.72 | -8.75 | 111801.4 | 3759327. | 27360.5 | .479  | 29.34 | .874 | .685 |
| 5.75   | 12828.95 | 12918.76   | 13241.73   | -4.27  | 3.12   | 11.92 | 299.44 | 2856.98 | -8.83 | 112986.1 | 3801461. | 27667.1 | .479  | 29.49 | .878 | .686 |
| 5.80   | 12972.23 | 13063.04   | 13389.61   | -4.32  | 3.15   | 11.95 | 299.29 | 2870.71 | -8.90 | 114154.5 | 3841657. | 27959.7 | .479  | 29.63 | .882 | .687 |
| 5.85   | 13116.18 | 13208.00   | 13538.20   | -4.37  | 3.18   | 11.97 | 299.03 | 2884.05 | -8.96 | 115308.3 | 3880521. | 28242.5 | .479  | 29.77 | .885 | .688 |
| 5.90   | 13260.80 | 13353.62   | 13687.46   | -4.42  | 3.21   | 11.99 | 298.69 | 2897.06 | -9.00 | 116449.3 | 3918322. | 28517.6 | .480  | 29.90 | .889 | .689 |
| 5.95   | 13406.06 | 13499.90   | 13837.40   | -4.47  | 3.23   | 12.00 | 298.26 | 2909.74 | -9.04 | 117576.7 | 3955110. | 28785.4 | .481  | 30.03 | .892 | .691 |
| 6.00   | 13551.95 | 13646.81   | 13987.98   | -4.52  | 3.26   | 12.02 | 297.76 | 2922.15 | -9.06 | 118691.9 | 3991054. | 29047.0 | .482  | 30.16 | .895 | .692 |
| 6.05   | 13698.46 | 13794.35   | 14139.21   | -4.57  | 3.29   | 12.04 | 297.22 | 2934.34 | -9.08 | 119796.9 | 4026322. | 29303.7 | .483  | 30.29 | .898 | .693 |
| 6.10   | 13845.59 | 13942.51   | 14291.07   | -4.62  | 3.32   | 12.05 | 296.64 | 2946.34 | -9.09 | 120893.8 | 4061078. | 29556.6 | .484  | 30.41 | .901 | .694 |
| 6.15   | 13993.31 | 14091.27   | 14443.55   | -4.67  | 3.35   | 12.07 | 296.03 | 2958.19 | -9.09 | 121985.5 | 4095480. | 29807.0 | .485  | 30.53 | .904 | .696 |
| 6.20   | 14141.63 | 14240.63   | 14596.64   | -4.72  | 3.38   | 12.09 | 295.40 | 2969.94 | -9.09 | 123074.5 | 4129674. | 30055.9 | .486  | 30.65 | .907 | .697 |
| 6.25   | 14290.55 | 14390.58   | 14750.34   | -4.76  | 3.41   | 12.10 | 294.78 | 2981.62 | -9.08 | 124163.4 | 4163798. | 30304.2 | .487  | 30.78 | .910 | .698 |
| 6.30   | 14440.04 | 14541.12   | 14904.65   | -4.81  | 3.44   | 12.12 | 294.15 | 2993.21 | -9.07 | 125250.7 | 4197841. | 30552.0 | .488  | 30.90 | .913 | .699 |
| 6.35   | 14590.12 | 14692.25   | 15059.56   | -4.85  | 3.47   | 12.13 | 293.55 | 3004.85 | -9.05 | 126348.4 | 4232255. | 30802.4 | .489  | 31.02 | .916 | .700 |
| 6.40   | 14740.80 | 14843.98   | 15215.08   | -4.89  | 3.50   | 12.15 | 293.00 | 3016.65 | -9.03 | 127468.1 | 4267519. | 31059.1 | .490  | 31.14 | .919 | .702 |

SHIP CONSULTING

## REPORT ON INCLINING EXPERIMENT

Ship : M S W A S A K I N G

Owner: SALLY LINE AB MARIEHAMN

Main dimensions: LENGTH OVER ALL 155.40 m  
LENGTH BETWEEN PERP. 137.40 m  
BREADTH MOULDED 24.20 m  
DEPTH TO A DECK 7.65 m  
DEPTH TO C DECK 13.40 m

Date: 11.01 1991 betw. 16.00-19.00 o'clock

Place: MASA YARDS TURKU

- SPEC. GRAVITY OF SEAWATER 1.004 t/m<sup>3</sup>
- TEMPERATURE abt.-6 centigrade
- TEMPERATURE OF WATER abt. 0 centigrade
- WIND no wind

Present: MR ALF ANDERSSON MS WASA KING  
MR CARL GUNNAR EKSTRAND MS WASA KING  
MR BO HENRIK STOLPE MS WASA KING  
  
MR TIM R. E. AUTERO Finnish Board of  
Navigation  
MR VELI-MATTI JUNNILA Ship Consulting

SHIP CONSULTING

## READED DRAUGHTS

| DRAUGHT<br>MARK | DISTANCE<br>TO SEA-<br>LEVEL | DRAUGHT | MEAN  |
|-----------------|------------------------------|---------|-------|
| $d_{AP}$        | =                            |         | 5.07  |
| $d_{ASB}$       | =                            |         |       |
| $d_{BP}$        | 5.567 - 0.61                 | = 4.957 | 5.082 |
| $d_{BSB}$       | 7.667 - 2.46                 | = 5.207 |       |
| $d_{FP}$        | 5.20 - 0.08                  | = 5.12  | 5.12  |
| $d_{FSB}$       | 5.20 - 0.08                  | = 5.12  |       |

$$\text{TRIM } d_F - d_A = 5.12 - 5.07 = +0.05 \text{ m}$$

## HOGGING CORRECTIONS

$$FO = \frac{d_H}{L} (d_F + d_A) = \\ = 5.082 - \frac{1}{L} (5.12 + 5.07) = 0.013 \text{ m}$$

$$\begin{aligned} \text{CORRECTED MEAN DRAUGHT} &= d_H + CB \times FO \\ &= 5.082 + 0.667 \times 0.013 = 5.091 \text{ m} \\ CB &= \text{block coefficient at draught of 5.10 m} \end{aligned}$$

Displacement at draught 5.091 m is 11132 t and LCG -3.657 m

## TANKS TO BE SUBTRACTED

|       |                         |         |        |      |      |      |
|-------|-------------------------|---------|--------|------|------|------|
| TK8   | DB-TANK 8               | 53,55   | 86,60  | 0,00 | 0,55 | 236  |
| TK41  | DO DAY TANK             | 11,56   | 31,03  | 0,00 | 2,85 | 4    |
| TK 45 | OVERFLOW TANK 45        | 1,19    | 35,78  | 0,00 | 0,10 | 8    |
| TK20  | DB-TANK 20              | 3,49    | 59,87  | 0,00 | 0,25 | 27   |
| TK10  | H-TANK 10               | 42,75   | 74,20  | 0,00 | 1,30 | 150  |
| TK11  | H-TANK 11               | 27,55   | 74,20  | 0,00 | 1,28 | 150  |
| TK38  | SETTLING TANK 38        | 21,38   | 32,20  | 0,00 | 2,30 | 10   |
| TK39  | SETTLING TANK 39        | 13,59   | 33,84  | 0,00 | 1,85 | 7    |
| TK36  | HFO DAY TANK 36         | 17,29   | 36,23  | 0,00 | 2,20 | 8    |
| TK37  | HFO DAY TANK 37         | 19,79   | 36,62  | 0,00 | 2,81 | 6    |
| TK40  | OVERFLOW TANK           | 3,04    | 34,38  | 0,00 | 0,11 | 74   |
| TK4A  | TANK 4A                 | 70,00   | 114,25 | 0,00 | 2,72 | 48   |
| TK4B  | TANK 4B                 | 65,00   | 114,25 | 0,00 | 2,65 | 48   |
| TK5   | TANK 5                  | 135,00  | 113,65 | 0,00 | 2,70 | 138  |
| TK44  | SLUDGE OIL              | 5,50    | 32,20  | 0,00 | 0,11 | 123  |
| TK33  | BILGE WATER             | 21,00   | 35,83  | 0,00 | 0,53 | 50   |
| TK42  | DIRTY OIL               | 6,20    | 33,85  | 0,00 | 0,35 | 12   |
| TK17  | FRESH WATER CIRCUL.     | 13,70   | 58,30  | 0,00 | 0,52 | 14   |
| TK22  | COOLING WATER           | 1,00    | 55,40  | 0,00 | 0,35 | 3    |
| TK29  | COOLING WATER           | 7,00    | 59,82  | 0,00 | 0,32 | 11   |
| TK6   | DB-TANK 6               | 87,95   | 104,84 | 0,00 | 0,64 | 0    |
| TK2   | TRIM TANK 2             | 303,06  | 121,40 | 0,00 | 4,69 | 0    |
| TK1   | FORE PEAK TANK 1        | 175,98  | 133,92 | 0,00 | 4,45 | 0    |
| TK24  | THERMAL OIL TANK 24     | 5,13    | 45,78  | 0,00 | 0,25 | 13   |
| TK25  | LUBR OIL TANK 25        | 11,68   | 45,40  | 0,00 | 0,45 | 3    |
| TK26  | LUBR OIL TANK 26        | 9,00    | 45,40  | 0,00 | 0,40 | 3    |
| TK27  | LUBR OIL TANK 27        | 9,90    | 45,40  | 0,00 | 0,42 | 3    |
| TK28  | LUBR OIL TANK 28        | 9,72    | 45,40  | 0,00 | 0,41 | 3    |
| TK30  | LUBR OIL SUPPLY TANK 30 | 5,85    | 50,15  | 0,00 | 0,32 | 7    |
| TK32  | LUBR OIL TANK 32        | 7,74    | 47,40  | 0,00 | 0,55 | 3    |
| TK50  | KAMEWA TANK 50          | 0,88    | 24,60  | 0,00 | 0,25 | 2    |
| TK51  | KAMEWA TANK 51          | 1,71    | 23,40  | 0,00 | 0,50 | 0    |
| TK52  | KAMEWA TANK 52          | 1,71    | 23,40  | 0,00 | 0,50 | 0    |
| TK55A | STERN TUBE OIL          | 0,99    | 15,06  | 0,00 | 0,20 | 5    |
| TK55  | STERN TUBE TANK         | 0,59    | 15,10  | 0,00 | 0,30 | 1    |
|       | GEAR OIL STORAGE        | 1,35    | 39,40  | 0,00 | 3,50 | 0    |
| TK13  | HEELING TANK SB         | 28,60   | 78,10  | 0,00 | 0,52 | 193  |
| TK14  | HEELING TANK P          | 129,90  | 77,60  | 0,00 | 1,91 | 73   |
|       | TOTAL OF TANKS          | 1331,52 | 59,42  | 0,00 | 2,73 | 1436 |

## SHIP CONSULTING

## SUBTRACTED WEIGHT

| CODE<br>NUM. | WEIGHT<br>T | NAME                   | FRAME | FROM | FROM | DECK |
|--------------|-------------|------------------------|-------|------|------|------|
|              |             |                        | NO    | DECK | CL   | NO   |
|              | 0.3         | FORK LIFT PLATFORMS    | 5     | 0.2  | 0    | 2    |
|              | 1.3         | FORK LIFT              | 10    | 0.7  | 0    | 2    |
|              | 0.5         | VENEER                 | 59    | 0.6  | 0    | 2    |
|              | 16.0        | WASTE CONTAINERS       | 53    | 0.8  | 0    | 2    |
|              | 1.5         | EMPTY CONTAINER        | 122   | 2.4  | 0    | 2    |
|              | 0.1         | CLEANING EQUIPMENTS    | 105   | 0.2  | 0    | 0    |
|              | 0.1         | CLEANING EQUIP.        | 100   | 0.2  | 0    | 1    |
|              | 0.8         | INSULATION MATERIALS   | 45    | 0.5  | 0    | 8    |
|              | 1.5         | FUEL FOR EMER. GENER.  | 76    | 0.9  | 0    | 8    |
|              | 1.9         | STEEL PLATES           | 57    | 0.6  | 0    | 8    |
|              | 1.75        | CARPETS                | 8     | 1.0  | 0    | 1    |
|              | 1.0         | GLASS                  | 8     | 0.3  | 0    | 1    |
|              | 0.5         | MATERIALS              | 7     | 0.2  | 0    | 1    |
|              | 2.8         | MATERIALS              | 13    | 1.2  | 0    | 1    |
|              | 1.0         | FORK LIFT              | 25    | 0.5  | 0    | 1    |
|              | 0.25        | TOOLS                  | 26    | 0.2  | 0    | 1    |
|              | 1.5         | PROVISIONS             | 35    | 0.8  | 0    | 1    |
|              | 3.5         | PROVISIONS             | 37    | 0.8  | 0    | 1    |
|              | 0.05        | CLEANING EQUIP.        | 118   | 0.2  | 0    | 9    |
|              | 0.1         | COPY MACHINE           | 110   | 0.7  | 0    | 7    |
|              | 0.15        | LINEN STORE            | 117   | 1.0  | 0    | 7    |
|              | 0.1         | OFFICERS DAY ROOM      | 110   | 0.8  | 0    | 7    |
|              | 0.4         | MISCELLANEOUS          | 95    | 0.5  | 0    | 7    |
|              | 0.05        | HOSPITAL               | 90    | 0.6  | 0    | 7    |
|              | 1.3         | MATERIALS              | 81    | 0.3  | 0    | 7    |
|              | 2.0         | MISCELLANEOUS          | 80    | 0.7  | 0    | 7    |
|              | 0.15        | MATERIALS              | 54    | 0.3  | 0    | 7    |
|              | 0.3         | MESS ROOMS             | 25    | 0.5  | 0    | 7    |
|              | 0.15        | SPORT ROOM             | 10    | 0.8  | 0    | 8    |
|              | 0.4         | MATERIALS              | 73    | 0.3  | 0    | 7    |
|              | 0.2         | LINEN STORE            | 28    | 0.7  | 0    | 6    |
|              | 0.4         | GALLEY                 | 47    | 1    | 0    | 6    |
|              | 0.24        | CARPETS                | 81    | 0.4  | 0    | 6    |
|              | 2.9         | CARPETS                | 80    | 0.5  | 0    | 5    |
|              | 0.15        | WELDING MACHINE        | 40    | 0.5  | 0    | 5    |
|              | 1.3         | CARPETS                | 81    | 0.6  | 0    | 4    |
|              | 0.6         | INSULATION MATERIALS   | 82    | 0.8  | 0    | 4    |
|              | 0.42        | CARPETS                | 82    | 0.6  | 0    | 4    |
|              | 0.1         | STORES                 | 42    | 0.6  | 0    | 4    |
|              | 0.6         | WASTE                  | 75    | 0.3  | 0    | 4    |
|              | 0.1         | REFRIGERATOR           | 122   | 0.6  | 0    | 4    |
|              | 5.6         | PROPELLER SPARE PLADES | 15    | 0.4  | 0    | 2    |
|              | 0.2         | U-PROFILES             | 25    | 0.2  | 0    | 2    |
|              | 0.8         | I-PROFILES             | 25    | 0.2  | 0    | 2    |
|              | 0.3         | WASTE                  | 24    | 0.2  | 0    | 2    |
|              | 0.9         | WASTE                  | 70    | 0.4  | 0    | 2    |
|              | 1.1         | ICE AND SNOW           | 80    | 0.0  | 0    | 7    |
|              | 0.9         | ICE AND SNOW           | 85    | 0.0  | 0    | 8    |
|              | 0.1         | ICE AND SNOW           | 120   | 0.0  | 0    | 10   |

## SHIP CONSULTING

## SUBTRACTED WEIGHT

| CODE<br>NUM. | WEIGHT<br>T | NAME                       | FRAME | FROM  | FROM | DECK |
|--------------|-------------|----------------------------|-------|-------|------|------|
|              |             |                            | NO    | DECK  | CL   | NO   |
|              | 3.2         | MATERIALS IN ENG ROOM      | 60    | 0.2   | 0    | 1    |
|              | 1.65        | 22 PERSONS IN SHIP         | 80    | 1.1   | 0    | 5    |
|              | 3.75        | CREW'S PERS. GOODS         | 70    | 1.0   | 0    | 7    |
|              | 66.96       | TOTAL OF SUBTRACTED WEIGHT | 40.12 | 12.22 |      |      |

4/7/2021

## evacuation plan 1

SHIP CONSULTING

PENDEL NUMBER 1 LENGTH OF PENDEL 4455 MM

NAME OF OBSERVERS: TOMI JUNNILA

LOCATION OF PENDEL: ON CARDECK AFTER

| CASE NUMB.<br>NO OF<br>OBS. | 1 | 2    | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | SUM  | MEAN | LIST<br>VALUE |
|-----------------------------|---|------|---|---|---|---|---|---|---|----|------|------|---------------|
| I                           | 1 | 2330 |   |   |   |   |   |   |   |    | 2330 | 0.00 |               |
| II                          | 1 | 2252 |   |   |   |   |   |   |   |    | 2252 | 1.00 |               |
| III                         | 1 | 2226 |   |   |   |   |   |   |   |    | 2226 | 1.34 |               |
| IV                          | 1 | 2324 |   |   |   |   |   |   |   |    | 2324 | 0.08 |               |
| V                           | 1 | 2388 |   |   |   |   |   |   |   |    | 2388 | 0.75 |               |
| VI                          | 1 | 2454 |   |   |   |   |   |   |   |    | 2454 | 1.59 |               |
| VII                         | 1 | 2511 |   |   |   |   |   |   |   |    | 2511 | 2.33 |               |
| VIII                        | 1 | 2415 |   |   |   |   |   |   |   |    | 2415 | 1.09 |               |
| IX                          | 1 | 2343 |   |   |   |   |   |   |   |    | 2343 | 0.17 |               |

SHIP CONSULTING

PENDEL NUMBER 2 LENGTH OF PENDEL 4470 MM

NAME OF OBSERVERS: BO HENRIK STOLPE

LOCATION OF PENDEL: ON CARDECK AFTER

| CASE NUMB.<br>NO OF<br>OBS. | 1 | 2   | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | SUM | MEAN | LIST<br>VALUE |
|-----------------------------|---|-----|---|---|---|---|---|---|---|----|-----|------|---------------|
| I                           | 1 | 728 |   |   |   |   |   |   |   |    | 728 | 0.00 |               |
| II                          | 1 | 650 |   |   |   |   |   |   |   |    | 650 | 1.00 |               |
| III                         | 1 | 622 |   |   |   |   |   |   |   |    | 622 | 1.36 |               |
| IV                          | 1 | 723 |   |   |   |   |   |   |   |    | 723 | 0.06 |               |
| V                           | 1 | 788 |   |   |   |   |   |   |   |    | 788 | 0.77 |               |
| VI                          | 1 | 853 |   |   |   |   |   |   |   |    | 853 | 1.60 |               |
| VII                         | 1 | 910 |   |   |   |   |   |   |   |    | 910 | 2.33 |               |
| VIII                        | 1 | 813 |   |   |   |   |   |   |   |    | 813 | 1.09 |               |
| IX                          | 1 | 742 |   |   |   |   |   |   |   |    | 742 | 0.18 |               |

SHIP CONSULTING

## HEELING TANK SOUNDINGS AND VOLUMES

| CASE NO | LIST   | PORT | SIDE | SB-SIDE |         |                    |        |       |         |        |                    |         |
|---------|--------|------|------|---------|---------|--------------------|--------|-------|---------|--------|--------------------|---------|
|         |        |      |      | SOUN cm | CORR cm | VOL m <sup>3</sup> | WEIG t | TCG m | SOUN cm | COR cm | VOL m <sup>3</sup> | WEIG. t |
| I       | .6°SB  | 450  | 452  | 129.7   | 129.9   | -8.69              |        | 121   | 119     | 28.5   | 28.6               | 7.57    |
| II      | .4°P   | 485  | 483  | 141.8   | 142.3   | -8.74              |        | 68    | 70      | 16.4   | 16.5               | 7.34    |
| III     | .7°P   | 491  | 494  | 146.1   | 146.8   | -8.75              |        | 47    | 50      | 11.8   | 11.8               | 7.20    |
| IV      | .5°SB  | 453  | 455  | 130.9   | 131.4   | -8.70              |        | 116   | 114     | 27.2   | 27.3               | 7.54    |
| V       | 1.3°SB | 422  | 427  | 120.0   | 120.5   | -8.67              |        | 161   | 155     | 38.1   | 38.3               | 7.69    |
| VI      | 2.2°SB | 391  | 399  | 109.3   | 109.7   | -8.59              |        | 206   | 199     | 48.6   | 48.8               | 7.95    |
| VII     | 2.8°SB | 365  | 375  | 100.2   | 100.6   | -8.54              |        | 246   | 235     | 57.9   | 58.1               | 8.13    |
| VIII    | 1.7°SB | 411  | 417  | 116.2   | 116.7   | -8.63              |        | 179   | 171     | 41.7   | 41.9               | 7.79    |
| IX      | .8°SB  | 446  | 449  | 128.5   | 129.0   | -8.72              |        | 126   | 123     | 29.6   | 29.6               | 7.59    |

**SHIP CONSULTING****D U R I N G E X P E R I M E N T**

MEAN MOULDED DRAUGHT 5.091 m  
 TRIM +0.05 m  
 SEAWATER DENSITY 1.004 ton/m<sup>3</sup>  
 DISPLACEMENT 11132 t  
 HEIGHT OF METACENTER ABOVE BL 11.69 m

| CASE NO | INCLINING    |               | INCLINING ANGLE  |               | METACENTRIC HEIGHT GM |
|---------|--------------|---------------|------------------|---------------|-----------------------|
|         | WEIGHT (TON) | MOMENT (TONM) | TOTAL MOM (TONM) | DIFFER. (DEG) |                       |
| II      | 12.14        | 196.30        | 196.30           | 1.00          | 1.011                 |
| III     | 4.47         | 71.55         | 267.86           | 0.35          | 1.021                 |
| IV      | 15.36        | -247.24       | 20.62            | -1.28         | 0.07                  |
| V       | 10.94        | -178.38       | -157.76          | -0.83         | -0.76                 |
| VI      | 10.64        | -174.96       | -332.72          | -0.84         | -1.595                |
| VII     | 9.24         | -153.38       | -486.10          | -0.73         | -2.33                 |
| VIII    | 16.16        | 267.44        | -218.66          | 1.24          | -1.09                 |
| IX      | 12.24        | 200.45        | -18.21           | 0.92          | 1.032                 |

METACENTRIC HEIGHT DURING EXPERIMENT GM = 1.050 M  
 FREE SURFACE CORRECTION GMC = 0.129 M  
 CORRECTED METACENTRIC HEIGHT GM0 = 1.179 M  
 HEIGHT OF METACENTER ABOVE BL KM = 11.690 M

CENTRE OF GRAVITY ABOVE BL KG = 10.511 M

| L I G H T   S H I P      | WEIGHT<br>(TON) | CENTRE OF GRAVITY FROM |           |           |
|--------------------------|-----------------|------------------------|-----------|-----------|
|                          |                 | LPP/2<br>(M)           | CL<br>(M) | BL<br>(M) |
| DURING EXPERIMENT        | 11132           | -3.553                 | 0.00      | 10.511    |
| WEIGHTS TO BE ADDED      | 0               | -0.000                 | 0.00      | 0.00      |
| WEIGHTS TO BE SUBTRACTED | 67              | -28.58                 | 0.00      | 12.22     |
| TANKS TO BE SUBTRACTED   | 1332            | +29.72                 | 0.00      | 2.73      |
| LIGHT SHIP               | 9733            | -7.934                 | 0.00      | 11.564    |
| INCLINING TEST 21.6 1980 | 9420            | -7.02                  | 0.00      | 11.31     |
| DIFFERENCE               | 313             | -0.914                 | 0         | +0.254    |

| SURVEYS CARRIED OUT BY BUREAU VERITAS ON M/C "ESTONIA" |                         |                     |                   |  |
|--|-------------------------|---------------------|-------------------|--|
| Place  | Intervention dates      | Class surveys       | Statutory surveys | Observations   |
| Papenburg  | 1980 07 01              |                     | ISLL              | Issuance of Class and Load Line certificates to Messrs Meyerwerft Newbuilding S 580 VIKING SALLY |
| Hamburg  | 1981 02 12              | OS AUT              |                   |  |
| Stockholm  | 1981 04 13              | CSH CSM             |                   | Issuance of definitive AUT certificate   |
| Turku  | 1981 05 04 - 08         | AS DOK CSH CSM      | ASLL              |  |
| Stockholm  | 1981 4 23               | CSM                 |                   |  |
| Turku  | 1981 9 3                | OSAB                |                   |  |
| Turku  | 1981 09 21 - 22         | CSM ASAUT           |                   |  |
| Turku  | 1981 10 20              | OSH                 |                   | Survey after minor collision   |
| Turku  | 1982 5 13               | ASM CSM             |                   |  |
| Turku  | 1982 5 17               | CSM                 |                   |  |
| Stockholm  | 1982 05 24 - 25         | ASH CSH CSM         |                   |  |
| Stockholm  | 1982 05 25 - 06 07      | CSH AB              | ASLL              |  |
| Turku  | 1982 11 8               | ASAUT               |                   |  |
| Turku  | 1982 12 9               | OSAB                |                   |  |
| Stockholm  | 1983 01 07              | CSM                 |                   |  |
| Stockholm  | 1983 03 04              | CSH                 |                   |  |
| Turku  | 1983 04 25 - 29         | AS DOK CSH CSM      | ASLL              | CSH item Bow Door credited   |
| Stockholm  | 1983 05 02 - 16         | OSM                 |                   |  |
| Turku  | 1983 05 25              | OSM CSM             |                   |  |
| Stockholm  | 1983 10 24 - 1984 01 02 | ASAUT               |                   |  |
| Turku  | 1984 04 02              | CSM                 |                   |  |
| Stockholm  | 1984 05 07              | CSM                 |                   |  |
| Stockholm  | 1984 05 18              | AS UWS CSH CSM ASAB | ASLL              |  |
| Mariehamn  | 1984 05 25              | OSH                 |                   | Survey after grounding ,voyage to Helsinki for repairs   |
| Helsinki   | 1984 05 25 - 26         | OSH                 |                   | Temporary repairs of grounding damages   |
| Turku  | 1984 11 23              | OSM                 |                   | Extension of tailshaft survey periodicity  |
| Turku  | 1984 12 10              | ASAUT               |                   |  |

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| Place     | Intervention dates | Class surveys         | Statutory surveys | Observations  |
|-----------|--------------------|-----------------------|-------------------|---|
| Stockholm | 1984 12 17         | OSH                   |                   | Diver survey,postponement of grounding repairs        |
| Turku     | 1985 02 15         | OSM                   |                   |   |
| Stockholm | 1985 03 25         | OSH                   |                   | Diver survey, postponement of grounding repairs       |
| Helsinki  | 1985 04 22 - 05 06 | DOK CSH TS CSM        |                   | Permanent repairs, stem modification                  |
| Stockholm | 1985 05 24 - 07 15 | AS CSH CSM ASAB ASAUT | PSLL              | Renewal of class term and load line certificate       |
| Turku     | 1986 04 10         | CSM                   |                   |   |
| Stockholm | 1986 04 25         | CSH CSM               |                   |   |
| Stockholm | 1986 05 27         |                       | ASLL              |   |
| Stockholm | 1986 08 18         | CSM                   |                   |   |
| Stockholm | 1986 09 01         | CSM                   |                   |   |
| Stockholm | 1986 09 24         | AS UWS                |                   |   |
| Stockholm | 1986 09 24 - 12 08 | ASAUT                 |                   |   |
| Turku     | 1987 01 13 - 21    | DOK CSH               |                   | Repairs of cracks in rudder plating                   |
| Turku     | 1987 04 06 - 08    | OSH OSM OSAB CSH      |                   | Bottom of bow door repaired/strengthened (ice damage) |
| Turku     | 1987 04 23 - 05 08 | OSM                   |                   | Repairs to main engine n°1                            |
| Stockholm | 1987 05 10         | CSM                   |                   |   |
| Stockholm | 1987 07 23         | AS ASAUT ASAB         | ASLL              |   |
| Stockholm | 1988 02 08         | CSH ASAB              |                   |   |
| Turku     | 1988 03 14         | CSM                   |                   |   |
| Turku     | 1988 03 28         | CSM                   |                   |   |
| Stockholm | 1988 05 10         | AS CSH CSM            | ASLL              | CSH item Bow Door credited                            |
| Stockholm | 1988 05 25         | CSH CSM               |                   |   |
| Turku     | 1988 09 15         | DOK CSM               |                   |   |
| Turku     | 1988 09 26         | ASAUT                 |                   |   |
| Stockholm | 1988 11 06 - 12 09 | DOK TS                |                   | Surveys after grounding and periodical surveys        |
| Turku     | 1989 05 02 - 03    | DOK ASAUT CSH CSM     |                   |   |
| Turku     | 1989 05 29 - 30    | AS CSH CSM            | ASLL              |   |
| Turku     | 1990 04 30 - 05 07 | DOK CSH CSM           |                   | Change of name to "SILJA STAR"                        |

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| Place     | Intervention dates | Class surveys       | Statutory surveys              | Observations   |
|-----------|--------------------|---------------------|--------------------------------|--|
| Stockholm | 1990 06 14 - 07 03 | AS CSH CSM ASAB AUT | PSLL                           | Renewal of class term and load line certificate  |
| Turku     | 1990 11 21 - 12 14 | DOK                 |                                |  |
|           |                    | OS                  |                                | Change of name to "WASA KING"  |
| Holmsund  | 1991 04 13 - 15    | AS CSH CSM          | ASLL                           |  |
| Holmsund  | 1991 09 23         | ASAUT CSM           |                                |  |
| Holmsund  | 1992 06 17 - 18    | AS ASAUT CSH CSM    | ASLL                           |  |
| Holmsund  | 1992 11 28         | ASAB CSM            |                                |  |
| Abo       | 1993 01 04 - 14    | DOK TS CSH          | PSLL IOPP PSCONS<br>PSEQ PSRAD | Change of name to "ESTONIA" and of Owners/Flag<br>Issuance of interim LL certif.; interim cargoship safety certificates. |
| Tallinn   | 1993 01 16 - 28    |                     | PSPS                           | Issuance of interim PSSC certificate (passenger ship)  |
| Stockholm | 1993 03 15         | CSH CSM             | OSIOPP                         | Issuance of interim IOPP certif.(definitive certificate issued on 07/04/1993)  |
| Abo       | 1993 03 22 - 04 03 | CSM                 |                                | Change of outboard tailshaft sealings  |
| Stockholm | 1993 05 22 - 24    | CSH CSM             |                                | Postponement of CSH/CSM items  |
| Stockholm | 1993 06 14         |                     | OSLL OSPS                      | Renewal of interim LL & PSSC certificates  |
| Stockholm | 1993 08 12 - 13    | AS ASAUT            | ASIOPP                         |  |
| Stockholm | 1993 10 18         | CSH CSM             |                                | CSH item Bow Door credited   |
| Stockholm | 1993 11 11         |                     | OSLL OSPS                      | Renewal of interim LL & PSSC certificates  |
| Stockholm | 1993 11 16         | ASAB                |                                |  |
| Nadendal  | 1994 01 10 - 14    | DOK                 |                                | Installation of Stabiliser units   |
| Stockholm | 1994 01 27         |                     | PSPS                           | Periodical survey and renewal of interim PSSC certif.  |
| Stockholm | 1994 03 16         | CSH CSM             |                                |  |
| Stockholm | 1994 04 11         |                     | OSLL                           | Renewal of interim LL certificate  |
| Stockholm | 1994 05 09 - 11    | CSH CSM             |                                | Issuance of definitive PSSC (clerical mishandling) 23 june 1994  |
| Stockholm | 1994 06 26         |                     | OSPS                           | Renewal of interim PSSC certificate  |
| Stockholm | 1994 08 23 - 25    | AS ASAUT ASAB CSM   | ASLL ASIOPP                    |  |
| Stockholm | 1994 09 09         |                     | OSLL                           | Renewal of interim LL certificate  |

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## SURVEY CODES USED IN THE TABLE

| CLASS SURVEY CODES |                                      | STATUTORY SURVEY CODES |                                     |
|--------------------|--------------------------------------|------------------------|-------------------------------------|
| AS                 | Annual survey (Hull & Machinery)     | ISLL                   | Initial survey Load Line            |
| ASAB               | Annual survey Boilers                | ASLL                   | Annual survey Load Line             |
| ASAUT              | Annual survey Automated installation | PSLL                   | Periodical survey Load Line         |
| CSH                | Continuous survey Hull               | ASIOPP                 | Annual survey Marpol                |
| CSM                | Continuous survey Machinery          | IOPP                   | Periodical survey Marpol            |
| DOK                | Periodical bottom survey in drydock  | PSPS                   | Periodical survey Passenger ship    |
| UWS                | Underwater survey                    | PSCONS                 | Periodical survey Saf. construction |
| TS                 | Tailshaft survey                     | PSEQ                   | Periodical survey Saf. equipment    |
| OSH                | Occasional survey Hull               | PSRAD                  | Periodical survey Saf. radio        |
| OSM                | Occasional survey Machinery          | OSLL                   | Occasional survey Load Line         |
| OSAB               | Occasional survey Boilers            | OSIOPP                 | Occasional survey Marpol            |
| OSAUT              | Occasional survey AUT installation   | OSPS                   | Occasional survey Passenger ship    |

Page 4

01/02/95 16:14 MERENKUL KUOS, 358 0 1800500 + 05593594

Enclosure 3.4.88

|  |                                  |  |  |
|--|----------------------------------|--|--|
| KATSASTUS-/TARKASTUSPÖYTÄKIRJA   |                                  |  |  |
| Sini ja Väistä KING  | Ask. polku ja m/e VRASS 283      | Dannuskirjaimet OIKW                   |  |
| ent. nimi Sini ja RENE   | Kotipaikka VRASS                 | Alikseen 1a/1 KUURHANIA                |  |
| Elokuvan vuosi 1980  | alustat TELIS paikka TAPPE-PUURA | Pituus: 187 cm = Lavaaja 21.2.2.       |  |
| Alus en avoinna <input type="checkbox"/> kannellinen <input checked="" type="checkbox"/> Br.vetoisuuksia 15596   | Pikkoneiden lukumäärä: 4         | Ekonominen hinta 17600                 |  |
| Miltain viinankaeksi selakoitus  | 11/90                            | Missä viinankaeksi selakoitus NAANTALI |  |
| Laittavuuden tarkastaja:   | Istamaa LAIVANVUORISTO JAANI 12  |  |  |
|  | postiosoite: 65170 VRASSI        |  |  |
| <u>VARAINEN</u> o.   |                                  |  |  |
| HUOMAUTUKSIA SIVU: 13 TÄYÄN RAAY TÄYDEN: 1680 12.4.2000<br>PÖYTÄKIRJA SIVU: 14 SIIPIKUOLE / DECEA postitettu<br>1680. vuoden lopulla G.P.S. ASENTAMATTA<br>ASETEKNIKKO: JÄÄLVIÄISILÄ 27.1.92 |                                  |  |  |

| Kysymyksen olio        | Perus- | Mikäli kaikein | Vtii- | Vuosin- | Tiimiheitkinen<br>katsaus |
|------------------------|--------|----------------|-------|---------|---------------------------|
| Merkiläpäsuudenkattaus |        | X              |       |         |                           |
| Koneisostekattaus      |        |                |       |         |                           |
| Bungonkattaus          |        |                |       |         |                           |
| Radiolaittakattaus     |        |                |       |         |                           |
| Karpol-kattaus         |        |                |       |         |                           |

Katsastus/väkästus on toimitettu 25.5 / G 2 19

01/02/95 16:14 MERENKULKUOS. 358 0 1808500 + 05593584

Enclosure 3.4.88

|   |                          |                            |                                     |
|---|--------------------------|----------------------------|-------------------------------------|
| KATTAUSTUS-/TÄRKATTUSTÖTTÄVIRJA                 |                          |                            |                                     |
| Mies ja   | VETTER KING              |                            |                                     |
| ent. nimi                                       | SINIA STAE               |                            |                                     |
| Rk.palkka ja -nro                               | VAPAA 283                |                            |                                     |
| Notipalika                                      | VAPAA                    |                            |                                     |
| Tunnuskirjaimet                                 | OIKW                     |                            |                                     |
| Elokuvavuosi:                                   | 1980                     | Aluksen nimi               | AURZLAUTIA                          |
| Alus on ovin                                    | <input type="checkbox"/> | Kannellinen                | <input checked="" type="checkbox"/> |
| Milloin viietyksi selakoitu:                    | 11/90                    | Mistä viietyksi selakoitu: | NAANTALI                            |
| Leivansäntä:                                    |                          | Istannan postiosoite:      | LÄIVANVAELSTIJÄRVI 12               |
| WÄRÄNNE OY                                      |                          |                            |                                     |
| HUOMAUTUKSIA SIVU 13 TUTVU RAY HYDRO 1650 12.82 |                          |                            |                                     |
| PÖRSEKKI SINIÄLK SKIMMUT / DECCA POSTI          |                          |                            |                                     |
| SAS VOLLMER G.P.S. ASENNUSTUL                   |                          |                            |                                     |
| ASENNUKSI TAULUSTEESSA 27.1.92                  |                          |                            |                                     |

| Kysymysnumero              | Perryt- | Mikäleikaisinen | Villi- | Vuosi- | Viljimääräinen kattavuus |
|----------------------------|---------|-----------------|--------|--------|--------------------------|
| Merikalpoisluodenkattavuus |         | X               |        |        |                          |
| Koneistonkattavuus         |         |                 |        |        |                          |
| Rungonkattavuus            |         |                 |        |        |                          |
| Radioaktiviteeteskattavuus |         |                 |        |        |                          |
| Korpol-kattavuus           |         |                 |        |        |                          |

Katsactus/Tekkastus on toimitettu 22.5 / 19.5

## Office translation

## REPORT OF INSPECTION

Name of the vessel: M/S Wasa King  
Port of Registry: Vaasa  
Call sign: OIKW  
Former name: Silja Star  
Home port: Vaasa  
Ship type: Car Ferry  
Date of build: 1980  
Material: Steel  
Place of build: Papenburg  
Length: 157,02 m  
Breadth: 24,22 m  
The vessel is Open/decked: Decked  
Gross tonnage: 15598  
Number of Main Engines: 4  
Total power: 17600 kW  
Last drydocked: 11/90 in Naantali  
Shipowner: Wasaline Oy  
Address: Laivanvarustajankatu 1, 65170 Vaasa  
  
Remarks: Page: 13 Radar Raytheon 1650 12 x? removed. Page: 11 Shipmate/Decca removed. Satellite Navigation Device GPS installed. Medicines inspected 27.1.92.  
Periodical Inspection of Seaworthiness.  
Inspection carried out: 22.5.1992

|  |   |                   |                |            |
|--|---|-------------------|----------------|------------|
| 81/02/95 16:14 MERENKULKUOS. J58 0 1808580 + 05593584  | NR0676 SF   |                   |                |            |
| <b>KATSASTUSTODISTUS</b>   |   |                   |                |            |
| <b>M/S WILHELMINA Väinö</b> ... OIKU...  |   |                   |                |            |
| Aluksen nimi   | Aottipalkka   | Tunnusmerkijainot |                |            |
| Rakennusvuosi 1988   | Palkka-PÖRÖVÄRVI Aide TE-23.. Br.vetoisous 15.58 Pitous 17.02 |                   |                |            |
| Palkoneiden lukumäärä 14 Kokonaisteho 17.500 liikenneas.   | Laituri 1.600 m²  |                   |                |            |
| Suurin sallittu henkilömaara/matkustajamaara   |   |                   |                |            |
| Rajoitukset  |   |                   |                |            |
| Katsastussa todetut puutteet   |   |                   |                |            |
| Puutteet korjattava /.../ 19... mennessä. (emästämä 1 kk)  |   |                   |                |            |
| Puutteet todettu korjatuksi /.../ 19... Tarkastaja/katsastaja  |   |                   |                |            |
| Alus on tällä perustella <input checked="" type="checkbox"/> edelläkäytössä <input type="checkbox"/> välttämättä <input type="checkbox"/> katsastussa hyväksytty |   |                   |                |            |
| Myyntitarkoitus 19.5.1992. Asukka edellytyksellä, että vuosikatsastukset toimitetaan säädetyn välein.  |   |                   |                |            |
| V.A.T. 19.5.1992   | Paikka  | Aika              |                |            |
|  | Katsastaja  | Katsastuspäiri    |                |            |
| <b>VOOSTIKATSASTUKSET / NIIDEN SISÄLTÖJSET KATSASTUKSET</b>  |   |                   |                |            |
| Vuosikatsastus / sen sisältöinen katsastus on toimitettu   |   |                   |                |            |
| Paikka   | /.../ 19...   | Katsastaja        | Katsastuspäiri |            |
| Vuosikatsastus / sen sisältöinen katsastus on toimitettu   |   |                   |                |            |
| Paikka   | /.../ 19...   | Katsastaja        | Katsastuspäiri |            |
| Vuosikatsastus / sen sisältöinen katsastus on toimitettu   |   |                   |                |            |
| Paikka   | /.../ 19...   | Katsastaja        | Katsastuspäiri |            |
| Vuosikatsastus / sen sisältöinen katsastus on toimitettu   |   |                   |                |            |
| Paikka   | /.../ 19...   | Katsastaja        | Katsastuspäiri |            |
| Aluksella on lankituslaitteita tai MÖÖM edellästään jättiläiskulttuurijoitoja <input type="checkbox"/> Ei ole <input type="checkbox"/>                           |   |                   |                |            |
| <b>Alus on hyväksytty talviliikenteeseen</b>   |   |                   |                |            |
| talvikautena 19.... - 19....   | Paikka  | /.../ 19....      | Katsastaja     |            |
| talvikautena 19.... - 19....   | Paikka  | Aika              | /.../ 19....   | Katsastaja |
| talvikautena 19.... - 19....   | Paikka  | /.../ 19....      | Aika           | Katsastaja |
| talvikautena 19.... - 19....   | Paikka  | /.../ 19....      | Aika           | Katsastaja |
| talvikautena 19.... - 19....   | Paikka  | /.../ 19....      | Aika           | Katsastaja |

## Office translation

## CERTIFICATE OF INSPECTION

Name of the vessel: M/S Wasa King  
Port of Registry: Vaasa  
Call sign: OIKW  
Date of build: 1980  
Place of build: Papenburg  
Material: Steel  
Gross tonnage: 15598  
Length: 157,02 m  
Number of Main Engines: 4  
Total power: 17600 kW  
Traffic area: Near traffic

The vessel has approved in this Periodical Inspection fit for use till 28/5 1993 subject to Yearly Inspection as required by the Rules.

Place and date: Vaasa 22/5 1992  
Inspector: Signature  
Inspection District: Vaasa

01/02/95 16:14 MERENKULUOS. 358 0 1808580 + 85593584

NR0576 14

Ote  
Valvontakansio nro

Sivun nro

15

|  |                             |
|--|-----------------------------|
| Aukseen nimi<br>MK LIPSA KIRK          | Kotipaikka<br>VAAS          |
| Varustamo (nimi, osoite)<br>WILHELM OY | Laihavuorenkat. 1 6510 VAAS |
| Päällikkö<br>J. HUKKANEN               |                             |

VAASITÄ 22.5.92

Suuritehty määritäjäkäinen koneriston katsastus  
 Koneristus SOUTAVAL Määritäjäkäinen  
 koneristus 28.5.93 (~3kk) 1 kätyni 2760,-

J. Lehtinen

VIITÄSTÄ 22.5.1992

Suuriletku määritäjäkäinen koneriston katsastus  
 seuraava määritäjäkäinen koneriston katsastus 28.5.1993-34  
 2 kätyni 3540,-

J. Lehtinen

## Office translation

## Extract

CONTROL FILE NO. Page No.  
15

Name of the vessel: M/S Wasa King  
Port of Registry: Vaasa  
Shipowner (name, Address): Wasaline Oy  
Laivanvarustajankatu 1, 65170 Vaasa  
Master: O.Hokkanen  
Vaasa 22.5.92  
Carried out Periodical Inspection. Next Periodical Inspection  
28.5.93 (- 3 months) 1 visit 2.300,-.

Signature

Vaasa 22.5.1992  
Carried out Periodical Machinery Inspection. Next Periodical  
Machinery Inspection 28.5.1993 - 3 months.  
2 visits 3.540,-.

Signature

03/08 '95 09:15... D-14 40 7205744

INT. FARBERS, VS

## Enclosure 3.4.89



## TELEFAX

PAGE 1 \*

TO ANDREW.RAYNER  
 COMPANY INTERNATIONAL PAINT  
 FAX NO. 090-44-101 438 3077  
 FROM JARMO LANTI  
 DATE 31.7.1995

RE: YOUR FAX TO BPNGT SJÖLUM 28 JULY

1. ESTONIA, ex Viking Sally, Sjö Star, Vasa King

-51 no docking report  
-90 primed with INERTA 160, viking blue

No other reports available.

2. Specification done according the following:

Inlet ducts for waterjets PRELIMINARY

## Preparations:

- Aluminum work grade: 05
- Degreasing, followed by fresh water cleaning to remove contamination
- Sandblasting or grinding (sand papering)
- Surface roughness requirement: Coarse, according to ISO 8503-2.
- Abrasive material: Quartz sand, nickel slag or aluminum silicate

| Product                 | Colour | Layers | DETA/m      |
|-------------------------|--------|--------|-------------|
| Baloflake*              | green  | (1x)   | 1000        |
| Intershield Newbuilding |        |        |             |
| ENAO01/ENAO03 aluminium | alum.  | (1x)   | 150         |
| Intensif                |        |        |             |
| JXA464/JXA465           | black  | (1x)   | 75          |
| Interspeed extra        |        |        |             |
| BWA001                  | black  | (2x)   | 150         |
|                         |        |        | 1000+375 µm |

\* In vicinity of the waterjet unit in Inlet duct Baloflake to be replaced with Belzona Ceramic H-metal DFT 2000 +>600 µm. Prior application of the subsequent coat Belzona surface to be sandblasted. Exact definitions for Belzona application areas to be done, when work will be carried out. (total protection area ab, 5 sqm/vessel).

0280E001 A

Best regards  
Jarmo Lantti

TEKNOS WINTER OY  
 PO BOX 100 HELSINKI FINLAND 00101  
 PHONE +358 0 500 001  
 FAX 00358 107 HELSINKI, FINLAND

| SHIP DETAILS                   |  | SILVA STAR            |  | COATING APPLICATION                   |  | DRYDOCK: 1 MAY 95 VALMET YUOSAARI THIS               |  |
|--------------------------------|--|-----------------------|--|---------------------------------------|--|--|--|
| OWNER/MANAGER                  |  | : SALLY REDERI AB     |  | AREA OF SHIP                          |  | C TYPE B/T PRODUCT & NAME                            |  |
| SHIP TYPE                      |  | : FERRY               |  | *PLATS                                |  | 1 T/F 80 ERASIS INTERSHIELD VINYL TAR HS TINTED      |  |
| NAME                           |  | : SILVA STAR          |  | *PLATS                                |  | 2 T/F 100 JVA007 INTERTUF VINYL BLACK                |  |
| LLOYDS NO.                     |  | : 7921003             |  | PORT SIDE U/W                         |  | 1 T/F 500 ERA05 INTERSHIELD HS BLUE-INERTA 160 BASE  |  |
| EXECUTIVE POINT                |  | : HELSINKI            |  | STANDBRD SIDE U/W                     |  | * FULL 500 ERA05 INTERSHIELD HS BLUE-INERTA 160 BASE |  |
| DELIVERY DATE                  |  | : 1 JUN 80            |  | PORT BOOTTOP                          |  |  |  |
| SERVICE SPEED                  |  | : 19 KNOTS            |  | STARBOARD BOOTTOP                     |  |  |  |
| DIMENSIONS (METERS)            |  |                       |  | *SPLIT AREA                           |  |  |  |
| LENGTH B/D                     |  | : 137.49              |  | PRODUCT & NAME                        |  | ERA05 INTERSHIELD HS BLUE-INERTA 160 BASE 0.356      |  |
| BEAM MOULDED                   |  | : 24.21               |  | JVA005 INTERTUF VINYL TAR HS TINTED 0 |  | JVA007 INTERTUF VINYL BLACK 0                        |  |
| ANTI-FOULING HT (FWD)          |  | : 5.60                |  |                                       |  |  |  |
| ANTI-FOULING HT (AFT)          |  | : 5.60                |  |                                       |  |  |  |
| BOOTTOP HT (FWD)               |  | : 0.00                |  |                                       |  |  |  |
| BOOTTOP HT (AFT)               |  | : 0.00                |  |                                       |  |  |  |
| SURFACE AREAS (SQ METRES)      |  |                       |  |                                       |  |  |  |
| HULL BELOW WATER               |  | : 3850                |  |                                       |  |  |  |
| PLATS                          |  | : 2300                |  |                                       |  |  |  |
| STANDBRD                       |  | : 0                   |  |                                       |  |  |  |
| TOPSIDES                       |  | : 0                   |  |                                       |  |  |  |
| DRYDOCK SUMMARY                |  |                       |  |                                       |  |  |  |
| DATE LOCATION                  |  | MFR X TYPE OF REPORT  |  |                                       |  |  |  |
| 0707 KVAERNER MASA YARDS-TURKU |  | HEM 100 DRYDOCK CM/S3 |  |                                       |  |  |  |
| 8806 KVAERNER MASA YARDS-TURKU |  | HEM 100 DRYDOCK CM/S3 |  |                                       |  |  |  |
| 8806 FINLAND                   |  | HEM 100 DRYDOCK CM/S3 |  |                                       |  |  |  |
| 8805 VALMET YUOSAARI           |  | HEM 100 DRYDOCK CM/S3 |  |                                       |  |  |  |
| 0707 KVAERNER MASA YARDS-TURKU |  | INC 100 DRYDOCK CM/S3 |  |                                       |  |  |  |
| 8809 KVAERNER MASA YARDS-TURKU |  | INC 100 DRYDOCK CM/S3 |  |                                       |  |  |  |
| 8809 FINLAND                   |  | INC 100 DRYDOCK CM/S3 |  |                                       |  |  |  |
| 8805 VALMET YUOSAARI           |  | INC 100 DRYDOCK CM/S3 |  |                                       |  |  |  |

03/08 '95 09:14 D-14 40 7205744  
 12-JUL-95 FRI 10:15 TECH CONTROL  
 INT. FARBERS, VS  
 FAX NO. 090-44-101 438 3077  
 FILE # 2002

| SHIP DETAILS                  |                 | SILVA STAR       | COATING APPLICATION | DRYDOCK:- JAN 87 KVARNER NASA YARDS-TURKU FINN   |
|-------------------------------|-----------------|------------------|---------------------|--|
| OWNER/MANAGER                 | SALLY REDERI AB |                  | AREA OF SHIP        | C TYPE DFT PRODUCT & NAME  |
| SHIP TYPE                     | FERRY           |                  | PLATS               | 1 FULL 500 ERA165 INTERSHIELD HS BLUE-INERTA 160 BASE  |
| TONNAGE                       | 15566           |                  | STERN               | 1 T/U 500 ERA165 INTERSHIELD HS BLUE-INERTA 160 BASE<br>2 T/U 500 ERA163 INTERSHIELD INERTA 160 BLACK BASE |
| LLWOS NO.                     | 7921023         |                  |                     |  |
| EXECUTIVE POINT               | HELSINKI        |                  | PRODUCT & NAME      | BLAT10 INTERSHIELD PREMIUM A/F RED LITRES  |
| DELIVERY DATE                 | 1 JUN 80        |                  |                     | ERA163 INTERSHIELD INERTA 160 BLACK BASE 40  |
| SERVICE SPEED                 | 18 KNOTS        |                  |                     | ERA165 INTERSHIELD HS BLUE-INERTA 160 BASE 1500  |
| DIMENSIONS (METERS)           |                 |                  |                     |  |
| LENGTH B/P                    | 137.42          |                  |                     |  |
| BEAR MOULDED                  | 24.21           |                  |                     |  |
| ANTIFOULING HT (FWD)          | 5.60            |                  |                     |  |
| ANTIFOULING HT (AFT)          | 5.60            |                  |                     |  |
| BOOTTOP HT (AFT)              |                 |                  |                     |  |
| BOOTTOP HT (FWD)              |                 |                  |                     |  |
| SURFACE AREAS (50 METRES)     |                 |                  |                     |  |
| HULL BELOW WATER              | 3850            |                  |                     |  |
| FLAKS                         | 2300            |                  |                     |  |
| ROXTOP                        |                 |                  |                     |  |
| TOPSIDES                      |                 |                  |                     |  |
| DRYDOCK SUMMARY               |                 |                  |                     |  |
| DATE LOCATION                 | WFR %           | % TYPE OF REPORT |                     |  |
| 8208 FINLAND                  | HEM 100         | DRYDOCK (W/S)    |                     |  |
| 8208 KVARNER NASA YARDS-TURKU | HEM 100         | DRYDOCK (W/S)    |                     |  |
| 8304 FINLAND                  | HEM 100         | DRYDOCK (W/S)    |                     |  |
| 8505 VALNET VUOSAARI          | HEM 100         | DRYDOCK (W/S)    |                     |  |
|                               | INC             | DRYDOCK          |                     |  |
| 8701 KVARNER NASA YARDS-TURKU | INC 100         | DRYDOCK (W/S)    |                     |  |
| 8809 KVARNER NASA YARDS-TURKU | INC 100         | DRYDOCK (W/S)    |                     |  |
| 9005 KVARNER NASA YARDS-TURKU | INC 100         | DRYDOCK (W/S)    |                     |  |
|                               | INC             | DRYDOCK          |                     |  |

04/09/88 09:15 10:15  
DRYDOCK FINNINT-FARERS  
V.S.

200

03/09/85 09:15 10:15  
DRYDOCK FINNINT-FARERS  
V.S.

200

| SHIP DETAILS                  |                 | SILVA STAR       | COATING APPLICATION | DRYDOCK:- SEP 88 KVARNER NASA YARDS-TURKU FINN        |
|-------------------------------|-----------------|------------------|---------------------|---|
| OWNER/MANAGER                 | SALLY REDERI AB |                  | AREA OF SHIP        | C TYPE DFT PRODUCT & NAME                             |
| SHIP TYPE                     | FERRY           |                  | PORT SIDE           | 1 T/U 500 ERA165 INTERSHIELD HS BLUE-INERTA 160 BASE  |
| TONNAGE                       | 15566           |                  | STARBOARD SIDE      | 1/W   |
| LLWOS NO.                     | 7921023         |                  |                     |   |
| EXECUTIVE POINT               | HELSINKI        |                  | PORT BOOTTOP        | 1 FULL 330 ERA165 INTERSHIELD HS BLUE-INERTA 160 BASE |
| DELIVERY DATE                 | 1 JUN 80        |                  | STARBOARD BOOTTOP   |   |
| SERVICE SPEED                 | 18 KNOTS        |                  |                     |   |
| DIMENSIONS (METERS)           |                 |                  | STERN               | 1 F/U 500 ERA165 INTERSHIELD HS BLUE-INERTA 160 BASE  |
| LENGTH B/P                    | 137.42          |                  |                     |   |
| BEAR MOULDED                  | 24.21           |                  | PRODUCT & NAME      | ERA165 INTERSHIELD HS BLUE-INERTA 160 BASE LITRES     |
| ANTIFOULING HT (FWD)          | 5.60            |                  |                     | 0   |
| ANTIFOULING HT (AFT)          | 5.60            |                  |                     |   |
| BOOTTOP HT (AFT)              |                 |                  |                     |   |
| BOOTTOP HT (FWD)              |                 |                  |                     |   |
| SURFACE AREAS (50 METRES)     |                 |                  |                     |   |
| HULL BELOW WATER              | 3550            |                  |                     |   |
| FLAKS                         | 2300            |                  |                     |   |
| ROXTOP                        |                 |                  |                     |   |
| TOPSIDES                      |                 |                  |                     |   |
| DRYDOCK SUMMARY               |                 |                  |                     |   |
| DATE LOCATION                 | WFR %           | % TYPE OF REPORT |                     |   |
| 8208 FINLAND                  | HEM 100         | DRYDOCK (W/S)    |                     |   |
| 8208 KVARNER NASA YARDS-TURKU | HEM 100         | DRYDOCK (W/S)    |                     |   |
| 8304 FINLAND                  | HEM 100         | DRYDOCK (W/S)    |                     |   |
| 8505 VALNET VUOSAARI          | HEM 100         | DRYDOCK (W/S)    |                     |   |
|                               | INC             | DRYDOCK          |                     |   |
| 8701 KVARNER NASA YARDS-TURKU | INC 100         | DRYDOCK (W/S)    |                     |   |
| 8809 KVARNER NASA YARDS-TURKU | INC 100         | DRYDOCK (W/S)    |                     |   |
| 9005 KVARNER NASA YARDS-TURKU | INC 100         | DRYDOCK (W/S)    |                     |   |
|                               | INC             | DRYDOCK          |                     |   |

03/09/85 09:15 10:15  
DRYDOCK FINNINT-FARERS  
V.S.

200

|                            |                          |            |                     |                |
|----------------------------|--------------------------|------------|---------------------|----------------|
| SHIP DETAILS               |                          | SILVA STAR | COATING APPLICATION |                |
| OWNER/MANAGER              | SALLY REDERI AB          |            |                     |                |
| SHIP TYPE                  | FERRY                    |            |                     |                |
| TONNAGE                    | 1556G                    |            |                     |                |
| LLOYDS NO.                 | 780303                   |            |                     |                |
| EXECUTIVE POINT            | HELSINKI                 |            |                     |                |
| DELIVERY DATE              | 1 JUN 80                 |            |                     |                |
| SERVICE SPEED              | 18 KNOTS                 |            |                     |                |
| DIMENSIONS (METERS)        |                          |            |                     |                |
| LENGTH O/B                 | 137.62                   |            |                     |                |
| BEAM MOULDED               | 24.21                    |            |                     |                |
| ANTIFOULING HT [FHG]       | 5.60                     |            |                     |                |
| ANTIFOULING HT [ATF]       | 5.60                     |            |                     |                |
| BOWSPURGE HT               |                          |            |                     |                |
| BOOTTOP HT [FTD]           |                          |            |                     |                |
| SURFACE AREAS (100 METRES) |                          |            |                     |                |
| HULL BELOW WATL            | 3850                     |            |                     |                |
| FLYING ST                  | 2300                     |            |                     |                |
| ROXTOP                     |                          |            |                     |                |
| TOPSIDES                   |                          |            |                     |                |
| DRYDOCK SUMMARY            |                          |            |                     |                |
| DATE                       | LOCATION                 | MFR        | %                   | TYPE OF REPORT |
| 8/10/80                    | KVAERNER ASA YARDS-TURKU | HEM        | 100                 | DRYDOCK (M/S)  |
| 8/30/80                    | FINLAND                  | HEM        | 100                 | DRYDOCK (M/S)  |
| 8/5/80                     | VALMET VUOSAARI          | TMC        | 100                 | DRYDOCK (W/S)  |
|                            |                          | TMC        | 100                 |                |
| 8/7/80                     | KVAERNER ASA YARDS-TURKU | TMC        | DRYDOCK             |                |
| 8/9/80                     | KVAERNER ASA YARDS-TURKU | TMC        | 100                 | DRYDOCK (M/S)  |
| 8/20/80                    | KVAERNER ASA YARDS-TURKU | TMC        | 100                 | DRYDOCK (W/S)  |
|                            |                          | TMC        | DRYDOCK             |                |
|                            |                          | TMC        | 100                 | DRYDOCK (W/S)  |
|                            |                          | TMC        | DRYDOCK             |                |

|                        |             |   |
|------------------------|-------------|---|
| <b>WÄRTSILÄ MARINE</b> |             | <b>FAKTURA</b>                                    |
| Åbo reparationsvarv    |             | Datum   |
| Avdelning              | Handläggare | 19.10.1987  |
|                        |             | Köparens referens                                 |
|                        |             | Insp. Y. Röblom                                   |
|                        |             | Sjörörens referens                                |
|                        |             | ABP/lit   |
|                        |             | Beställare  |
|                        |             | Sally Rederi Ab<br>Hamngatan 8<br>22100 MARIEHAMN |
|                        |             | Enclosure 3.4.90                                  |
| Leveransadress         |             |   |
| Anbudet giltig t.o.m.  |             |   |
| Leveransvilkor         |             |   |
| Leveransstad           |             |   |
| Betalningsvilkor       |             |   |
| 1: d. netto            |             |   |
| *)                     |             |   |

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Märkte

MS VIKING SALLY

Dockning 12-23.1.1987

Anbud WTKT1101/87

23449 [View details](#)

Digitized by srujanika@gmail.com

### 1.6.2. X-ray absorption fine structure (XAFS)

| specifikation   | Mängd | Enhetspris | Total pris                           |
|---|-------|------------|--------------------------------------|
| 100 In- och utdockning av fartyget inkl.<br>lockshyra 1 dygn.<br>Dockshyra för de följande 10 dygna.                                      |       |            | 23.886,-<br>107.490,-                |
| 101 Extra omändring av dockningspådädd.   |       |            | 8.640,-                              |
| 100 Smältnings av is från fören med hett<br>vatten, 2 smältbilär med manskap i arbete.  |       |            | 10.000,-                             |
| 102 Anslutning av elkabel ombord 1 ggr.<br>Anslutning av telefon 1 ggr.<br>Telefonavgift 3088 impulser<br>Hyra för värmefilsktar.         |       |            | 560,-<br>305,-<br>1.853,-<br>3.140,- |
| 103 Anslutning av vattenslang 2 ggr.<br>Leverans av kylvatten under 10 dygn.<br>Borttransport av avfall 7 ggr.                            |       |            | 1.120,-<br>2.750,-<br>2.870,-        |
| 104 Anslutning av brandslang 1 ggr.<br>Brandvakt 18 arbetskift.<br>Till brandbekämpning 50 m <sup>2</sup> aluminiumbekl.<br>glasfiberväv. |       |            | 560,-<br>11.310,-<br>2.830,-         |

WÄRTSILÄ MARINE

Abo reparationsvarv

no

Sida 2/20 Page

MS VIKING VALKY

20449

|     |   |          |
|-----|---|----------|
| 300 | Bultar förnyats till bogpropellernas tryckhuv.<br>Borrning och göngning av hål. Löstagning av<br>skyddsnuvan och maskinbearbetning av<br>fördjupningar för läsbultar enl. ritning.<br>Bultarna förnyats. Borrnings samt göngning.<br>Återmontering samt montering av läsningar.<br>Ställningsarbete.  | 25.050,- |
| 301 | För reparation av SB och SS bottenventiler<br>Löstagts 2st NS300 rörkrökar.<br>Ventilernas vridningsaxlader öppnats och förnyats<br>kilar och stoppare. Kilarna svängts åt rätt håll<br>och monterats på platsen.<br>Fäthet kontrollerats och ventilerna samt rören<br>målats med Epoksläffärg. Rörkrökarna återmonterats.<br>2st NS150 bordläggningventiler översätts. | 18.820,- |
| 302 | Måtniong av spel i röder och propelleraxlar.  | 3.450,-  |
| 303 | Propellerbladens ytor fyllts med keramisk Belzona<br>metall samt Prostolith blandning.<br>Bladens ytterkantars slipats jämn och stötta kanter<br>på såda propellrarna avrundats.  | 13.500,- |
|     | Såda propellrarnas sladytor polerats.   | 9.600,-  |
| 304 | Propelleraxierna Cederwall-skydd (SB och SS)<br>löstagts, öppnats samt granskats Cederwall-<br>tätningsarnas ytor och utbytts Gemset-tätning.<br>Fastställningsbultarna kontrollerats samt<br>skydden återmonterats och svetsats.<br>Ställningsarbete.  | 16.160,- |
| 305 | Helikopterdickets Plexi-glas, röck samt belysning<br>löstagts. Röckena tapats ned slipsaxiva.<br>Röckena sandblästrats ca 1,5 samt målats 2 ggr med<br>beställaren förg. Glasen tvättats och monterats.<br>Röck med glas återmonterats. Svetsning, elmontering<br>samt flöckmålning.<br>Övertidsermittlning.  | 62.500,- |
| 400 | Reparation av yrcalborör enl. beställarens<br>nummerering.<br>I arbaret används material enl. följande.<br>Rör 1<br>Ø159 yrcalborör L-1500<br>2st yrcalbrokrökar Ø159<br>2st nav Ø159<br>1st spinnlinssat WS150.  | 5.300,-  |

WÄRTSILÄ MARINE

Abc reparationsvarv

Sida Sida Frist

| 10449   |          |  |
|---|----------|--|
| Rör 17<br>d323,9 yrcalbrorör 1-2000<br>1st yrcalbrokrök d323,9<br>2st yrcalbrokrök d323,9<br>2st spännlåsas NS300<br>1st förgreningsstuts NS200 + flåna + nav NS200.  | 16.000,- |  |
| Rör 17.A<br>d267 yrcalbrorör L-500<br>1st yrcalbronav d267<br>1st spännlåsas NS250  | 5.000,-  |  |
| Rör 18<br>d76,1 yrcalbrorör L-500<br>2st yrcalbrokrök d76,1<br>2st yrcalbronav d76,1<br>2st spännlåsas NS65<br>1st yrcalbronav NS40<br>1st spännlåsas NS40.   | 3.020,-  |  |
| 401 Mellan cromantkar 13 och 14 monterats av beställaren levererad hydr. ventil. Erforderliga stålarketter i mellanskott för montering av ventilen. Montering av d12mm hydr.rör med brämeto-koppling, 12m.<br>Gamla gränslägesbrytarnas kablar avlägsnats och monterats nya gränslägesbrytare och nya kablar samt tasselur. | 36.000,- |  |
| 402 Yrcalbrorör NS150 färgnads till 63 i buren.<br>Materialläggång: 1300mm NS150 yrcalbrorör,<br>1st NS150 yrcalbrokrök<br>1st NS150 yrcalbronav, 1st NS150 spännlåsas  | 4.830,-  |  |
| 500 Lager utbytts i maskinrumsfliktkartarnas elmotorer.   | 44.960,- |  |
| 601 Blöndrindningsarbeten i boggrörelsernas motor.<br>Materialläggång:<br>Jön kabell NJEM 1x70<br>2m Cu-väva 60x17<br>3m Cu-väva 80x19<br>kopplingsskor, skruvar och muttrar.   | 15.120,- |  |
| 600 I matstaisins mellanvägg ejorts öppning i gatnerat<br>jättekott 1050x500mm. Öppningen inreddats och<br>garnerats med minningsskål. Ramarna beställarsens.   | 9.130,-  |  |
| 700 Förvinrats och båda akterrampernas dörrar<br>försyntas delvis, sammankl.22s.  | 14.110,- |  |

WÄRTSILÄ MARINE

Åbo reparationsvarv

Sida 3 Page

MS VIKING SALLY

20449

|   |          |
|---|----------|
| Rör 2<br>ø180 yorcalbrorör L-1200<br>2st Yorcalbrokrökar ø180<br>2st " nav ø180<br>2st spänflinsar NS125  | 5.000,-  |
| Rör 4<br>ø133 Yorcalbrorör L-2000<br>2st yorcalbro krökar ø133<br>2st " " ø133<br>2st soñnflinsar NS125   | 6.000,-  |
| Rör 5<br>ø180 yorcalbrorör L-2100<br>1st yorcalbronav ø180<br>1st spänflins NS175 (gammal standard)<br>1st förgreningsstutts ø133 + krök ø133<br>+ nav + flins<br>1st förgreningsstutts ø88,9 + nav + spänflins<br>1st förmänskningskon ø180-ø159 + nav ø159<br>+ tlinas. | 10.500,- |
| Rör 8<br>ø125 yorcalbrokrökar 2st<br>förmänskning ø125-100<br>2st flinsar + nav NS125<br>1st flinsar + nav NS100  | 7.000,-  |
| Rör 10<br>ø267 yorcalbrorör L-1000<br>1st yorcalbronav ø267<br>1st soñnflins NS250<br>1st Straub koppling ø267  | 9.000,-  |
| Rör 11<br>ø267 yorcalbrorör L-1000<br>1st yorcalbronav ø267<br>1st soñnflins NS250<br>1st Straub koppling   | 9.000,-  |
| Rör 16<br>ø267 yorcalbrorör L-1000<br>1st yorcalbrokrök ø133<br>1st yorcalbronav ø133<br>1st yorcalbronav ø267<br>1st spänflins NS250<br>1st soñnflins NS125<br>1st Straub koppling ø267<br>(fröret har NS125 förgreningsstutts.)   | 10.000,- |

WÄRTSILÄ MARINE

Av reparationsvarv

Side Page

5

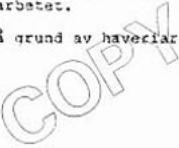
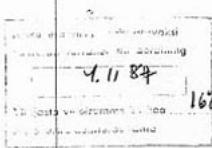
|  |                           |  |
|--|---------------------------|--|
| AS VIKING SALLY  |                           |  |
| 20449  |                           |  |
| 701 Rodrens bottenpluggar öppnats.<br>För BB rodret förynats plåtar<br>2st 500x250x20mm<br>1st 630x600x20mm, bockats<br>För SB rodret förynats plåtar<br>1st 450x250x20mm<br>1st 550x350x20mm<br>1st 1700x650x20mm, bockats<br>Svetssömmarna påsvetsats samt fritta schillen<br>fyllts med Belzona Prestolith massa. | 52.370,-                  |  |
| 702 Frätta svetssömmar i bottnen påsvetsats.   | 7.280,-                   |  |
| 703 Bottensilar öppnats och fastsatts.<br>Svetssömmar reparationssvetsats.   | 6.480,-                   |  |
| 704 Förynats zinkanoder a 10kg i orunnar 5st, i<br>förpropellertunneln 6st.  | 3.190,-                   |  |
| 707 Till köket tillverkats vask och dräneringsröhna<br>av plåt 900x560x5mm, djup 100mm med galler<br>900x560mm.<br>(Taket nedanför rivits av fartyget)   | 5.470,-                   |  |
| 708 Försliga inkörsbanans klaffars gångjärn<br>repareras, förynats 2st gångjärn. Gångjärnen<br>jämför jänqjärnstapoor 6st förynats<br>för täckplatser mellan inkörsbadan och fartyget<br>Ställningsarbete.   | 25.270,-                  |  |
| 709 Bullklysen för- och akterut reparerats enl.<br>Anvisning med beställarens delar.<br>Ovanför klysen monterats 18st kniv 300x250x15mm.<br>Målningsarbete.<br>Arbetet utförs på yttra bordläggningen med<br>hjälp av krankorg.  | 24.080,-                  |  |
| 900 Fartygets flatbotten sandblistrats SA 2,5<br>samt målats med Inerta 160, 1450 m2. (Beställarens<br>färg)<br><br>Fartygets akterliga och förliga delar fläck-<br>sandblistrats SA 2,5 samt fläckmålats med<br>Inerta 160 (Beställarens färg)<br>Förliga delen 50 m2<br>akterliga delen 300 m2.                    | 116.000,-<br><br>29.750,- |  |

WÄRTSILÄ MARINE

| Redressationsvaror  |       | Side Sida Page |
|---|-------|----------------|
| ad VIKING JALLY   |       | 5              |
| 20449   | 91144 |                |
| 901 Ramoernas och hyllornas vägrar samt block<br>granats visuellt.                            |       | 810,-          |
| 903 Sötvattentank no 17 tvättats och rengjorts.   |       | 8.000,-        |
| 904 Smutsoljetankarna rengjorts och oljigt och<br>fast avfall transporterats att förstöras.   |       | 42.000,-       |
| 905 Värmeväxlarens gevlar 4st sandblästrats<br>SA 1,5 samt målats med Inerta 160.             |       | 2.000,-        |
| Saltvattenfilter 2st, brunnar 2st och rör<br>2st rengjorts samt målats i ggr med Antifouling. |       | 6.620,-        |
| 907 Bottentränen rengjorts och målats i ggr med<br>Antifouling.                               |       | 3.150,-        |
| 909 Täckning av fartygsbottnen och värmling på grund<br>av Inerta målnings.                   |       | 120.000,-      |
| 910 Fartygets däck och utsidor tvättats med nett vatten<br>Förre utdockning.                  |       | 32.810,-       |
|   | FIM   | 1.021.844,-    |

|                                 |       |
|---------------------------------|-------|
| Yttersta vederstående kalender  | 16/78 |
| Vid denna vederstående kalender |       |
| För överstå de återstående      |       |

2v 11-82

| <b>WÄRTSILÄ MARINE</b>   |          | <b>FAKUTRA</b>     |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|--|----------|--------------------|-------------|-------|-------|------------|-------------|---|----------|--|--|--|---------|--|--|--|--|-----|----------|--|--|--|--|--|--|--|--|
| Åbo reparationsvarv  | Avtäring | Datum              | nr          |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          | 19.10.1987         | 24 1860     |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          | Köparens referens  |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          | Insp. f. Röslin    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          | Säljarens referens |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          | AEP/lit            |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          | Betalnings-        |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Godsmottagare  |          | tid                |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Sally Rederi Ab  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Hamngatan 3  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| 22100 MARIEHAMN  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Leveransadress   |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Anbudet giltig t.o.m.  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Leveransort  |          | Leveransviktor     |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Leveranstid  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Betalningsviktor   |          | Oms%               |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| 14 d. netto  |          | 0                  |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Mark<br><b>MS VIKING SALLY</b><br>Dockning 12-23.1.1987  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Anbud WTKT1101/37  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| <table border="1"> <thead> <tr> <th>20449</th> <th>Mängd</th> <th>Enhetspris</th> <th>Totals pris</th> </tr> </thead> <tbody> <tr> <td>706 Spänningar i ytterre bordläggningen invid matsalen<br/>på BB-sida repareras medels försnyggs av<br/>skottplätt 830x300x12mm och däcksplätt 200x150x12mm<br/>samt svetsning, montering av garneringar och<br/>inredningsskivor. Skyddande av golvet på<br/>inre sidan.<br/>Ställningsarbete. Skydd på utsidan under<br/>reparationsarbetet.</td> <td>17.620,-</td> <td></td> <td></td> </tr> <tr> <td>104 Braudväkt på grund av havariarbetet 2 arbetsaft.</td> <td>1.740,-</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>PIM</td> <td>19.360,-</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> |          |                    |             | 20449 | Mängd | Enhetspris | Totals pris | 706 Spänningar i ytterre bordläggningen invid matsalen<br>på BB-sida repareras medels försnyggs av<br>skottplätt 830x300x12mm och däcksplätt 200x150x12mm<br>samt svetsning, montering av garneringar och<br>inredningsskivor. Skyddande av golvet på<br>inre sidan.<br>Ställningsarbete. Skydd på utsidan under<br>reparationsarbetet. | 17.620,- |  |  | 104 Braudväkt på grund av havariarbetet 2 arbetsaft. | 1.740,- |  |  |  |  | PIM | 19.360,- |  |  |  |  |  |  |  |  |
| 20449  | Mängd    | Enhetspris         | Totals pris |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| 706 Spänningar i ytterre bordläggningen invid matsalen<br>på BB-sida repareras medels försnyggs av<br>skottplätt 830x300x12mm och däcksplätt 200x150x12mm<br>samt svetsning, montering av garneringar och<br>inredningsskivor. Skyddande av golvet på<br>inre sidan.<br>Ställningsarbete. Skydd på utsidan under<br>reparationsarbetet.  | 17.620,- |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| 104 Braudväkt på grund av havariarbetet 2 arbetsaft.   | 1.740,-  |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          | PIM                | 19.360,-    |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  <div style="text-align: right; margin-top: -20px;">  </div>  |          |                    |             |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
| Postadress   | Telex    | Telefon            | Telexkopier |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          |                    | Bank        |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          |                    | Postgiro    |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |
|  |          |                    | Oms         |       |       |            |             |   |          |  |  |  |         |  |  |  |  |     |          |  |  |  |  |  |  |  |  |

| WÄRTSILÄ MARINE   |           | FAKURA                         |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|---|-----------|--------------------------------|-----------------|--|----------|-----------|----------|---|----------|----------|--|---|--|---------|-----|--|--|------------|-----------------|
| Abo reparationsvarv   | Avdelning | Datum                          | nr.             |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | 19.10.1987                     | 24.1859         |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | Köparens referens              |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | Insp. Y. Röblom                |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | Säljarens referens             |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | ABP/Lt                         |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | Beställare                     |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| Godsmottagare   |           | Sally Rederi Ab<br>Hamngatan 8 |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | 22100 MARIEHAMN                |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| Leveransadress  |           |                                |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | Anbudet giltig t.o.m.          |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| Leveranssett  |           | Leveransvilkår                 |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| }   |           | Leveranstid                    |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | Betalningsvilkår               |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | 14 d. netto                    | 0 ms%           |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| Mark  |           |                                |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| MS VIKING SALLY   |           |                                |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| Dockning 12-23.1.1987   |           |                                |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| Anbud WTKT1101/97   |           |                                |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| <table border="1"> <thead> <tr> <th>20849: specifikation</th> <th>Mängd</th> <th>Enhetspri</th> <th>Totalpri</th> </tr> </thead> <tbody> <tr> <td>705 Fjästöron 8st för huvudmotorernas avgasrörsljuddämpare flyttata. Förnyats av beställaren levererade ljuddämpare. Ställningsarbetet.</td> <td></td> <td>20.230,-</td> <td></td> </tr> <tr> <td>104 Brandvakt på grund av havariarbetet 3 arbetsaskift.</td> <td></td> <td>2.610,-</td> <td></td> </tr> <tr> <td></td> <td></td> <td><b>FIM</b></td> <td><b>22.840,-</b></td> </tr> </tbody> </table> |           |                                |                 | 20849: specifikation   | Mängd    | Enhetspri | Totalpri | 705 Fjästöron 8st för huvudmotorernas avgasrörsljuddämpare flyttata. Förnyats av beställaren levererade ljuddämpare. Ställningsarbetet. |          | 20.230,- |  | 104 Brandvakt på grund av havariarbetet 3 arbetsaskift. |  | 2.610,- |     |  |  | <b>FIM</b> | <b>22.840,-</b> |
| 20849: specifikation  | Mängd     | Enhetspri                      | Totalpri        |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| 705 Fjästöron 8st för huvudmotorernas avgasrörsljuddämpare flyttata. Förnyats av beställaren levererade ljuddämpare. Ställningsarbetet.   |           | 20.230,-                       |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| 104 Brandvakt på grund av havariarbetet 3 arbetsaskift.   |           | 2.610,-                        |                 |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           | <b>FIM</b>                     | <b>22.840,-</b> |  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |
| <p style="text-align: center;"><i>COPY</i></p> <table border="1"> <tr> <td>Postadress<br/>Wärtsilä Marinindustri Ab<br/>Abo reparationsvarv</td> <td>Telex</td> <td>Telefon</td> <td>Teleskop</td> <td>Bank</td> <td>Postgiro</td> <td>Oms</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>FBF</td> <td></td> <td></td> </tr> </table> <p style="text-align: center;">4.11.87<br/>16%</p>   |           |                                |                 | Postadress<br>Wärtsilä Marinindustri Ab<br>Abo reparationsvarv | Telex    | Telefon   | Teleskop | Bank  | Postgiro | Oms      |  |   |  |         | FBF |  |  |            |                 |
| Postadress<br>Wärtsilä Marinindustri Ab<br>Abo reparationsvarv  | Telex     | Telefon                        | Teleskop        | Bank   | Postgiro | Oms       |          |   |          |          |  |   |  |         |     |  |  |            |                 |
|   |           |                                |                 | FBF  |          |           |          |   |          |          |  |   |  |         |     |  |  |            |                 |

| WÄRTSILÄ MARINE  |                | FAKTURA<br>Doknum 7.10.1987     | 24 1800          |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
|--|----------------|---------------------------------|------------------|-----------------------|-------|-----------|----------|-------|--|--|--|--|--|---------------------------------|--|--|--|----------|--|---|--|----------------|--|---|--|---------|--|--|--|---------------------------|--|---|--|----------|--|
| Åbo reparationsvar   | Handläggare    | Köparens referens               |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Arbetsfri  |                | Insp. RSblom                    |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Godsmottagare  |                | Säljarens referens              |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
|  |                | AEP/lt                          |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
|  |                | Beställare                      |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
|  |                | Sally Rederi Ab                 | Enclosure 3.4.91 |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
|  |                | Bamngatan 8                     |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
|  |                | 22100 MARIEHAMN                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Leveransadress   |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Anbudet giltig t.o.m.  |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Leveranssätt   | Leveransvilkor |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Leveranstid  |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Betalningsvilkor   |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| 14 d. netto  |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Merke  |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| MS VIKING SALLY  |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| 20518  |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Dockning 6-8.4.1987  |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
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| Pos nr. specifikation  | Mängd          | Enhetspri                       | Totalpri         |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| 20518  |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| 100 In- och utdockning av fartyget inkl. dockshyra för 1 dygn. Dockshyra för de följande 2 dygnen. Bogseraasistans vid utdockning.   |                | 23.886,-<br>21.498,-<br>7.970,- |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| 101 Omändring av dockningsbädd. Avlägsnande av is från dockan.   |                | 11.340,-                        |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| 102 Anslutning av 2st telefoner. Telefonavgift, 772 impulser.  |                | 610,-<br>309,-                  |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| 103 Borttransport av fartygets avfall, 3 ggr.  |                | 1.230,-                         |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| 104 Anslutning av brandslang ombord. Brandvakt 5 arbetskräft. Tork för uppsamling av olja.   |                | 560,-<br>4.350,-<br>210,-       |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| 300 Båda propelleraxlarnas Cederwall-skydd 18stagits. BB-tätning utbytts (beställarens leverans). Gamla vitmetallringen maskinbearbetats. 800 l. spillolja tagits tillvara. BB-propelleraxelspal mätts. BB akselns skyddsplätt 10x240x3500mm tillverkats och förnyats. Skydden återmonterats. Ställningsarbete.  |                | 31.320,-                        |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |
| Postadress Telex Telefon Telecopier Bank Postgiro Omr<br>Wärtsilä Malmöindustri AB   |                |                                 |                  |                       |       |           |          |       |  |  |  |  |  |                                 |  |  |  |          |  |   |  |                |  |   |  |         |  |  |  |                           |  |   |  |          |  |

| WÄRTSILÄ MARINE  |           | no               |
|--|-----------|------------------|
| Abo reparationsvarv  |           | 2 Sivu Side Page |
| X9-VIKING-SALLY  |           |                  |
| 20518  |           |                  |
| 301 Loggens ventil 1st NS300 utbytts (beställarens);<br>I förliga tankens tak gjorts öppning och genomgångs-<br>luckan förstorats. Fläns tillverkats och ventilen<br>provtryckts från utsidan. Gjorda öppningar stängts.   | 12.580,-  |                  |
| 303 Propellerblad på SB och BB propellrar utbytts<br>1 + 1 st.<br>Beställaren levererar blad, tätninor och<br>läsningsar.<br>Alla propellerblads läsningsar granskats, 5st nya<br>nya bladbultar samt läsningsar (beställarens delar)<br>monterats.<br>Lösa pluggar i bladens lyftihål förnyats.<br>Ställningsarbete.  | 28.640,-  |                  |
| 700 Reparation av bordläggningen vid bogportens undre<br>kant.<br>- gamla glästar avlägsnats genom skärbränning.<br>- nya plåtar och profiler tillverkats, bockats,<br>monterats och svetsats.<br>1st plåt 18x1280x4800mm 1770 kg<br>1st plåt 18x2900x3250mm 1357 kg<br>P-stång 160x8 750kg<br>Stället med sprickor svetsats.<br>Reparerat område maskinborstats på in- och utsida<br>samt målats med beställarens färg.<br>Kittning utförts med Prestoflex-massa.<br>Visirets gummitäthning förnyats. | 137.070,- |                  |
| 701 SB slingerköl förnyats spt 84-95<br>material används:<br>- plåt 15x600x7300 mm 2st<br>- plåt 15x600x2000 mm 2st<br>- plåt 15x300x540mm 5st<br>- rundjärn ø50 -950mm 1st.<br>Bordläggningsskada reparerats invid slingerkölen<br>spt 91-32, 1st plåt 12x500x500mm förnyats.<br>1st anodzinkar i 10 kg monterats.<br>Den förnyade slingerkölen maskinborstats och<br>målats med varvets färg.  | 32.790,-  |                  |
| 702 SB slingerköl förnyats spt 71-95<br>material används:<br>- plåt 15x600x1900mm 2st<br>- plåt 15x600x2000mm 2st<br>- plåt 15x300x540mm 15st<br>rundjärn ø50 21000 mm 1st.<br>5st anodzinkar i 10 kg monterats.<br>Reparationssvetsning samt fastsvetsning av<br>nål för bottenplugg. (pluggen saknats)<br>Den förnyade slingenkölen maskinborstats samt<br>målats med varvets färg.  | 71.140,-  |                  |

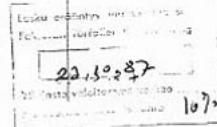
WÄRTSILÄ MARINE

Åbo reparationssvarv

Sida 3 Sida Page

30518

801 Sixt för 3B bottenorunn löstagits, riktats,  
spricka svetsats.  
Förnyats och svetsats mellansjöslor och  
plattjärn vid kanten.  
Återmonterats.

4.990,-EIM 390.493,-

| <b>WÄRTSILÄ MARINE</b>   |             | <b>FAKTURA-</b>    |             |      |          |     |
|--|-------------|--------------------|-------------|------|----------|-----|
| Åbo reparationsvarv  | Handläggare | Datum              |             |      |          |     |
| Avdelning  |             | 7.10.1987          |             |      |          |     |
| Godsmottagare  |             | Köparens referens  |             |      |          |     |
| Leveransadress   |             | Insp. Röblom       |             |      |          |     |
| Leveranssatt   |             | Säljarens referens |             |      |          |     |
| Märke  |             | AEP/lt             |             |      |          |     |
|  |             | Beställare         |             |      |          |     |
| Sally Rederi Ab  |             |                    |             |      |          |     |
| Hamngatan 8  |             |                    |             |      |          |     |
| 22100 MARIEHAMN  |             |                    |             |      |          |     |
| Anledet giltig Lm.   |             |                    |             |      |          |     |
| Leveransvilkor   |             |                    |             |      |          |     |
| Leveranstid  |             |                    |             |      |          |     |
| Betalningsvilkor   |             |                    |             |      |          |     |
| 14 d. netto  |             |                    |             |      |          |     |
| Omrä % 0   |             |                    |             |      |          |     |
| MS VIKING SALLY  |             |                    |             |      |          |     |
| 20518  |             |                    |             |      |          |     |
| Dockning 6-8.4.1987  |             |                    |             |      |          |     |
| Pos. nr. specifikation<br>20518  | Mängd       | Enhetspris         | Totalpris   |      |          |     |
| 302 Hissaxeln transporterats från fartyget till<br>maskinverkstaden och demonterats.<br>Lagerställen besprutats med metall och<br>slipats.<br>2st lager 6018 förnyrats. Axeln ihopmonterats<br>och transp. ombord.<br>Sätersring för ventil, ø315x300x30 tillverkats,<br>maskinbearbetats av beställarens material.<br>Ventiltallrikens tätningsytorna maskinbearbetats<br>ø315mm. |             |                    | FIM 7.870,- |      |          |     |
|  |             |                    | 23.10.87    |      |          |     |
| Postadress<br>Wärtsilä Marineindustri Ab   | Telex       | Telefon            | Telekopier  | Bank | Postgiro | Öns |

|  |             |                         |
|--|-------------|-------------------------|
| <b>WÄRTSILÄ MARINE</b>   |             | <b>FAKTURA</b>          |
| Åbo reparationsvarv  |             | Datum                   |
| Avaldning  | Handläggare | <b>12.12.1988</b>       |
| Godsmottagare  |             | Köparens referens       |
|  |             | <b>Insp. Mickelsson</b> |
|  |             | Självansvarat referens  |
|  |             | <b>AEP/it</b>           |
|  |             | Beskrivning             |
| Leveransadress   |             | <b>Sally Rederi Ab</b>  |
|  |             | <b>Strandgatan 7</b>    |
|  |             | <b>22100 MARIEHAMN</b>  |
| Leveranssätt   |             | Anbudet giltig t.o.m.   |
|  |             | Leveransstid            |
|  |             | Leveransstid            |
|  |             | Betalningsvilkor        |
|  |             | <b>14 dgr netto</b>     |
|  |             | Oms % 0                 |
| Mark   |             |                         |
| MS VIKING SALLY  |             |                         |
| Dockning: 12-16.9.1988   |             |                         |
| Po. nr, specificering  | Mängd       | Enhetspris              |
| Anbud WMTR1066/88  |             | Totalpris               |
| 20706  |             |                         |
| 0010 In- och utdockning av fartyget inkl. 1 dygn dockshyra.        |             | 23.886,-                |
| Dockshyra för de följande dygnen                                   |             | 42.996,-                |
| 0020 Omändring av dockningsbåda.                                   |             | 8.640,-                 |
| 0030 Anslutning av el ombord, 1 ggr Leverans av 44440 kWh elström. |             | 560,-                   |
| Anslutning av telefon  |             | 26.664,-                |
| Teleraonsamtal 995 impulser  |             | 305,-                   |
| 0040 Anslutning av brandslang ligg Brandvakt 5 arbetssekret        |             | 399,-                   |
| 0050 Borttransport av avfall 2 ggr.                                |             | 560,-                   |
|  |             | 4.350,-                 |
|  |             | 820,-                   |
| Postadress Wärtsilä Marinredsk. Ab                                 |             |                         |
| Telex  | Telefon     | Telecopier              |
|  |             | Bank                    |
|  |             | Postno                  |
|  |             | Oms                     |

| WÄRTSILÄ MARINE   |          | 2 | Sida Page |
|---|----------|---|-----------|
| Åbo reparationsvarv   |          |   |           |
| NS VIKING SALLY   |          |   |           |
| 20706   |          |   |           |
| 0060 Partygsbotten högtrycksvattenspolats, 1000m2.  | 3.000,-  |   |           |
| 0070 Bottnen sandblästrats Sa2 och målats med lösningsmedelsfri Inerta 160 620 m2. Beställarens färg.   | 55.800,- |   |           |
| Bottnen lätsandblästrats och målats med lösningsmedelsfri Inerta 160 800 m2. Beställarens färg.   | 43.280,- |   |           |
| Målning av djupgångsmärken.   | 2.600,-  |   |           |
| Skyddande av propellerar och rodertappar  | 2.880,-  |   |           |
| 0080 Frätta svetsfogar påsvetsats på rodret och i bogpropellertunneln. Ställningsarbete.  |          |   |           |
| På rodren monterats och fastsvetsats plåt 20x180x180mm ist, 20x350x430mm ist.   | 20.000,- |   |           |
| 0090 Zinknoder a 50kg förnyas<br>- i bogpropellertunneln 8st<br>- på skrovet 18st<br>- på rodren 8st<br>- på roderstockarna 4st   | 11.020,- |   |           |
| Lickanče stålens så zinckrök vid spt 85-86 BB-sida<br>reparerats genom sveessning.  | 600,-    |   |           |
| 0100 Matning av specum i roder och i propellersaxelns lager.<br>Matningsprotokoll uppgjorts och levererats till fartyget.   | 3.450,-  |   |           |
| 0110 St propellersaxels yttre Cederwallaxlaketsättning<br>öppnats och ihopmonterats med beställarens delar.   | 10.800,- |   |           |
| Gamla Cederwallaxsättningen iständsatts,<br>ytorna maskinbearbetats, levererats ombord.<br>Låsningar inspekterats och reparerats samt nät<br>avläggnats från förr- och akterpropellrar. | 19.800,- |   |           |
| 0120 Bortenbrunnarnas sikt öppnats och brunnarna<br>rensgjorts samt målats med Interspeed BLA10.<br>Sikten återmonterats.   | 5.400,-  |   |           |
| Svatsadskur i bottensicketens galler utskäts 4st  | 3.400,-  |   |           |
| Filcerbrunnarna rengjorts, målats med Antifouling<br>färg 3st.  | 11.250,- |   |           |
| Snäckor bortskrapats från brunrnarna.   | 5.400,-  |   |           |
| Fir; från varvet: Interspeed BLA10 50 l.  | 1.675,-  |   |           |

**WÄRTSILÄ MARINE**

Bo reparationsvarv

nr

Siv 3 Sida 3/16

01706

0130 SB akterligaste bottenventil NS250 öppnats och gummiträning levereras av beställaren förnyats.  
Rostfri kil tillverkats 12x50mm samt läsning  
Ø50x100mm. Ventilen ihommonterats och tätheten  
kontrollerats.

10.000,-

0140 Saltvattenrör mellan akterliga bottenventiler och  
filtren löstagts 3st NS250 och transporterats till  
färverkstaden. Rören repareras genom svetsning av  
flansjor och föryngande av färgrenningar Ø120x200x8mm,  
3sc. Rören målats på insida med Antifouling färg  
och svetsfogarna med Galvex färg.  
Transporterats till fartyget och monterats på platsen  
med nya packningar och builar.

16.000,-

0150 I maskiarummet föryngats och repareras yrcalbro-  
kyllor enl. anvisning.

|   |      |
|---|------|
| NS175 yrcalborrdr   | 1m   |
| NS175 " krök  | 1st  |
| NS125 " lät   |      |
| NS200/150 " färmålningslängd  | 0,5m |
| NS150/175 " lät   |      |
| NS175 fläns + nav   | lsc  |
| NS125 " lät   |      |
| NS200 yrcalborrdr   | 0,5m |
| NS200 " krök  | lsc  |
| NS175 fläns + nav   | lsc  |
| NS150 yrcalborrdr   | 0,5m |
| NS150 fläns + nav   | lsc  |
| NS50 yrcalborrdr  | lsc  |
| NS50 " krök   | lsc  |
| NS50 fläns + nav  | lsc  |
| NS50 blindfläns   | lsc  |
| NS100 gärvicdr  | 0,5m |
| NS100 färlinje  | lsc  |
| Plåtsäckningar, builar samt muttrar föryngas<br>tillverkats och monterats till färdningsnippelar av brons<br>Viking Koppling; Ø24 lsc |      |
| " Ø20 lsc   |      |
| vridventil NS150 lsc  |      |
| yrcalbromuff " lsc  |      |

40.000,-

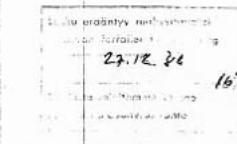
0160 2st fjäderboltsfasta bordläggningsventiler lösttagits  
och transporteras till verkstaden samt demonterats.  
Ventilhusen och tägiccha maskinbearbetats.  
Föryngrat stålflansar för fjäder samt O-ringar.  
Ventilerna sätts, ihommonterats samt monterats på  
platsen.

10.000,-

0170 Plåtbassläningar för HM avgaspannor 4st repareras  
genom att jämna fogarna och monteras plåt på  
fogarna samt i botten och på hörnen i väggen,  
ett h-järn 80x80 L=2100mm. Svetsningarna utförs.

32.830,-

| WÄRTSILÄ MARINE   |          | no               |
|---|----------|------------------|
| en förtjänstfullt arbete  |          | Vår Sida         |
| <u> </u>  |          |                  |
| <u> </u>  |          |                  |
| Avgasrören snyttades i pannorna med fäner-skivor.   | 3.200,-  |                  |
| Avgaspannan rengjorts (beställaren skött om<br>öppnande och fastsättning av licker).  | 9.150,-  |                  |
| 0190 Spilloljettanken tömtes med hjälp av tvätt- och<br>sugbil samt högtrycks tvätttata.  | 11.000,- |                  |
| ) 0200 Tillverkats enl. räkning samt svarvats 4st 6-kant<br>skruvar och bultar 4st.   | 5.560,-  |                  |
| 0210 Förliga hissens växjehus och axel transp. till<br>vertikalsidan. Lagret utpressats från roet och från<br>axeln. Axeln reparerats genom påsvetsning och silpats<br>till angivet mått. Nya av beställaren levererade<br>tätaningar och lager monterats på axeln. | 5.760,-  |                  |
| 0220 Propelleraldrrens städade och fritta kanter<br>slyfts och frittingarna slyfts med Belzona.<br>Frittingar på roren och på skalbararna slyfts med<br>Pratolin mässa. Fjällningsarbetet.  | 14.000,- |                  |
| 0230 Bildhöckets gångplattform på B8-sida invid<br>maskinhuset reparerades genom förnyande av plåt<br>exp60x6050mm.   | 5.140,-  |                  |
| FIM   |          | <b>472.224,-</b> |



| WARTSILA MARINE   |           | FAKTURA               |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|-----------|-----------------------|---|-------------|-------|------------|------------|-------------|------|----------|----------|-----|---------------------------|--|----------|------|--|--|---------|------|--|---------------------|-------|------|--------------|--|-------|------|--|--|----------|------|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Äbo reparationsvarv   | Audelning | 22.6.1989             | 24-6784   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           | Köparens referens     |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           | L Janlöv              |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           | Säljares referens     |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           | ABP/lit               |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           | Betalarbetare         |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           | Godmottagare          |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Rederi Ab Sally Enclosure 3.4.93<br>Hamngatan 8   |           |                       |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Leveransadress  |           | 22100 MARIEHAMN       |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Leveranssätt  |           | Anbudet gäller t.o.m. |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Leveransplikter   |           | Leveransplikter       |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Leveranstid   |           | Leveranstid           |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Betalningsvilkår  |           | 14 d netto            |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           | 0 omr %               |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mark  |           |                       |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MS VIKING SALLY   |           |                       |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Doktning 2.5.-3.5.1989  |           |                       |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <table border="1"> <thead> <tr> <th></th> <th>Mängd</th> <th>Enhetspris</th> <th>Total pris</th> </tr> </thead> <tbody> <tr><td>7010</td><td></td><td></td><td>26.271,-</td></tr> <tr><td></td><td></td><td></td><td>11.943,-</td></tr> <tr><td>7011</td><td></td><td></td><td>6.100,-</td></tr> <tr><td>3020</td><td></td><td></td><td>305,-</td></tr> <tr><td>5040</td><td></td><td></td><td>560,-</td></tr> <tr><td>1060</td><td></td><td></td><td>75.100,-</td></tr> <tr><td>1060</td><td></td><td></td><td>Tillverkning av 4 st ytor för förslipning<br/>med till från fakturygd.<br/>Partytyska sätts i Kästgatans de gamla och<br/>monteras på apelsöran.<br/>Material<br/>• för 133 x 2,5 CuZn20Al F33 DIN:17577 L T 1,50 m<br/>• 133 x 2,5 " " 17571 TF 1,50 m<br/>• 119,1 x 3 " 17571 1,50 m<br/>hexskruvar M16 x 8,8 mm pass 421,3,2. 30 st<br/>hexskruvar M16 8,8 mm. 452,3,2. 30 st<br/>träk 90 ytor förslipade 133 x 2,5 R=1,5xD 3 st<br/>träk 90 " 219,1x3,0 " 1 st</td><td></td></tr> </tbody> </table> |           |                       |   |             | Mängd | Enhetspris | Total pris | 7010        |      |          | 26.271,- |     |                           |  | 11.943,- | 7011 |  |  | 6.100,- | 3020 |  |                     | 305,- | 5040 |              |  | 560,- | 1060 |  |  | 75.100,- | 1060 |  |  | Tillverkning av 4 st ytor för förslipning<br>med till från fakturygd.<br>Partytyska sätts i Kästgatans de gamla och<br>monteras på apelsöran.<br>Material<br>• för 133 x 2,5 CuZn20Al F33 DIN:17577 L T 1,50 m<br>• 133 x 2,5 " " 17571 TF 1,50 m<br>• 119,1 x 3 " 17571 1,50 m<br>hexskruvar M16 x 8,8 mm pass 421,3,2. 30 st<br>hexskruvar M16 8,8 mm. 452,3,2. 30 st<br>träk 90 ytor förslipade 133 x 2,5 R=1,5xD 3 st<br>träk 90 " 219,1x3,0 " 1 st |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | Mängd     | Enhetspris            | Total pris  |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7010  |           |                       | 26.271,-  |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           |                       | 11.943,-  |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7011  |           |                       | 6.100,-   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3020  |           |                       | 305,-   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5040  |           |                       | 560,-   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1060  |           |                       | 75.100,-  |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1060  |           |                       | Tillverkning av 4 st ytor för förslipning<br>med till från fakturygd.<br>Partytyska sätts i Kästgatans de gamla och<br>monteras på apelsöran.<br>Material<br>• för 133 x 2,5 CuZn20Al F33 DIN:17577 L T 1,50 m<br>• 133 x 2,5 " " 17571 TF 1,50 m<br>• 119,1 x 3 " 17571 1,50 m<br>hexskruvar M16 x 8,8 mm pass 421,3,2. 30 st<br>hexskruvar M16 8,8 mm. 452,3,2. 30 st<br>träk 90 ytor förslipade 133 x 2,5 R=1,5xD 3 st<br>träk 90 " 219,1x3,0 " 1 st |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <table border="1"> <thead> <tr> <th>Postadress</th> <th>Telex</th> <th>Telefon</th> <th>Fax</th> <th>Teleskopier</th> <th>Bank</th> <th>Postgiro</th> <th>Oms</th> <th>Utg</th> </tr> </thead> <tbody> <tr><td>Wärtsilä Marinindustri Ab</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Äbo reparationsvarv</td><td></td><td>Nr</td><td>(021)359-600</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>  |           |                       |   | Postadress  | Telex | Telefon    | Fax        | Teleskopier | Bank | Postgiro | Oms      | Utg | Wärtsilä Marinindustri Ab |  |          |      |  |  |         |      |  | Äbo reparationsvarv |       | Nr   | (021)359-600 |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Postadress  | Telex     | Telefon               | Fax   | Teleskopier | Bank  | Postgiro   | Oms        | Utg         |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Wärtsilä Marinindustri Ab   |           |                       |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Äbo reparationsvarv   |           | Nr                    | (021)359-600  |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           |                       |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |           |                       |   |             |       |            |            |             |      |          |          |     |                           |  |          |      |  |  |         |      |  |                     |       |      |              |  |       |      |  |  |          |      |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |

**WÄRTSILÄ MARINE**  
Abo reparationsvarv

Sida Sida Page

MS.VIKING GALLY

20784

|  |  |          |
|--|--|----------|
| 18efflans 200/219,1 DIN 2642 NP10 ST37-2<br>nav NS200/219,1 628.2.4. NP10 CuZn2Al<br>spännflans NS125/133 620.9.2. NP10 ST37-2<br>" NS150/159 "  | 2 st<br>2 st<br>4 st<br>2 st<br>4 st<br>2 st | 24.396,- |
| 0070 Låsstagnings och montering av axelskydd<br>för mätning av spel i cederwall-<br>tätningen på SB-sida.  |  | 3.080,-  |
| 0080 Partyget använd kran och lyftkorg för målnings<br>av axelöd.  | 7.000,-                                      |          |
| 0100 1 man som sällskap till Kameawa-montör för undersökning<br>av låckage i BB-box.   | 1.600,-                                      |          |
| 0110 Tønsfjord radermaskinens låckor undersökts och<br>reparerats, tillsammans med tillverkarens representant.   | 8.251,-                                      |          |
| 0120 - svitcam sverigas på SB-sidan i bottanbord-<br>tätningen, längd ca 3,5 m.<br>- Backa i BB condens levereras fast, ett noten-nål<br>ytlits med Preatorolik<br>- Zincar monterats på slingeknalar SB och BB<br>rimminni. List till ig. | 8.608,-                                      |          |
| 0130 Material av volkoma i sojer och monteras.   | 2.800,-                                      |          |
|  | FIM 176.318,-                                | =====    |

6.7.95

1676

## Enclosure 3.4.94

TURUN  
KORJAUSTELAKKA OY  
Turku Repairs Ltd.

FÄKTURÄ nr 229/90  
2.10.1990

Beställare  
Sally Line Ab  
Hamngatan 8  
22100 MARIEHAMN

Köparens ref  
Lars Karlsson Order 09-9440  
Saljarens ref  
AEP/ta

Betalningsvillkor  
per omgående      Om%

Förfallodag  
Försäningstränta      18 %

Märke

M/S VIKING SALLY

916  
969

0071

| Pos. nr                     | Specifikation  | Totalpris                |
|-----------------------------|--|--------------------------|
|                             | Raparationer, som utfärts i samband med dockningen av M/S Viking Sally under tiden 30.4. - 7.5.1990 enligt tidigare överlämnad specifikation | 1.420.000,-<br>*****     |
| TOTALT                      |  | 1.420.000,-<br>*****     |
| <br>./. FÖRSKOTTSBETALNING  |  | <br>300.000,-            |
| <br>ÅTERSTÄR TILL BETALNING |  | <br>1.120.000,-<br>***** |

|                        |                                |   |  |                       |  |   |
|------------------------|--------------------------------|---|--|-----------------------|--|---|
| Postiosoite/<br>PL 430 | Postal address<br>P.O. Box 430 | Puhelin/Telephone<br>(921) 638711<br>Internal: +358 21 638711 | Telekopia/Telecopier<br>(921) 6387250<br>Internal: +358 21 6387250 | Telex<br>62484 try sf | Postkod/Bank<br>SF-20101 TURKU Finland | Lvv<br>TYP 43310-19056<br>PSB Tu 227389 |
|------------------------|--------------------------------|---|--|-----------------------|--|---|

TURUN  
KORJAUSTELAKKA OY  
TURKU BODÖ YARD

1(6)

SPECIFIKATION AV DE REPARATIONER SOM UTFÖRTS UNDER DOCKNINGEN  
AV M/S VIKING SALLY 30.4 - 7.5.1990 TILL FAKTURA NR. 229/90  
av den 9.8.1990

|      |  |           |
|------|--|-----------|
| 0010 | Dockning och sjösättning av fartyget<br>inkl. dockshyra för 1 dygn   | 26.275,-  |
| 0011 | Ändringsarbeten i dockningsbädden  | 7.100,-   |
| 0010 | Dockhyra för 7 dygn  | 83.601,-  |
| 0010 | Kostnader för övertidsarbete i samband<br>med dockningen   | 8.930,-   |
| 0012 | Anslutning av 4 st elkablar  | 2.240,-   |
| 0013 | Anslutning av 3 st. brandslangar   | 1.680,-   |
|      | Brandvakt 16 arbetsshift   | 13.920,-  |
| 0014 | Anslutning av färskvattensslang 1 gång   | 560,-     |
|      | Levererats 175 m' färskvatten  | 1.575,-   |
| 0015 | Anslutning av telefon 1 st.  | 305,-     |
|      | Telefonsamtalsavgifter 3847 impulser   | 2.501,-   |
| 0016 | Leverans av kylvatten till hjälpmaskiner<br>4 500 m' färskvatten, till havsvattens-<br>pris à 3,- / m'                     | 13.500,-  |
| 0017 | Borttransport av fartygets avfall 18 ggr.  | 7.380,-   |
| 0018 | - -  |           |
| 0019 | Lyftkranshyra för att lyfta CO2-flaskor  | 1.200,-   |
| 0021 | Färskvattenssköljning av utsidorna för<br>att avlägsna salt.<br>Kostnader för övertidsarbete.                              | 9.680,-   |
| 0022 | Sandblästring av bottnen SA 2,5 1800 m'<br>och målning med INERTA 160 målfärg<br>1800 m'                                   | 270.000,- |
| 0024 | Rullmålnings av Boottop området 1 ggr<br>1050 m' med beställarens målfärg<br>INERTA-70. Kostnader för övertids-<br>arbete. | 15.090,-  |

TURUN  
KORJAUSTELAKKA OY  
Turku Repair Yard

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|      |   |           |
|------|---|-----------|
| 0025 | Målning av djupgångs- och fribordsmärkena.  | 2.600,-   |
|      | Linjering av vattenlinjeområdet 300 m   | 2.700,-   |
| 0026 | Lätt sandblästring av utsidorna samt blästring av rostiga ställen SA 2,5. Målning 3 ggr med beställarens färg. Målats 2 st. ca 1 m svarta ränder på utsidan.  | 130.000,- |
|      | Breddning av ränderna från ca 1 m till 1,5 m.   | 3.120,-   |
| 0027 | Slipning av rostiga ställen samt fläckmålning och övermålning av skorstenen, däcksbyggnadens skorsten, samt ställen på förskeppsskottet och kommandobryggan. Beställarens färg.   | 99.000,-  |
|      | Breddning av ränderna från ca 1 m till 1,5 m  | 432,-     |
| 0029 | Utmärkning och målning av fartygets nya namn samt målning av Siljas logo på utsidorna. Beställarens färg.   | 63.000,-  |
|      | Namnet målat på två ställen på aktra bilporten.   | 1.640,-   |
| 0400 | Utsidans sandblästring och målning i gång, slipning och fläckmålning av ställen där första strykningen flagat. Ställningsarbete   | 11.350,-  |
| 0410 | Målning av Världsnaturfondens märken på SB- och BB-sidorna  | 10.830,-  |
|      | Målning av rederiets märke  | 2.040,-   |
|      | Bogportens insida, uppfartsbron utsida och sidor samt avsatser under uppfartsbron rengjorts, avskärmats samt målats. Rengöring, avskärmning och målning av akterrampen samt röda områden som kommit i dager efter att rampen öppnats. Beställarens färger | 53.540,-  |
|      | Sönderslipning av ytan samt övermålning av akterspegelns vita del 150 m <sup>2</sup> . Beställarens färg.   | 4.290,-   |

|  |                     |
|--|---------------------|
| Extra övermålning av blå rand på SB-sidan<br>20 m, på BB-sidan 60 m  |                     |
| Ställningsarbete   |                     |
| Beställarens färg  | 10.820,-            |
| 0031 Avskärmning av propeller och rodertappar  | 4.500,-             |
| 0041 - -   |                     |
| 0050 Zinkanoder å 10 kg förnyats<br>- i skrovet 7 st.<br>- i förpropellertunneln 7 st.<br>- i bottenbrunnarna 2 st.                              | 4.880,-             |
| 0060 Mätts spelrum i propelleraxlarna,<br>uppgjorts och levererats mätnings-<br>protokoll.   | 2.450,-             |
| Kontrollmätning utförts  | 1.260,-             |
| 0070 Mätts spelrum i rodren, uppgjorts och<br>levererats mätningsprotokoll   | 1.550,-             |
| 0080 - -   |                     |
| 0090 Öppning och rengörning av bottenbrunnarna<br>3 st. samt målning av brunnarna 1 ggr<br>antifouling   | 7.560,-             |
| Skada förorsakad av vattenflöde i samband<br>med behandlingen av bottenbrunnarna   | 3.810,-             |
| 0100 Transport av 7 st. havsvattenfilter<br>från fartyget till plåtverkstad,<br>reparation av filtrens ramar<br>genom att förnya plattorna.      |                     |
| 2 st φ 550 mm  | 10 mm platta        |
| 3 st φ 400 mm  | 10 mm platta        |
| 1 st φ 650 mm  | 10 mm platta        |
| 1 st φ 600 mm  | 3 mm rostfri platta |
| Förnyats byglar 3 x 30 mm i plattstången.<br>Förnyats siktens låsanordningar 20 st<br>10 x 70 x 100 mm   |                     |
| Utförts fyllnadssvetsning av ramarna.<br>Sandblästring och målning av filtren med<br>INERTA 160 målfärg<br>Installerats 6 st zinkanoder å 5,5 kg | 26.130,-            |
| 0110 Reparation av Yorcalbro kylvattenrören<br>enl. pos. 1-9 i specifikationen<br>(beställaren lossar och monterar rören<br>på plats.)           | 91.500,-            |

TURUN  
KORJAUSTELAKKA OY  
Turku Repair Yard

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0360 Utöver offerten har Turun korjaus-telakka Oy assisterat vid löstagningen av rören samt levererat 1 st. STRAUB-koppling 219,1. Därutöver har reparerats 3 st av beställaren löstagna Yorcalbro-rör, som ej ingått i offerten.

Material som används vid reparationen:

|                       |          |
|-----------------------|----------|
| 1 m Calbro-rör        | NS 250   |
| 1 st Calbro-nav       | NS 250   |
| 1 st Calbro-nav       | NS 100   |
| 1 st Calbro-krok      | NS 100   |
| 0,3 m Calbro-rör      | NS 100   |
| 2 st spänfläns        | NS 250   |
| 1 st spänfläns        | NS 100   |
| 0,5 m Calbro-rör      | NS 250   |
| 2 st Calbro-krok      | NS 250   |
| 2 st Calbro- nav      | NS 250   |
| 2 st spänfläns        | NS 250   |
| 1 st svetsupphöjning  | 1/2 "    |
| 3 st Calbro-nav       | NS 50    |
| 3 st spänfläns        | NS 50    |
| 4 st Calbro-krok      | NS 50    |
| 1 m Calbro-rör        | φ 57     |
| 1 st tapp             | 2 "      |
| 1 st förmänskningskon | NS 50-40 |

55.610,-

0120 Tömning och rengöring av spilloljetanken 6.800,-

Kostnader för behandling av 14 m<sup>3</sup> spillolja 29.120,-

0160 Byte av 2 st BB-propellerblad 16.560,-

Reparation av fartygets felaktiga bladbultsnyckel samt vriddning av propellern med hjälp av talja 8.800,-

0170 SB-rodermaskins distansstång löstagsits från hjärtstocken och fraktats till verkstad.  
Lager hålet gjorts större och mellanhylsa φ 120 x 60 mm tillverkats samt nytt av beställaren levererat lager monterats.  
Montering på plats och provkörning utförts. 16.770,-

0190 Ventilationskanalernas alla galler på utsidan löstagsits, sandblästrats samt målats med beställarens färg. 38.000,-

**TURUN  
KORJAUSTELAKKA OY**  
TURUN REPAIR YARD

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|      |  |          |
|------|--|----------|
| 0200 | Utmärkning och målning av skorstenens nya märke  | 20.200,- |
| ...  | Avlägsning av det gamla rederimärket från skorstenen.  | 12.540,- |
| 0210 | Avlägsning medelst skärbränning av namnet "Viking Sally" 4 st, samt utjämning av spåren  | 24.000,- |
| 0220 | Övertäckning av fartygsbottnen akterifrån 3/4 av längden, samt uppvärmingskostnader.<br>Brännolja för uppvärmning 7950 l från varvet.                                | 98.050,- |
| 0250 | Avlägsning av gamla landgångsfästen 8 st. samt tillverkning av 4 st. nya fästen på båda sidorna av fartyget.<br>Ställningsarbete.                                    | 33.990,- |
| 0260 | Avlägsning av E3-skyltarna från fartygets båda sidor   | 3.520,-  |
| 0270 | Högtryckstvätt och tvätt med upplösningsmedel av oljiga fläckar på fartygets båda sidor  | 8.870,-  |
| 0280 | Mätning av kompressionen i Cederwall-boxarna i SB- och BB-propelleraxlarna, uppgjorts och levererats mätningsprotokoll.<br>Skydden lösgjorts och monterats på plats. | 10.830,- |
| 0290 | Ändringsarbete på landgångarna på passagerardäck. Borttagning av ledstångerna samt breddning enligt instruktionerna.   | 6.580,-  |
| 0300 | --   |          |
| 0310 | Assisterat vid monteringsarbete av lysrör  | 11.230,- |
| 0320 | Reparation av läckage i rodren och roderkonsolerna genom att förnya en plåt 12 x 450 x 900 och svetsa korroderade stället.<br>Ställningsarbete.                      | 24.510,- |
| 0330 | Reparerats läckage i SB-propellerns stårör.<br>Löstagits skyddskon och packring.<br>Förnyats o-ringbandet $\phi$ 16 mm 1,9 m.<br>Delarna monterade på plats.         | 25.660,- |

TURUN  
KORJAUSTELAKKA OY  
TURUN REPAIR YARD

6

|      |  |          |
|------|--|----------|
| 0340 | Utlånats gascentral och brännskärnings-aggregat för fartygsmanskaps bruk.              | 800,-    |
| ...  |  |          |
| 0350 | --   |          |
| 0360 | --   |          |
| 0370 | --   |          |
| 0380 | Uppsugning av oljeavfall från diesel-dagtanken samt rengöring av tanken                | 13.100,- |
| 0390 | Svetsning av bunkerluckans<br>öra  | 880,-    |
| 0410 | Skaffats billyftkran till varvet<br>för att få allt extra arbete slutfört<br>förlöver. | 40.445,- |

Totalt: mk 1.511.404,-  
\*\*\*\*\*

## Enclosure 3.4.95

**TURUN KORJAUSTELAKKA OY**  
TURKU REPAIR YARD LTD

F A K T U R A    nr 30014  
1.2.1991

Beställare  
Vaasanlaivat-Vasabåtarna Oy Ab  
C. Rickhardsson  
PL 213

Köparens ref  
Säljarens ref  
ARP/SeR/TA

65101 VASA

Betalningsvillkor      Om  
14 dagar netto      0 %

Förfallodag 15.2.1991  
Försäningsträte 18 %

Märke

M/S WASA KING

107

Pos. nr Specification Totalpris

Reparationer, som utförts i samband med  
dockningen av M/S Wasa King under  
tiden 20.11. - 23.11.1990  
enligt bifogad specifikation

Totalt                        mk 846.769,-  
\*\*\*\*\*

|                                       |                         |                        |                      |  |             |
|---------------------------------------|-------------------------|------------------------|----------------------|--|-------------|
| Postiosoite/<br>PL 430<br>20101 TURKU | Telefon<br>(921) 638711 | Telex<br>(921) 6387250 | Telex<br>62484 trysl | Pankki<br>TYP 433110-19066<br>PSPTu 227388 | Lvv<br>Ref. |
|---------------------------------------|-------------------------|------------------------|----------------------|--|-------------|

**TURUN KORJAUSTELAKKA OY**  
TURKU REPAIR YARD LTD  
M/S WASA KING

**SPECIFIKATION FÖR REPARATIONER UTFÖRDA UNDER DOCKNINGEN I NÄDENDAL**

Indockning 20.11.90  
Utdockning 23.11.90  
Avfärd från kajen 5.12.90

|          |   |           |  |
|----------|---|-----------|--|
| 0100     |   |           |  |
| 1.       | In och utdockningen inkl. dockshyra<br>för ett dygn   | 26.300,00 |  |
| 1.1.     | Omändring av dockningsbädden  | 12.000,00 |  |
| 2.       | Dockshyra för 3 dygn  | 35.850,00 |  |
|          | Kostnader för övertidsarbete i samband<br>med indockningen  | 10.010,00 |  |
|          | Kostnader för övertidsarbete i samband<br>med utdockningen  | 12.936,00 |  |
| 0120     |   |           |  |
| 7.       | Till och fränkoppling av telefon 2 ggr  | 610,00    |  |
| 7.1.     | Samtalsavgifter 3.870 impulsar  | 2.516,00  |  |
| 0130     |   |           |  |
| 4.       | Anslutning av kylvatten en gång   | 600,00    |  |
| 4.1.     | Leverans av kylvatten för hjälpmaskiner 3 dygn  | 825,00    |  |
| 0140     |   |           |  |
| 5.       | Till och fränkoppling av brandslang 3 ggr   | 1.800,00  |  |
| 8.       | Brandvakt 27 arbetsskift<br>50 m <sup>2</sup> glasfibertyg med AL-yta för<br>skyddning                  | 26.190,00 |  |
| 2.940,00 |   |           |  |
| 0150     |   |           |  |
| 6.       | Anslutning av dricksvatten 2 ggr  | 1.200,00  |  |
| 6.1.     | Leverans av färskvatten 109,4 m <sup>3</sup>  | 1.094,00  |  |
| 0160     |   |           |  |
| 9.       | Borttransport av avfall 14 ggr  | 5.740,00  |  |
| 0170     |   |           |  |
| 10.      | -   |           |  |
| 0180     |   |           |  |
| 15.      | Färskvattenspolning av utsidorna, 780 m <sup>2</sup><br>BB 240 m <sup>2</sup> och SB 540 m <sup>2</sup> | 4.680,00  |  |

|                                       |                         |                          |                      |   |              |
|---------------------------------------|-------------------------|--------------------------|----------------------|---|--------------|
| Postiosoite/<br>PL 430<br>20101 TURKU | Puhelin<br>(021) 638711 | Telefax<br>(021) 6387250 | Telex<br>62484 Tryst | Pankki<br>TYP 433110-10066<br>PSP Tu 227388 | Lvv<br>Rett. |
|---------------------------------------|-------------------------|--------------------------|----------------------|---|--------------|

|      |   |  |
|------|---|--|
| 0190 |   |  |
| 15.  | Lätt sandblästring av sidorna<br>Fläckning 2 x 210 m <sup>2</sup><br>Målning 2 ggr 2 x 210 m <sup>2</sup><br>Märkning och målning av logo<br>Rederiets färg<br>Kostnader för kranbil  | 4.800,00<br>2.940,00<br>1.890,00<br>63.000,00<br>11.070,00 |
|      | Sandblästring av bordläggningsöppningarnas<br>kanter på utsidan, SA 2,5, samt målning med<br>zinksilikatfärg och med ytfärg 2 ggr.<br>Rederiets färger  | 2.360,00   |
| 0200 |   |  |
| 16.  | -   |  |
| 0210 |   |  |
| 17.  | Högtryckstvätt av skorsten med tvätt-<br>medel.<br>Kostnader för övertidsarbete   |  |
|      |   | 5.650,00   |
|      | Skorstenens gamla målta slipats med<br>handslipmaskin. Nya blåa ränder har<br>linjerats, märkts samt målats 2ggr.<br>Det gamla salmärket har övermålats med vit<br>färg. Tillverkning av schablon för rederi-<br>logen. Logon märkts och målats på<br>båda sidorna av skorstenen. | 48.780,00  |
|      | Kostnader för kranbil   | 18.680,00  |
| 0220 |   |  |
| 18.  | Målning av EFFJOHN-logo på ena sidan<br>av fartyget. Rederiets färg   | 2.500,00   |
|      | Målning av ramar runt EFFJOHN-logo<br>på SB-sidan   | 2.250,00   |
| 0230 |   |  |
| 19.  | Slipning av Panda-logons kantbitar och<br>målning med vit ytfärg 2 ggr.   | 1.320,00   |
|      | Övermålning av Panda-logon med<br>beställarens blå ytfärg 2 ggr.  | 800,00   |
|      | Kostnader för kranbil   | 1.150,00   |
| 0240 |   |  |
| 20.  | Bortskärning av "Mariehamn" på båda sidorna<br>i aktern   | 12.500,00  |

|      |   |                       |
|------|---|-----------------------|
| 0250 |   |                       |
| 21.  | Märkning och målning av nytt namn "Wasa King"<br>och hemort "Wasa".<br>Tillverkning av 3 st schabloner.   | 4.600,-               |
|      | Förutom i offerten nämnda arbeten har gamla<br>namn bortslipats med handslipmaskin samt<br>ytorna målats 2 ggr med vit ytfärg.  | 7.850,00              |
|      | Två namn märkta och målade under<br>akterkanten.  | 1.640,00              |
|      | Kostnader för kranbil   | 2.180,00              |
| 0260 |   |                       |
| 22.  | Avikerlisten  |                       |
|      | Avikerlistens övre del sandblästrad,<br>SA 2,5 och nedre delen lätsandblästrad.<br>Listen ca 80 m <sup>2</sup> målats 4 ggr<br>med rederiets färg.  | 8.800,00              |
|      | Kostnader för kranbil   | 6.540,00              |
| 0270 |   |                       |
| 23.  | -   |                       |
| 0280 |   |                       |
| 24.  | -   |                       |
| 0290 |   |                       |
| 31.  | Mätning av propelleraxelspel  | 2.700,00              |
| 0300 |   |                       |
| 32.  | Mätning av roderspel  | 2.100,00              |
| 0310 |   |                       |
| 33.  | -   |                       |
| 320  |   |                       |
| 34.  | Förnyande av zinkanoder 10 kg<br>Roder 2 + 2 st<br>Bottenbrunnar 12 st  | 4.880,00              |
| 0330 |   |                       |
| 35.  | Bottenbrunnar öppnats, rengjorts och målats<br>med antifouling 4 st   | 10.080,00             |
| 0340 |   |                       |
| 36.  | Byte av 2 st propellerblad BB sida<br>I samband med byte av bladen har tätnings-<br>ringar av brons lösmonterats och lyfts<br>ut, 6 st lyftskruvar har tillverkats.<br>O-ringarna förnyade. Hopmontering. | 16.500,00<br>1.600,00 |

|      |  |            |
|------|--|------------|
| 0350 |  |            |
| 41.  | Reparation av 12 st yorcalbrör.  | 79.900,00  |
|      | Tillverkning av delar till rör NS 175 av<br>gammal standard och ihoppassning med rör<br>NS 200.  | 2.160,00   |
| 0360 |  |            |
| 42.  | Rengöring av slamtank, 20 m <sup>3</sup> och<br>bilgevattentank 22 m <sup>3</sup>  | 12.700,00  |
|      | Transport av oljeavfall till Ekokem<br>och behandlingskostnader, 21.000 kg   | 46.430,00  |
| 0370 |  |            |
| 43.  | Rören för djupgångsmätnarna,<br>2 st φ 50 x 6 m, borrats öppna<br>och krassats rena. Rören blindats<br>och fyllts med Antifouling-färg,<br>därefter avtappats.<br>20 l Antifouling-färg från varvet.   | 16.360,00  |
| 0380 |  |            |
| 51.  | De gamla plastnamnen har avlägsnats genom<br>uppvärming och bortslipning.<br>Namnskyltarna slipats och målats<br>med ytfärg 2 ggr. Tillverkning av schablon<br>för namnet samt märkning och målning av<br>det nya namnet. Vid arbetet utförande har<br>en saxhiss använts. | 12.820,00  |
| 0390 |  |            |
| 52.  | Löstagning av landgångsfästena<br>på båda sidorna genom brännskärning<br>och förflyttning till däck nr 4<br>enligt skiss. Rengöring och<br>målning 3 ggr.  | 21.580,00  |
| 0400 |  |            |
| 53.  | Kostnader för kranbil  | 1.120,00   |
|      | Reparation av bordläggningsskada<br>spanter 122-140 för och akter i<br>rändningen enligt offert inkl.<br>arbetena, plättjocklek 10 mm,<br>2900 kg  | 147.370,00 |

Förnyade bordläggningsplåtarna,  
tjocklek 10 mm:

|                               |                     |         |
|-------------------------------|---------------------|---------|
| spt 119 - 131                 | 18 m <sup>2</sup>   | 1440 kg |
| spt 131 - 142                 | 23,1 m <sup>2</sup> | 1848 kg |
| spt 142 - 146,5               | 4,75 m <sup>2</sup> | 380 kg  |
| P-220 stång 4 x 2 m + 4 x 3 m |                     | 456 kg  |

|                                    |                     |                 |
|------------------------------------|---------------------|-----------------|
| Spant -5--7<br>bordläggningsplåtar | 2,12 m <sup>2</sup> | 170 kg          |
| däcksplåtar                        | 0,46 m <sup>2</sup> | 37 kg           |
| balkbricka                         | 0,08 m <sup>2</sup> | 6 kg            |
| <b>sammanlagt</b>                  |                     | <b>4.337 kg</b> |

Debitering för extra kilon inkl.  
ställningsarbeten  
(4337 kg - 2900 kg) x 27,50

39.518,00

Sandblästring av utsidan av skadade områden  
SA 2,5 samt målning med zinksilikatfärg och  
grundfärg samt ytfärg 2 ggr. Insidan ren-  
gjord och grundmålad 2 ggr.

37.860,00

0410 Öppning och påsvetsning av frätta svets-  
sömmar på SB och BB rodren.

Dubbleringsplåt 500 x 1200 x 23 mm  
monterats på BB-rodern.  
Ställningsarbete

17.980,00

0420 Nedre delen av BB propelleraxelskyddet  
löstagits och fisknät borttagits runtom  
propelleraxeln. Skyddet fastsatt.  
Ställningsarbete

2.640,00

0430 Slipning av BB propellerblad 2 st  
Ställningsarbete

4.830,00

0440 Skyddsörer och platta under SB sidoporten  
borttagna genom skärbränning.

880,00

0450 Skyddsjärn för avrinningsrör på bildäcket  
tillverkad av rundstång och monterats på  
plats.

640,00

0460 Leverans och lyftning av asetylen- och  
syre-behållarepaket ombord på fartyget  
nära skorstenen för reparationer av pannor.

4.670,00

0470 Loss och fast av bottenpluggar 8 st.  
Montering och svetsning av en ny  
3/4" muff och 1 st messingplugg.

2.860,00

Totalt

846.769,00

\*\*\*\*\*

25.9.1992

## Enclosure 3.4.96

Per Alce  
TURBUST

"S" VÄRSA KING

|       |  |                     |
|-------|--|---------------------|
| 1.    | In och utdockningen inkl. en dag i docka   | 26.300,-            |
| 1.1.  | Omändring av dockningsbädden               | 12.000,-            |
| 2.    | Stående i docka, dockshyra/dygn            | 11.950,-/dygn       |
| 3.    | Anslutning av el-kabel                     | 660,-/anslutning    |
| 3.1.  | Leverans av el-ström 1200A, 18000V         | 0,60/kWh            |
| 4.    | Anslutning av brandslang                   | 660,-/anslutning    |
| 5.    | Anslutning av dricksvatten                 | 660,-/anslutning    |
| 5.1.  | Leverans av dricksvatten                   | 11,-/m <sup>3</sup> |
| 6.    | Anslutning av telefon                      | 405,-/kabel         |
| 6.1.  | Samtalsavgifter                            | 0,65/impuls         |
| 7.    | Brandvakt                                  | 1.320,-/8 h skift   |
| 8.    | Borttransport av avfall 150 l              | 410,-/gång          |
| 9.    | Anslutning av kylvatten för hjälpmotorer   | 660,-/anslutning    |
| 9.1.  | Leverans av kylvatten                      | 275,-/dygn          |
| 10.   | Anslutning av tryckluft                    | 660,-/anslutning    |
| 10.1. | Leverans av tryckluft 7 kp/cm <sup>2</sup> | 450,-/arbetaskift   |

| Målning                            |  |
|------------------------------------|--|
| 1122                               | Täckning av fartygsbotten<br>Uppvärmning   |
|                                    | - INDIKATIOT HINNOT<br>- LÄMMITYSÖLJY<br>FAKTAJ MUKAAN   |
| 1222                               | Sandblästring fläckvis   |
|                                    | - HINTA KOSKEE YLI 500M <sup>2</sup><br>MAALATTAVAA ALAA   |
| 1322                               | Målning med Inerta   |
|                                    | - ALLE 500M <sup>2</sup><br>LÄSKETTU TYÖNÄ   |
| 1422                               | B.B. avvisarlist blästras och målas med Galvosit<br>Hempel 1570, 127 m.  |
| 1522                               | Ankarklys och ankaren blästras och målas med<br>Galvosit   |
| 1622                               | Färskvattentanken 4A och 4B ca 75 m <sup>3</sup> vardera<br>samt 5, 145 m <sup>3</sup> rengörs och målas ca 10 - 20 t.   |
|                                    | - LÄSKETTU MAALAUUS LAJAVUUS 20 %<br>- KORKEYPAINEVESI PESU KÄRGI TANKKI<br>- MAALATTAVAT ALUEET KÄYTTÄÄKSI PUHALLUS   |
| 1722                               | Ballasttanken TK 1, 175 m <sup>3</sup> ; TK 2, 300 m <sup>3</sup> ;<br>TK 13 och TK 14, 183 m <sup>3</sup> vardera; TK 54, 54 m <sup>3</sup> ;<br>TK 58, 220 m <sup>3</sup> . Rengörs och målas 10 - 20 t. |
|                                    | - LÄSKETTU MAALAUUS LAJAVUUS 20 %<br>- KORKEYPAINEVESI PESU KÄRGI TANKKI<br>- MAALATTAVAT ALUEET KÄYTTÄÄKSI PUHALLUS   |
| 1822                               | Förliga rampan, sidorna, blästras och målas<br>ca 24 m <sup>2</sup> .  |
| 1922                               | Akterliga ramparna, sidorna, blästras och målas<br>2 x 12 m <sup>2</sup> .   |
| <u>VARUSTAMO TÖIMITTAA MAALIT.</u> |  |

| <b>Bottenarbeten</b> |  |
|----------------------|--|
| 31.28                | Mätning av propelleraxelspel   2700,-  |
| 32.28                | Cedervall tätningarna yttra / inre läcker olja   39500,-/AKSEL<br>repareras  |
|                      | - TILAAVAN VARAOJAT<br>- TEINEET JA SUOJAN IRROITUS/ASENNUS<br>LASKETTU POSITIOON 33.28  |
| 33.28                | Partiell axeldragning "klassning"   49000,-/AKSEL<br>SUORITETTAAN MODIFIIOITU AKSELINVEETO   |
| 34.28                | Lyftning av propellerblad, byte av tätningar / blad 8250,-/KPL   |
| 35.22 C              | Mätning av roderespel   4100,-   |
| 36.22                | Lyftning av roder (roden har ett skrikande oljud när man svänger med dem, troligen är smörjrören till lagret stockade.   28600,-   |
|                      | - EHDOTUS TYÖN SUORITTAJÄÄSEN:  <br>- VIBRAAUS LEUKEYEN PISTO / ASENNUKSEN<br>- ALATAPPIN IRROITUS JA TARKASTUS<br>- ALALÄÄKKÖIN TARKASTUS<br>- ALALÄÄKKÖIN RASVAULIPUTKEN TOIMINTA<br>TARKASTUS JA PUHDISTUS.<br>- PERÄSİMEN ALASOTTO LISÄHINTA<br>2500,- |
| 37.28                | Täckning av propellrar och roderattappar   4500,-  |
| 38.22                | Förryande av zinkanoder 10 kg / st   325,-/KPL.  |
| 39.22                | Bottenbrunnar upp och fast rengörs, målas.   3500,-/KPL.   |
| 40.22                | Ankare med kätting färs ut, klassas.   7000/- KETJU<br>2kg   |

*Jyväskylä*

**Maskinrumsarbeten**

51.26 Bottenventiler överkalas  
DN 100, 9 st; DN 125, 3 st; DN 150, 2 st;  
DN 200, 6 st; DN 250, 5 st; DN 300, 2 st;  
DN 450, 1 st.  
Samtliga ventiler fjädermanövrade. 37200,-

52.26 Aktra SW filterhusen förnyas 2 st.  
diam 700, längd 800. 36500,-

53.26 Övrig filterhus rengörs och målas, 4 st. 7100,-

PESUL, HARJAS JA MAALALLS

54.26 Filterkorgar till dito filterhus förnyas eller  
repareras, om så behöves 5400,-/kpl.

LASKETTU UUSIMINEN

55.26 SW-kylvattenrör förnyas och repareras i maskin.

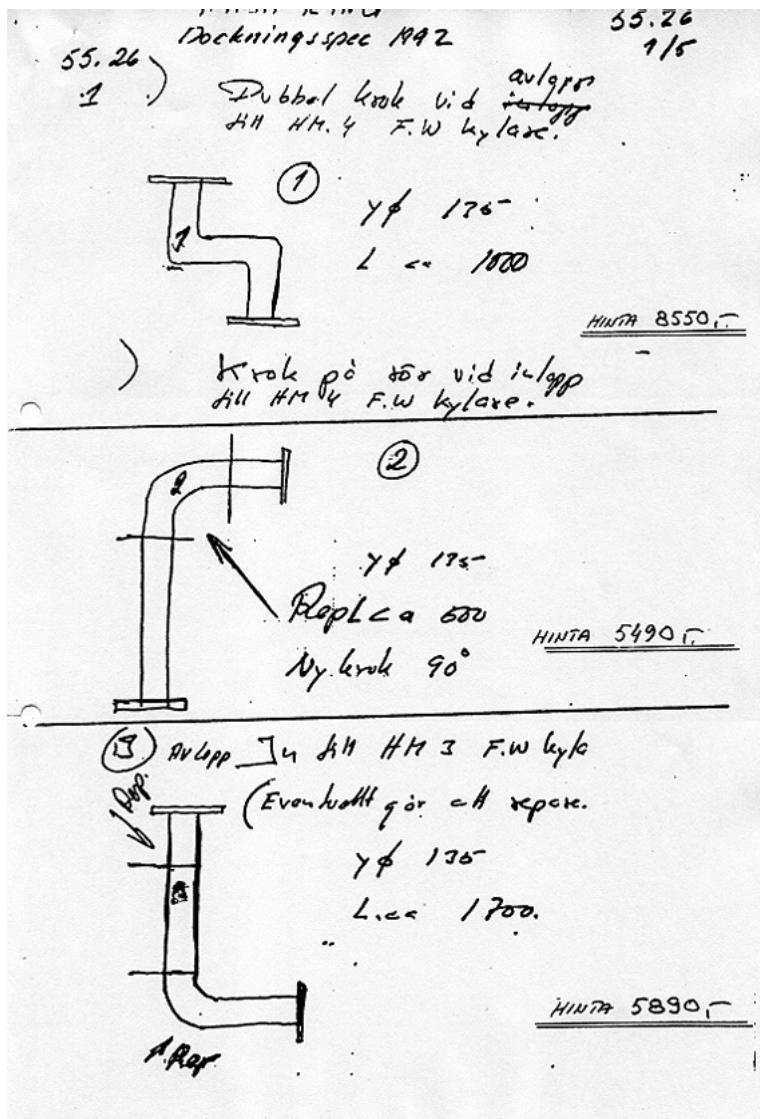
- PUTEET LÄSKETTU OHJESTU SKISSIEN MUKAAN
- HINNAT SISÄLTÄVÄS POSITIOISSA MAINITTUT STROUB-LIITTIMET
- MATERIAALI YOCALIBRO
- HINNAT EIVÄT SISÄLLÄ MAHDOLLISIA OHJIS JA LUOKSEPPÄSY TÖITÄ
- HINNAT POSITIOITTAIN SKISSESSÄ

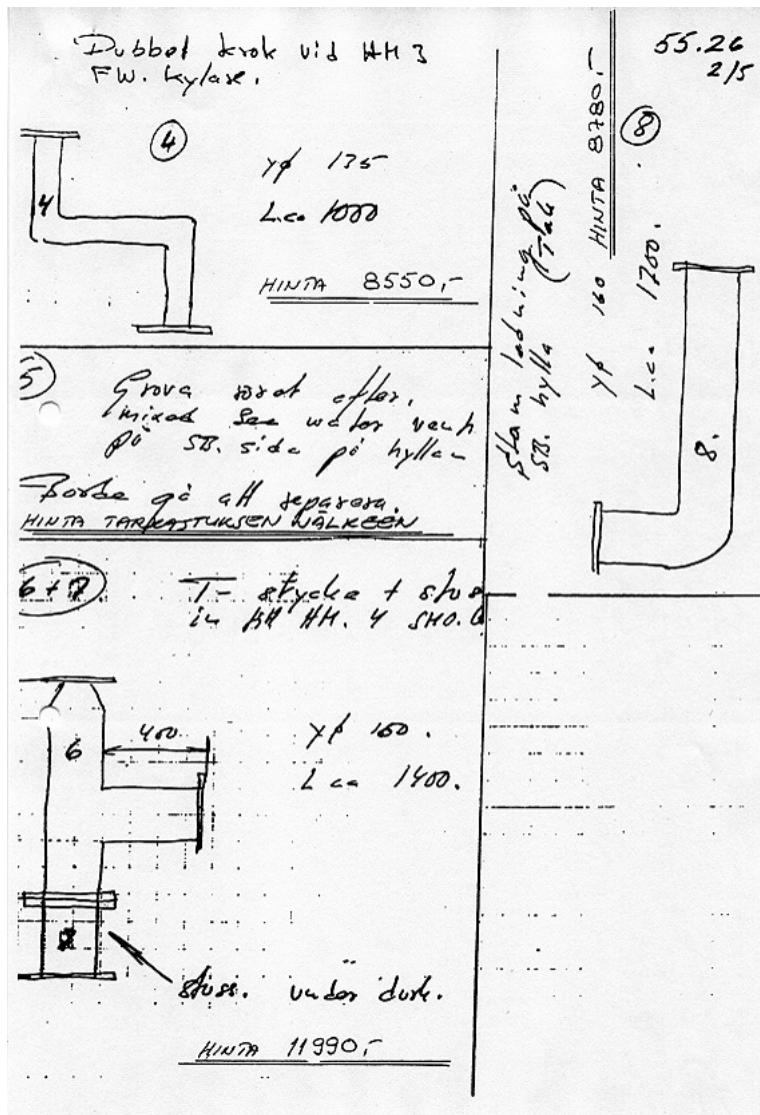
56.26 HJM FW kylvattenrörssystem förnyas och repareras.

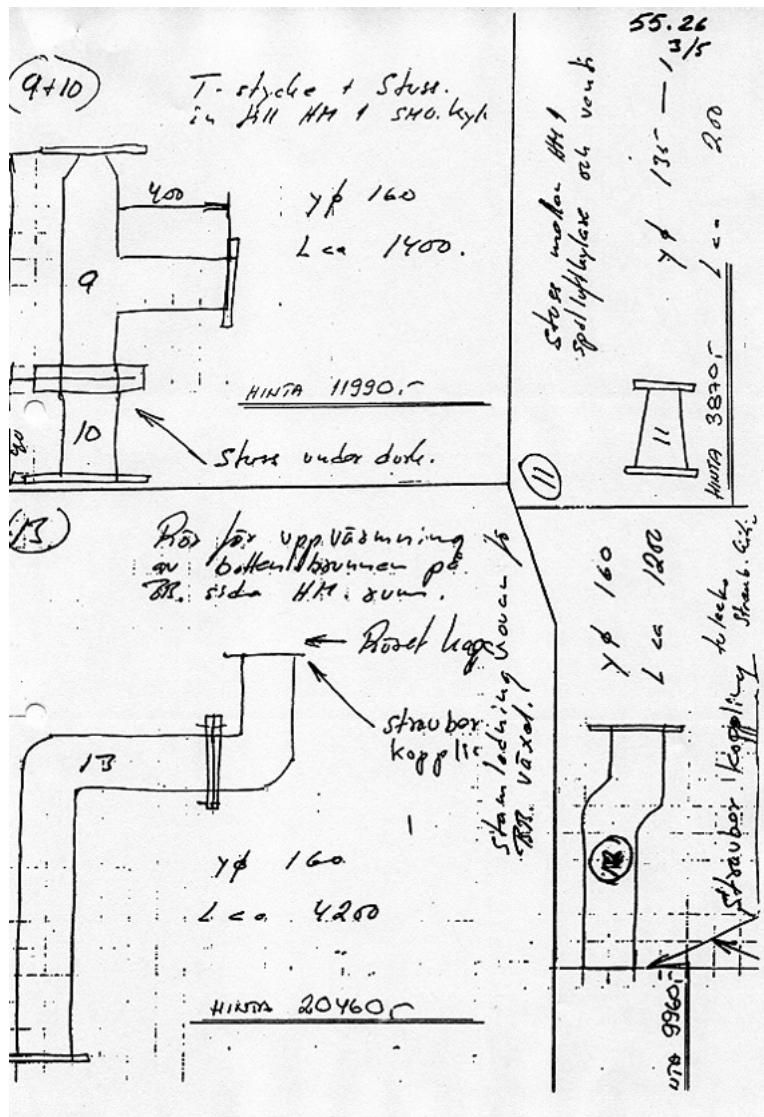
- PUTEET LÄSKETTU OHJESTU SKISSIEN MUKAAN
- HINNAT SISÄLTÄÄ SKISSISSÄ N:o 4 OLEVAT VENTTILIT
- MATERIAALI = TERÄSPUTKI
- HINNAT EIVÄT SISÄLLÄ MAHDOLLISIA OHJIS JA LUOKSEPPÄSY TÖITÄ
- HINNAT POSITIOITTAIN SKISSESSÄ

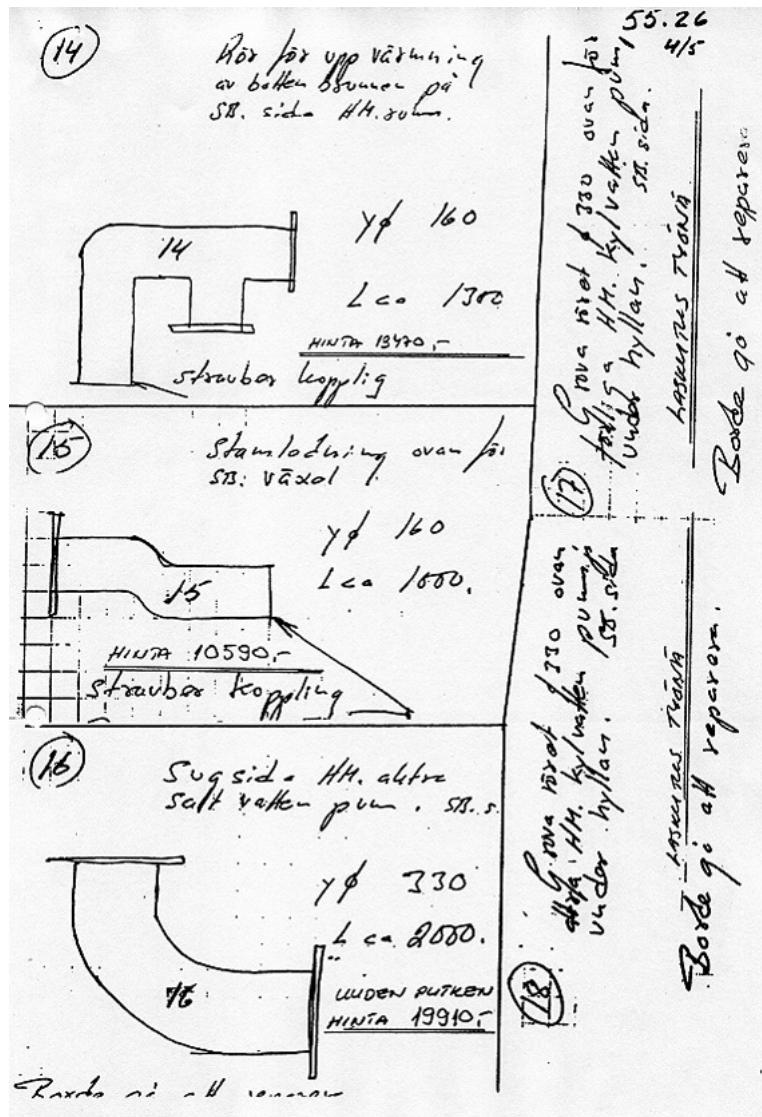
57.26 HJM FW Expansionstanken förnyas och flyttas upp till  
samma nivå som HJM expansionstankar.  
Tanken 700 x 1220 x h 1220. 2 st rör L 15 m,  
diam 60 mm, tillop och overflow.

LUOKSEPPÄSY HINTA 50000,-



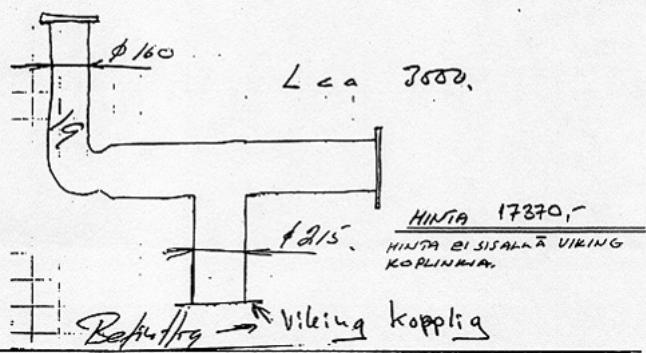






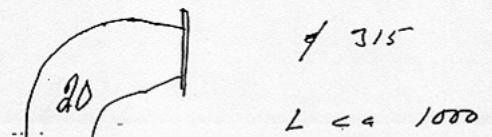
(19)

Stam ledning från Hu  
kylrum. 55.26  
575



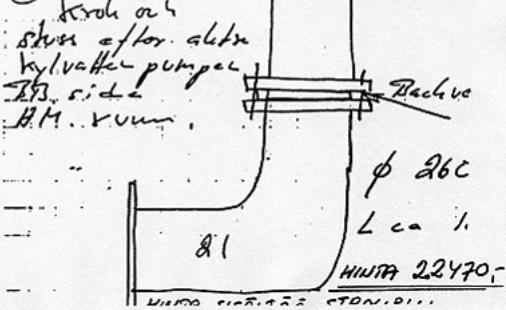
(20)

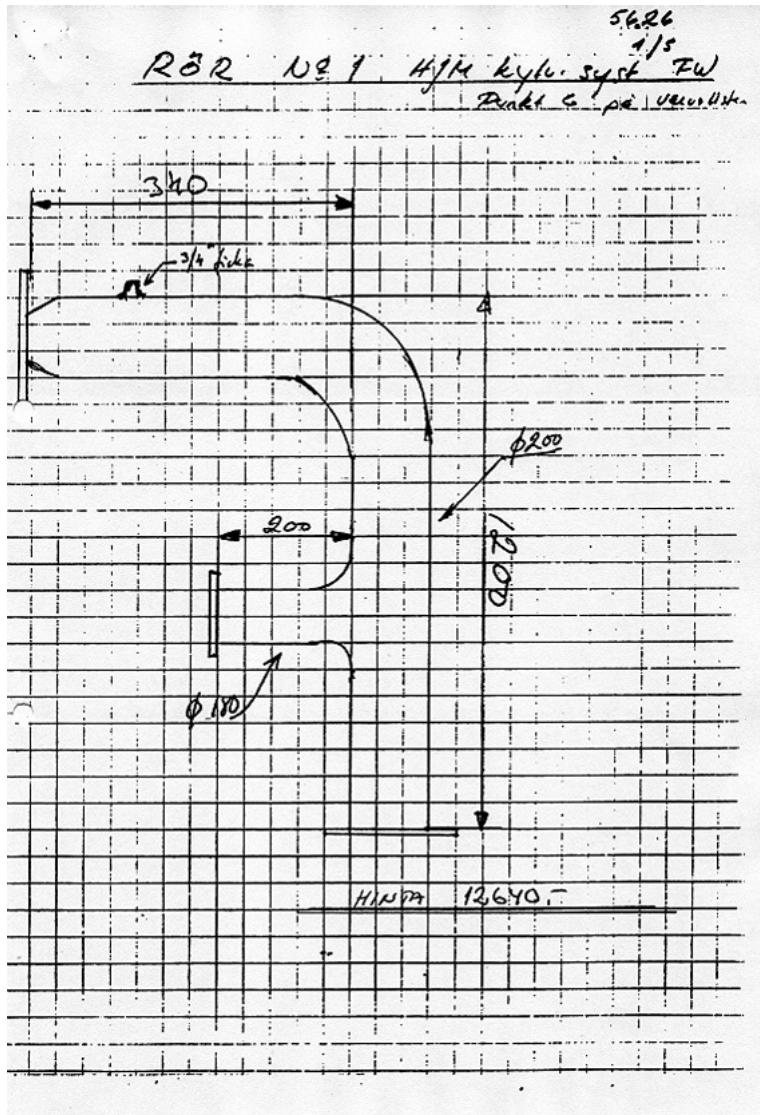
Krok före förliga  
Hin saltvattenpum

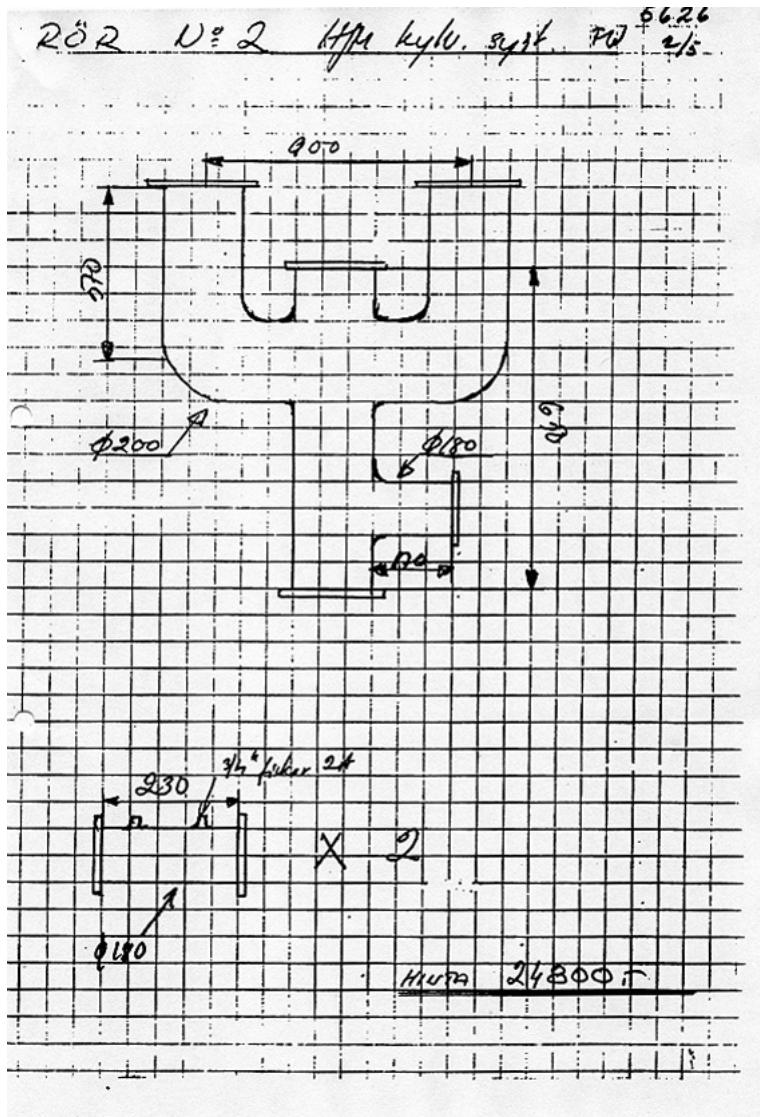


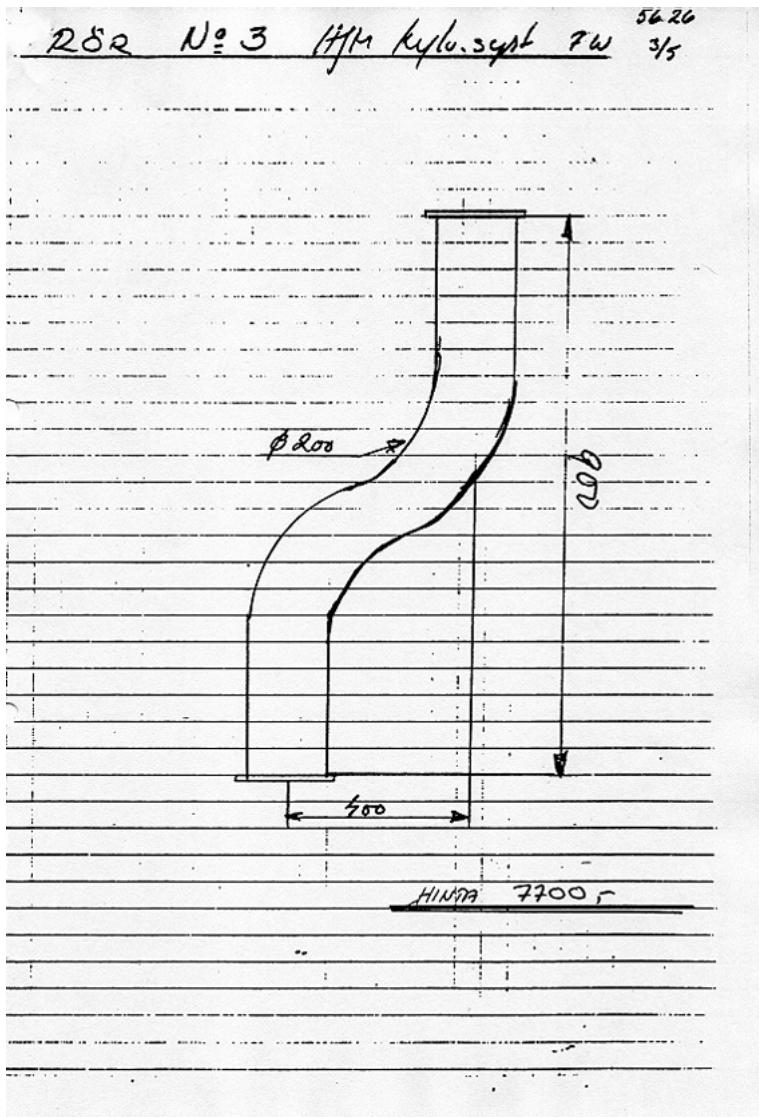
HINTA 17770,-

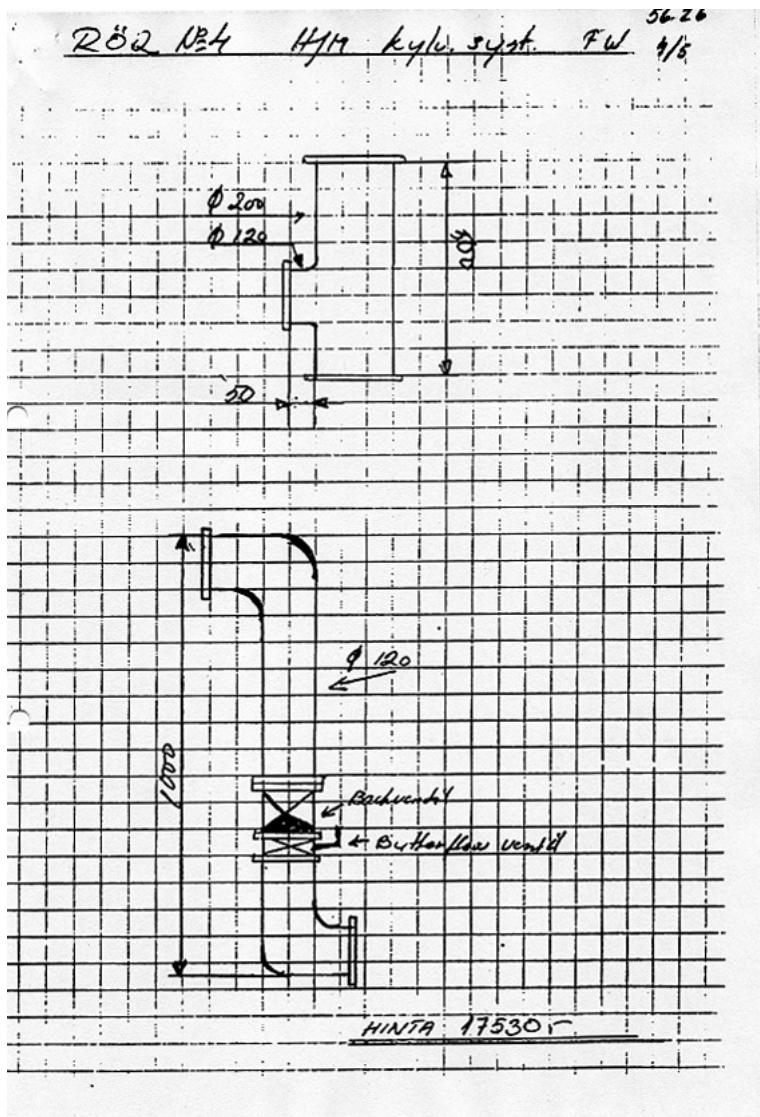
(21)

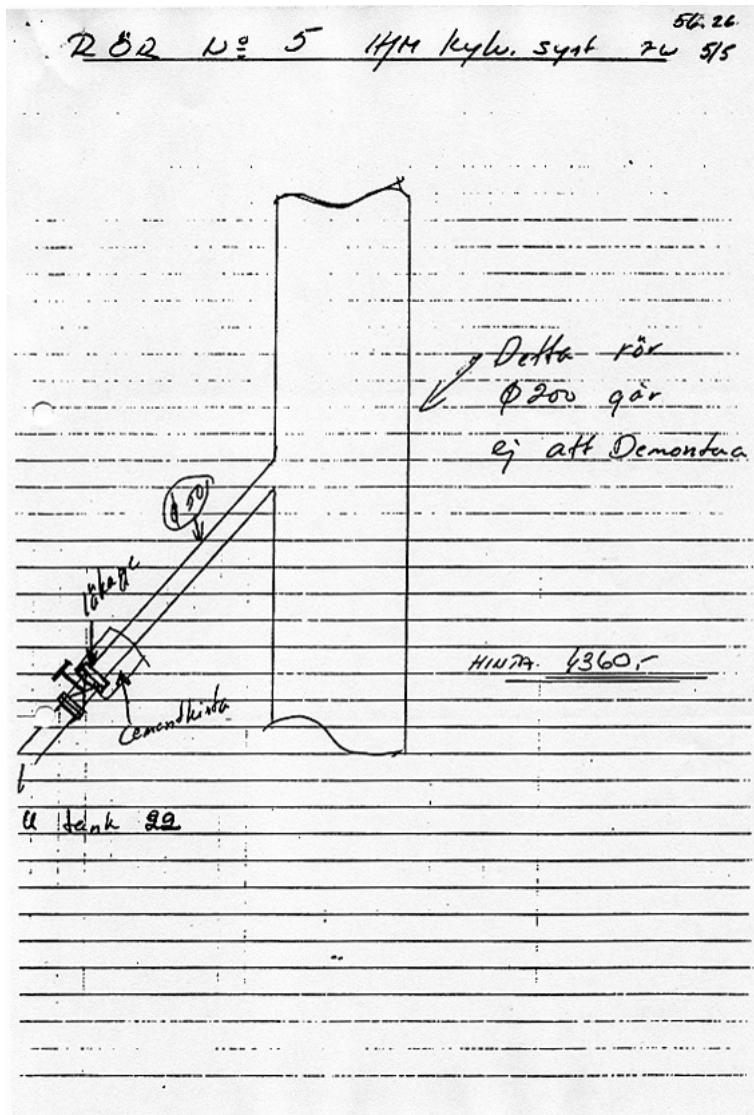












58.26 Röret mellan fettavskiljningstanken i spritförrådet och grävattentanken i separatori rummet förnyas.  
Diam 110 mm, L 12 m, 4 st krökar 90° samt flänsar.

INDIKATIO HINTA 37000,-

59.26 Bilgevattentank no 33, 22 m<sup>3</sup>, rengöring. 12700,-  
60.26 Smutsoljetank no 42, 17 m<sup>3</sup>, rengöring. 8500,-  
61.26 Sludgetank no 44, 25 m<sup>3</sup>, rengöring.

HINTA PARKASTUKSEN JA KEEVÖI

62.26 HJM Avgaspannor 4 st, Sanea 65 m<sup>3</sup> reparation, förnyande av bottnet.

INDIKATIO HINTA 200000,-

63.26 Hisschakten på 2 provianthissar, skotten riktas, avståndet för stort till hisskorgen

HINTO PARKASTUKSEN KUIN TYYÖ

KRAJUS ON MÄÄRÄTETY

64.26 Flexibel tryckslang med stålsväv, diam 50 mm, längd 200 mm, 150°C, 8 st insättes i HUM H.O.fuel tryck och returnrör.

65.26 Expansionstankar i HUM kylsystem rengöres och målas 7000,-  
2 st x 1,5 m<sup>3</sup>.

#### Övrigt

|   |             |
|---|-------------|
| 70.22 Akterramperna, skalkningarna service<br>samt förstärkningar                       | 5200,-/kpl. |
| 71.22 Akterramperna, gångjärn överhalas, nya bussningar.                                | 36600,-     |
| 72.22 Förramp och Visir skalkningar överses förstärkes.<br>HINTA PARKASTUKSEN JA KEEVÖI |             |
| 73.22 Förramp, gångjärn överhalas eventuellt nya bussningar.                            | 23300,-     |
| 74.22 Visir 15 m och ramp-packningar 10 m förnyas                                       | 18600,-     |
| 75.22 Vajerbyten på bildäckshyllorna (12 VMJERIK)                                       | 54600,-     |

**Enclosure 3.4.97**

1/5

M/S Wasa King  
Dockningsspecifikation 1993

**Particulars****Passengership**

|         |        |                |
|---------|--------|----------------|
| LOA     | 157.00 | Bureau Veritas |
| LPP     | 137.40 | DWT 3345       |
| B.extr. | 24.2   | Gross 15598    |
| Draft   | 5.55   | Net 8394       |

**Allmän del**

- 01 Indockning, utdockning, 1 dag dockstående
- 02 Dockstående / dygn
- 03 Anslutning av elkablar  
Leverans av el 1200 A, 380 V, 50 Hz
- 04 Anslutning av brandslangar
- 05 Anslutning av dricksvatten  
Leverans av dricksvatten
- 06 Anslutning av telefon  
Samtalsavgifter
- 07 Brandvakt
- 08 Avfall

2/5

## Målning

- 1122 Täckning av fartygsbottnet  
Uppvärmning
- 1222 Sandblästring fläckvis
- 1322 Målning med Inerta
- 1422 B.B. avisarlist blästras och målas med Galvosil  
Hempel 1570, 127 m.
- 1522 Ankarklys och ankaren blästras och målas med  
Galvosil
- 1622 Färskvattentanken 4A och 4B ca 75 m<sup>3</sup> vardera  
samt 5, 145 m<sup>3</sup> rengöres och målas ca 10 - 20 % .
- 1722 Ballasttanken TK 1, 175 m<sup>3</sup> ; TK 2, 300 m<sup>3</sup> ;  
TK 13 och TK 14, 183 m<sup>3</sup> vardera; TK 54, 54 m<sup>3</sup> ;  
TK 58, 220 m<sup>3</sup>. Rengörs och målas 10 - 20 % .
- 1822 Förliga rampen, sidorna, blästras och målas  
ca 24 m<sup>2</sup>.
- 1922 Akterliga ramperna, sidorna, blästras och målas  
2 x 12 m<sup>2</sup>.

3/5

**Bottenarbeten**

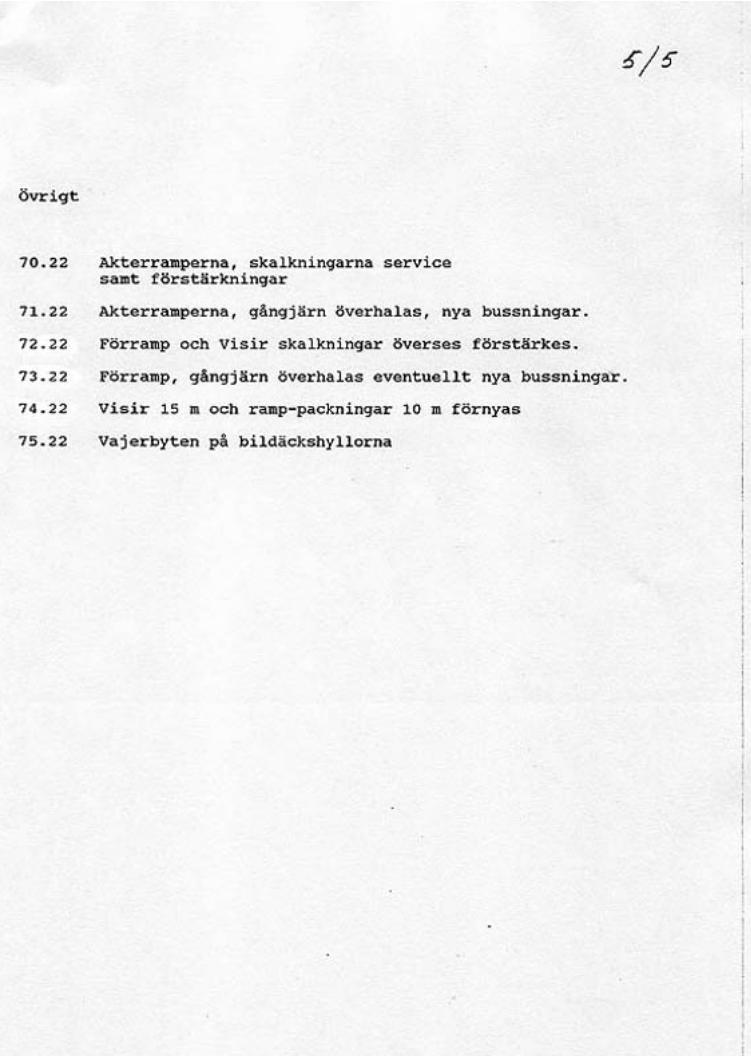
- 31.28 Mätning av propelleraxelspel
- 32.28 Cedervall tätningarna ytter / inre läcker olja repareras
- 33.28 Partiell axeldragning "klassning"
- 34.28 Lyftning av propellerblad, byte av tätningar / blad
- 35.22 Mätning av roderspel
- 36.22 Lyftning av roder (rodren har ett skrikande oljud när man svänger med dem, troligen är smörjrören till lagret stockade.
- 37.28 Täckning av propellrar och rodertappar
- 38.22 Förryande av zinkanoder 10 kg / st
- 39.22 Bottenbrunnar upp och fast rengöres, målas.
- 40.22 Ankare med kätting firas ut, klassas.

**Maskinrumssarbeten**

- 51.26 Bottenventiler överhalas  
DN 100, 9 st; DN 125, 3 st; DN 150, 2 st;  
DN 200, 6 st; DN 250, 5 st; DN 300, 2 st;  
DN 450, 1 st.  
Samtliga ventiler fjädermanövrerade.
- 52.26 Aktra SW filterhusen förryas 2 st.  
diam 700, längd 800.
- 53.26 Övrig filterhus rengörs och målas, 4 st.
- 54.26 Filterkorgar till dito filterhus förryas eller repareras, om så behöves
- 55.26 SW-kylvattenrör förryas och repareras i maskin.
- 56.26 HJM FW kylvattenrörssystem förryas och repareras.
- 57.26 HJM FW Expansionstanken förryas och flyttas upp till samma nivå som HJM expansionstankar.  
Tanken 700 x 1220 x h 1220. 2 st rör L 15 m ,  
diam 60 mm, tillop och overflow.

4/5

- 58.26 Röret mellan fettavskiljningstanken i spritförrådet och grävattentanken i separatorummet förnyas.  
Diam 110 mm, L 12 m, 4 st krökar 90° samt flänsar.
- 59.26 Bilgevattentank no 33, 22 m<sup>3</sup>, rengöring.
- 60.26 Smutsoljetank no 42, 13 m<sup>3</sup>, rengöring.
- 61.26 Sludgetank no 44, 25 m<sup>3</sup>, rengöring.
- 62.26 HJM Avgaspannor 4 st, Sanea 65 m<sup>3</sup> reparation, förnyande av bottnet.
- 63.26 Hisschakten på 2 provianthissar, skotten riktas, avståndet för stort till hisskorgen
- 64.26 Flexibel tryckslang med stållvåv, diam 50 mm, längd 200 mm, 150°C, 8 st insättes i HUM H.O.fuel tryck och returör.
- 65.26 Expansionstankar i HUM kyldsystem rengöres och målas  
2 st x 1,5 m<sup>3</sup>.



5/5

**Övrigt**

- 70.22 Akterramperna, skalkningarna service samt förstärkningar
- 71.22 Akterramperna, gångjärn överhalas, nya bussningar.
- 72.22 Förramp och Visir skalkningar överses förstärkes.
- 73.22 Förramp, gångjärn överhalas eventuellt nya bussningar.
- 74.22 Visir 15 m och ramp-packningar 10 m förnyas
- 75.22 Vajerbyten på bildäckshyllorna

**TURKU REPAIR YARD LTD**  
 SF-20101 TURKU, FINLAND  
 Box 430  
 Tel. +358 21 638711 Telex 62484 try si

**TELECOPIER WORK ORDER**  
 Telecopier No. +358 21 638 7250  
 638 7251 prod.

To: YHÄSANLAIVAT OY Date: 25.9.1992  
 No: 961-3260199  
 Attn: C. RICKHARDSSON  
 From: B. KUJALA

IF NOT CORRECTLY RECEIVED PLEASE REPORT IMMEDIATELY

Subject: "Ms " WASA KING "

OHEISENÄ LÄHETÄMME TYÖ-  
 KAPPALEEN TARJOUKSESTAMME  
 KOSKIEN 18.9 PÄIVÄTTYÄ ERITELYÄ  
 ALUKSELAIT SUORISETTAVISTA TÄISTÄ  
 TÄMÄTÄKUCLUSSA -93.  
 PUNTAHKSI KIRJOITETUN TARJOUKSEN  
 LÄHETÄMME VIRRKO 40 ALUSSA.

YSTÄVÄLLISIN PERHEESSÄ

TURUN KOMIKISTELAKKA OY

MYYNTIOSASTO

Boris Kujala

✓ PÄÄTTÄÄ KIRJUTETTU  
 (päät. kohd. 25.9.1992 klo 11.40  
 ala man palkkau-  
 asiapäät kulturessa  
 asiapäät)

**Enclosure 3.4.98**

Office Translation:

MacGREGOR-NAVIRE (FIN) Oy / No. / Date 22.9.92 / Our ref. T. Mäki / page 1/1  
 To: Turku Repair Yard, attn: Boris Kujala / Ref. M/S Wasa King, Offer

**OFFER**

Referring to your fax request for a tender, dated 19.9.92 we hereby offer spare parts and repair works as follows:

**Pos 70.22 Stern ramps, service and strengthening of locking devices.**

Price: Work FIM 3,500 / locking device, VAT 0%  
 Materials FIM 500 / locking device, VAT 0%

**Pos 71.22 Stern ramps, exchange of end hinge bushings and hinge axles.**

Price: Work FIM 33,000 / vessel, VAT 0%  
 Materials FIM 2,800 / vessel, VAT 0%

**Pos 72.22 Bow ramp, exchange of end hinge bushings and hinge axles.**

Price: Work FIM 16,500 / vessel, VAT 0%  
 Materials FIM 1,400 / vessel, VAT 0%

**Pos 73.22 Bow visor, exchange of 15 metres and bow ramp 10 metres rubber sealing gasket.**

Price: Work FIM 6,300 / 25 metres, VAT 0%  
 Materials FIM 8,000 / 25 metres, VAT 0%

**Pos 74.22 Exchange of car deck wires.**

Price: Work FIM 3,000 / wire, VAT 0%  
 Materials FIM 500 / wire, VAT 0%

**Delivery time for:** Work 1 week  
**Materials:** 2 weeks from ordering

**Delivery terms:** Free Turku - 93

**Payment terms:** 30 days net

**Other terms:** NLM 84

Best regards

signed  
 Tomi Mäki

|   |  |                               |         |          |      |
|---|--|-------------------------------|---------|----------|------|
| MacGREGOR NAVIRE  |  | No.                           | Date    | Our ref. | Page |
| MacGREGOR-NAVIRE (FIN) Oy<br>Marine Services Unit   |  |                               | 22.9.92 | T.MAKI   | 1/1  |
| TO: TURKU REPAIR YARD<br>ATTN: BORIS KUJALA   |  | REF: MIS WASA KING<br>TARJOUS |         |          |      |
| IF NOT CORRECTLY RECEIVED, PLEASE INFORM US.<br>TELEPHONE: +358-21-892111 TELEX: 62112, 62382 mgmfi sf<br>TELEFAX: +358-21-892517 |  |                               |         |          |      |
| TELEFAX   |  |                               |         |          |      |

TARJOUS

VIITATEN TARJOUSPYYNTÖÖNNE FAX 19.9.-92 TARJOAMME  
TEILLE EM. ALUKSEN VAROSIA JA KORJAUSTYÖÄ SEURAVAST!

Pos. 70.22 PERÄRAMPIEN LUKITUSLAITTEIDEN HUOLTO JA  
VÄHVISTUS.

HINTA TYÖLLE : FIM 3500,-/LUKITUSLAITE, LVV 0%  
HINTA MATERIAALILLE : FIM 500,-/LUKITUSLAITE, LVV 0%

Pos. 71.22 PERÄRAMPIIT, PÄÄTYSARANOIDEN LAAKERIN JA SARANA-  
TAPIN VAIHTO

HINTA TYÖLLE : FIM 33.000,-/ALUS, LVV 0%  
HINTA MATERIAALILLE : FIM 2800,-/ALUS, LVV 0%

Pos. 72.22 KEULÄRAMPIN PÄÄTYSARANOIDEN LAAKERIN  
JA SARANATAPPien VAIHTO

HINTA TYÖLLE : FIM 16.500,-/ALUS, LVV 0%  
HINTA MATERIAALILLE : FIM 1400,-/ALUS, LVV 0%

Pos. 73.22 KÄÄVISETKUUN 15M JA KEULÄRAMPIN 10M  
TIIVISTEKUMIN VAIHTO

HINTA TYÖLLE : FIM 6.300,-/25 ,LVV 0%  
HINTA MATERIAALILLE : FIM 8.000,-/25M. LVV 0%.

22/09 '92 09:09- 358 21 892517 NGN FIN MSE +++ LUKAU REPAIR YAR 0002

M/S 'WASA KING - TARJOUS 2/2

POS. 74122 AUTOKANNEN VAUERIEN VAIHTO

HINTA TÖÖLLE : FIN 3000,- / VAUERI, LUV 0%  
HINTA MATERIAALILLE : FIN 500,- / VAUERI, LUV 0%

TOLIMINUSAIIA TÖÖLLE : 1 VIIKKO  
— — MATERIAALILLE : 2 VIIKKOÄÄ TILAUKSESTA

TOLIMINUSAIIA: VAPAASTN TURKEN - 93  
MAKSUTAITO : 30%VU NETTO  
MONT EHdot : NLM 84 MUKAAN

YST. TERVELSIN

(Tomi Jukka)

**Office Translation**

To: Vasanlaivat Oy, no: 961 - 3260199, attn: C. Rickhardsson, date 25.9.92  
Fm: Turku Repair Yard, Boris Kujala  
Telecopier Work Order

Subject: M/S Wasa King

Attached please find a draft of our offer regarding the specification dated 18.9 for works to be performed on the vessel in January -93.

We shall mail you a final offer at the beginning of week 40.

Best regards

Turku Repair Yard Oy  
Sales Department

signed  
Boris Kujala

Added text: Final version not necessary. Phone conference at 1140 on 25th September. Revert to the business in a months time.

**TURKU REPAIR YARD LTD**

SF-20101 TURKU, FINLAND  
Box 430  
Tel. +358 21 638711 Telex 62484 try sf

**TELECOPIER WORK ORDER**

Telecopier No. +358 21 638 7250  
638 7251 prod.

To: YASANLAIVAT OY Date: 25. 9. 1992  
No: 961-3260199 Ref:  
Attn: C. RICKHARDSSON  
From: B. KUJALA No. of pages including  
cover sheet: 16

IF NOT CORRECTLY RECEIVED PLEASE REPORT IMMEDIATELY

Subject: "Ms "WASA KING"

OHEISENÄ LÄHETÄMME TYÖ-  
KAPPALEEN TARJOUKSESTAMME  
KOSKIEN 18.9 PÄIVÄTTYÄ ERITELYÄ  
ALUKSELLA SUORITETTAVISTA TÖISTÄ  
TAMMIKUUSSA -93.  
PUNTAAKSI KIRJOITETUN TARJOUKSEN  
LÄHETÄMME VIKKO 40 ALUSSA.

YSTÄVÄLÄISIN TERVEISIIN

TURUN KORVAKISTELAKKA OY  
MYYNTIOSASTO

*Boris Kujala*

① PÄÄVITSE LÄHETTÄVÄ  
puntakuva, Kirjutettua  
puh. kestä 25'.  
klo 11.40  
"MS" man puhuvan  
"MS" kulkuvan  
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**Enclosure 3.4.99**

21/03 '97 PE 09:25 FAX +358 0 4550619 VTT/Laiva&amp;Kone

## Witness Statement

Central Criminal Police, Turku Thursday 20.03.1977 at 1100

Interrogator: Senior Constable Esko Vesani

Witnessed by: Senior Constable Esko Alu-Hannula

Mäki, Tarmo Kalevi 290854-201K

Engineer Kaarina Parish  
Koristontie 16 20780 Kaarina 02-243 7770 home  
DNV Turku 02-273 7200 office

Re: Investigation into the Estonia accident

Others present: Special Expert VTT's special investigator Tuomo Karppinen

## Witness Statement

I commenced working for Navire Cargo Gear (FIN) Oy in 1979. This company changed name into Mac Gregor-Navire (FIN) Oy in 1984, as I recall, and then again in 1992 into MacGregor (FIN) Oy.

At first in 1979 I worked as a designer and from November 1980 my assignment was changed and I was assigned the job of maintenance engineer. My term of service ended in the fall of 1995 when I started working as a DNV surveyor.

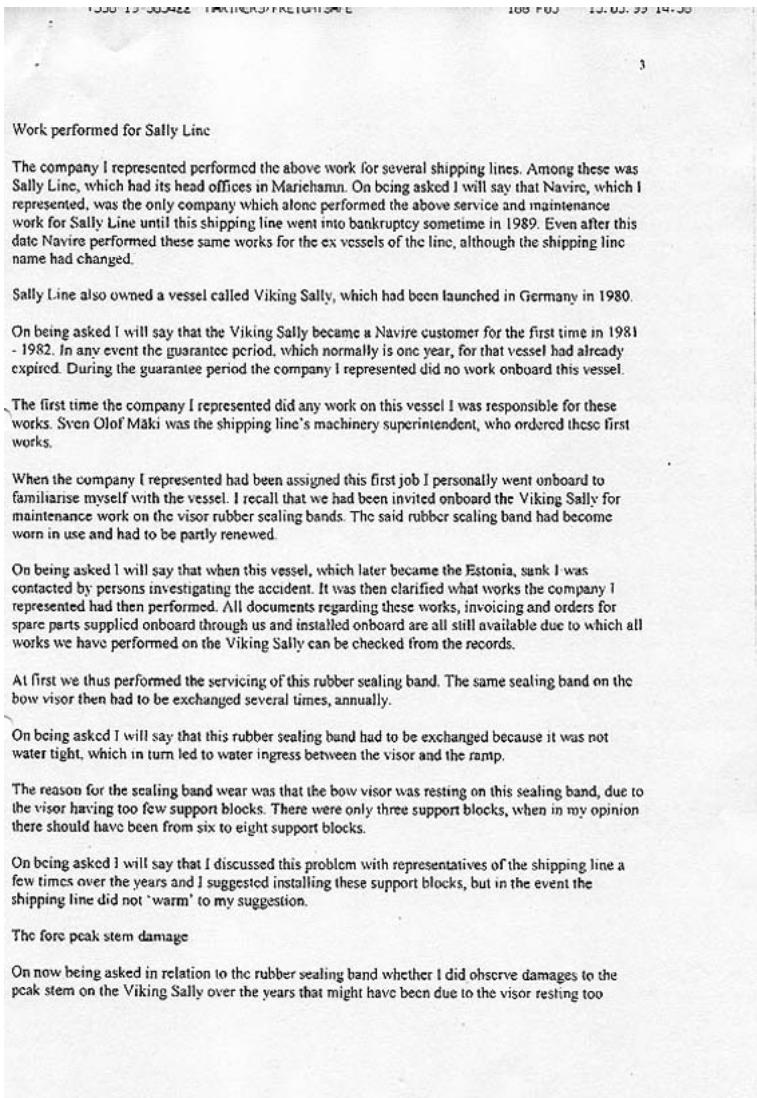
This assignment covered service and maintenance and modernisation of cargo handling gear of trading vessels. On being asked specifically about this cargo handling gear I will say that they comprised bow visors, bow ports, bow and stern ramps, hatches and car decks and also deck cranes, i.e. the gear necessary for loading and discharging a vessel. Everything which had to do with the servicing and other maintenance of the aforementioned gear was my responsibility.

On being asked how our company acquired these assignments I will say that either the vessel itself or a shipping line surveyor would always order the job to be done. In general our company was always informed in detail about 'problems' and we assumed the assignment as a 'general responsibility'.

In practice we boarded the object, i.e. the vessel, and discovered these 'problems', after which we prepared a maintenance plan to remedy the 'problem' after which we performed the job itself (in Finnish the wording used may also mean 'we ourselves performed the job').

On being asked I will say that that the company I represented also on request performed annual inspections of cargo handling gear on vessels. We issued our own certificates to the vessels regarding these inspections.

In addition to inspections performed by us the classification societies and maritime authorities performed their own inspections on ships, for which they issued their own certificates. These were so called 'official inspections'.



#### Work performed for Sally Line

The company I represented performed the above work for several shipping lines. Among these was Sally Line, which had its head offices in Mariehamn. On being asked I will say that Navire, which I represented, was the only company which alone performed the above service and maintenance work for Sally Line until this shipping line went into bankruptcy sometime in 1989. Even after this date Navire performed these same works for the ex vessels of the line, although the shipping line name had changed.

Sally Line also owned a vessel called Viking Sally, which had been launched in Germany in 1980.

On being asked I will say that the Viking Sally became a Navire customer for the first time in 1981 - 1982. In any event the guarantee period, which normally is one year, for that vessel had already expired. During the guarantee period the company I represented did no work onboard this vessel.

The first time the company I represented did any work on this vessel I was responsible for these works. Sven Olof Mäki was the shipping line's machinery superintendent, who ordered these first works.

When the company I represented had been assigned this first job I personally went onboard to familiarise myself with the vessel. I recall that we had been invited onboard the Viking Sally for maintenance work on the visor rubber sealing bands. The said rubber sealing band had become worn in use and had to be partly renewed.

On being asked I will say that when this vessel, which later became the Estonia, sank I was contacted by persons investigating the accident. It was then clarified what works the company I represented had then performed. All documents regarding these works, invoicing and orders for spare parts supplied onboard through us and installed onboard are all still available due to which all works we have performed on the Viking Sally can be checked from the records.

At first we thus performed the servicing of this rubber sealing band. The same sealing band on the bow visor then had to be exchanged several times, annually.

On being asked I will say that this rubber sealing band had to be exchanged because it was not water tight, which in turn led to water ingress between the visor and the ramp.

The reason for the sealing band wear was that the bow visor was resting on this sealing band, due to the visor having too few support blocks. There were only three support blocks, when in my opinion there should have been from six to eight support blocks.

On being asked I will say that I discussed this problem with representatives of the shipping line a few times over the years and I suggested installing these support blocks, but in the event the shipping line did not 'warm' to my suggestion.

#### The fore peak stem damage

On now being asked in relation to the rubber sealing band whether I did observe damages to the peak stem on the Viking Sally over the years that might have been due to the visor resting too

heavily on this stem peak due to bad sealing bands I will say that I do not recall observing anything in this direction. I believe that had I observed this kind of issue I would have interfered in one way or the other.

These service and maintenance works were carried out by Navire on the Viking Sally annually ever since the guarantee period of the vessel had expired.

In addition I performed an annual survey onboard this vessel of her lifting gear, from 1984 until 1992. These inspections were so called official inspections which I personally had been authorised to perform although I performed them on behalf of the company I represented.

On being asked in general about these inspections and maintenance works I will state that in practice I was onboard the Viking Sally annually on a trip during which we inspected i.a. problems with other cargo handling gear on location. I thus obtained an idea of the problem at hand by observing the gear in actual operation. These inspections were performed annually, always in the beginning of May, before the summer season started.

#### Problems with the visor and the bow ramp

On now being asked what problems the visor itself or the bow ramp were suffering from I will state that in addition to the rubber packing problem there were no problems apart from one which was the exchange of a joint bearing on the upper part of the visor actuator which appeared in 1990.

The said bearing had broken and had also broken the stud inside the bearing. The bearing and stud were then replaced. The job was done in the spring of 1990 and the work itself was performed en route from Turku via Stockholm to Turku. At that time the vessel was already sailing as the Silja Star. The work was performed by Mac Gregor Navire. I was responsible for the performance of the job.

#### Visor locks

On being asked what service or maintenance works the company I represented performed on these over the years I will state there were none. In my opinion no works were ever performed on the visor locks through the years. As far as I know they developed no problems. Had there been problems with the visor locks I and the company I represented would surely have been advised, since our customer relationship with the shipping line was at all times very close and confidential. On being asked I will state that Sally Line related very 'respectfully' towards these locking devices and would therefore surely not by themselves have commenced working on them, had they developed problems, but the work would have been delegated to specialists in the field.

#### The Atlantic lock

On being asked whether the company I represented performed any service or maintenance work on the Atlantic lock of the visor I will state that we did not. No defect was ever observed with the Atlantic lock.

The company I represented still annually inspected this lock. No visual defect or defect in operation was found. The lock always worked without problems. On being asked I will state that these

inspections also included inspecting the moving bolt of the locking device as well as the lower lugs which engage the bolt on closing.

During the inspection the signal lights of the locking devices and operation of the limit switches were also inspected. The inspection of lights and switches was performed and noted both on the bridge and on the car deck, at the operating panel close to the ramp. I do not recall ever encountering anything out of the ordinary at these inspections either. Had anything special appeared during these inspections the matter would certainly have been rectified.

I do, however, recall in relation to these signal lights that the mechanical limit switches, which signalled close or open visor locks, were replaced at some stage and exchanged for inductive switches, because the original limit switches did not stand up well to humidity which now and again was able to enter the space between the visor and the ramp past the visor.

I do not with certainty recall whether exchange of the above switches was performed by the company I represented or by the vessel's own electricians. This work was, however, done sometime in the mid 80's.

#### Inspections in general

As stated above the company I represented commenced performing the said inspections on the said vessel in 1981 - 1982 when the vessel was the Viking Sally. These inspections were always performed regularly and annually until the spring of 1992, when the vessel was called Wasa King. During 1990, before this, during a period of less than a year the vessel was also called Silja Star.

When the vessel was sold to Est-Line at the end of 1992 the service and maintenance works of the company I represented came to an end onboard the vessel. The company I represented performed no work on behalf of Est-Line.

Read, checked and accepted: signature  
Witnessed: signature  
Present: signature  
Heard by: signature

*Note: The hearing was finished at 1255*

358 9 455 0619 FIN MSE

22.09.22. 09:09 358 21 892511

MacGREGOR-NAVIRE (FIN) Oy  
Marine Services Unit

Enclosure 3.4.100

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|------------------------------|--------------------|---------|----------|------|
| <b>MacGREGOR-NAVIRE</b>      | No.                | Date    | Our ref. | Page |
|                              |                    | 22.9.92 | T.MÄKI   | 1/1  |
| TO: <b>TURKU REPAIR YARD</b> | REF: MIS WASA KING |         |          |      |
| ATTN: <b>BORIS KUJALA</b>    | TARJOUS            |         |          |      |

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TARJOUS

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Stig Lindström berättade vidare: När man befann sig på bryggan var det 2 faktorer som spelade en viktig roll i hur mycket man kunde se av fartygets för, för det första var man befann sig på bryggan och för det andra hur lång man var. Manöverpanelen täckte nästan hela "framkanten", men det fanns platser där man kunde komma ända fram till förskottet och gick man ända fram dit, så såg man en del av själva fören. Detta om man var av normal längd. Men, om man stod bakom instrumentpanelen så såg man i princip ingenting av fören, bara gösen.

- Eftersom Viking Sally (sedermåra Estonia) inte var byggd som "ett vanligt fartyg" utan hade bryggan förskjuten någon bakåt, var uppsikten över fören slätre. Framför bryggan och 2 däck därunder fanns ett promensdäck som delvis skyddade.

Vid mörker kastades en del ljus från fartygets främre fönster fram mot fören och på den gös som fanns på bogvisiret fanns ett styr-ljus i toppen. Detta gjorde att man vid mörker kunde se något av fören.

Stig Lindström tror att det kan ha varit ganska vanskt att från bryggan se om bogvisiret hade öppnat sig under färd utan att man direkt misstänkte detta. Han tror inte att man rutinmässigt kunnat se detta. Däremot fanns det lampor i en kontrollpanel på bryggan som visade om bogvisiret var öppet eller stängt. Man hade också bogvisiret under uppsikt med hjälp av dessa kontrolllampor. Naturligtvis såg man vid angöring till kaj att bogvisiret öppnade sig, var öppet eller stängt, och ju mer öppet det var ju mer såg man av visirat.

Under den tid Sig Linström seglat på Viking Sally hade de enligt hans uppfattning inte haft några, som han ser det, problem med bogvisiret, men däremot hade man blivit tvungna att göra en förstärkning på en läsanordning vid ett tillfälle.

Några restriktioner eller direktiv över hur fartyget skulle framföras vid hårt väder mod grov sjö fanns inte under den tid han seglade på Viking Sally. Däremot var man tvungen att dra ner på farten eftersom fartyget var så pass utsvänt i fören, annars hade