

Evacuation plan 1

Enclosure 2.4.4.51

							
17. 10. 1979							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Nr.</td> <td style="width: 50%;">Art. der Änderung</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">Datum:</td> <td>Name:</td> </tr> </table>		Nr.	Art. der Änderung			Datum:	Name:
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Modellab:	Jos. L. Meyer Papenburg (Ems) Schiffswerft, Maschinenfabrik, Dockbetrieb						
Datum:	17.10.79						
EVACUATION PLAN 1							
Gewerk:	Schiffs Nr.	Sektion Nr.	Zeichn. Nr.	Archiv Nr.			
	90		02114	G.1			

Signal lights plan

Enclosure 2.4.4.52

20. 2. 1980

		Art der Änderung	Datum	Name
<i>Meldetext:</i>	Jos. L. Meyer, Papenburg (Ems) Schiffswerft, Maschinenfabrik, Dockbetrieb			
<i>Datum:</i>	20.2.80			
<i>Gewerk:</i>	Schiff Nr.: 500	Seitfahrt Nr.:	Zeichen. Nr.: 61/3	Archiv Nr.: G.1
396179/317				

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

Untitled Document

**The German Group of Experts
investigating the sinking of M/V "ESTONIA"**
c/o AHLERS & VOGEL · Schaeffter 1 D-2045 Hamburg · Telephone 49-40-371075

Memo for Dr. Holtappels

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

- Attendants:

Multilainen	- 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).

- 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.

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.

- 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.

The German Group of Experts
investigating the sinking of M/V "ESTONIA"
2nd Meeting FBN on 27.10.95

5

- 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



Passenger ship safety certificate (temp)

 MATKUSTAJA-ALUKSEN TURVALLISUUSKIRJA SÄKERHETSCERTIFIKAT FÖR PASSAGERARFARTYG	SUOMI FINLAND																																												
<p><u>Kansainvälisellä matkalla.</u> <u>lyhyelle kansainväliselle matkalle.</u></p> <p>för <u>en</u> <u>kort</u> internationell resa.</p> <p>Annettu ihmishengen turvallisuudesta merellä vuonna 1960 tehdyn kansainvälisen yleissopimuksen määritysten mukaisesti Utfärdat enligt bestämmelserna i internationella konventionen om säkerhet för människoliv till sjöss, 1960</p>																																													
Enclosure 2.4.4.55																																													
Aluksen nimi Fartygets namn	Tunnus- kirjaimet lgenkänning- bekräftever	Kolpalkka Hemort	Bruttovägoitus Bruttodräktighet	Tiedot III luvun 27 säännön cl 7 kohdalla mukaan Bruttovägoitus Detaljer berörfards över tulla resor, tillfina enl. kapitel III, regel 27 cl 7	Kölönlaekemispalv Datum, då kölen sträcktes																																								
VIKING_SALLY	OYKJ	Mariehamn	15566,89		1979																																								
<p>Minä, allekirjoittanut, todistan:</p> <ol style="list-style-type: none"> I. Etta kysymyksessä oleva alus on asiamukaisesti kattavasti edellä mainitun sopimuksen määritysten mukaisesti. II. Etta kattauksessa todettu aluksen liityttävin sanottuun sopimukseen liittyviin sääntöjen vastimukset, sikillä kuin kysymyksessä on: <ol style="list-style-type: none"> 1. aluksen rakenne, pää- ja apukätilät ja muut paineistat sekä koneisto; 2. vedenpitämän osastolimiten järjestely ja yksityiskohtat; 3. seuravat osastolimitatilivarat; 																																													
<p>Jag, underskricknad, bestryker:</p> <ol style="list-style-type: none"> I. Att ovan angivna fartyg undergått vederbörig besiktning enligt bestämmelserna i ovan nämnda konvention. 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"> 1. konstruktionen, huvud- och hjälplagnpannor och andra tryckkärl samt maskineri; 2. anordning och detaljer av den vattenlära rumsindelningen; 3. följande indelningarattenlinjer: 																																													
<table border="1" style="width: 100%;"> <tr> <td colspan="2" style="width: 25%;">Alukselle määritetyt ja sen kylkoon piltoon keskikohdalle määritetyt vedenpitämästilivarat keskikohdalle määritetyt vedenpitämästilivarat ja laiva-alusten säännöt</td> <td colspan="4" style="width: 75%;">Varalaita Fribord</td> </tr> <tr> <td colspan="2"></td> <td colspan="4" style="text-align: center;">Käytettävä milloin matkustajia kuljetetaan seuraavissa vaihtoehtoista matkailuna käytettävissä tiloissa Galler ob passagerare förs i följande, jämväl för fast användbara rum</td> </tr> <tr> <td style="width: 15%;">För fartyget fastställda och endekopiga 3 fartygsidorna utmärkta indelningar vattenlinjer (Kap. II regd 11)</td> <td>C. 1</td> <td>2062 mm</td> <td colspan="4"></td> </tr> <tr> <td></td> <td>C. 2</td> <td></td> <td colspan="4"></td> </tr> <tr> <td></td> <td>C. 3</td> <td></td> <td colspan="4"></td> </tr> <tr> <td></td> <td></td> <td>1230</td> <td colspan="4"></td> </tr> </table>						Alukselle määritetyt ja sen kylkoon piltoon keskikohdalle määritetyt vedenpitämästilivarat keskikohdalle määritetyt vedenpitämästilivarat ja laiva-alusten säännöt		Varalaita Fribord						Käytettävä milloin matkustajia kuljetetaan seuraavissa vaihtoehtoista matkailuna käytettävissä tiloissa Galler ob passagerare förs i följande, jämväl för fast användbara rum				För fartyget fastställda och endekopiga 3 fartygsidorna utmärkta indelningar vattenlinjer (Kap. II regd 11)	C. 1	2062 mm						C. 2							C. 3								1230				
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<p>III. Etta pelastusvenälinceti oli riittävästi erilaista ... henkilöä varten, nimittäin</p> <p>18... pelastusvenettä (niihin luetutina ... 18... moottoripelastusvenettä), joihin mahtuu ... 692... henkilöä, ja ... radiosähkö- tydäitteellä ja valonheittimellä varustettua moottoripelastusvenettä (mitkä sisältävät edellä mainittuun pelastusveneiden kokonaismäärään), joista veneksi tulee olla ... 390... hyväksytty pelastusvenemiesti;</p> <p>12... pelastusauttaa, joita varien vaaditaan hyväksytty vesilleskulailettai ja joille mahtuu ... 1275... henkilöä; ja</p> <p>51... pelastusauttaa, joita varien ei vaudita hyväksytty vesilleskulaileita 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 radiotelegrafinstallation och strålcastare (infäknade i det ovan angivna sammanlagda antalet livbilar) åvensom ... motor- livbåtar utrustade endast med strålcastare (också infäknade i ovan angivna sammanlagda antalet livbåtar), förförande ... godkända livbåtmän;</p> <p>12... livbåtar, för vilka fordras godkända sjösättninganordningar, tillräckliga för ... 300... personer; och</p> <p>51... livflottar, för vilka godkända sjösättninganordningar icke fordras, tillräckliga för ... 1275... personer;</p>																																													

6	kulumavälinettä, jotka kykenevät kannattamaan 120 henkilöissä;
18	pelastusengasta;
227	pelastusliiviä.
6	flytredskap, tillräckliga för personer;
12	livbojar;
2298	livvistar.

IV. Ett pelastusveneet ja pelastusaluit ollut varustettu sääntöjen määrysten mukaisesti.
 V. Että pelastusveneellä määrysten mukainen nuorenheittoalais sekä pelastusveneiden ja pelastuslaitojen siirrettävä radiolaite.
 VI. Että alus täytti radiosähkötydälteitä 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 Fördringar enligt reglerna	Todellisuudessa I verkligheten
Radiosähkötytäjän kuuntelutunten määrä	HS	HS
Lysningstimer för radiotelegrafist	1	1
Radiosähkötytäjien lukumäärä	Antal radiotelegrafister	1
Onko automaattinen hälytin	Finnes automatlarm	1
Onko pääradioalaitet	Finnes huvudinstallation	1
Onko vararadioalaitet	Finnes reservinstallation	erilliset separata
Onko pääradioalaitet	Onko päälaite ja varalaite sähköisesti erilliset vai yhdistetyt Aro huviidänsä ja reservländare elektriskt separata eller kom- binerade	erilliset separata
Onko radioasennustimilaitet	Finnes radiopilotapparat	1
Salitut matkustajajärjestä	Iyhyillä kansainvälisillä matkoilla	1100
Tiläisei ainoi passagere	För kort internationell resa	1100

- VII. Ett mötter pelastusveneiden radiosähkötydälteit 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, luostikkat sekä laitteet sini- ja härämerkkien antamista varten näiden sääntöjen määrysten ja kansainvälisen meriteiden määntöjen 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 överens-
 stimmelse 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 ljudsignaler och nödsignaler enligt bestämmelserna i dessa regler och i de internationella sjöväggreglerna.
 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 päivänä heinäkuuta/juli 86
 Todistuskirja on voimassa 19.....maka.

Certifikatet gäller intill den
 Annettu Helsingissä 27 päivänä juni/kesä kuuta 19.....
 Utfärdat i Helsingfors den

Allkjohtajan ilmoittaa olevansa mainittujen hallituksen sallinutkaisesta valtuuttama antamaan tähän todistuskirjan.
 Undertecknad förklarar sig vara en nämnda regering behörigen bemynthdigd att utfärdta detta certifikat.

Leima 10 r-
 Stämpel mk.
 HD N:o Morenkuluntarkastaja
 HD N:o Sjöfartsinspektör Jari Janson

Passenger ship safety certificate (temp)



PASSENGER SHIP SAFETY CERTIFICATE

FINLAND

Enclosure 2.4.4.56

for ~~360~~
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, mentioned under Regulation 27 (c) (VIII) of Chapter III	Date on which keel was laid
VIKING SALLY	OIKN	Marihamn	15566,88		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 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		

- III. That the life-saving appliances provide for a total number of **1280** persons and no more, viz.:
- 10** lifeboats (including **10** motor lifeboats) capable of accommodating **692** persons, and **—** motor lifeboats fitted with radiotelegraph installation and searchlight (included in the total lifeboats shown above) and **—** motor life-boats fitted with searchlight only (also included in the total lifeboats shown above), requiring **—** certificated lifeboat-men;
- 12** liferafts, for which approved launching devices are required, capable of accommodating **300** persons; and **51** liferafts, for which approved launching devices are not required, capable of accommodating **1275** persons;
- 6** buoyant apparatus capable of supporting **120** persons;
- 18** lifebuoys;
- 2298** 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	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:.....

Passenger ship safety (permanent)


MATKUSTAJA-ALUKSEN TURVALLISUUSKIRJA
SÄKERHETSCERTIFIKAT FÖR PASSAGERARFARTYG
SUOMI
FINLAND

Kort för internationell resa.
 Matkalle.
 Tyypille kansainväliselle.

Enclosure 2.4.4.57

Annettu ihmishengen turvallisuudesta merellä vuonna 1960 tehdyn kansainvälisen yleissopimuksen määritysten mukaisesti
 Ut lärdat enligt bestämmelserna i internationella konventionen om säkerhet för människor i till sjöss, 1960

Aluksen nimi Partytgets namn	Tunnus- koodin- lämäntnings- bokstaver	Koripaikka Hamnen	Bruttoeteväsus Bruttodräktighet	Tiedot III luvan 27 sää- nön c) ja kohdan numero 100, salvoitettuna Detaljer beträffande even- tualna resor, tillståns nr: kapitel III, regel 27 c)	Kölinskeimpäivä Datum, då kölen sträcktes
VIKING SALLY	OTMA	Maarianhamina Mariehamn	15566,95		1575

Minni, allekirjoittanut, todistan:

- I. Ettå kysymyksessä oleva alus on asiamukaisesti kattavasti edellä mainitun sopimuksen määritysten mukaisesti.
- II. Ettå kattavuudessa todettu aluksen syytävin sanoitettu sopimukseen liittyvien sääntöjen vaatimukset, sikäli kuin kysymyksessä on:
 1. aluksen rakenne, pää- ja apukotilat ja muut paineistat sekä koneisto;
 2. vedenpäivän osoitointien järjestely ja yksityiskohtat;
 3. seuraavat osastotilatilivirat:

Jag, underskricknad, bestyrker:

- I. Att ovan angivna fartyg undergått vederbörlig besiktning enligt bestämmelserna i ovannämnda konvention.
- II. Att besiktningen utvisade, att fartygget uppfyllde fordringarna i de regler, som är bifogade närmsta konvention, i vad avser:
 1. konstruktionen, huvud- och hjälplängpannor och andra trycksläkt samt maskineri;
 2. anordning och detaljer av den vattenätta rumsindelningen;
 3. följande indelningsvattenlinjer:

Alukselle määritetyt ja sen kykyeen pituuden keskikköihin ja niiden suhteisiin määritellivät (luvan 11 sääntö)	Varalaita Frärbord	Käytettävissä milloin matkustajia kuljettavaa seuravissa suhteissä määritellään laivatiloja käytettävissä tiloissa Ettå fartypet färsställd och määrskaps å fartysidorna utmärkta indelnings- vattenlinjer (Kap. II regel 11)
C. 1	2282 m³	
C. 2		
C. 3		

- III. Ettå pelastusvälineillä oli riittävistä eri tasoista henkilöitä varten, nimittäin
 - 1.1 pelastusveneillä (niihin luetuina 10 motoripelastusvenettä), joihin mahtuu 692 henkilö, ja radiesihkösäädistelijä ja valonheittimellä varustettua moottoripelastusvenettä (mitkä sisältyvät edellä mainittuun pelastusveneiden kokonaismäärään) ja vain valonheittimellä varustettua moottoripelastusvenettä (mitkä myös sisältyvät edellä mainittuun pelastusveneiden kokonaismäärään), joissa vesisuo tulee olla 300 hyväksyttyä pelastusvenemicisti;
 - 1.2 pelastuslautta, joita varren vasittaan hyväksytty vesillelaikulaitteet ja joille mahtuu 1275 henkilö; ja
 - 5.1 pelastuslautta, joita varren ei vauduta hyväksyttyjä vesillelaikulaitteita ja joille mahtuu 1275 henkilö;
- III. Att livräddningsredskopen varo tillräckliga för högst personer, nämligen
 - 1.0 livbåtar (där inräknade motorlivbåtar) tillräckliga för personer, och motorlivbåtar försedda med radiotelegrafinstallation och strålkastare (inräknade i ovan angivna sammantagna antalet livbåtar) åvensom motorlivbåtar utrustade endast med strålkastare (exkl. inräknade i ovan angivna sammantagna antalet livbåtar), fordrande godkända livbåtmän; 300
 - 1.2 livfötter, för vilka fordras godkända sjösättninganordningar, tillräckliga för personer; och
 - 5.1 livfötter, för vilka godkända sjösättninganordningar icke fordras, tillräckliga för personer;



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
.....	motor lifeboats
fitted with radiotelegraph installation and searchlight (included in the total lifeboats shown above) and			
..... motor life-			
boats fitted with searchlight only (also included in the total lifeboats shown above), requiring			
certified lifeboat-			
men;			
12		300	
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

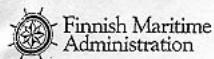
The undersigned declares that he is duly authorised by the said Government to issue this certificate.

Inspector of Navigation


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

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.

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.

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.

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.

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.

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.

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



Delivery certificate

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 23³⁰ 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

Paperkings, 29th June, 1980

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.

Rederiaktiebolaget Sally

Sven-Erik Johansson
Sven-Erik Johansson
for the Owners

Jos. L. Meyer
Jos. L. Meyer
as Builders

TOOQ

SA MEIER MELT

06/07 10:37 24+19 1981 01300

Handing over report

Enclosure 2.4.5.62

Jos. L. Meyer, Papenburg-Ems Schiffswerft, Maschinenfabrik, Dockbetriebe																	
Car and Passenger Ferry "VIKING SALLY" 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 1,186 cabin places 110 officers and crews 1,650 seats in restaurants, bars, clubs, etc. 52 lorries w. trailers (18 m) 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 1,186 cabin places 110 officers and crews 1,650 seats in restaurants, bars, clubs, etc. 52 lorries w. trailers (18 m) or 460 passenger cars
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- 2 -

2000

JUNIOR MEYER HS SE 00018 T089 84-02 17:01 '86 10/90

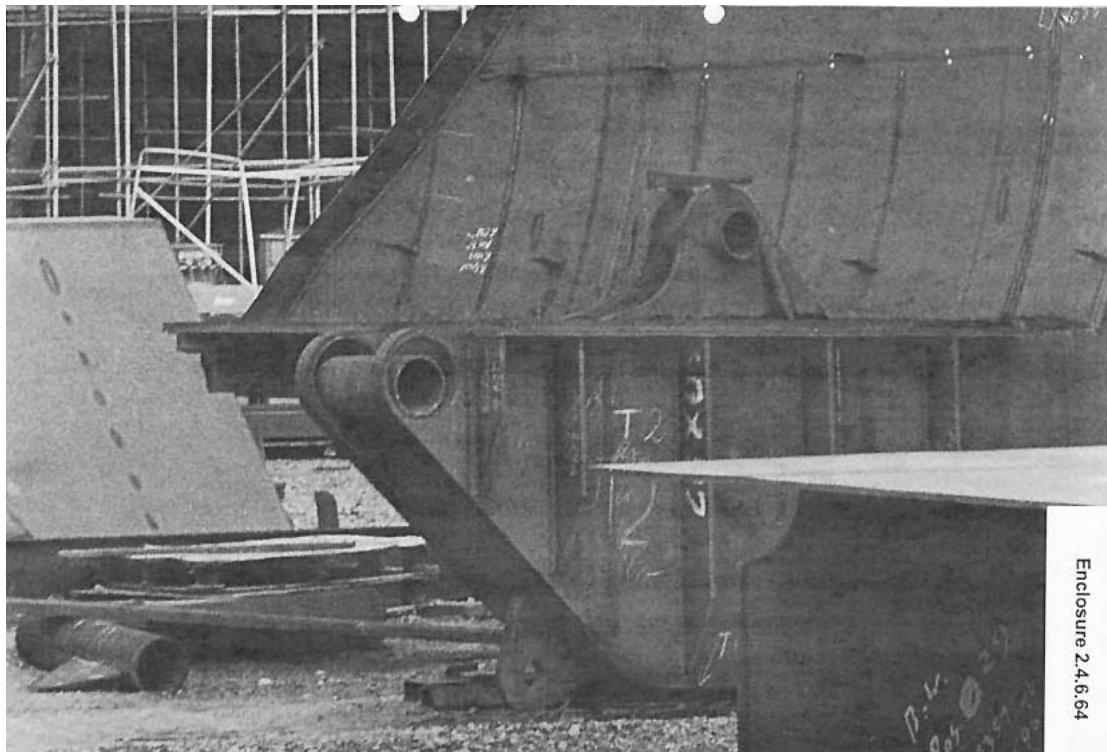
Jos. L. Meyer, Papenburg-Ems <small>Schiffswerft, Maschinenfabrik, Dockvertrieb</small>	
- 2 -	
<p>The following facts may give an idea of the expenditure of work involved in the construction of such a big ferry:</p> <ul style="list-style-type: none"> - About 280 km cables were laid out, i.e. 1.6 km cable/m of ship. - About 30,000 m² areas were insulated, as much as 6 football fields or a small farm. - 460 passenger cars can be transported on this vessel, i.e. a 2.1 km long line of cars. - 1,300 beds and more than 1500 doors were installed. - 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. <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>	

Photos showing fore ship area

Enclosure 2.4.6.63



Detail photo of the starboard visor hinge plate



Enclosure 2.4.6.64

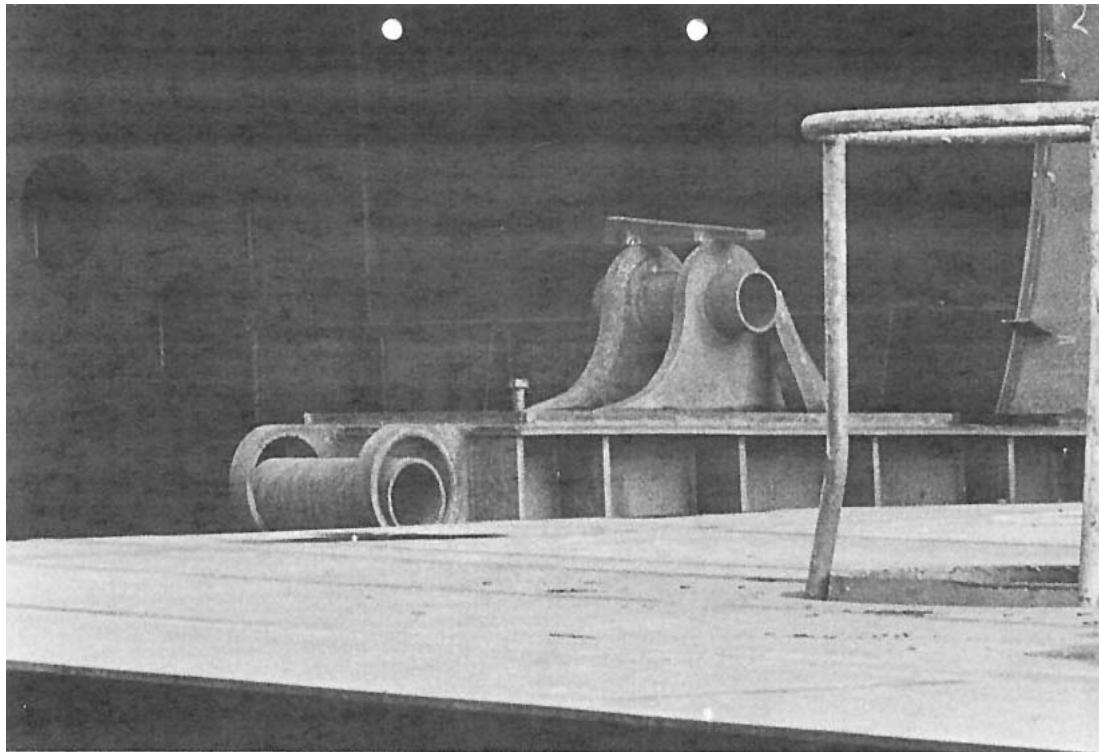


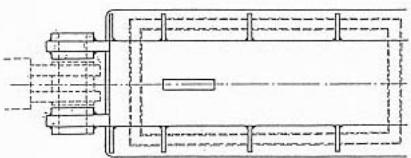
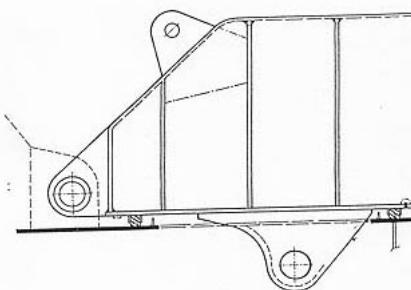
Photo showing visor at the vessel without hinge connection



Enclosure 2.4.6.6E

Drawing arrangement if the visor hinges

Enclosure 2.4.6.6E



Arrangement of deck hinges

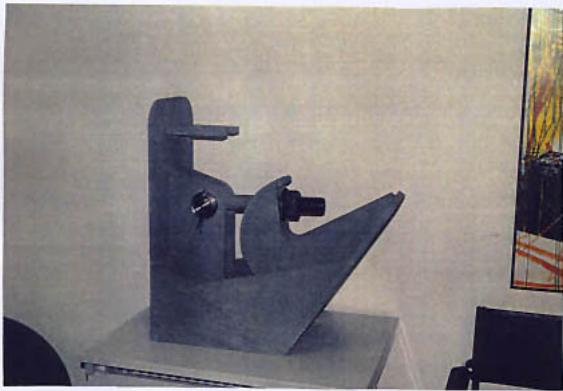
Photo viking sally with open visor and bow ramp



Enclosure 2.6.2.67

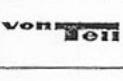
Untitled Document

Enclosure 2.6.2.68



Part of von tell manual

	Enclosure 2.6.2.69 6:19
<p>II. BOW VISOR</p> <p>1) Construction</p> <p>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.</p> <p>2) Maintenance</p> <p>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).</p> <p>All piston-rods and cylinders should be covered during painting. Dry paint spirits upon the surface of the piston-rod would spoil the cylinder packings within short time, what means undesirable leakages.</p> <p>Check all hoses, hose connections and pipe connections to prevent leakages. Damaged components should be replaced if necessary in order to avoid interruption.</p> <p>The hose connections should be painted, but not the hydraulic hoses.</p> <p>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.</p> <p>3) Locking device (25)</p> <p>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).</p> <p>In open position the bow visor is locked by 2 locking pins which are hydraulic operated with one hydraulic cylinder (12) each.</p> <p>In closed position the rubber packing is compressed by the sole weight of the bow visor. The rubber packing is fixed with bolts.</p>	



7:19

4) Operation

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.

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.

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.

5) Control

Opening of the bow visor

- 1) Start both of the pumps.
- 2) Open the atlantic locking device and the cleats.
Put the control levers (one by one) in position UPPNA until red lamp indicates UPPEN.
If the manual locking device has been used this has to be opened.
- 3) Check that the lamp for the locking devices indicates UPPEN. If not, open up the locking devices which are locked.
- 4) Open the bow visor. The control lever will be in position UPP until green lamp indicates UPPE.
- 5) Close the locking device. The control lever will be in position LASA until green lamp indicates LAST.
- 6) Lower the bow visor and let it rest on the locking device in order to release the hydraulic pressure in the operating cylinder.
- 7) Switch off the pumps.

Von Hei		
		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 UPPA until red lamp indicates OPEN.
- 5) Close the bow visor. The control lever will be in position NER until green lamp indicates HERE.
- 6) Lock the cleats. The control lever will be in position LASA until green lamp indicates LAST.
- 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.)

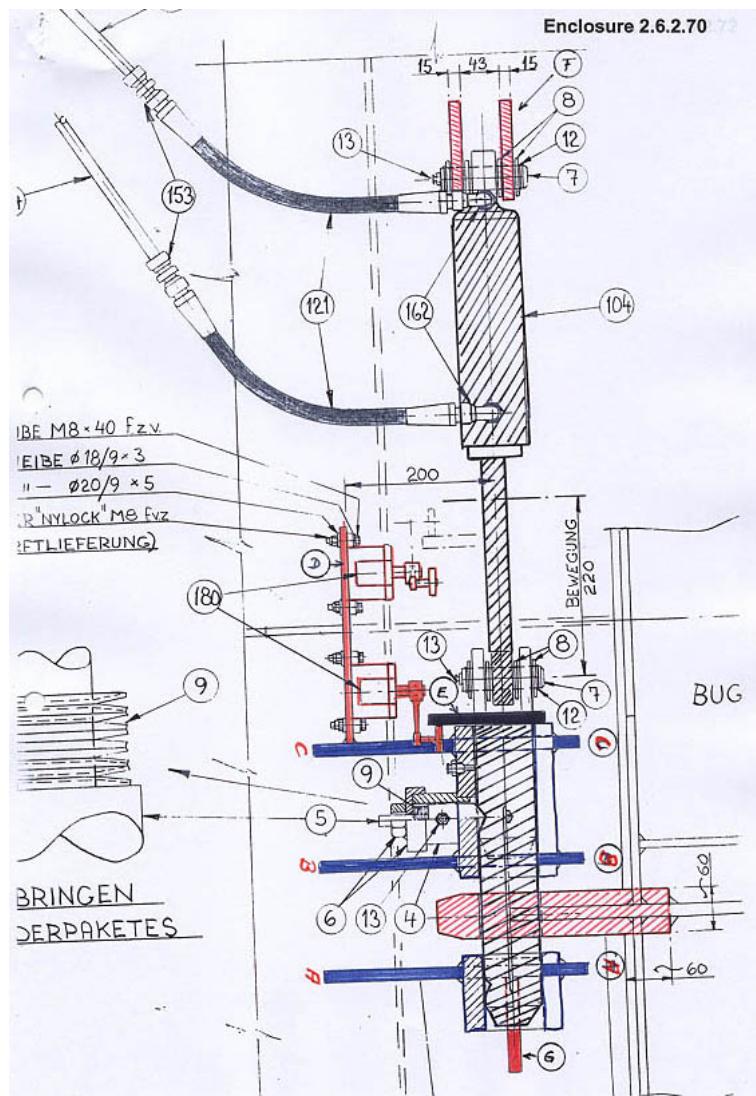
The ramp is pivoted to the ship with 4 hinges. The two outer hinges are provided with spherical bearings and the two inner with bronze bushes. The axles are of stainless steel.

The ramp is equipped with fastenings for preventer stays.

2) Maintenance

See item I. pos. 2).

Drawing atlantic lock



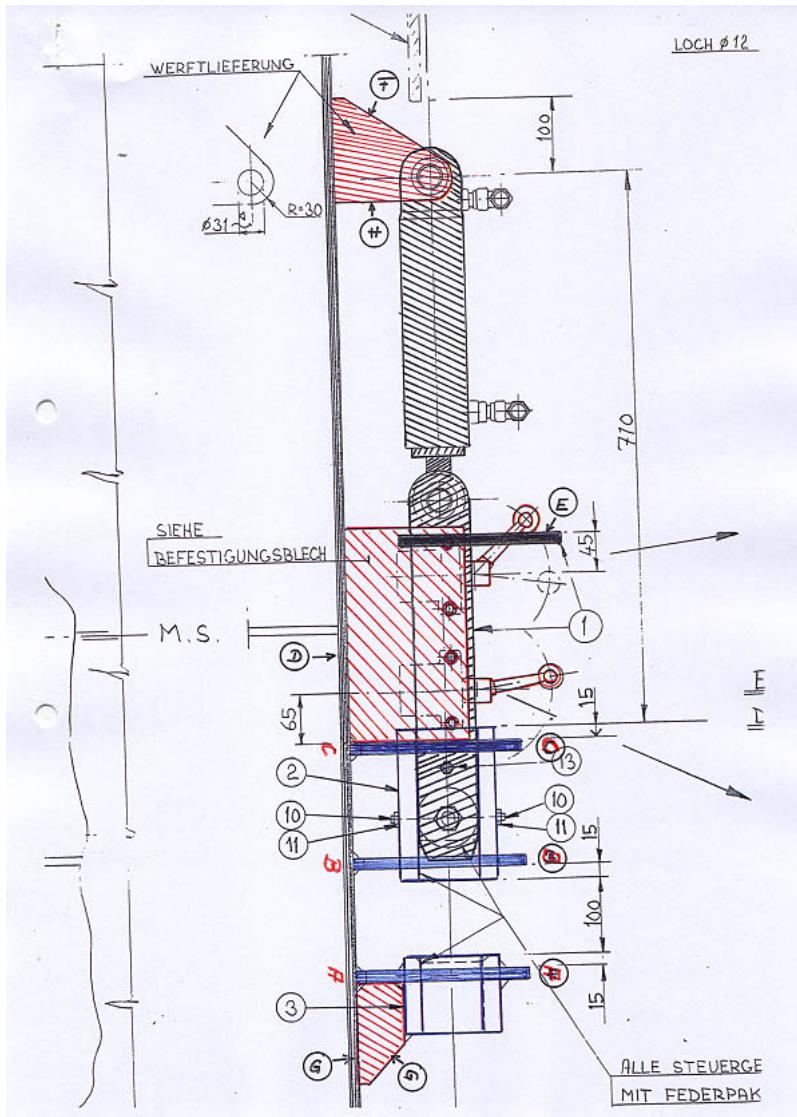


Photo estonia



Enclosure 2.6.2.71

Photo car deck of estonia

Enclosure 2.6.2.72

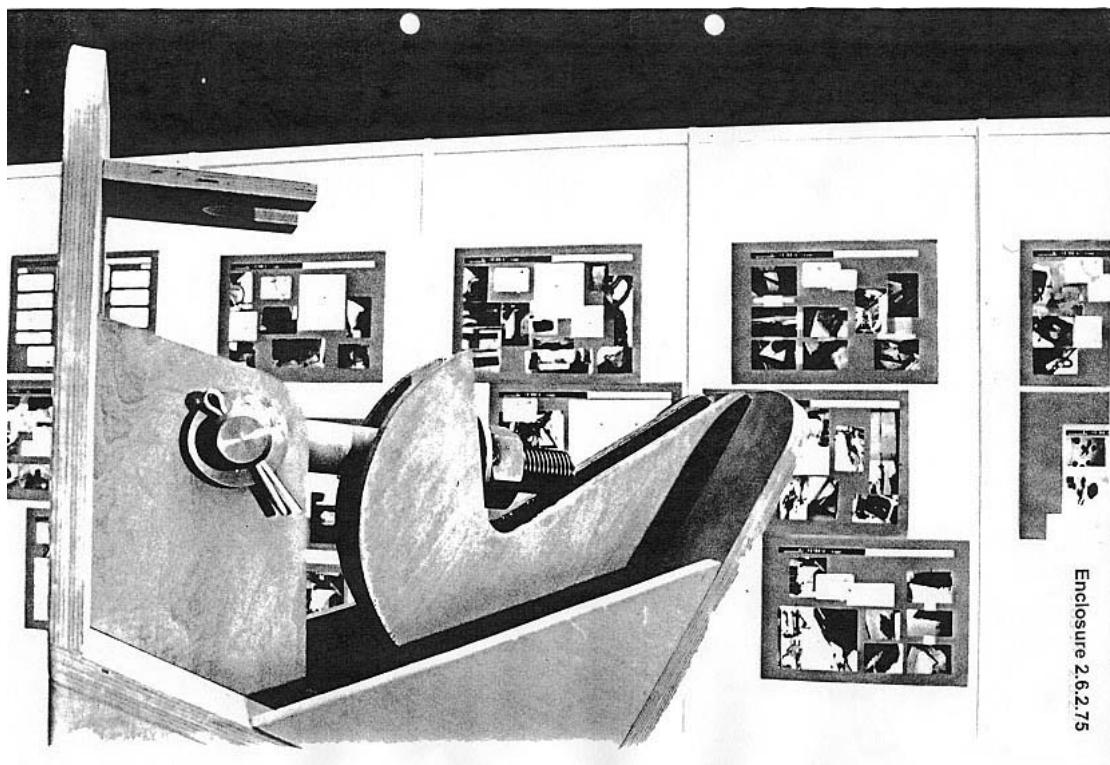


Photo showing hydraulic an manual side locks

Enclosure 2.6.2.74



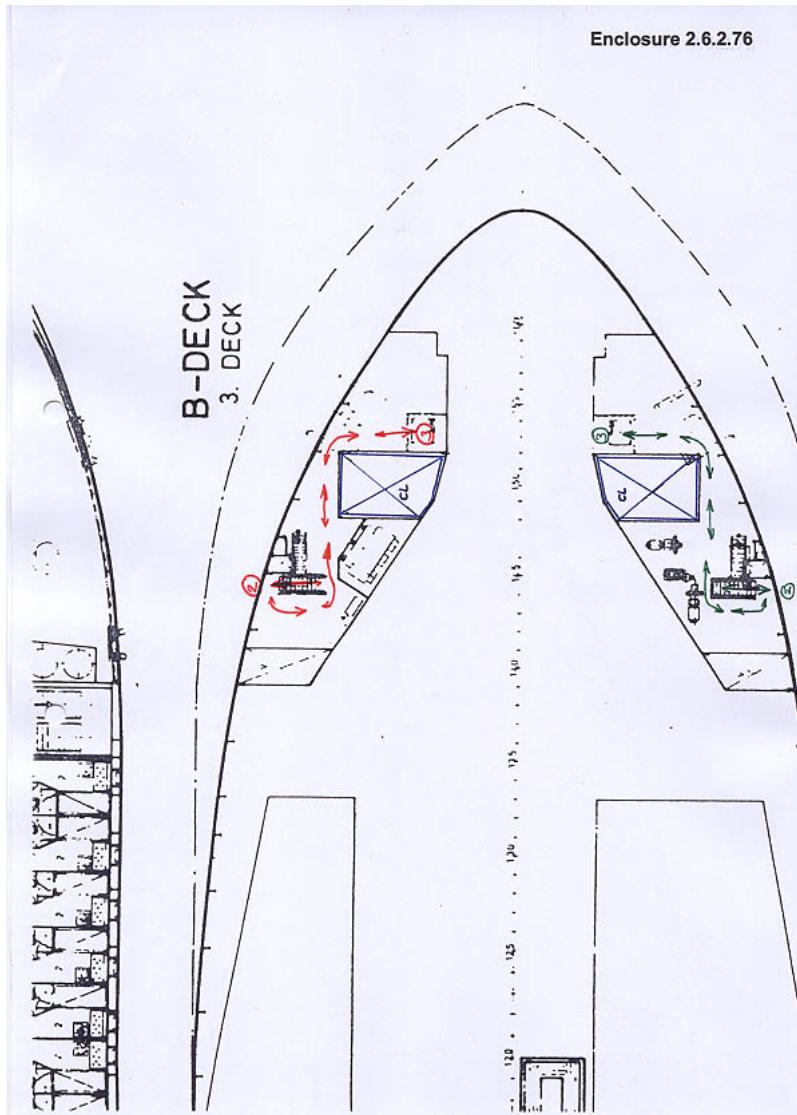
Photo showing mock up of side lock

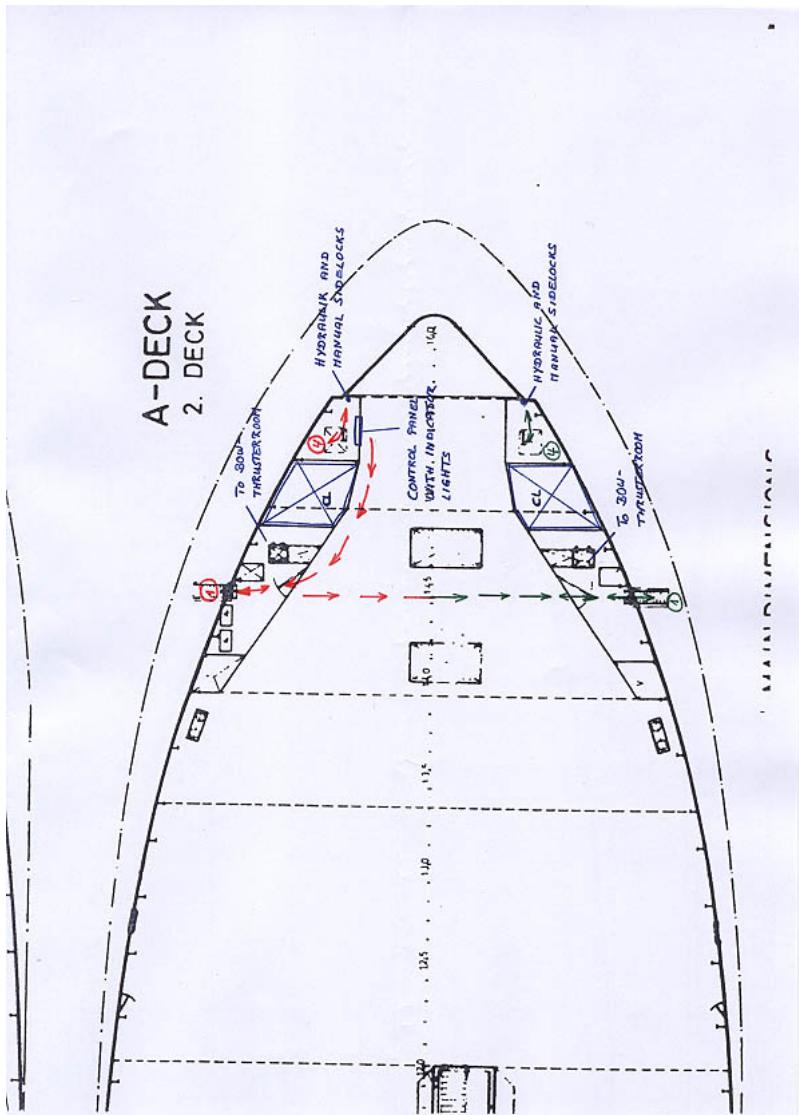


Enclosure 2.6.2.75

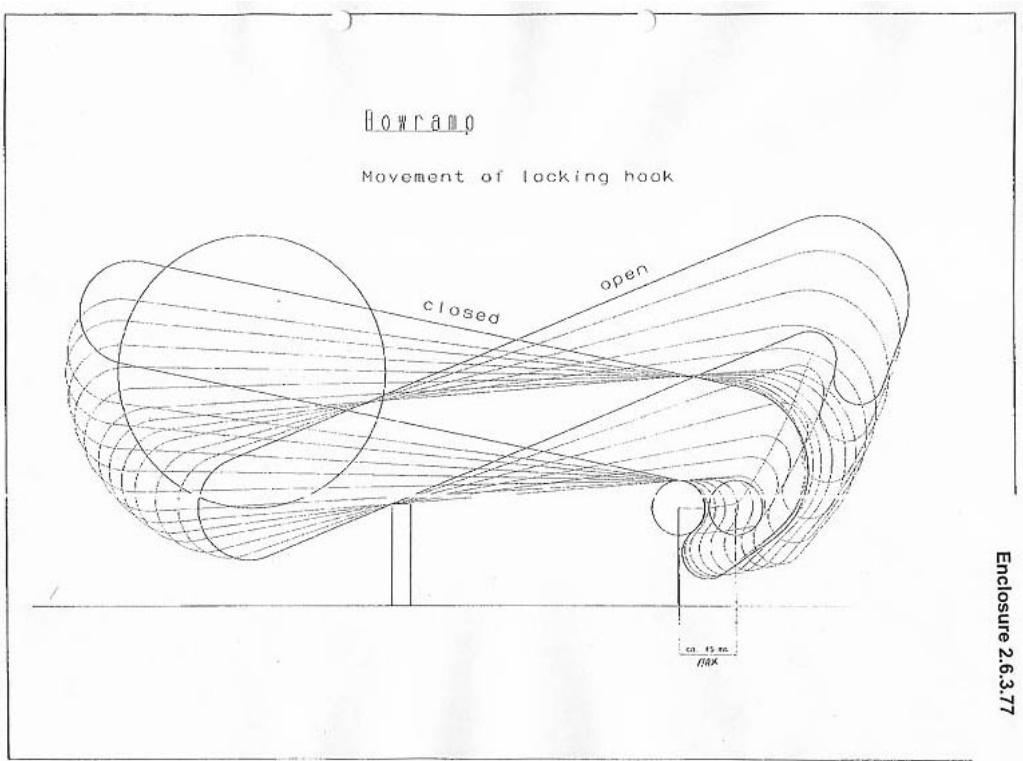
Drawings showing way from control panel

Enclosure 2.6.2.76



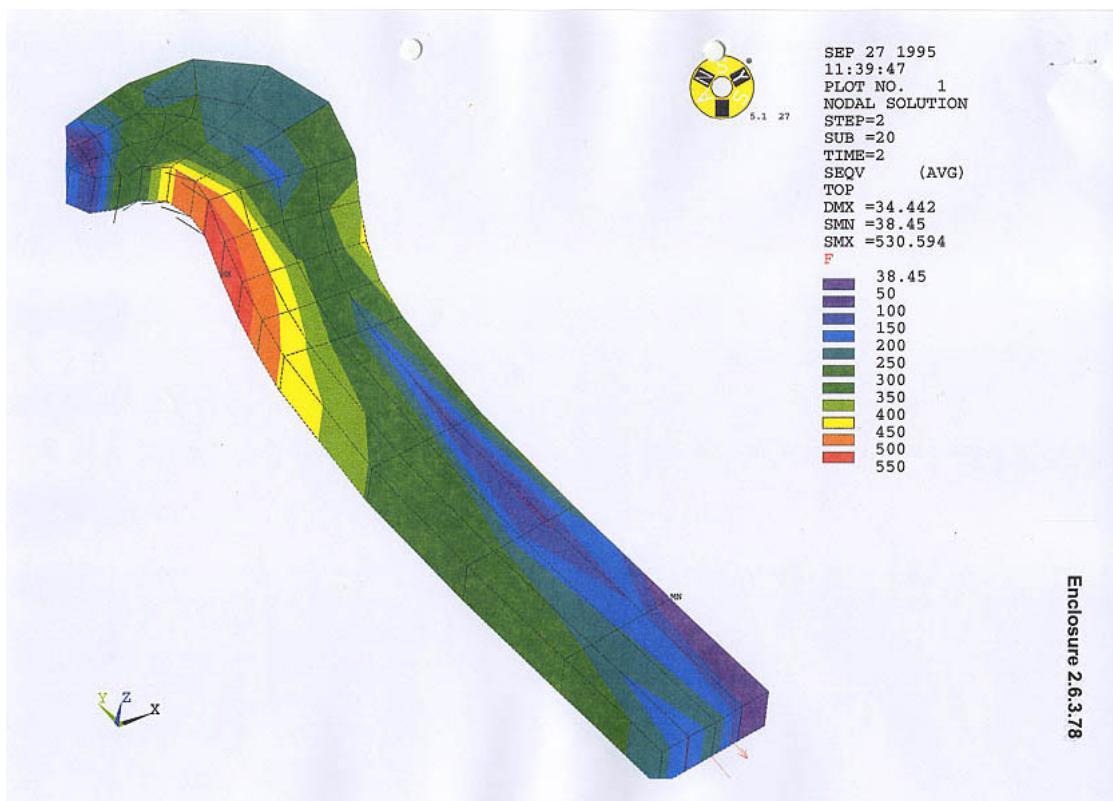


Drawing showing moving range of locking hook



Enclosure 2.6.3.77

Load distribution on bow ramp hooks 2



Enclosure 2.6.3.78

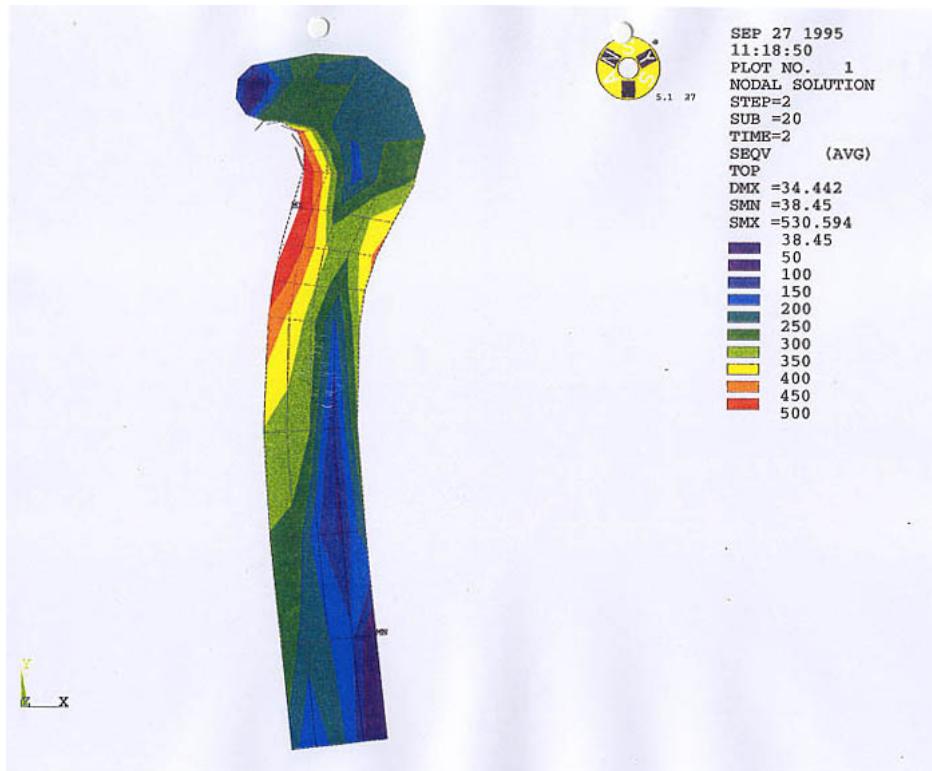
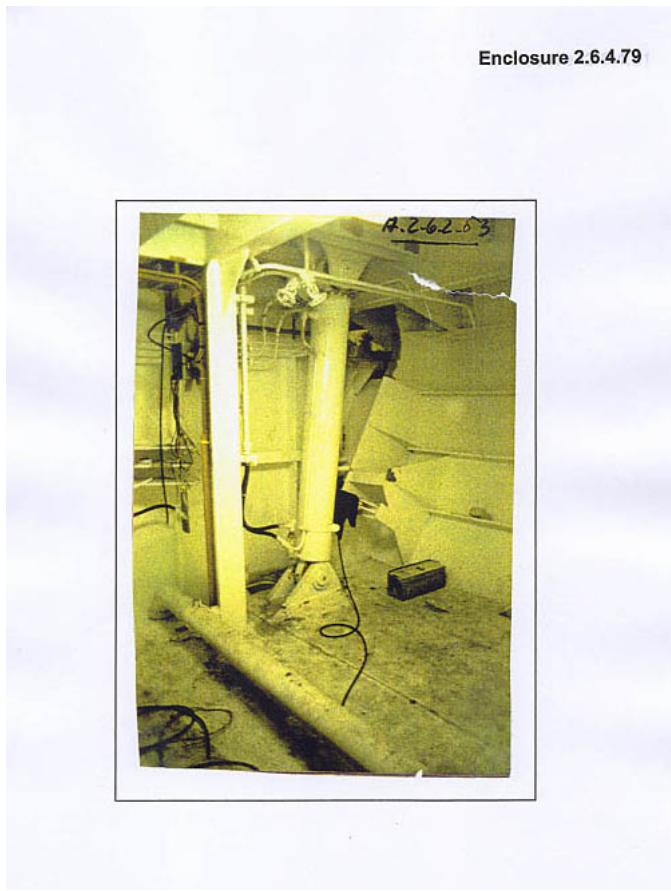
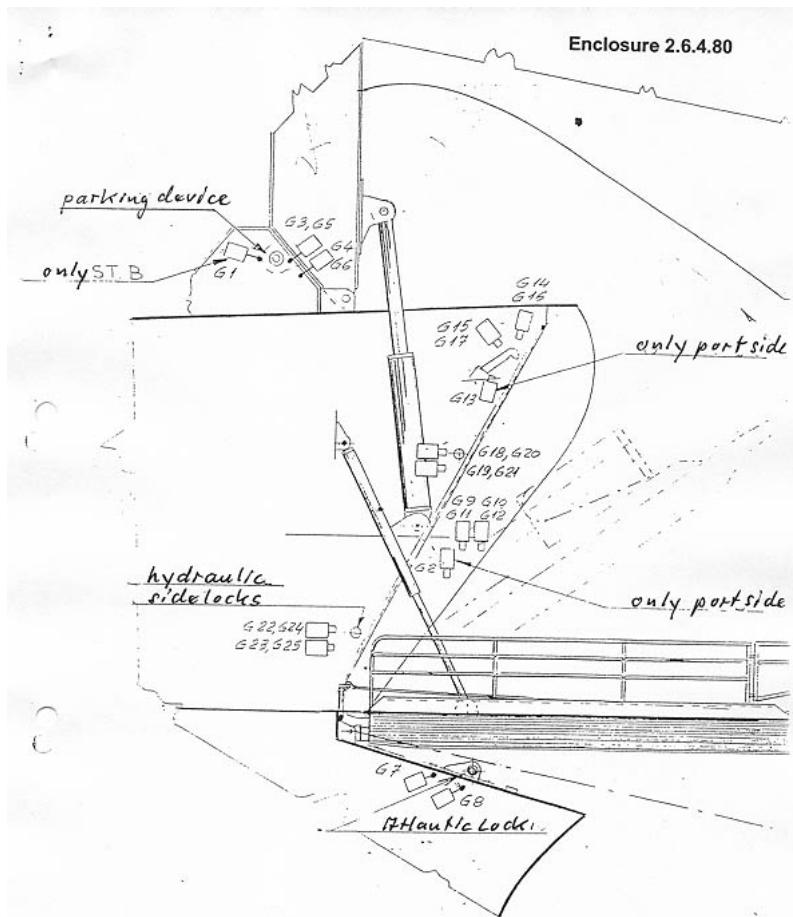


Photo B deck with lifting cylinder



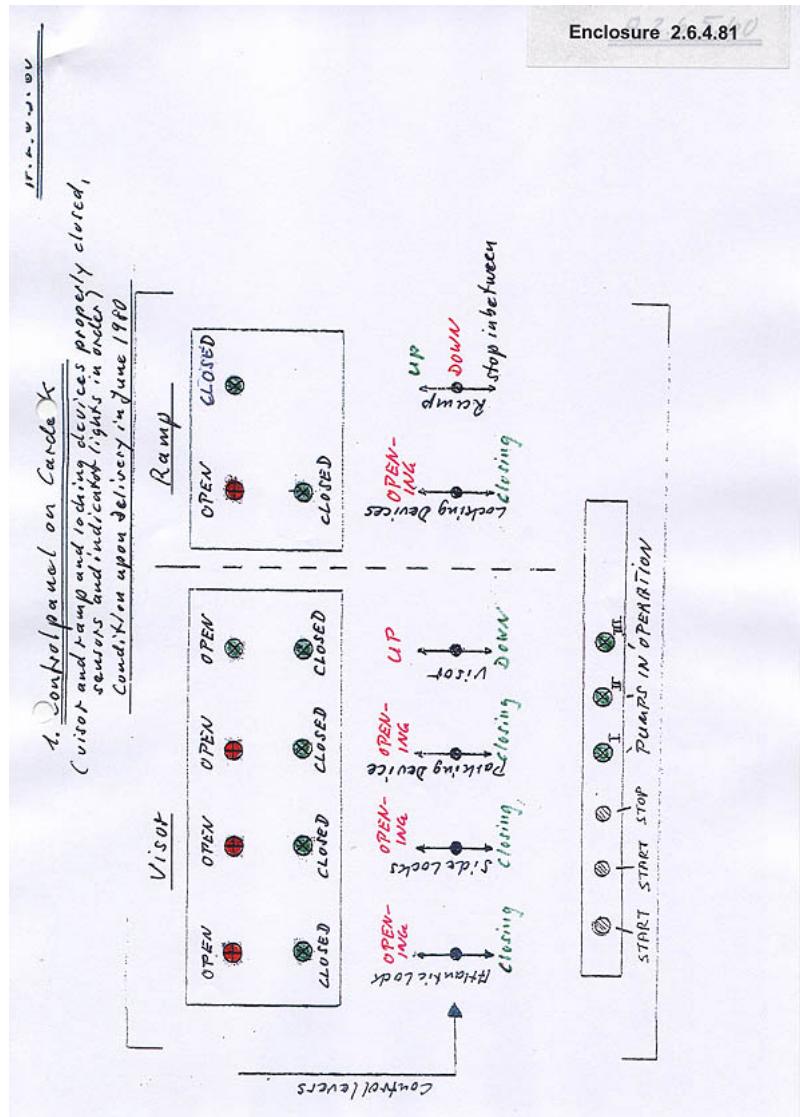
Drawing with sensors part of drawing 49111-871

Enclosure 2.6.4.80

Bowvisor and RampPart of drawing
49111-871

+ STAHLECKI

Drawing of control panel on car deck condition june 1980



Solas 1992 edition chapter V

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

Interview juhani luttunen

**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.

Trim and stability booklet

4/8/2021

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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ACCOUNT 571066-22441

SHIP CONSULTING

CONTENTS

General particulars	1
General	2
Combination table for loading cases	3
Loading cases:	
LC1 Light ship	4-5
LC2 Ballast condition at departure	6-8
LC3 Ballast condition at arrival	9-11
LC4 Ship with full bunkers and stores + 2000 passengers at departure	12-14
LC5 Ship with full bunkers and stores + 2000 passengers at arrival	15-17
LC6 Fully loaded to draught 5.567 m, 47 trailers and 2000 passengers at departure	18-20
LC7 As case 6 but 50 % of bunkers and stores	21-23
LC8 As case 6 but 10 % of bunkers and stores	24-26

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

SHIP CONSULTING

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/m³) : T = 5.567 M 12708 T

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

COMBINATION TABLE FOR LOADING CASES

CASE NO	LOADING CONDITION	HFO	FW	PASS	CARGO	WB	DWT	MEAN DRAUGHT	TRIM	GM'	GM _{SEQ}
		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

SHIP CONSULTING WASA KING 20.01.1991 4

LOAD CASE 1

LIGHT SHIP

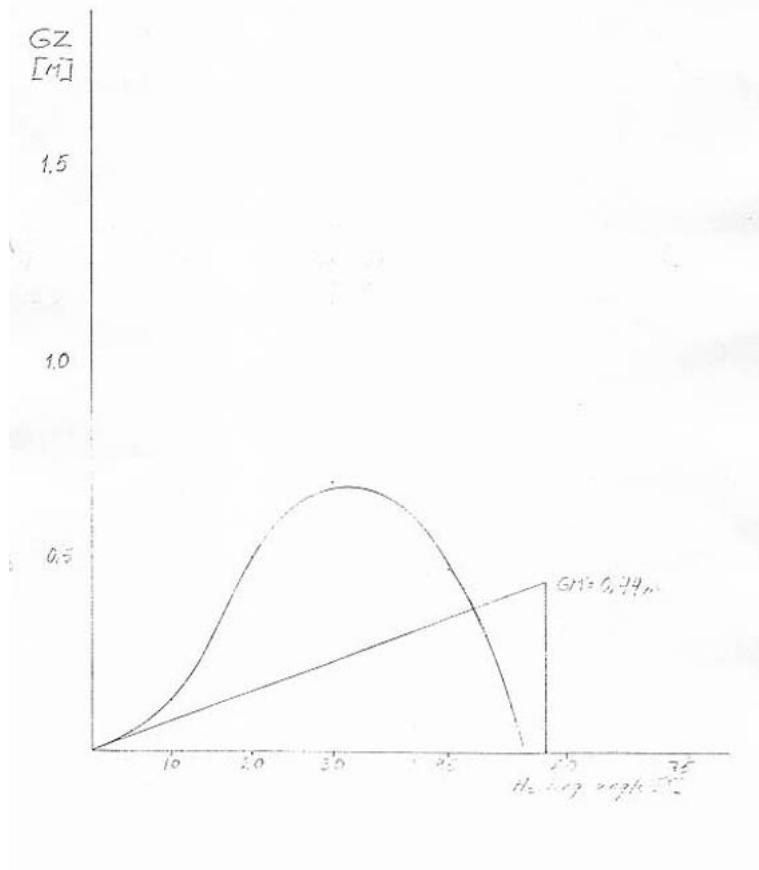
	Weight t	VCG from BL m	Mom tm	LCG from A_{pp} m	Mom tm	Free surf tm
Light ship weight	9733	11.56	112513	60.76	591377	-
Dead weight		"				
Displacement	9733	11.56	112513	60.76	591377	

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 Turku Finland	LOAD CASE 1 LIGHT SHIP	WASH KING 20.01.1991/VMT
----------------------------------	---------------------------	-----------------------------



LOAD CASE 2

BALLAST CONDITION AT DEPARTURE

	Weight t	VCG from BL m	Mom tm	LCG from A_{pp} m	Mom tm	Free surf 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

Fresh Water					
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	

Water Ballast					
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	

Dead weight	2307	2.71	6247	75.17	173419 4331
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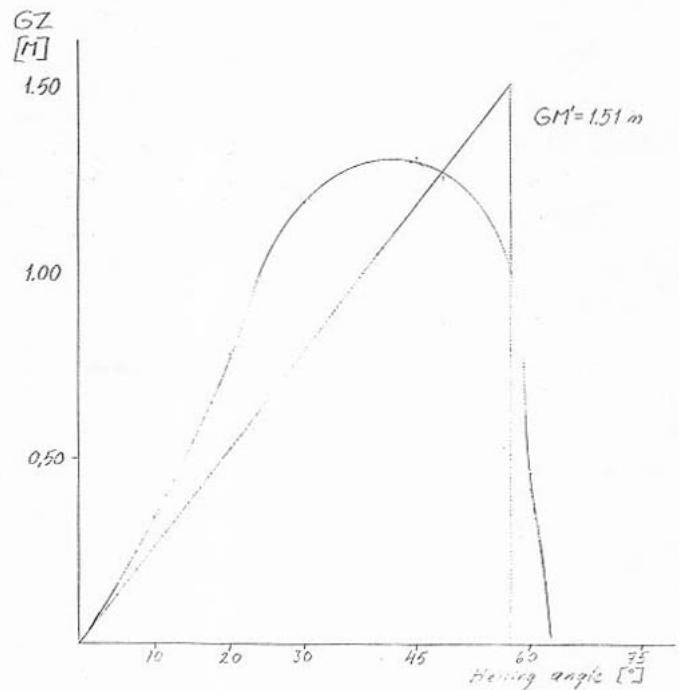
Displacement	12040	9.86	118760	63.52	764796 4331
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Mean draught	5.33 m	KM	11.73 m		
Trim	-0.64 m	KG	9.86 m		
Draught aft	5.65 m	GM	1.87 m		
Draught forw	5.01 m	MM'	0.36 m		
		GM'	1.51 m		

Calculation of curve of statical stability

Heeling	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 Turku Finland	LOAD CASE 2 BALLAST AT DEPARTURE	WASA KING 20.01.1991/vmj
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LOAD CASE 3

BALLAST CONDITION AT ARRIVAL

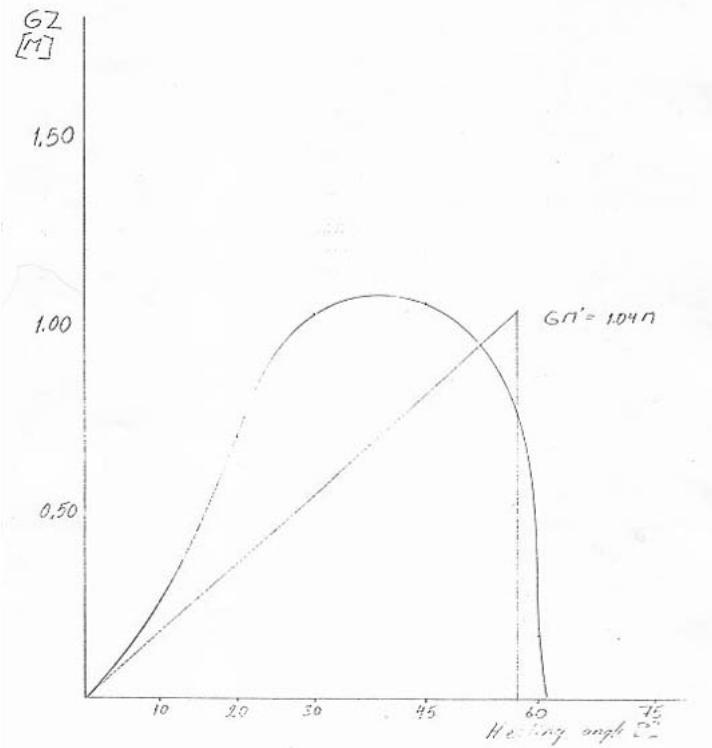
	Weight t	VCG from BL m	Mom tm	LCG from A_{pp} m	Mom tm	Free surf tm
Light ship weight	9733	11.56	112513	60.76	591377	
Crew + effects	20	22.00		55.00		
Provisions + stores	15	10.00		46.00		
Heavy Fuel Oil						
Day tank 36	24	2.82		36.23		
Day tank 37	18	2.81		36.62		
Settling tank 38	30	2.90		32.20		
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		
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
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 Turku Finland	LOAD CASE 3 BALLAST AT ARRIVAL	WASH LINE 20.01.1991/VMJ
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SHIP CONSULTING WASA KING 20.01.1991 12

LOAD CASE 4

SHIP WITH FULL BUNKERS & STORES + 2000 PASSENGER AT DEPARTURE

	Weight t	VCG m	Mom tm	LCG A_{pp} m	Mom tm	Free surf 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

Fresh Water				
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

Water Ballast				
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

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
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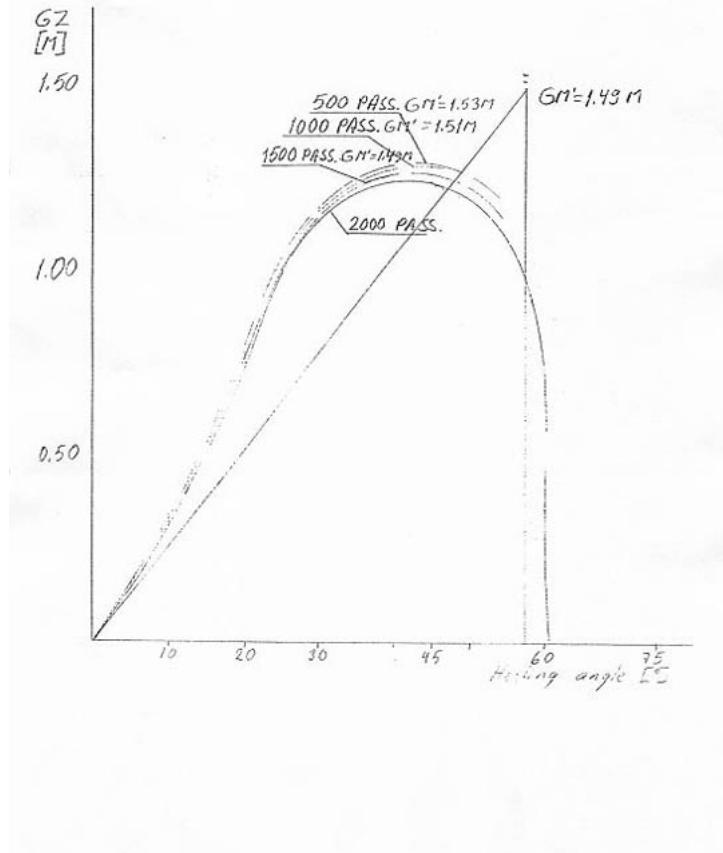
Displacement	12340	9.94	122720	63.68 785756 4331
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Mean draught	5.44 m	KM	11.78 m	
Trim	-0.51 m	KG	9.94 m	
Draught aft	5.70 m	GM	1.84 m	
Draught forw	5.19 m	MM'	0.35 m	
		GM'	1.49 m	

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 Turku Finland	LOAD CASE 4 FULL BUNKERS + 2000 PASS. AT DEPARTURE	WASA KING 20.01. 1991/WM
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SHIP CONSULTING

WASA KING

20.01.1991

15

LOAD CASE 5

SHIP WITH FULL BUNKERS AND STORES + 2000 PASSENGERS AT ARRIVAL

	Weight t	VCG from BL m	Mom tm	LCG from A _{pp} m	Mom tm	Free surf 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	160		

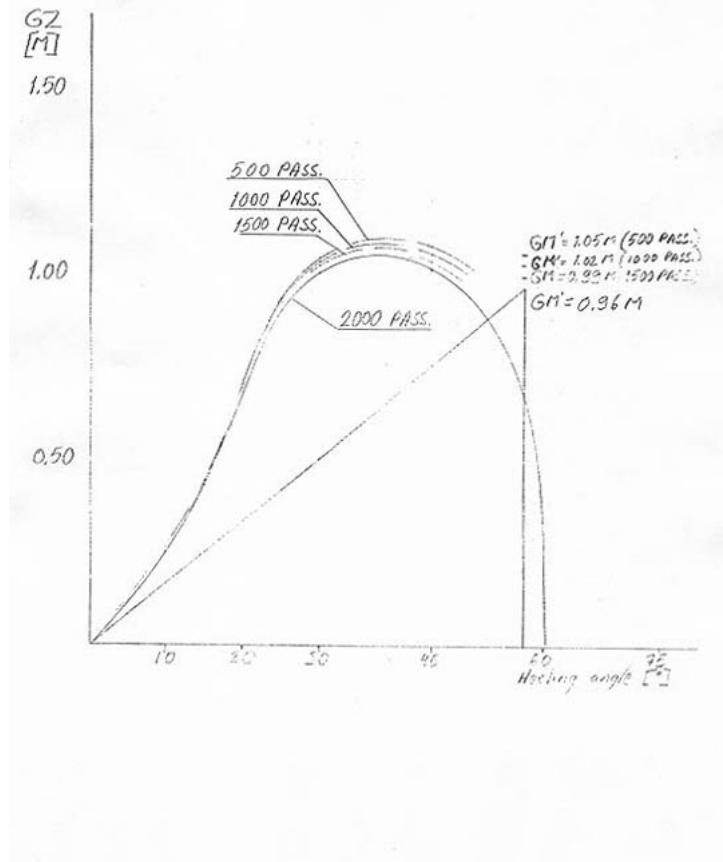
Dead weight	1555	5.23	8132	85.72	133294	470
Displacement	11288	10.69	120646	64.20	724671	470

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 Turku Finland	LHD CASE 5 FULL BUNKER +2000 PASS. AT ARRIVAL	WASH KING 20.01 1991/VM7
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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 t	VCG from BL m	Mom tm	LCG from A_{pp} m	Mom tm	Free surf 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

Fresh Water						
Tank 4a	75	2.79	114.25			
Tank 4b	75	2.79	114.25			
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	287	2.51	106.10	138		

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			

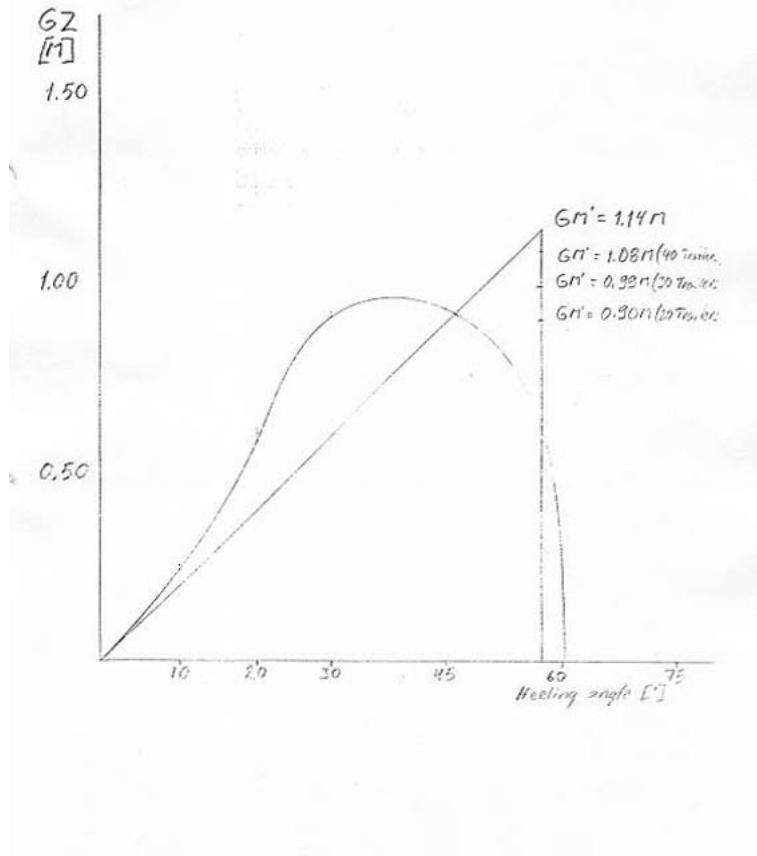
Dead weight	2975	7.40	22022	69.71	207381	1251
Displacement	12708	10.59	134536	62.85	798758	1251

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 Turku Finland	LOAD CASE 6 FULLY LOADED TO DRAUGHT 5.567 m AT DEPARTURE	WASH KING 20.01 1991/VI/17
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SHIP CONSULTING

WASA KING

20.01.1991

21

LOAD CASE 7

AS CASE 6 BUT 50 % OF BUNKERS AND STORES

	Weight t	VCG from BL m	Mom tm	LCG from Δ_{LP} m	Mom tm	Free surf 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

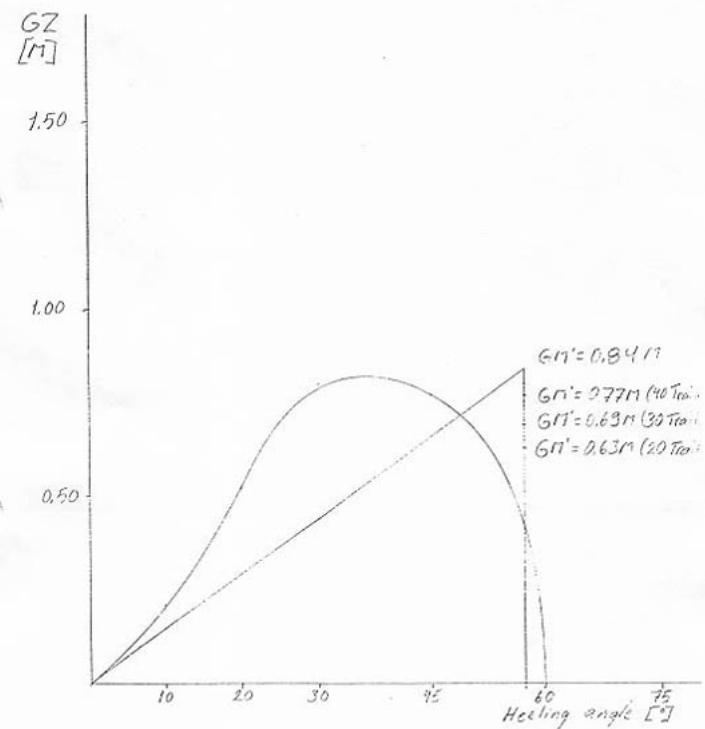
Displacement 12391 10.86 134560 63.17 782688 968

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 Turku Finland	LOAD CASE 7 FULLY LOADED TO DRAUGHT 5.567M BUT 50% BUNKERS	WASA KING 20.01 1991/VMJ
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SHIP CONSULTING

WASA KING

20.01.1991

24

LOAD CASE 8

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

	Weight t	VCG from BL m	Mom tm	LCG from A_{pp} m	Mom tm	Free surf 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		

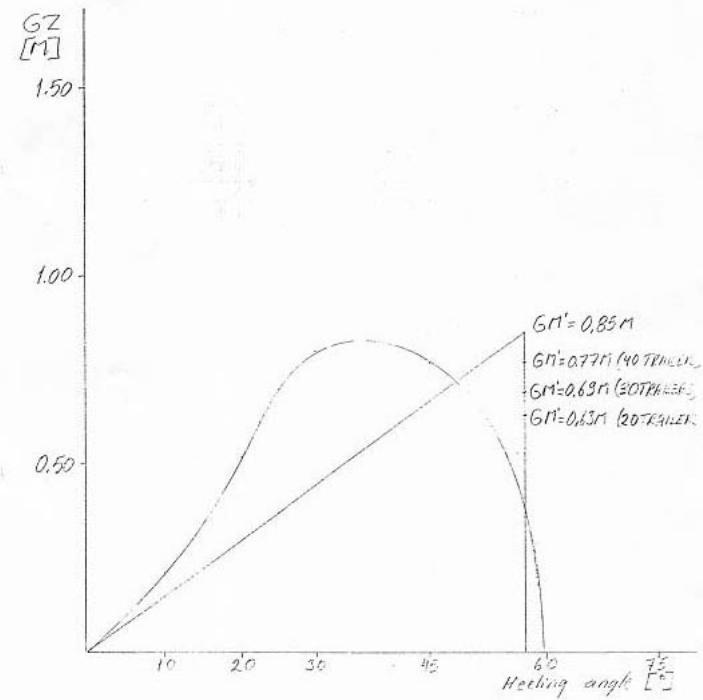
Dead weight	2694	8.52	22959	77.87	209790	470
Displacement	12427	10.90	135473	64.47	801167	470

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 Turku Finland	LOAD CASE 8 FULLY LOADED TO DRAUGHT 5.567 M AT ARRIVAL	WASA KING 20.01.1991/VM7
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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

- a) Enter the individual weights (light ship, crew and provision, tank contents, cargo weights) into the column WEIGHT.
- b) Ascertainment of the c.g. above base line of the individual weights (see enclosed documents) and enter in the column OH.
- c) Multiplication of individual weight with the belonging to centers of gravity. Enter into column MH.
- d) Addition of the individual weights. Enter into column $\Sigma G = \textcircled{1}$.
- e) Addition of the vertical moments. Enter into column $\Sigma MH = \textcircled{2}$.
- f) Division of $\textcircled{2} = \textcircled{3} = KG$. Enter into column 5.
KG = C.g. above baseline of the loaded vessel.

- 3 -

- 3 -

- g) Ascertainment of the longitudinal C.G.'s of the individual weights (see enclosed documents) and insert in column ΘL .
- 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 Θ
 ΘL = 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 -

- 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.

ΔMG = 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 ΔMG 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_L (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 ΔMG 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 ΔMG 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

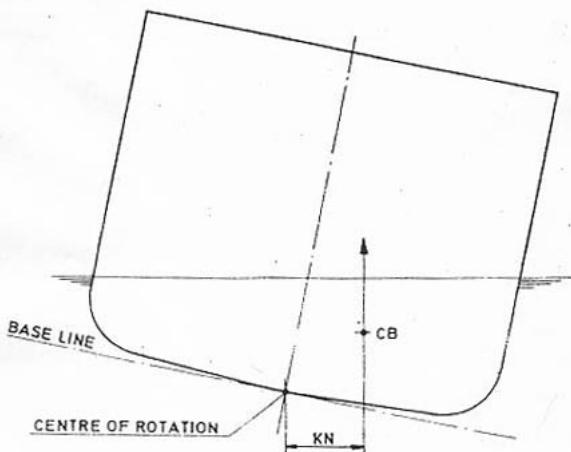
REMARK:

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
PAPENBURG EMS

BUILDING NO 590

MAIERFORM
6891.01-171.200
-1-

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

 DRAFT: DISPL.: INCLINATION (DEGREES)
 8K. SEA-
 (4) (1) 10 20 30 45 60 75

 3.50 7256.0 2.33° 4.73° 6.69° 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 9467.0 2.15° 4.47° 6.48° 8.65° 9.54° 9.15°
 4.45 9585.0 2.15° 4.45° 6.47° 8.64° 9.53° 9.13°
 4.50 9703.0 2.14° 4.44° 6.46° 8.64° 9.52° 9.12°
 4.55 9822.0 2.13° 4.43° 6.45° 8.64° 9.51° 9.11°
 4.60 10041.0 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

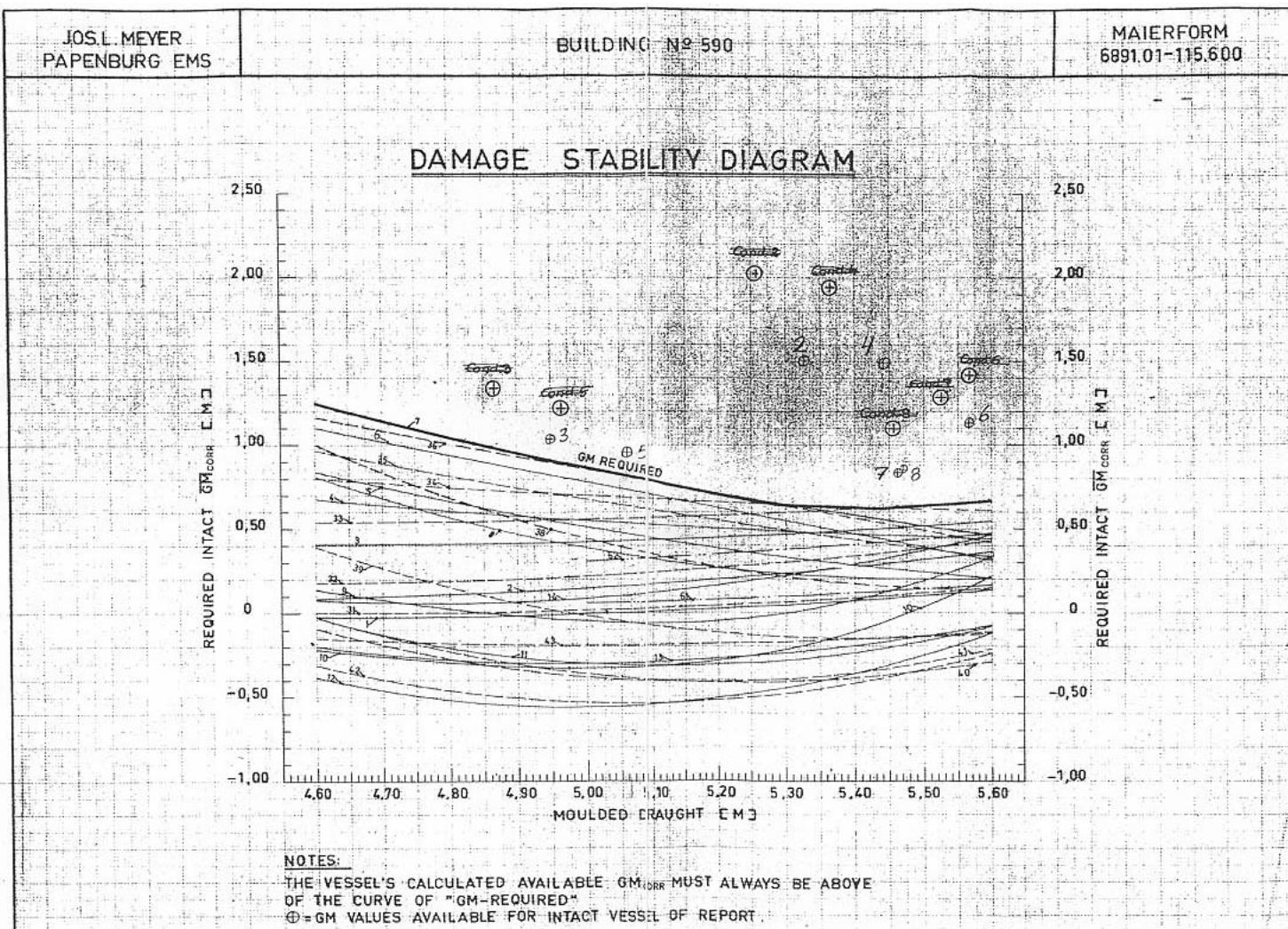
 DRAFT: DISPL.: INCLINATION (DEGREES)
 8K. SEA-
 (4) (1) 10 20 30 45 60 75

 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 SEAT (I) 10° 20° 30° 45° 60° 75°

Draft (K)	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	14229	2.10°	4.15°	6.16°	8.35°	9.03°	8.74°
6.15	14381	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 PAPENBURG EMS	BUILDING N° 590	MAIERFORM 6891.06-171.120
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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 26TH 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)	(BP)	(BP)		

METRES	H003	METRIC-T.	METRIC-T.	METRES	METRE	METRES	H002	METRES	H004	METRES	HT/M	-	T/CM	-	-
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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 90403.3 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 PAPENBURG EMS		HYDROSTATIC PARTICULARS										MAIERFOHM GMbH BREMEN		PAGE 6		
<hr/>																
		SPEC.GRAVITY OF SEA-W. = 1.025 T/CBM														
		COEFF.FOR DISPLS. OF STEEL 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	PHM	TA
BK	VOLUME	FRESH-W.	SEA-W.								BP	(DP)	(BP)			
METRES	M ³	METRIC-T.	METRIC-T.	METRES	METRES	M ³	M ³	METRES	M ³	M ³	M ³	M ³	M ³	M ³	M ³	
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.LHEYER
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	LCF	TM	LMI	HCT	D/MCT	T/PC	PHA	TA
BK	VOLUME	FRESH-W.	SEA-W.									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/m³
- 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 MARK	DISTANCE TO SEA- 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 NUM.	WEIGHT 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 NUM.	WEIGHT 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			

4/8/2021

SHIP CONSULTING

PENDEL NUMBER 1 LENGTH OF PENDEL 4455 MM

NAME OF OBSERVERS: TOMI JUNNILA

LOCATION OF PENDEL: ON CARDECK AFTER

CASE NUMB.	1	2	3	4	5	6	7	8	9	10	SUM	MEAN	LIST VALUE
NO OF OBS.													
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.	1	2	3	4	5	6	7	8	9	10	SUM	MEAN	LIST VALUE
NO OF OBS.													
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 NO	PORT SOUN	SIDE CORR	SB-SIDE							
				VOL cm ³	WEIG. t	TCG m	SOUN cm	COR cm	VOL. m ³	WEIG. t	TCG m
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/m³
 DISPLACEMENT 11132 t
 HEIGHT OF METACENTER ABOVE BL 11.69 m

CASE NO	INCLINING		INCLINING ANGLE DIFFER.	TOTAL (DEG)	METACENTRIC HEIGHT GM (M)
	WEIGHT (TON)	MOMENT (TONM)			
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
					1.127

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 (TON)	CENTRE OF GRAVITY FROM		
		LPP/2 (M)	CL (M)	BL (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

Summary of BV inspections

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		

Enclosure 3.4.87

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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 PSEQ PSRAD	Change of name to "ESTONIA" and of Owners/Flag Issuance of interim LL certif.; interim cargo ship 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
OSH	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

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Wasa king certificates issued by FBN

KÄSKÄSTUS-/TÄSKÄSTUSPÖYTÄT 1833

Kiini ja WATSON	Vinko	Hk-palkka ja m- Kotipalika	Vinko	283	Tunnuskirjaimi OIKU
ens. naisi Sinja RENE					Alikseen lajikilauranlaita
Ehitasuosa: 1980 sinet Jens paikka: TADEC-BUZGA			Pituus: 157cm		Lavavaa: 21-22
Alus on avoin <input type="checkbox"/> kannellinen <input checked="" type="checkbox"/> R-kvetoisous: 15596			Pilkkojeni lukumäärä: 4		Kokonaishinta: 1760
Mitoini viihtyeksi sekoitusti: W/90		Mitoini viihtyeksi sekoitusti: NAAHTAHLI			
Laivaniidenki: WATSON		Istutuksia: LAIVANVUORISTO			
		postimeseikat: 65170 VAASTSA			

HUOMAUTUSTA SIVU 11 TUTTU ILLÄTÄVÖT 1650 12.4.20
PÄÄTEHTÄVÄ SIVU 11 SUHDEKUUSI / SEISSÄ PÄÄTEHTÄVÄ
SÄÄTIÖN VÄLILLE GPE ASENNUKSIIN
ASETUKSET 27.4.2011 27.1.02

Kyseessä ollut	Peraus-	Mitä kaikin menin	Vaihto-	Vuosia-	Tilimääränne katsastus
Herrakipulaisuudenkatastos		X			
Koneistuskatastos					
Rungonkatastos					
Radiopäällystyskatastos					
Kirpol-katsastus					

Katsastus/Tagkastus on toimittettu 25.5 / 1 19G 2

KATEASTUS-/TARKASTUSPÖTTÄKIRJA				
Nimi ja	UPEA VILLE	rek.palais ja nro	VAPPU 283	Tunnuskeksijäime OIVU
ent. nimi	SINIA RENE	Kotipaikka	VAPPU	Aukseen laji AURINKAUTIA
Eteenvarsiovi	1980 aine TEOS paikka PÄÄTÄ BUNGA	Pituus:	157cm	Leveys 22-23
Alus on avoin	<input type="checkbox"/> kantellinen	<input checked="" type="checkbox"/> Dr.vetoisuuksia:	1559E	Pääkoneiden lukumäärä: 4 Kokonaisteho: 17600
Milloin viimeksi selakoitu:	11/90	Milta viimeksi selakoitu:	NAANTALI	
Leiväntäntä:		Ikkuna	LAINAVUORISTOJA 12	
<u>VARRELLA OJ</u>				
HOOMAUTUKSIA	SIVU : 13 : 14/14 : RA 17/EGOU : 1680 : 12.82 TÄSSÄ ELLÄ SINNÄKSI STIPULAAT / DECES PROSES ISÄN VAL. LÄHTÉ G.P.S. AGENTTIM KOTIOMAKI 17400 TURKU 271-92			

Kysymys oli:	Pere-	Miekkailukirja	Vatti-	Vuosi-	Ylimääräinen katsastus
Merikelpoisuudenkatsastus		X			
Koneiltoonkatsastus					
Bungonkatsastus					
Radioilmaistidenkatsastus					
Karpel-katsastus					

Katsactus/Tækactus on coimicetus 22.5 / 19.2

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

	KATSASTOSTOISTOS		
NR. 146/ KUUSAKING... Varsa.....			01.kwi. Tunnustusjärjestö
Aluksen nimi Antipaikka			
Rakennusvuosi 1980. Palkka ... PÄÄTE ... Aika ... TE ... J. Br.vetoisuuks ... 15.5.88 Pitkä ... 17.10.2022			
Palkoneiden lukumäärä ... 4. Kokonaistila ... 17.10.2022 Liikenneyhteys ... Lähde ... Väylät ... 6			
Suurin salittu henkilöilmä/katsastustajansiksi			
Rajoitukset			
Katsastuksessa todetut poutteet			
Poutteet korjattava 19.... mennessä. (minimikin 1 kk)			
Poutteet todettu korjatuksi 19.... Tarkastaja/katsastaja			
Alus on tällä perustalla määräaikais ... valtiollinen ylinhallituskeskus ... katsastuksessa hyväksytty klyttettävissä 19.10.1993. Asakka edellytyksellä, että vuosikatsastukset toimitetaan säädyin välein.			
V.A.T.S.I.L. 5225-1992		Jerkka V.A.T.S.A.	
Paikka	Aika	Katsastaja	Katsastuspäri
VUOSIKATSASTUKSET / NIINEN SISÄLTÖISET KATSASTUNSET			
Vuosikatsastus / sen sisältöön katsastus on toimitettu			
..... / 19.... Katsastaja Katsastuspäri			
Paikka Aika			
Vuosikatsastus / sen sisältöön katsastus on toimitettu			
..... / 19.... Katsastaja Katsastuspäri			
Paikka Aika			
Vuosikatsastus / sen sisältöön katsastus on toimitettu			
..... / 19.... Katsastaja Katsastuspäri			
Paikka Aika			
Aluksella on luoituslaitoksen tai MOLIN coditus ilman julkisulkurajoituksia <input type="checkbox"/> Ei ole <input type="checkbox"/>			
Alus on hyväksytty talviilkkiteeseen			
talvikautena 19.... - 19.... / 19.... Katsastaja			
Paikka Aika			
talvikautena 19.... - 19.... / 19.... Katsastaja			
Paikka Aika			
talvikautena 19.... - 19.... / 19.... Katsastaja			
Paikka Aika			
talvikautena 19.... - 19.... / 19.... Katsastaja			
Paikka Aika			

Office translation

CERTIFICATE OF INSPECTION

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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

Ote
Valvontakansio nro

Sivun nro

15

Aukion nimi MK LIPSA KINN	Kotipaikka VAAS
Varustamo (nimi, osoite) WIRKLINGS OY Laihivaaraukijankel. 6510 VAASA	
Päällikkö J. HUKKANEN	

VAAS 22.5.92

Suuritehty määritäjäkaiken koneriston katsastus
 Koneristus suorataan määritäjäkaiken koneriston katsastus
 ~ katsastus 28.5.93 (~3kk) 1 kätyni 2760,-

J. Lehtinen

VIITÄSTÄ 22.5.1992

Suoritettu määritäjäkaiken koneriston katsastus
 Suorato määritäjäkaiken 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

Records of international paint

4/8/2021

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

INT. FABRENS. VS

Enclosure 3.4.89



TELEFAX

PAGE 1+

TO ANDREW.RAYNER
 COMPANY INTERNATIONAL PAINT
 FAX NO. 0044-101 438 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 INERTIA 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	DFT/µm
Baloflake*	green	(1x)	1000
Intershield Newbuilding			
ENAO01/ENAO03 aluminium	alum.	(1x)	150
Intertuf			
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-mat 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
 FAX +358 0 500 001
 PHONE +358 0 500 001
 FIN-00371 HELSINKI, FINLAND

SHIP DETAILS		SILVA STAR	
OWNER/MANAGER : SALLY REDERI AB		COATINGS APPLICATOR : JARMI VALMET YUOSAARI	
SHIP TYPE : FERRY	REG. NO. : 10000064	AREA OF SHIP : DECK	TYPE OF PRODUCT & NAME : VINYL TAR HS TINTED
LLOYDS NO. : 7921023	EXECUTIVE POINT : HELSINKI	*PLATS : 1 T/FU 500 ERALIS INTERSHIELD HS BLUE-INERTA 160 BASE	1 T/FU 100 JYARKE7 INTERTUF VINYL BLACK
DELIVERY DATE : 1 JUN 80	SERVICE SPEED : 19 KNOTS	PORT SIDE U/W : FULL 500 ERALIS INTERSHIELD HS BLUE-INERTA 160 BASE	STARBOARD SIDE U/W :
DIMENSIONS (METERS) : -		PORT BOOTTOP	
LENGTH B/D : 137.49	BEAM MOULDED : 24.21	STARBOARD BOOTTOP	
PLATS : 10000064	ANTI-FOULING HT (FWD) : 5.60	*SPLIT AREA	
STOKTOP : 2300	ANTI-FOULING HT (AFT) : 5.60	PRODUCT & NAME : ERALIS INTERSHIELD HS BLUE-INERTA 160 BASE	LTRES : 0360
TOPSIDES : -	BOOTTOP HT (FWD) : -	JVAL003 INTERTUF VINYL TAR HS TINTED	0
SURFACE AREAS (ISO METRES)		JVAL007 INTERTUF VINYL BLACK	0
HULL BELOW WATER : 3850	PLATS : 2300		
STOKTOP : 2300	STOKTOP : -		
TOPSIDES : -	TOPSIDES : -		
DRYDOCK SUMMARY			
DATE LOCATION : 0707 KVAERNER MASA YARDS-TURKU	MFR : INC	TYPE OF REPORT : INT. FABRENS. VS	
0808 KVAERNER MASA YARDS-TURKU	INC 100 DRYDOCK (M/S)	FAX NO. : 0044-101 438 3077	
0808 FINLAND	INC 100 DRYDOCK (M/S)		
0809 VALMET YUOSAARI	INC 100 DRYDOCK (M/S)		
	INC 100 DRYDOCK		
0707 KVAERNER MASA YARDS-TURKU	INC 100 DRYDOCK (M/S)		
0809 KVAERNER MASA YARDS-TURKU	INC 100 DRYDOCK (M/S)		
0809 VALMET YUOSAARI	INC 100 DRYDOCK (M/S)		
	INC 100 DRYDOCK		

03/08 '95 00:14
 D-14 40 7205744
 TECH CONTROL
 INT. FABRENS. VS
 FAX NO. : 0044-101 438 3077
 2002

SHIP DETAILS		SILVA STAR	COATING APPLICATION	DRYDOCK:- JAN 87 KVAERNER ASA YARDS-TURKU FINN
OWNER/MANAGER	SALVY REGERI AB			AREA OF SHIP
SHIP TYPE	FERRY			PLATS
TONNAGE	15586			C TYPE DFT PRODUCT A NAME
LLOYD'S NO.	7921932			1 FULL 500 ERA185 INTERSHIELD HS BLUE-INERTA 160 BASE
REGISTRATION POINT	FINLAND			STERN
DELIVERY DATE	1 JUN 80			1 T/W 500 ERA185 INTERSHIELD HS BLUE-INERTA 160 BASE
SERVICE SPEED	10 KNOTS			2 T/W 500 ERA185 INTERSHIELD INERTA 160 BLACK BASE
DIMENSIONS (METRES)				
LENGTH O/B	137.42			PRODUCT & NAME
BOW MOLDING	24.21			BLA110 INTERSHIELD PREMIUM A/F RED LITRES
ANTIFOULING WT (FWD)	0.00			ERA165 INTERSHIELD INERTA 160 BLACK BASE 40
ANTIFOULING WT (AFT)	5.00			ERA165 INTERSHIELD HS BLUE-INERTA 160 BASE 120
BOOTTOP WT (FWD)	0.00			
BOOTTOP WT (AFT)	0.00			
surface areas (sq metres)				
HULL BELOW WATER	3860			
FLATS	1300			
SCOTSTOP	0			
TOPSIDE DECKS	0			
DRYDOCK SUMMARY				
DATE LOCATION	W/M	%	TYPE OF REPORT	
8608 FINNLAND	HEM	100	DRYDOCK (M/S)	
8608 KVAERNER ASA YARDS-TURKU	HEM	100	DRYDOCK (M/S)	
8604 FINNLAND	HEM	100	DRYDOCK (M/S)	
8505 VALMET VUOSAARI	ZNC	100	DRYDOCK (M/S)	
	INC	100		
8701 KVAERNER ASA YARDS-TURKU	INC	100	DRYDOCK	
8902 KVAERNER ASA YARDS-TURKU	INC	100	DRYDOCK (M/S)	
9005 KVAERNER ASA YARDS-TURKU	INC	100	DRYDOCK (M/S)	
	INC	100	DRYDOCK	

29-JUL-95 FRI 10:15 0049 40 7208744 TECH LUNAR INT. FARBEW. VS. 2003

SHIP DETAILS		SILVA STAR		COATING APPLICATION		DRYDOCK:- SEP 88 KVAERNEN NASA YARDS-TURKU FINN	
OWNER/MANAGER	: SALLY REDERI AB	DATE OF SHIP	C TYPE DFT PRODUCT & NAME	PORT SIDE D/W	1 T/U 500 ERATES INTERSHIELD HS BLUE-INERTA 100 BASE	STANDARD SIDE D/W	
SHIP TYPE	: FERRY						
TONNAGE	: 15566						
LLOYD'S NO.	: 7921033						
REGISTRATION POINT	: HELSINKI FINN						
DELIVERY DATE	: JUN 89						
SERVICE SPEED	: 19 KNOTS						
DIMENSIONS (METRES)	: -						
LENGTH B/P	: 137.42						
BREADTH MASTED	: 22.00						
ANTIFOULING HT (FWD)	: 5.60						
ANTIFOULING HT (AFT)	: 5.60						
BOOTTOP HT (AFT)	: -						
BOOTTOP HT (FWD)	: -						
SURFACE AREAS (150 METRES)							
HULL BELOW WATER	: 3050						
FLAIS	: 2300						
BOOTTOP	: -						
TOPSIDES	: -						
DRYDOCK SUMMARY							
DATE LOCATION		MFR	%	TYPE OF REPORT			
8000 FINLAND		HEM	100	DRYDOCK (H/S)			
8000 KVAERNEN NASA YARDS-TURKU		HEM	100	DRYDOCK (H/S)			
8304 FINLAND		HEM	100	DRYDOCK (H/S)			
8306 VALMET VIOSKARI		HEC	100	DRYDOCK (H/S)			
		HEM	100				
8701 KVAERNEN NASA YARDS-TURKU		HEC	100	DRYDOCK			
8809 KVAERNEN NASA YARDS-TURKU		HEC	100	DRYDOCK			
8905 KVAERNEN NASA YARDS-TURKU		HEC	100	DRYDOCK (H/S)			
		HEC	100	DRYDOCK			

00:00 35 08:15 20:18 40 7208744
28-JUL-95 FRI 10:15 TECH CONNOL INT.FARBEK, VS
FBI NY U131249244

Invoice warsila marine

WÄRTSILÄ MARINE		FAKUTRA		
Åbo reparationsvarv	Avtredning	Datum		
		19.10.1987		
		Köparens referens:		
		Insp. Y. Röblom		
		Säljarens referens:		
		AEP/lit		
		Beställare		
		Sally Rederi Ab Hamngatan 8		
		22100 MARIEHAMN		
Leveransadress:		Enclosure 3.4.90		
		Anbudet gäller t.o.m.		
Leveranssätt:	Leveranseller			
		Leveranställe		
		Betreibningsvilkor		
Marke		l i d. netto		
MS VIKING SALLY		*)		
Dockning 12-23.1.1987		Vid betalning av fakturan ber vi Er notera a konto inbetalningar FIM 650.000,- 20.2.87, FIM 350.000,- 15.7.87		
Anbud WTKT1101/87				
20440 specifikation		Mängd	Enhetspris	Totalpris
100 In- och utdockning av fartyget inkl. dockshyra 1 dygn. Dockshyra för de följande 10 dygnen.			23.886,- 107.490,-	
101 Extra omändring av dockningsböädd.			8.640,-	
100 Smältning av is från fören med hett vattnet, 2 smältbilar med manuskap i arbete.			10.000,-	
102 Anslutning av elkabel ombord 1 ggr. Anslutning av telefon 1 ggr. Telefonavgift 3088 impulser Hyra för värmeeläcktar.			560,- 305,- 1.853,- 3.140,-	
103 Anslutning av vattenslang 2 ggr. Leverans av kylvattnet under 10 dygn. Borttransport av åvfall 7 ggr.			1.120,- 2.750,- 2.870,-	
104 Anslutning av brandslang 1 ggr. Brandvakt 18 arbetsskift. Till brandsköldning 50 m ² aluminiumbeklä. glasfiberliv.			560,- 11.310,- 2.830,-	
Postadress Telex Telefon Telecopier Bank Postresa Orns				

MS VIKING SALLY

20449

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

WÄRTSILÄ MARINE

Abc reparationsvarv

Sida Sida Frist

10449		
Rör 17 d323,9 yrcalbrorör 1-2000 1st yrcalbrokrök d323,9 2st yrcalbrokrök d323,9 2st spännlåsas NS300 1st förgreningsstuts NS200 + fläns + nav NS200.	16.000,-	
Rör 17.A d267 yrcalbrorör L-500 1st yrcalbronav d267 1st spännlåsas NS250	5.000,-	
Rör 18 d76,1 yrcalbrorör L-500 2st yrcalbrokrök d76,1 2st yrcalbronav d76,1 2st spännlåsas NS65 1st yrcalbronav NS40 1st spännlåsas NS40.	3.020,-	
401 Mellan cirkulationskar 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. Gamla gränslägesbrytarnas kablar avlägsnats och monterats nya gränslägesbrytare och nya kablar samt kabelsör.	36.000,-	
402 Yrcalbrorör NS150 försynt till 63 isbrumm. Materialflödsgång: 1300mm NS150 yrcalbrorör, 1st NS150 yrcalbrokrök 1st NS150 yrcalbronav, 1st NS150 spännlåsas	4.830,-	
500 Lager utbytts i maskinrumsflikktarnas elmotorer.	44.960,-	
601 Blöndrädringsarbeten i boggrörelsernas motor. Materialflödsgång: Jön kabell NJEM 1x70 2m Cu-väva 60x17 3m Cu-skena 80x10 kopplingsskor, skruvar och muttrar.	15.120,-	
600 I matstaisins mellanvägg ejorts öppning i gatnerat jätteläkt 1050x500mm. Öppningen inreddats och garnerats med mässingplätt. Ramarna beställarsens.	9.130,-	
700 Förvinirats och båda akterrampernas dörrar försyntas delvis, sammankl.22s.	14.110,-	

WÄRTSILÄ MARINE

Åbo reparationsvarv

Side Sida Page

3

MS VIKING SALLY

20449

Rör 2 ø180 yorcalbrorör L-1200 2st Yorcalbrokrökar ø180 2st " nav ø180 2st spänflänsar NS125	5.000,-
Rör 4 ø133 Yorcalbrorör L-2000 2st yorcalbro krökar ø133 2st " " ø133 2st soñnflänsar NS125	6.000,-
Rör 5 ø180 yorcalbrorör L-2100 1st yorcalbronav ø180 1st spänfläns NS175 (gammal standard) 1st förgreningsstutus ø133 + krök ø133 + nav + fläns 1st förgreningsstutus ø88,9 + nav + spänfläns 1st förmänskningskon ø180-ø159 + nav ø159 + tlinas.	10.500,-
Rör 8 ø125 yorcalbrokrökar 2st förmänskning ø125-100 2st flänsar + nav NS125 1st flänsar + nav NS100	7.000,-
Rör 10 ø267 yorcalbrorör L-1000 1st yorcalbronav ø267 1st soñnfläns NS250 1st Straub koppling ø267	9.000,-
Rör 11 ø267 yorcalbrorör L-1000 1st yorcalbronav ø267 1st soñnfläns NS250 1st Straub koppling	9.000,-
Rör 16 ø267 yorcalbrorör L-1000 1st yorcalbrokrök ø133 1st yorcalbronav ø133 1st yorcalbronav ø267 1st spänfläns ø250 1st soñnfläns NS125 1st Straub koppling ø267 (röret har NS125 förgreningsstutus.)	10.000,-

WÄRTSILÄ MARINE

Av reparationsvarv

no

Side Page

5

AS VIKING SALLY

20449

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

WÄRTSILÄ MARINE

2023 RELEASE UNDER E.O. 14176

10

Siva Sida Page

5

© VIKING PRESS

20449

901 Ramoernas och hylliornas vägar samt block
granskats visuellt.

310,-

903 Sötvattentank no 17 svätrats och rengjorts.

200

904 Smutsoljetankarna rengjorts och oljigt och fast avfall transporterats att förstöras.

905 Värmeväxliarens pavlar året sandblästrats

888 -

Saltwater infiltration 2000-2001, 2002-2003

2st vengjorts samt målats i ygrt med Antifo

620,-

907 Bottentränen rengjorts och målats i ggr med
Antifoualing .

150,-

919. Färjor och färjor med last som värmning på grund av Inerta mälaning.

900,-

före uddockning.

810,-

FIM 1.021.844,-

— 2 —

2.11-87

4/8/2021

WÄRTSILÄ MARINE		FAKUTRA																										
Åbo reparationsvarv	Avtäring	Datum	nr																									
	Handläggare	19.10.1987	24 1860																									
	Kioskens referens																											
	Insp. f. Röslom																											
	Säljarens referens																											
Godsmottagare	AZP/lit	Betalare																										
Sally Rederi Ab Hamngatan 3																												
22100 MARIEHAMN																												
Leveransadress																												
Anbudet giltigt t.o.m.																												
Leveransort	Leveransviktor																											
Leveranstid																												
Betalningsviktor																												
14 d. netto																												
Om %																												
Mark: MS VIKING SALLY																												
Dockning 12-23.1.1987																												
Anbud WTKT1101/37																												
<table border="1"><thead><tr><th>20449</th><th>Artikulation</th><th>Mängd</th><th>Enhetspris</th><th>Totals pris</th></tr></thead><tbody><tr><td>706</td><td>Spricka i yttre bordläggningen invid matsalen på BB-sida repareras medels försnyggs av skottplätt 830x300x12mm och däcksplätt 200x150x12mm samt svetsning, montering av garneringar och inredningsskivor. Skyddande av golvet på inre sidan. Ställningsarbete. Skydd på utsidan under reparationsarbetet.</td><td></td><td>17.620,-</td><td></td></tr><tr><td>104</td><td>Braudvakt på grund av havariarbetet 2 arbetsaft.</td><td></td><td>1.740,-</td><td></td></tr><tr><td></td><td></td><td></td><td>PIM</td><td>19.360,-</td></tr><tr><td></td><td></td><td></td><td></td><td>161-</td></tr></tbody></table>				20449	Artikulation	Mängd	Enhetspris	Totals pris	706	Spricka i yttre bordläggningen invid matsalen på BB-sida repareras medels försnyggs av skottplätt 830x300x12mm och däcksplätt 200x150x12mm samt svetsning, montering av garneringar och inredningsskivor. Skyddande av golvet på inre sidan. Ställningsarbete. Skydd på utsidan under reparationsarbetet.		17.620,-		104	Braudvakt på grund av havariarbetet 2 arbetsaft.		1.740,-					PIM	19.360,-					161-
20449	Artikulation	Mängd	Enhetspris	Totals pris																								
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			PIM	19.360,-																								
				161-																								
<p style="text-align: center;"><i>COPY</i></p> <table border="1"><tr><td>Postadress</td><td>Telex</td><td>Telefon</td><td>Telexkopier</td><td>Bank</td><td>Postgiro</td><td>Oms</td></tr></table>				Postadress	Telex	Telefon	Telexkopier	Bank	Postgiro	Oms																		
Postadress	Telex	Telefon	Telexkopier	Bank	Postgiro	Oms																						

4/8/2021

WÄRTSILÄ MARINE		FAKURA																					
Abo reparationsvarv	Avdelning	Datum	nr.																				
Godsmottagare	Handläggare	19.10.1987	24.1850																				
Köparens referens																							
Insp. Y. Röblom																							
Säljarens referens																							
ABP/lt																							
Beställare																							
Sally Rederi Ab																							
Hamngatan 8																							
22100 MARIHAMN																							
Leveransadress																							
Anbudet giltig t.o.m.																							
Leveranssett	Leveransvilkor																						
Leveranstid																							
Detaljningsvilkor																							
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 Fjästörön 8st för huvudmotorernas avgasrörs ljuddämpare flyttata. Förnyats av beställaren levererade ljuddämpare. Ställningsarbete.</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>FIM</td><td>22.840,-</td></tr><tr><td></td><td></td><td>=====</td><td>=====</td></tr></tbody></table>				20849: specifikation	Mängd	Enhetspri	Totalpri	705 Fjästörön 8st för huvudmotorernas avgasrörs ljuddämpare flyttata. Förnyats av beställaren levererade ljuddämpare. Ställningsarbete.		20.230,-		104 Brandvakt på grund av havariarbetet 3 arbetsaskift.		2.610,-				FIM	22.840,-			=====	=====
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		=====	=====																				
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Postadress Wärtsilä Marinindustri AB Abo reparationsvarv																							
Telex	Telefon	Teleskop	Bank																				
			Postgiro																				
Nat	(921) 359 500	FBF	Oms																				

Invoice wartsila marine

WÄRTSILÄ MARINE		FAKTURA	
Åbo reparationsvar	Ardelning	7.10.1987	24 1800
Handläggare		Köparens referens	
	Insp. RSblom	Säljarens referens	
Godsmottagare	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			
Pos nr. specifikation 20518		Mängd	Enhetspri
100 In- och utdockning av fartyget inkl. dockshyra för 1 dygn. Dockshyra för de följande 2 dygnen Bogseraasistans vid utdockning.			23.886,- 21.498,- 7.970,-
101 Omändring av dockningsbädd. Avlägsnande av is från dockan.			11.340,-
102 Anslutning av 2st telefoner. Telefonavgift, 772 impulser.			610,- 309,-
103 Borttransport av fartygets avfall, 3 ggr.			1.230,-
104 Anslutning av brandslang ombord. Brandvakt 5 arbetskräft Torv för uppsamling av olja.			560,- 4.350,- 210,-
300 Båda propelleraxlarnas Cederwall-skydd 18stagits. BB-tätning utbytts (beställarens leverans). Gamla vitmetallringen maskin- bearbetats. 800 l. spillolja tagits tillvara. BB-propelleraxelspal mätts. BB akselns skyddsplätt 10x240x3500mm till- verkats och förnyats. Skydden återmonterats. Ställningsarbete.			31.320,-
Postadress Wärtsilä Marinindustri Ab	Telex	Telefon	Telekopier
			Bank
			Postgiro
			Oms

WÄRTSILÄ MARINE

Åbo reparationsvarv

2 Sivu Side Page

MS VIKING-SALLY

20518

301	Loggens ventil 1st NS300 utbytts (beställarens); I förliga tankens tak gjorts öppning och genomgångs-luckan förstorats. Fläns tillverkats och ventilen provtryckts från utsidan. Gjorda öppningar stängts.	12.580,-
303	Propellerblad på SB och BB propellrar utbytts 1 + 1 st. Beställaren levererar blad, tätninor och läsningsar. Alla propellerblads läsningsar granskats, 5st nya nya bladbultar samt läsningsar (beställarens delar) monterats. Lösa pluggar i bladens lyftihål förnyats. Ställningsarbete.	28.640,-
700	Reparation av bordläggningen vid bogportens undre kant. - gamla glästar avlägsnats genom skärbränning. - nya plåtar och profiler tillverkats, bockats, monterats och svetsats. 1st plåt 18x1280x4800mm 1770 kg 1st plåt 18x2900x3250mm 1357 kg P-stång 160x8 750kg Stället med sprickor svetsats. Reparerat område maskinborstsats på in- och utsida samt målats med beställarens färg. Kittning utförts med Prestoflex-massa. Visirets gummitäthning förnyats.	137.070,-
701	SB slingerköl förnyats spt 84-95 material används: - plåt 15x600x7300 mm 2st - plåt 15x600x2000 mm 2st - plåt 15x300x540mm 5st - rundjärn ø50 -950mm 1st. Bordläggningsskada reparerats invid slingerkölen spt 91-32, 1st plåt 12x500x500mm förnyats. 1st anodzinkar i 10 kg monterats. Den förnyade slingerkölen maskinborstsats och målats med varvets färg.	32.790,-
702	SB slingerköl förnyats spt 71-95 material används: - plåt 15x600x1900mm 2st - plåt 15x600x2000mm 2st - plåt 15x300x540mm 15st rundjärn ø50 21000 mm 1st. 5st anodzinkar i 10 kg monterats. Reparationssvetsning samt fastsvetsning av nål för bottenplugg.(pluggen saknats) Den förnyade slingenkölen maskinborstsats samt målats med varvets färg.	71.140,-

ansvarsfull

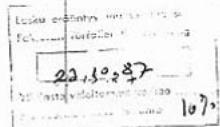
WÄRTSILÄ MARINE

Åbo reparationssvarv

Sida 3 Sida Page

30518

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

4.990,-EIM 390.493,-

WÄRTSILÄ MARINE		FAKUTRA		
Abo reparationsvarv	Händlare	Datum	7.10.1987	24 1801
Avdelning		Köparens referens		
Godsmottagare		Insp. Röblom	Själamens referens	
		AEP/lit	Beställare	
Leveransadress	Sally Rederi Ab Hamngatan 8 22100 MARIEHAMN			
Leveranssätt	Antal dels i beställning			
Leveransvilkor	Leveransvilkor			
Leveranstid	Leveranstid			
Betalingsvilkor	Betalingsvilkor			
Merke	14 d. netto			
MS VIKING SALLY				
20518				
Dockning 6-8.4.1987				
Pos nr, specifikation 20518	Mängd	Enhetspri	Totalpri	
302 Hissaxeln transporterats från fartyget till maskinverkstaden och demonterats. Lagerställen besprutats med metall och silipats. 2st lager 6018 förnyats. Axeln ihopmonterats och transp. ombord. Sätersring för ventil, ø315x300x30 tillverkats, maskinbearbetats av beställarens materialn. Ventiltallrikens tätningssyta maskinbearbetats ø315mm.		FIM 7.870,-		
23.10.87				
Postadress Wärtsilä Marinindustri Ab	Telex	Telefon	Telecopier	Bank
				Postgiro
				Ors

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Invoice wartsila marine

NS VIKING SALLY		
20706		
0060 Partygssbottnen 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 list, 20x350x430mm list.	20.000,-	
0090 Zincanoder a 50kg förnyas - i bogpropellertunneln 8st - på skrovet 18st - på rodren 8st - på roderstockarna 4st	11.020,-	
Lickanor stålens så sillerarköl vid apt 85-86 BB-sida reparerats genom sveessning.	600,-	
0100 Matning av specum i roder och i propellersaxelns lager. Matningsprotokoll uppgjorts och levererats till fartyget.	3.450,-	
0110 St propellersaxels yttre Cederwallaxlaketsättning öppnat och ihopmonterats med beställarens delar.	10.800,-	
Gamla Cederwallaxsättningen iständsatts, ytorna maskinbearbetats, levererats ombord. Lösningar inspekterats och reparerats samt nät avlägsnats från för- och akterpropellrar.	19.800,-	
0120 Bortenbrunnarnas sikt öppnats och brunnarna rengjorts samt målats med Interspeed BLA10. Sikten återmonterats.	5.400,-	
Svatsadömar i bottensicketens galler utskäts 4st	3.400,-	
Filcerbrunnarna rengjorts, målats med Antifouling färg 3st.	11.250,-	
Snäckor bortskrapats från brunrnarna.	5.400,-	
Fir; från varvet: Interspeed BLA10 50 l.	1.675,-	

WÄRTSILÄ MARINE

Bo reparationsvarv

Sida 3 Sida 37

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
flänslogar och föryngande av förgreningarna 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 ist
NS125 " ist
NS200/150 " förmålningsring ist
NS150/175 " ist
NS175 fläns + nav ist
NS125 " ist
NS200 yrcalborrdr 0,3m
NS200 " krök ist
NS175 fläns + nav ist
NS150 yrcalborrdr 0,3m
NS150 fläns + nav ist
NS50 yrcalborrdr 1,1m
NS50 " krök 9m
NS50 fläns + nav 16m
NS50 blindfläns ist
NS100 gäliv.rör 0,3m
NS100 färfläns ist
Plåtspackningar, builar samt muttrar föryngas
Tillverkats och monterats 7st födningssnöpplar av brons
Viking Koppling; Ø324 ist
" Ø280 ist
vridventil NS150 1st
yrcalbromuff 1" ist. 40.000,-

0160 2st fjäderboltsattade bordläggningsventiler löstagts
och transporterats till verkstaden samt demonterats.
Ventilhusen och tägiccha maskinbearbetats.
Föryngat stålflänsar för fjäder samt O-ringar.
Ventilerna sätts, ihommonterats samt monterats på
platsen. 10.000,-

0170 Plåtbasläggningar 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 90x80 L=2100mm. Svetsningarna utförs. 32.830,-

WÄRTSILÄ MARINE		nr
en förtjänstfullt arbete		Vår Sida
<u>1.700</u>		
Avgasrören snyttades i pannorna med fänerskivor.	3.200,-	
Avgasöppanen rengjorts (beställaren skött om öppnande och fastsättning av lockar.)	9.150,-	
0190 Spilloljettanken tömtes med hjälp av tvätt- och sugbil samt högtrycks tvätttata.	11.000,-	
) 0200 Tillverkats enl. räkning samt svarvats 4st 6-kant skruvar och builar 4st.	5.560,-	
0210 Förliga hissens växjehus och axel transp. till vertikalsidan. Lagret utpressats från roet och från axeln. Axeln reparerats genom påsvetsning och silpats till angivet mått. Nya av beställaren levererade tätaningar och lager monterats på axeln.	5.760,-	
0220 Propelleraldradens statade och frätska kanter slyfts och frätskingarna slyfts med Belzona. Frätskingar på roderen och på skålbararna slyfts med Prastolin massor. Dihlinsjöarbetet.	14.000,-	
0230 Bildhöckets gångplattform på BB-sida invid maskinhuset repareras genom förnyande av plåt ex 60x6050mm.	5.140,-	
FIM		<u>472.224,-</u>

Skicka godstransport med lastbil
Från företaget
23.7.26
- 162 -
Från lastbilsföretaget
Från lastbilsföretaget

Invoice wartsila marine

WARTSILA MARINE		FAKTURA																																																													
Äbo reparationsvarv	Audeling	22.6.1989	24-6784																																																												
Handläggare	Köparens referens																																																														
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	Säljares referens																																																														
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Godmottagare	Betalarne																																																														
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22100 MARIEHAMN																																																															
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Postadress Wärtsilä Marinindustri Ab
Äbo reparationsvarv
Telex Nr. (82)1359-600

Tel. 010-172 72 72
Telekopier 010-172 72 72
Bank FBF

MS.VIKING GALLY

20784

18efflåns 200/219,1 DIN 2642 NP10 ST37-2 nav NS200/219,1 628.2.4. NP10 CuZn21Al spänflåns NS125/133 620.9.2. NP10 ST/37- " NS150/159 " nav NS125/133 628.2.4 NP10 CuZn21Al2 " NS150/159 "	2 st 2 st 4 st 2 st 4 st 2 st	24.396,-
0070 Låsstagnings och montering av axelskydd för mätning av spel i cederwall- tätningen på SB-sida.		3.080,-
0080 Partyget använder kran och lyftkorg för målning av stålidor.	7.000,-	
0100 1 man som hjälpe till Kamewa-montör för undersökning av låskägga i BB-box.	1.600,-	
0110 Tønford rödermaskinens låckor undersökts och reparerats, tillsammans med tillverkarens representant.	8.251,-	
0120 - svitcam sverigas på SB-sidan i bottanbord- tätningen, längd ca 3,5 m. - Backa i BB condens levereras fast, ett noten-nål ytills med Preatorch - Zincar monterats på slingekärlar SB och BB tämmni. List till ej.	8.608,-	
0130 Material av volfram i rojor och monosilicrat.	2.300,-	
		FIN 175.318,-
		=====

6.9.95

1676

Invoice turku repair yard

Enclosure 3.4.94

TURUN
KORJAUSTELAKKA OY
Turku Repairs Ltd.

FÄKTURA 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
	0 %
Förfallodag Försäningstränta	18 %

Märke
M/S VIKING SALLY
916
969

0071

Pos. nr Specifikation Totalpris

Raparationer, som utförts i samband
med dockningen av M/S Viking Sally
under tiden 30.4. - 7.5.1990
enligt tidigare överlämnad
specifikation

TOTALT 1.420.000,-

./. FÖRSKOTTSBETALNING 300.000,-

ÅTERSTÄR TILL BETALNING 1.120.000,-

Postiosoite/ Postal address Puhelin/Telephone Telekopio/Telecopier Telex Postkod/Bank Lvv
PL 430 P.O. Box 430 (021) 638711 (021) 6387250 (021) 6387250 62484 try sf PGP 43310-19066 Rek.
20101 TURKU SF-20101 TURKU Finland Internal: +358 21 638711 Internal: +358 21 6387250

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 inkl. dockshyra för 1 dygn	26.275,-
0011	Ändringssarbeten i dockningsbädden	7.100,-
0010	Dockhyra för 7 dygn	83.601,-
0010	Kostnader för övertidsarbete i samband 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 4 500 m' färskvatten, till havsvattens- 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 att avlägsna salt.	
	Kostnader för övertidsarbete.	9.680,-
0022	Sandblästring av bottnen SA 2,5 1800 m' och mätning med INERTA 160 målfärg 1800 m'	270.000,-
0024	Rullmålnings av Boottop området 1 ggr 1050 m' med beställarens målfärg INERTA-70. Kostnader för övertids- arbete.	15.090,-

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 kommandostryggen. 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 1 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 ² . Beställarens färg.	4.290,-

Extra övermålning av blå rand på SB-sidan 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 - i skrovet 7 st. - i förpropellertunneln 7 st. - i bottenbrunnarna 2 st.	4.880,-
0060 Mätts spelrum i propelleraxlarna, uppgjorts och levererats mätnings- protokoll.	2.450,-
Kontrollmätning utförts	1.260,-
0070 Mätts spelrum i rodren, uppgjorts och levererats mätningsprotokoll	1.550,-
0080 - -	
0090 Öppning och rengörning av bottenbrunnarna 3 st. samt målning av brunnarna 1 ggr antifouling	7.560,-
Skada förorsakad av vattenflöde i samband med behandlingen av bottenbrunnarna	3.810,-
0100 Transport av 7 st. havsvattenfilter från fartyget till plåtverkstad, reparation av filtrens ramar 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. Förnyats siktens låsanordningar 20 st 10 x 70 x 100 mm	
Utförts fyllnadssvetsning av ramarna. Sandblästring och målning av filtren med INERTA 160 målfärg Installerats 6 st zinkanoder å 5,5 kg	26.130,-
0110 Reparation av Yorcalbro kylvattenrören enl. pos. 1-9 i specifikationen (beställaren lossar och monterar rören på plats.)	91.500,-

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 ³ 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 löstagits 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 löstagits, sandblästrats samt målats med beställarens färg.	38.000,-

**TURUN
KORJAUSTELAKKA OY**
TURUN REPAIR YARD

5

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 uppvärmlingskostnader. Brännolja för uppvärming 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. 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. 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. Ställningsarbete.	24.510,-
0330	Reparerats läckage i SB-propellerns stårör. Löstagits skyddskon och packring. Förnyats o-ringbandet ϕ 16 mm 1,9 m. Delarna monterade på plats.	25.660,-

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

Totalt: mk 1.511.404,-

8

Invoice turku repair yard

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/ PL 430 20101 TURKU	Telefon (921)638711	Telex (921)6387250	Telex 62484 trysl	Pankki TYP 433110-19066 PSPTu 227388	Lvv Ref.
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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 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 med indockningen	10.010,00	
	Kostnader för övertidsarbete i samband 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 arbetskift 50 m' glasfibertyg med AL-yta för 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 ³	1.094,00	
0160			
9.	Borttransport av avfall 14 ggr	5.740,00	
0170			
10.	-		
0180			
15.	Färskvattenspolning av utsidorna, 780 m ³ BB 240 m ³ och SB 540 m ³	4.680,00	

Postiosoite/ PL 430 20101 TURKU	Puhelin (021) 638711	Telefax (021) 6387250	Telex 62484 Tryst	Pankki TYP 433110-10066 PSP Tu 227388	Lvv Rik.
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0190	Lätt sandblästring av sidorna	4.800,00
15.	Fläckning 2 x 210 m ²	2.940,00
	Målning 2 ggr 2 x 210 m ²	1.890,00
	Märkning och målning av logo	63.000,00
	Rederiets färg	
	Kostnader för kranbil	11.070,00
	Sandblästring av bordläggningsöppningarnas kanter på utsidan, SA 2,5, samt målning med zinksilikatfärg och med ytfärg 2 ggr.	
	Rederiets färger	2.360,00
0200	-	
16.		
0210	Högtryckstvätt av skorsten med tvätt- medel.	
17.	Kostnader för övertidsarbete	5.650,00
	Skorstenens gamla målta slipats med handslipmaskin. Nya blåa ränder har linjerats, märkts samt målats 2ggr. Det gamla salmärket har övermålats med vit färg. Tillverkning av schablon för rederi- logen. Logon märkts och målats på båda sidorna av skorstenen.	48.780,00
	Kostnader för kranbil	18.680,00
0220		
18.	Målning av EFFJOHN-logo på ena sidan av fartyget. Rederiets färg	2.500,00
	Målning av ramar runt EFFJOHN-logo på SB-sidan	2.250,00
0230		
19.	Slipning av Panda-logons kantbitar och målning med vit ytfärg 2 ggr.	1.320,00
	Övermålning av Panda-logon med beställarens blå ytfärg 2 ggr.	800,00
	Kostnader för kranbil	1.150,00
0240		
20.	Bortskärning av "Mariehamn" på båda sidorna i aktern	12.500,00

0250	
21.	Märkning och målning av nytt namn "Wasa King" och hemort "Wasa". Tillverkning av 3 st schabloner. 4.600,-
	Förutom i offerten nämnda arbeten har gamla namn bortslipats med handslipmaskin samt ytorna målats 2 ggr med vit ytfärg. 7.850,00
	Två namn märkta och målade under akterkanten. 1.640,00
	Kostnader för kranbil 2.180,00
0260	
22.	Avikerlisten
	Avikerlistens övre del sandblästrad, SA 2,5 och nedre delen lätsandblästrad. Listen ca 80 m ² målats 4 ggr 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 Röder 2 + 2 st Bottenbrunnar 12 st 4.880,00
0330	
35.	Bottenbrunnar öppnats, rengjorts och målats med antifouling 4 st 10.080,00
0340	
36.	Byte av 2 st propellerblad BB sida I samband med byte av bladen har tätnings- ringar av brons lösmonterats och lyfts ut, 6 st lyftskruvar har tillverkats. O-ringarna förnyade. Hopmontering. 16.500,00 1.600,00

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

Förnyade bordläggningsplåtarna,
tjocklek 10 mm:

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

Spant -5--7 bordläggningsplåtar	2,12 m ²	170 kg
däcksplåtar	0,46 m ²	37 kg
balkbricka	0,08 m ²	6 kg
sammanlagt		4.337 kg

Debitering för extra kilon inkl.
ställningsarbetena
(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
propelleraxelet. 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

Wasa king tender specification and quotation

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 ³
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 ²	450,-/arbetaskift

Målning			
1122	Täckning av fartygsbotten Uppvärmning	- INDIKATIOT HINNOT - LÄMMITYSÖLJY FAKTAJ MUKAAN	200 000,-
1222	Sandblästring fläckvis	- HINTA KOSKEE YLI 500m ² MAALATTAVAA ALAA	145,-/m ²
1322	Målning med Inerta	- ALLE 500m ² LASKEUTYÖNÄ	12500,-
1422	B.B. avvisarlist blästras och målas med Galvosit Hempel 1570, 127 m.		
1522	Ankarklys och ankaren blästras och målas med Galvosit		5300,-
1622	Färskvattentanken 4A och 4B ca 75 m ³ vardera samt 5, 145 m ³ rengörs och målas ca 10 - 20 t.		79200,-
	- LASKEUTU MAALAUUS LAJAVUUS 20 %		
	- KORKEYPÄINEVÄESI PESU KÄVO TANKKI		
	- MAALATTAVAT ALUEET 50-75		
1722	Ballasttanken TK 1, 175 m ³ ; TK 2, 300 m ³ ; TK 13 och TK 14, 183 m ³ vardera; TK 54, 54 m ³ ; TK 58, 220 m ³ . Rengörs och målas 10 - 20 t.		178400,-
	- LASKEUTU MAALAUUS LAJAVUUS 20%		
	- KORKEYPÄINEVÄESI PESU KÄVO TANKKI		
	- MAALATTAVAT ALUEET KÄVYT NIEKKA PUHALLUUS		
1822	Förliga rampan, sidorna, blästras och målas ca 24 m ² .		3300,-
1922	Akterliga ramparna, sidorna, blästras och målas 2 x 12 m ² .		3300,-
<u>VARUSTAMO TOIMITAA MAALIT.</u>			

Bottenarbeten		
31.28	Mätning av propelleraxelspel	2700,-
32.28	Cedervall tätningarna yttra / inre läcker olja repareras	39500,-/AKSEL
	- TILAAVAN VARAOJAT	
	- TEINEET JA SUOJAN IRROITUS/ASENNUS	
	LASKETTU POSITIOON 33.28	
33.28	Partiell axeldragning "klassning"	49000,-/AKSEL
	SUORITETTU MODIFIOTU 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:	
	- VIBRAAUS LEVYVENNEN PISTO / ASENNEES	
	- ALATAPPIN IRROITUS JA TARKASTUS	
	- ALAHÄÄRIN TARKASTUS	
	ALAHÄÄREN RASVAUSPUTKEN TOIMINTA	
	TARKASTUS JA PUHDISTUS	
	- PERÄSİMEN ALASOTTO LISÄHINTA 2500,-	
37.28	Täckning av propellrar och roderattappar	4500,-
38.22	Förnyande av zinkanoder 10 kg / st	325,-/kpl.
39.22	Bottenbrunnar upp och fast rengöres, målas.	3500,-/kpl.
40.22	Ankare med kätting färs ut, klassas.	7000/-KETJU 2kg
	<i>Jyväskylä</i>	

Maskinrummarsarbeten

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 fjädermanövrerade.	37200,-
52.26	Aktra SW filterhusen förnyas 2 st. diam 700, längd 800.	36500,-

53.26	Övrig filterhus rengörs och målas, 4 st.	7100,-
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PESSL, HARJAS JA MAALALLS

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

55.26	SW-kylvattenrör förnyas och repareras i maskin.	
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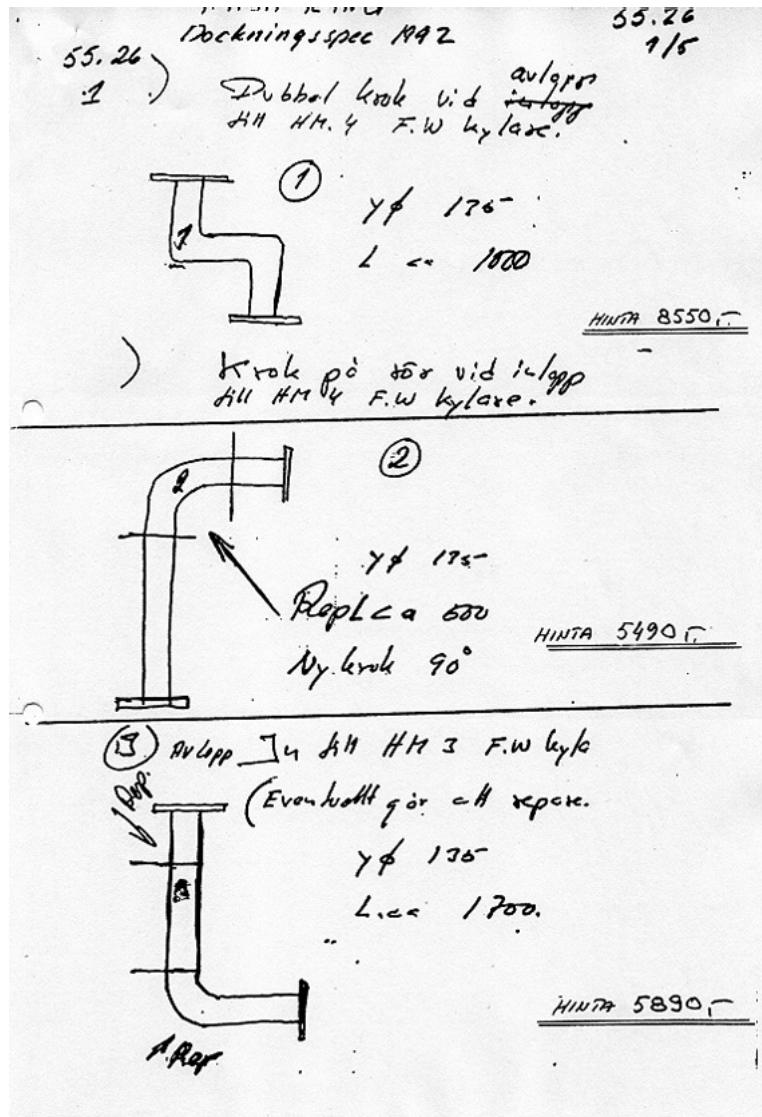
- PUTEET LÄSKETTU OHJESTU SKISSIEN MUKAAN
- HINNAT SISÄLTÄVÄT POSITIOISSA MAINITTUT STROUB-LIITTIMET
- MATERIAALI YRCALIBRO
- HINNAT EIVÄT SISÄLLÄ MÄÄRÄLLISIÄ OHJES JA LUOKSEPPÄSY TÖITÄ
- HINNAT POSITIOITTAIN SKISSESSÄ

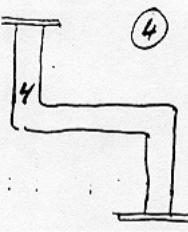
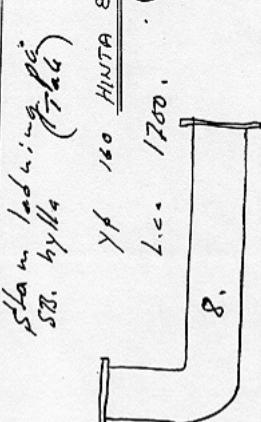
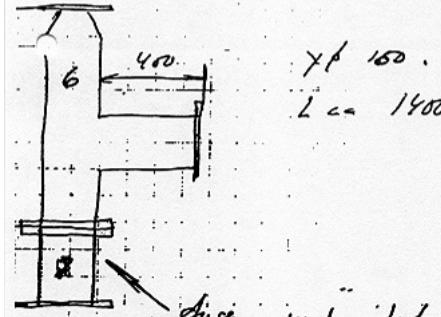
56.26	HJM FW kylvattenrörssystem förnyas och repareras.	
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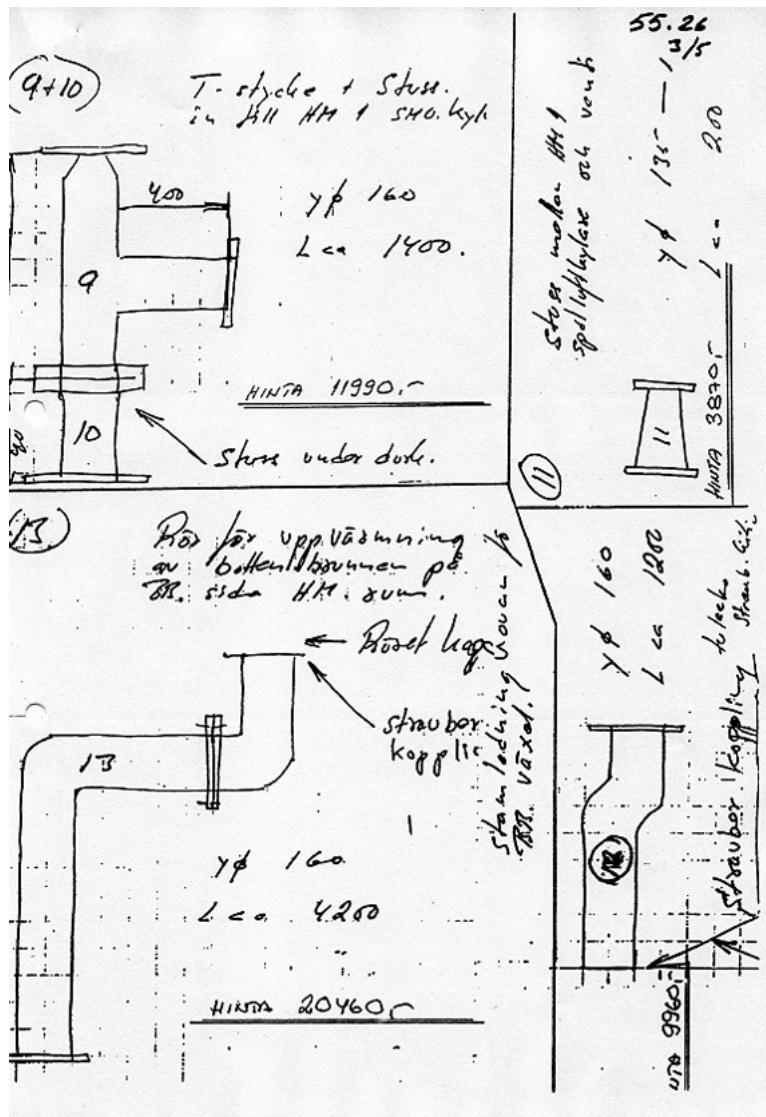
- PUTEET LÄSKETTU OHJESTU SKISSIEN MUKAAN
- HINNAT SISÄLTÄÄ SKISSISSÄ N:o 4 OLEVAT VENTTILIT
- MATERIAALI = TERÄSPUTKI
- HINNAT EIVÄT SISÄLLÄ MÄÄRÄLLISIÄ OHJES JA LUOKSEPPÄSY TÖITÄ
- HINNAT POSITIOITTAIN SKISSESSÄ

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.	
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LUOKSEPPÄSY HINTA 50000,-



Dubbel trösk vid HH 3 FW. hyllor.		
	Yf 175 L.ca 1000 <u>HINTA 8550,-</u>	55.26 2/5
(5) Prova trösk ofter. mixad. Se att var vett på s. sida på hylla Förvara g. till separata <u>HINTA TÄRKESTUSEN VALKEEN</u>	 Hyllan lädning (T-lag) SB. hylla Yf 180 L.ca 1200.	8780,-
(6 + 7) T- styrkor + skru in HH HH. 4 SHO. 0		
 stöd. under dukt. <u>HINTA 11990,-</u>	Yf 160. L.ca 1400.	



- (14) Rör för upp vattenflöd
av botten öppnar på
S.B. sida H4.20 cm. 55.26
4/5

\varnothing 160
L ca 1300
HINTA 13470,-

(15) Stängslötsning över för
S.B. Växel. 55.26
4/5

\varnothing 160
L ca 1000.
HINTA 10590,-

(16) Sug sid. H4. altro
soft vatten pum. S.B.s
55.26
4/5

\varnothing 330
L ca 2000.
UUDEN PUTKEN HINTA 19910,-

(17) Givna rörel
H4. kyl/vatten. Pum
under hyllan. S.B.s
55.26
4/5

Borde gör att reparera.

(18) Givna rörel
H4. kyl/vatten. Pum
under hyllan. S.B.s
55.26
4/5

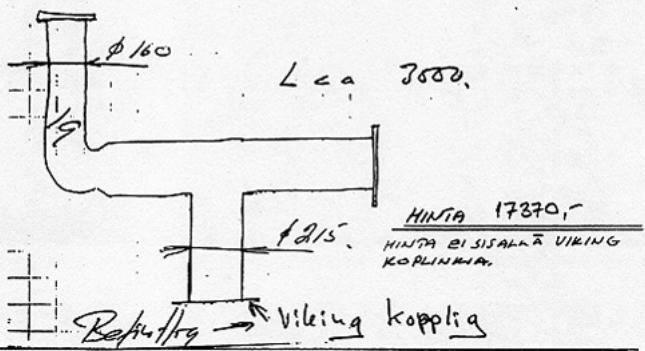
Borde gör att reparera.

(19)

Stål ledning för värme
kyllare.

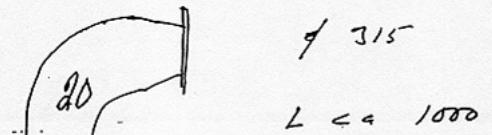
55,26

575



(20)

Krok före förliga
Hin saltvattenpumpe



HINTA 17770,-

(21)

Krok och
sluss efter slussen
kyllvette pumpen
Till sida
HM-vrum.

strubbe

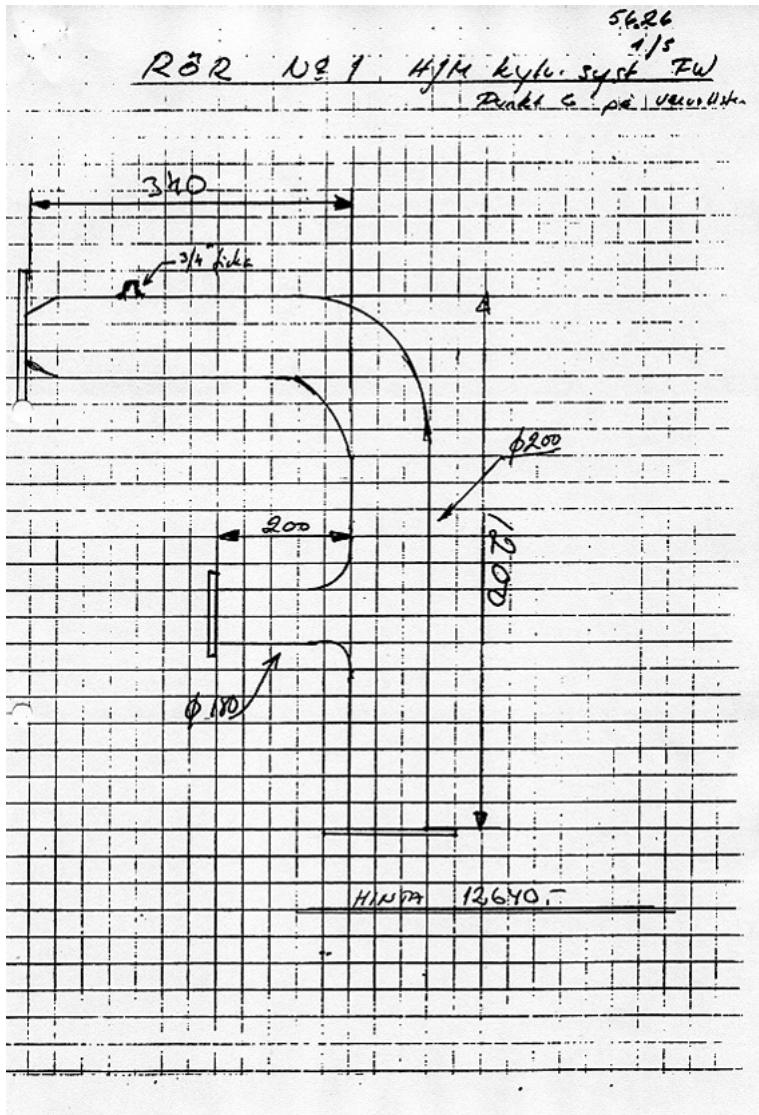
Dackve

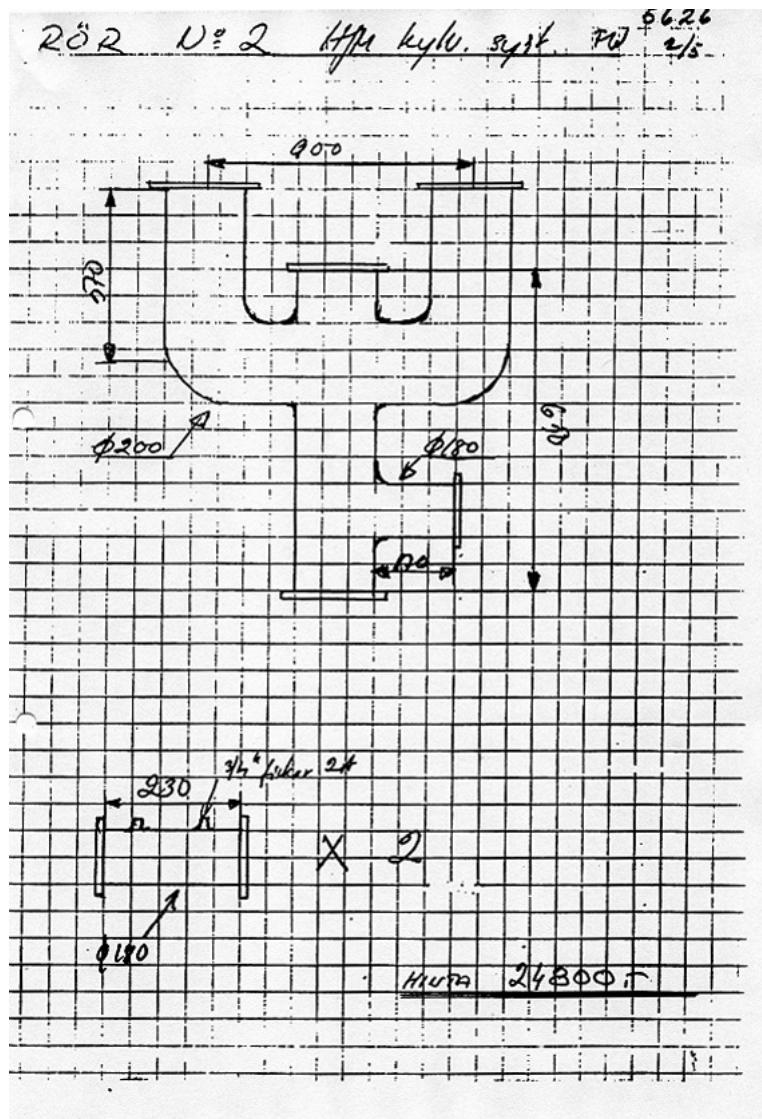
 $\phi 260$ $L \approx 1$

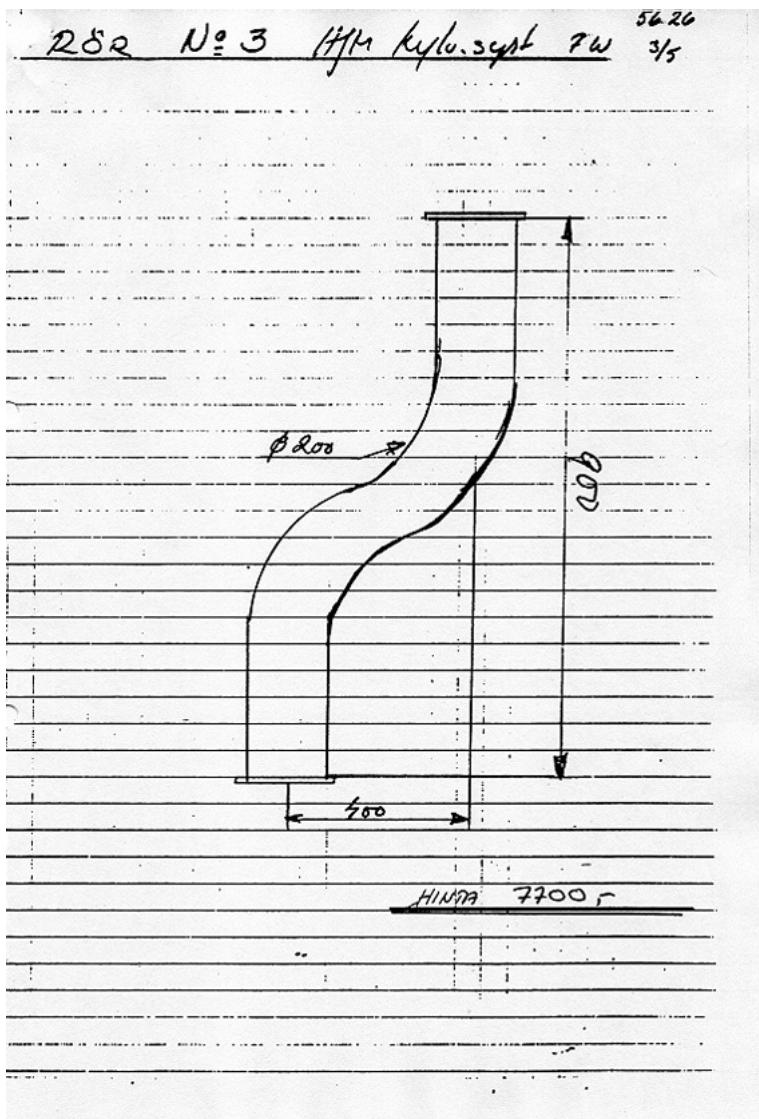
HINTA 22470,-

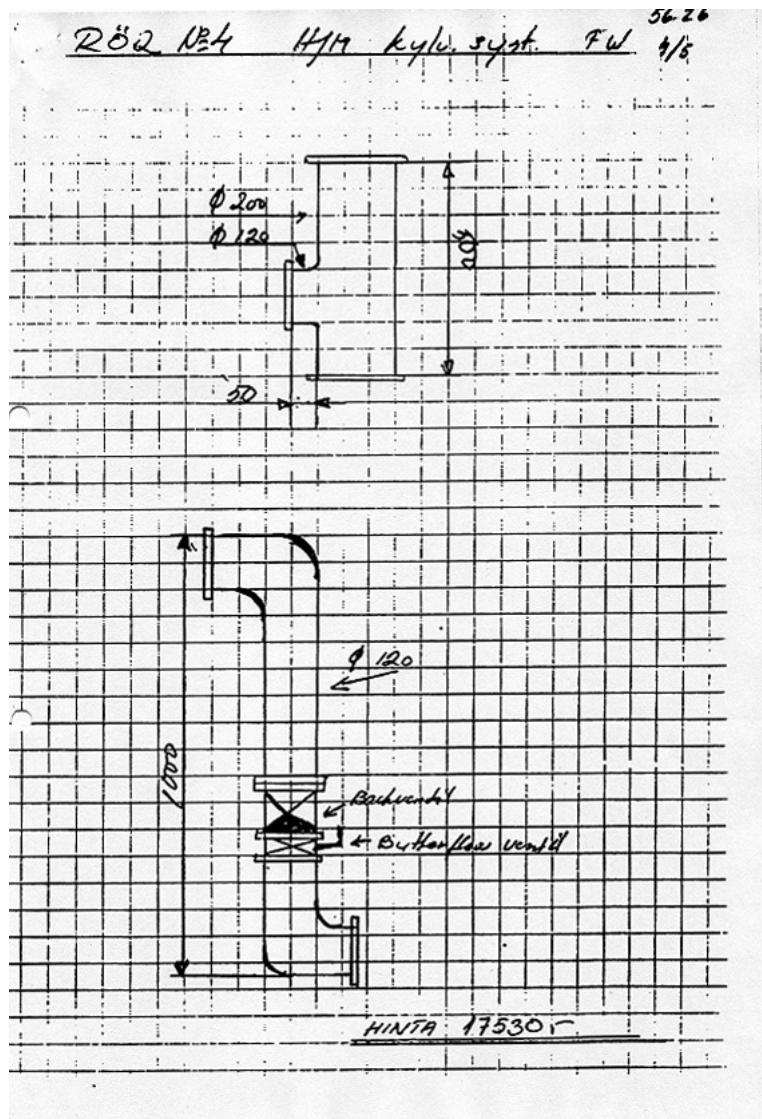
 $\phi 1$

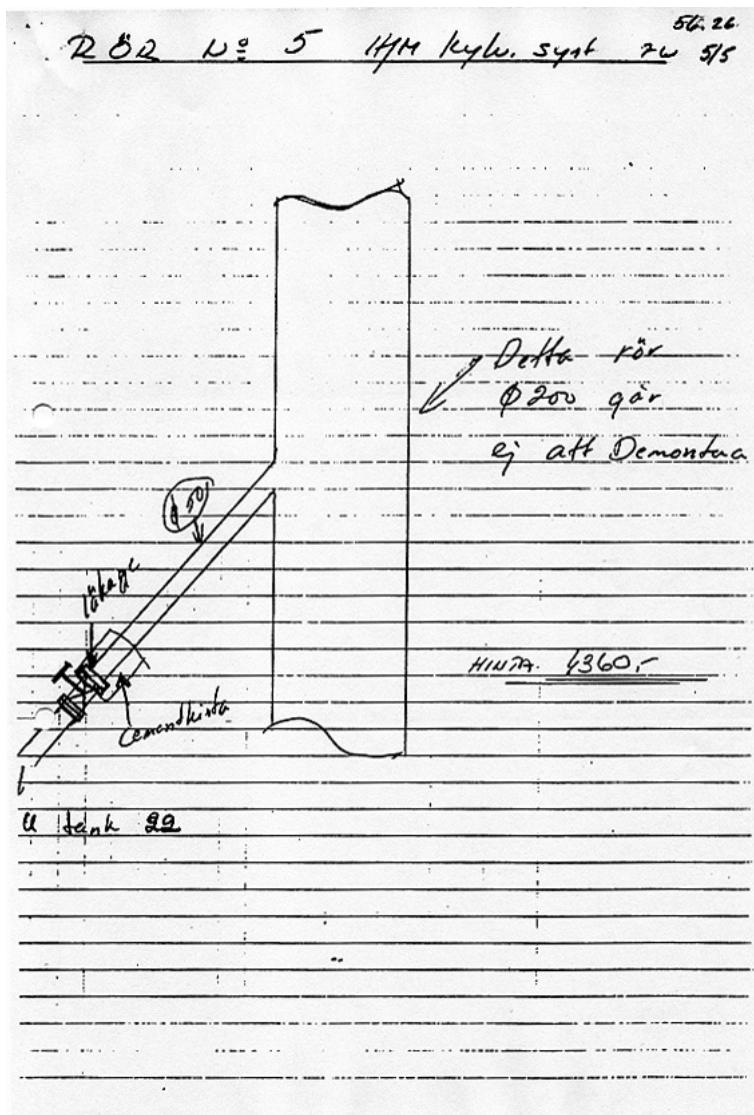
HINTA 22470,-











58.26	Röret mellan fettavskiljningstanken i spritförrådet och grävattentanken i separatortummet förnyas. Diam 110 mm, L 12 m, 4 st krökar 90° samt flänsar.	INDIKATÖR HINTA 37000,-
59.26	Bilgevattentank no 33, 22 m ³ , rengöring.	12700,-
60.26	Smutsoljetank no 42, 17 m ³ , rengöring.	8500,-
61.26	Sludgetank no 44, 25 m ³ , rengöring.	
	HINTA MARKASTUKSEN JÄKEEN	
62.26	HJM Avgaspannor 4 st, Sanea 65 m ³ reparation, förnyande av bottnet.	200000,-
63.26	Hisschakten på 2 provianthissar, skotten riktas, avståndet för stort till hisskorgen	
	HINTA MARKASTUKSEN JÄKEEN LÄMPLIUS ON MÄÄRÄTY	
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 2 st x 1,5 m ³ .	7000,-
	Övrigt	
70.22	Akterramperna, skalkningarna service samt förstärkningar	5200,-/kpl.
71.22	Akterramperna, gångjärn överhalas, nya bussningar.	36600,-
72.22	Förramp och Visir skalkningar överses förstärkes.	
73.22	Förramp, gångjärn överhalas eventuellt nya bussningar.	23800,-
74.22	Visir 15 m och ramp-packningar 10 m förnyas	18600,-
75.22	Vajerbyten på bildäckshyllorna (12 vajer/rkt)	54600,-

Wasa king docking specification 1993

Enclosure 3.4.97

1/5

M/S Wasa King
Dockningspecifikation 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

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 m³ vardera
samt 5, 145 m³ rengöres och målas ca 10 - 20 % .
- 1722 Ballasttanken TK 1, 175 m³ ; TK 2, 300 m³ ;
TK 13 och TK 14, 183 m³ vardera; TK 54, 54 m³ ;
TK 58, 220 m³. Rengörs och målas 10 - 20 % .
- 1822 Förliga rampen, sidorna, blästras och målas
ca 24 m².
- 1922 Akterliga ramperna, sidorna, blästras och målas
 $2 \times 12 \text{ m}^2$.

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 m³, rengöring.
- 60.26 Smutsoljetank no 42, 13 m³, rengöring.
- 61.26 Sludgetank no 44, 25 m³, rengöring.
- 62.26 HJM Avgaspannor 4 st, Sanea 65 m³ 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 m³.

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 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 PÄIVÄTÄYÄ ERITELYÄ
 ALUKSELAIT SUORISETTAVISTA TÄISTÄ
 TÄMÄN KUOLLESSA -93.
 PUNTAHKSI KIRJOITETUN TARJOUKSEN
 LÄHETÄMME VIKKO 40 ALUSSA.

Ystävällisin terveisin

TURUN KOMIKISTELAKKA OY
 MYYNTIOSASTO

Boris Kujala

HÄN ETTEI
 TÄRKEÄSSE KIRJOITTUA
 PUNTAHKSEN
 JÄRVI-KOHDE AS
 KLO 11.40
 VÄLÄÄN KUTTUESSA
 ASIARAJAAN!

Wasa king quotation by Macgregor, turku

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

TARJOUS

VIITATEN TARJOUSPYYNTÖÖNNNE FAX 19.9.92 TARJOAMME
TEILLE EM. ALUKSEN VARASIA 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%.

22705-82. 08:08- 7358 21 892517 RGN FIN MSE +++ LUKAU REPAIR TAK 0002
M/S WASA KING - TARJOUS 2/2
POS. 74:22 AUTOKANNEN VAIBRIEN VAHTO
HINTA TÖÖKLE : FIN 3000,- / VALERI, NUV 0%.
HINTA MATERIAALILLE : FIN 500,- / VALERI, NUV 0%.
TOIMINUSAIKA TÖÖLLE : 1 VIIKKO
— — MATERIAALILLE : 2 VIIKKOÄÄ TILAUDESTA
TOIMINUSEHTO : VAPAASTI TÖKEV - 93
MAKSUHTO : 30% PV NETTO
HUUT EHDOT : NLM 84 MUKAAN
YST. TERVELSIN
Tomas Jukka

4/8/2021

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 ORDERTelecopier 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 TARJOUKSESTÄMME
 KOSKIEN 18.9 PÄIVÄTTYÄ ERITELYÄ
 ALUKSELLA SUORITETTAVISTA TÖISTÄ
 TAMMIKUUSSA -93.
 PUNTAAKSI KIRJOITETUN TARJOUKSEN
 LÄHETÄMME VIKKO 40 ALUSSA.

YSTÄVÄLÄISIN TERVEISIN

TURUN KORVAKISTELAKKA OY
MYYNTIOSASTO

Boris Kujala

1) PÄÄVITSE LÄHETTÄÄ
 puntaaksi, Kirjutettua
 puh. kestä 25'.
 klo 11.40
 "man rekkau-
 "kukkessiv
 asian /

Statement tarmo makki-macgregor turku

Enclosure 3.4.99

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

Witness Statement

Central Criminal Police, Turku Thursday 20.03.1977 at 1100

Interrogator: Senior Constable Esko Vesanen

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.

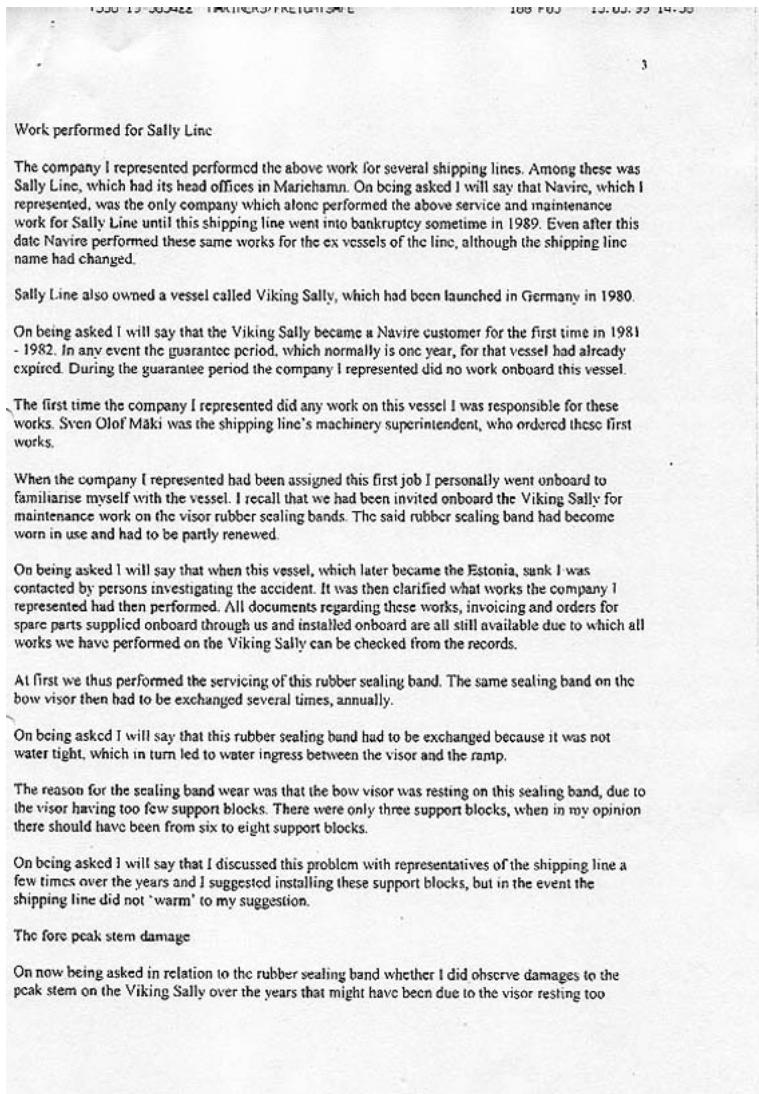
This assignment covered service and maintenance and modernisation of cargo handling gear of trading vessels. On being asked specifically about this cargo handling gear I will say that they comprised bow visors, bow ports, bow and stern ramps, hatches and car decks and also deck cranes, i.e. the gear 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'.



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 Esti-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 Esti-Line.

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

Note: The hearing was finished at 1255

Wasa king quotation by macgregor turku

358 9 455 0619 FIN MSE
22.09.22. 09:09 - 358 21 092511

Enclosure 3.4.100

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

TARJOUS

VIITATEN TARJOUSPYYNTÖÖNNE FAX 19.9.-92 TARJOAMME
KUOLEMALLE ALUKSEN VÄRÄOSIA JA KORJAUSTYÖTÄ SEURAAVASTA:

POS. 90.22 PERÄRAMPIEN LUKITUSLAITTEIDEN HUOLTO JA
VAHVIISTUS.

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

POS. 91.22 PERÄRAMPI, PÄÄTYSARANOIDEN LAAKERIN JA SARANA-
TAPIN VAHITO

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

POS. 92.22 KEULADAMPIN PÄÄTYSARANOIDEN LAAKERIN
JA SARANATAPPien VAHITO

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

POS. 93.22 KEULAVISIIRIN 15M JA KEULADAMPIN 10M
TIIVISTEKUMIN VAHITO

Bogrampens
Endgång/Tur. HINTA TYÖLLE : FIM 6.300,- /25 , LUV 0%
Agar och ging. HINTA MATERIAALILLE : FIM 8.000,- /25M, LUV 0%
stunthopparna Byte

16/02 '95 14:54
15/02 '95 KE 13:44T+358 0 75908265
FAX 358 21 656551OM-SUURONNETTOM
ERP TURKU@003/004
@003

2

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