

Uppdatering av drift och underhållsmanual för skrovöppningar och ro-ro utrustning till M/S Finlandia

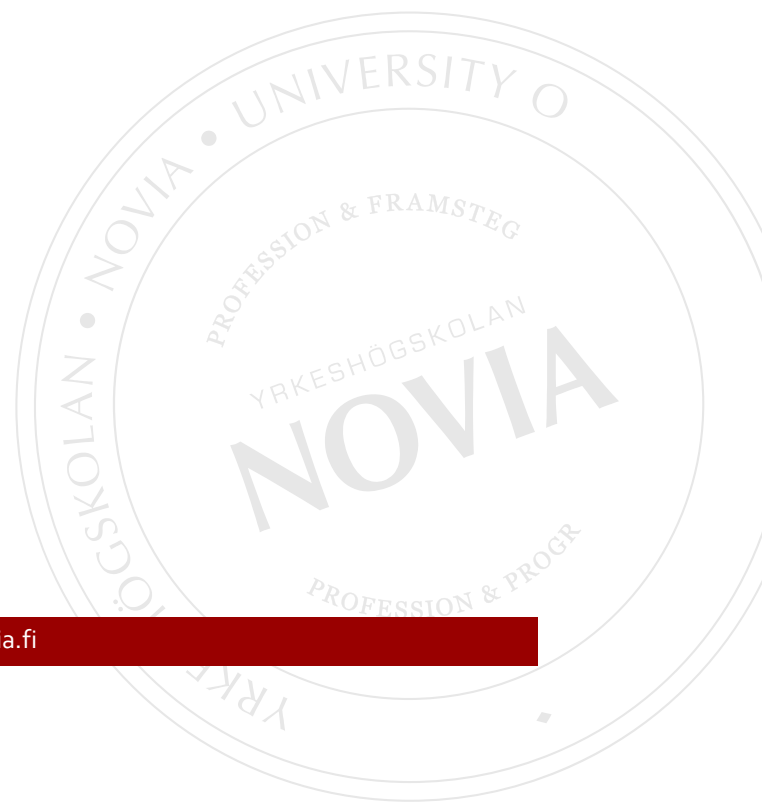
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Abstrakt

I detta examensarbete var uppgiften att förnya och förenkla Rederi AB Eckerös M/S Finlandias drift och underhållsmanual för skrovöppningar och ro-ro utrustning (Operating and maintenance manual for shell doors and ro-ro equipment). Målet med denna manual var att göra den funktionell och lättläslig. Manualen följer Bureau Veritas och IACS (The International Association of Classification Societies) riktlinjer och regler för en komplett och regelrätt manual.

Manualen som vi har arbetat med har till uppgift att ge fullständig information till fartygets besättning för att de ska förstå och ha uppsikt över fartygets skrovöppningssystem och ro-ro utrustning för att upprätthålla säkerheten ombord. Användning och underhållsanvisningar av fartygets skrovöppningssystem ska finnas lätt tillgängligt i manualen.

Denna manual har inte blivit skriven från grunden eftersom en sådan funnits från tidigare. Det har gjorts en fullständig genomgång samt komplettering med material för de nyinstallerade system ombord med den ursprungliga manualen som grund. Den äldre versionen av manualen var svåräst och utan bilder, vilket vi har kompletterat med att göra texten lättare för ögat samt lagt in bilder för att underlätta bl.a. körandet av de olika öppningarna i skrovet, t.ex. Akterramper, bogvisir, bogrampen och passagerardörrar.

Språk: Svenska

Nyckelord: Manual, skrovöppning, säkerhet

BACHELOR'S THESIS

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Abstract

In this thesis the task was to renew and update Rederi AB Eckerö's M/S Finlandia's Operating and maintenance manual for shell doors and ro-ro equipment. The goal of this manual was to make it functional and easy to read. The manual follows the rules and guidelines of M/S Finlandia's classification firm (Bureau Veritas) and IACS (The International Association of Classification Societies).

The main task of the manual is to give complete information to the ship's crew, so that they can understand and know how to operate the hull and shell opening systems to maintain safety onboard.

User- and maintenance instructions of the ship's Hull and Shell opening system shall be easy to find in the manual.

This manual is a renewal of the old one, so we have taken the old available info and supplemented the new info regarding the new installations onboard, while we also have made a review of the whole manual. The old version of the manual was hard to read and without any pictures, which we have supplemented with making the text more eye friendly and with pictures to make it easier to understand the opening- and closing procedures of the different systems onboard. For example, Stern Ramps, Bow Visor, Bow Ramp, and passenger doors.

Language: Swedish

Key words: Manual, Hull and shell opening, safety

Innehållsförteckning

1 Inledning	1
1.1 Ämnesval och bakgrund	1
1.2 Problemformulering	2
1.3 Syfte.....	2
2 Metod	2
3 Beställaren	3
4 Intervju	3
4.1 Besök ombord.....	4
5 Krav för manualen	5
6 Bilder	6
7 Skrivandet av manualen	6
7.1 Respons	11
7.2 Förbättringar och färdiga manualen.....	11
8 Slutsats	12
9 Referenser	13
Bilagor	

1 Inledning

Befäl och manskap tar vid flera tillfällen hjälp av en manual i arbetet. När du som läsare använder en manual, kan de ofta vara komplicerade med mycket teknisk information och svår text. Ändamålet med den nya drift- och underhållsmanualen är att besättningsmedlemmar på ett enkelt och snabbt sätt kan hitta den information som behövs vid stängande och öppnande av skrovöppningar och att allt sker enligt fartygets rutiner för att upprätthålla säkerheten ombord. Enligt Finlex innebär fartygssäkerhet: "fartygets sjöduglighet, säker användning av fartyget och fartygets säkerhetsåtgärder, såväl som ledningsarrangemang för säker användning, fartygsägarens säkerhetsledningssystem, bostadsutrymmen och arbetsplatser fartygets förhållanden och förebyggande av miljöföroreningar orsakade av fartyg "(Lag om övervakning av fartygssäkerhet 17.3.1995/370, 2 §). Manualen innehåller även instruktioner för underhållsarbeten och allmän information om alla befintliga skrovöppningar och ro-ro utrustning. Skrovöppningsmanualen har blivit uppdaterad enligt beställarens instruktioner med målet att göra den funktionell och lättläslig. År 2007 utfärdades ett cirkulär av IMO (International maritime organization) sjösäkerhetskommitté där det framgår betydelsen av uppdaterade, korrekta och användarvänliga drift och underhållsmanualer. I cirkuläret: Shipboard technical operation and maintenance manuals står det: "The IMO Maritime Safety Committee at its 83rd session considered the recommendation that the attention of 'all relevant stake holders' need to be drawn to the importance of ship's crews having access to up to date, accurate and user-friendly shipboard technical operating and maintenance manuals; particularly for safety-critical marine equipment" (International Maritime Organization 2007).

1.1 Ämnesval och bakgrund

Studierna närmade sig sitt slut och det var dags att skriva examensarbete. Eckerö Lines M/S Finlandia var i behov av att förnya och förbättra deras drift och underhållsmanual för skrovöppningarna och ro-ro utrustning. Via kontakter inom rederiet så blev Rederi Ab Eckerö kontorets safety manager informerad om vår situation med studierna. Han kontaktade oss och gav ett förslag på ett ämne till examensarbetet. Förslaget var att göra en fullständig genomgång av Finlandias manual för att därefter uppdatera och förbättra

den med nytt material. Ämnet var relevant för sjökaptensutbildningen och för framtiden kan det vara bra att ha erfarenheten av att göra en manual. Efter ett möte på Rederi Ab Eckerös kontor där vi diskuterade projektet, tackade vi ja till uppgiften. Manualen som skulle förnyas var av originalversion.

1.2 Problemformulering

Både ny och erfaren besättning ska på ett snabbt och enkelt sätt hitta den information som sökes. Säkerheten är viktig ombord och med den nya manualen kan besättningen hitta den information som behövs för att upprätthålla säkerheten ombord. Eftersom manualen var original saknades all information om nya installationer som gjorts på fartyget.

Manualen saknade även instruktioner om manövrering och rutiner vid öppning och stängning av skrovöppningarna, service och underhåll med mera. Den innehöll gammal information om installationer som tagits ur bruk. Manualen behövde vara mer praktiskt utformad och funktionell för besättningen.

Hur kan vi göra en funktionell manual för Finlandias besättning? Enligt Wiktionary.org (u.å) är definitionen för funktionell "som väl fyller sitt syfte". Synonymer till ordet är praktisk, användbar och effektiv enligt Synonymer.se (u.å). Finns det regelhänvisningar för vad manualen bör innehålla? Vilken metod för att samla information och material som behövs till manualen?

1.3 Syfte

Syftet med arbetet var att uppdatera och förbättra M/S Finlandias drift och underhållsmanual för skrovöppningar och ro-ro utrustning. Förbättringarna har gjort manualen mer lättläst och funktionell för besättningen.

2 Metod

Metoden som har använts för detta arbete är att intervjua besättning och kontorspersonal samt att besöka fartyget för att samla material till manualen. Litteratur har samlats både på kontoret och ombord på fartyget. Under besöket ombord så har besättningen hjälpt till med att instruera driften av alla relevanta öppningar i skrovet och utrustning som

manualen skulle innehålla. Diskussioner med fartyg och kontor gav svar på hur manualen skulle vara uppbyggd och vad den skulle innehålla.

3 Beställaren

Beställaren var det finska företaget Eckerö Line som tillhör Rederiaktiebolaget Eckerö. Företaget grundades år 1994 och har idag två ro-ro-fartyg som trafikerar mellan Finland och Estland (Eckerö Line, u.å). Manualen är gjord för M/S Finlandia. Fartyget är byggt år 2001 av Daewoo shipbuilding and heavy machinery Ltd i Sydkorea (Rederi ab Eckerö, u.å.).

4 Intervju

Efter diskussion med kontorets safety manager framkom bland annat att det som behövde förnyas i manualen var manöver och systembeskrivningar för alla nya interna ramper och utsides skrovluckor och portar för lasthantering samt landgångsportar. Tillägga begränsningar och specifikationer för ramper och portar som inte sedan tidigare finns i manualen. Uppdatera fartygets rutiner vid manövrering av ramper och luckor samt kommunikationen mellan fartyg och kajpersonal och vice versa. Beskrivning av underhållsarbeten och service. Indikationssystem för öppen och stängd av de nya installationerna lokalt och på bryggan. Safety managern tyckte även att manualen skulle vara kort och koncist, den skulle vara lättläslig. Originallets innehållsförteckning skulle användas som grund för i vilken ordning kapitlen skulle vara och de nya installationerna skulle vara i logisk ordningsföljd.

Under diskussionen kom det fram att det finns tydliga regelhänvisningar för vad manualen bör innehålla och att dessa hänvisningar skulle följas för att vara godkänd. Ett önskemål var att manöverinstruktionerna skulle beskrivas med kort text och bilder som klart och tydligt visar alla steg av manövreringen från början till slut.

Under besöket på Finlandia fördes en diskussion med fartygets överstyrman om vad som behövde förnyas i manualen. Det framkom att de nya installationerna som gjorts sedan original manualen skrivits var ett flertal landgångsportar, en sidoport till övre bildäck, en lucka samt lyftplattform på huvuddäck och slutligen en landströmslucka som var ett pågående projekt under besöket på fartyget. Manualen skulle vara uppbyggd likt originalet med kapitel och innehållsförteckning men med de nya uppdateringar insatta i logisk

ordning. Bilder som visade alla steg för manöverinstruktionerna tyckte överstyrman var viktigt. Kort sagt var åsikterna och önskemålen snarlika över hur manualen skulle byggas upp och vad som skulle uppdateras.

4.1 Besök ombord

Före besöket på Finlandia utfördes en total genomgång av den dåvarande manualen i samråd med safety managern. Detta gjordes för att ta reda på vilket material som skulle samlas och om något skulle prioriteras under besöket ombord. Resultatet av diskussionen var att materialet för kapitel ett till fem i manualen skulle ligga i fokus under besöket. De resterande kapitlen sex till nio krävde inte den praktiska erfarenheten ombord eftersom de endast bestod av litteratur och var möjligt att samla på kontoret eller online från fartyget. Största prioritet var att bli bekant med manöverinstruktionerna eftersom det behövde göras ombord på fartyget där besättningen kunde instruera oss.

Detta besök var under normal trafik vilket gav oss chansen att se hur det gick till vid ankomst och avgång samt vid lastning och lossning. Fartyget hade flera turer per dag och kort tid i hamnarna. När fartyget låg stilla och förtöjd till natten, kunde en mer grundlig genomgång ges av överstyrman.

Under den tre dagar långa vistelsen ombord gjordes en genomgång av radiokommunikationen mellan bryggan och den lokala porten eller rampen som öppnas och stängs samt radiokommunikation mellan fartygets besättning och hamnens personal. Överstyrman och andra besättningsmedlemmar demonstrerade de normala öppnings- och stängningsprocedurerna men även nödkörning av relevant utrustning och öppningar i skrovet. Dessa manövreringsprocedurer dokumenterades med videoinspelning och med bilder.

Det redogjordes för vilka nya installationer som hade gjorts på fartyget men även vilka delar som inte längre var aktuella i manualen. De ändringar som har gjorts på fartyget är en ny sidopassagerardörr på övre bildäck (däck 4) som installerades år 2011 med syftet att användas vid på och avstigning för passagerare. Detta var endast en tillfällig åtgärd innan hamnens landgångar anpassats för fartyget. Två sidopassagerardörrar installerades år 2012 på däck 6, en på babordssida och en på styrbordssida. Dessa två dörrar installerades då hamnen anpassats för fartyget. Följande installation år 2012 var en lucka på huvuddäck (däck 3) till en lyftplattform med syftet att transportera varor till de undre däcken. År 2015

installerades en sidoramp för bilar på övre bildäck (däck 4) och fungerade som access vid lastning och lossning av bilar i fartygets babordssida. Till detta hörde även en landbaserad ramp med möjlighet att styra från fartyget vid behov av justering. En manuellt manövrerad sidopassagerardörr installerades år 2019. Den senaste installationen var en landströmslucka på huvuddäck (däck 3) och installerades år 2021. Eftersom landströmsluckan var ett pågående projekt under besöket så var det inte möjligt att få en demonstration av manövreringen.

Det material som inte längre var aktuellt i manualen var allt som inkluderade en lucka på huvuddäck (däck 3) som hade täckt en fast ramp. Denna lucka existerade inte längre och var fastsvetsad så det fanns inget behov av att uppdatera den. Materialet angående luckan som fanns i original manualen finns även i den förnyade manualen men tydligt märkt att den inte längre existerar. En genomgång av fartygets indikationssystem utfördes. Vid öppet och stängt läge av skrovöppningarna och ro-ro utrustningen finns ett indikationssystem både lokalt och på bryggan.

5 Krav för manualen

Innan arbetet med att förnya den gamla manualen påbörjades tog vi reda på att följande regler måste tas i beaktande för att den ska vara godkänd: SOLAS ch.II-1, Bureau Veritas rules for sea going steel ships NR 467, Pt.B, Ch.11, Sec. 6 & Sec. 7, IACS UR-S S8 & S9.

Manualen ska innehålla den mest nödvändiga informationen om fartygets skrovöppningar och beskrivs i texten nedan. Detta är enligt (Bureau veritas rules for the classification of steel ships, 2022).

”Första delen av Burea Veritas lista är huvuduppgifter och designritningar, där ingår särskilda säkerhetsåtgärder, detaljer om fartyget, utrustning och dimensionerad belastning för ramper, nyckel plan av utrustning för dörrar och ramper, tillverkarens rekommenderade testning av utrustning, beskrivning av utrustning såsom bogdörrar, inner portar, bogramp, centralt kraftpaket, bryggpanel och maskinrummets kontrollrumspanel.

Den andra delen i listan är servicevillkor och där ingår begränsad slagsida och trim av fartyget vid lastning och lossning, begränsad slagsida och trim vid manövrering av skrovöppningarna, manövreringsinstruktioner av skrovöppningar och ro-ro utrustning samt nödmanövreringsinstruktioner av skrovöppningar och ro-ro utrustning.

Tredje delen i listan är underhållsarbete och där ingår schema och omfattning av underhållsarbetet, felsökning och acceptabla spelrum, tillverkarens underhållsrutiner. Fjärde delen av listan är register över inspektioner, inklusive inspektion av låsning, säkring och stödjande anordningar, reparationer och förnyelse”. Dessa regler påverkar inte utseendet eller uppbyggnaden av manualen men innehållet ska följa regelhänvisningarna.

6 Bilder

Original manualen saknade bilder och eftersom det inte fanns bilder att använda till den nya manualen togs egna bilder och videoinspelningar under besöket. Största delen av bilderna var på paneler för manövreringen men också på utrustningen och omgivningen. Bilderna och videoklippen var till stor hjälp eftersom allt skrivande av manualen gjordes på distans från fartyget. Med hjälp av bilder och filmer kunde alla steg under manövreringen vid öppnande och stängande av skrovöppningarna och ro-ro utrustningen kontrolleras.

Under besöket filmades runt 20 videoklipp och cirka 300 bilder togs. Därefter sällades de bästa bilderna ut. Efteråt kvarstod ungefär 200 bilder som användes för att förbättra manualen. Målet med bilderna var att det skulle bli lättare för läsaren att följa steg för steg hur de ska göra för att köra de olika portarna/ramperna på ett korrekt och säkert sätt. I manualen finns en helhetsbild av hela manöverpanelen vid varje manöverstation som visar alla knappar och brytare samt var dom är placerade. Detta gjordes för att få en bättre översikt. För varje steg under manövern finns en bild som visar vilken knapp som skall tryckas på samt en kort beskrivning om vad som sker.

7 Skrivandet av manualen

Efter diskussioner med både kontor och fartyg fanns det nu riktlinjer för hur manualen skulle byggas upp. Manualen skulle bestå av korta och tydliga instruktioner med bilder som visar alla moment i manöverinstruktionerna. Information utöver manöverinstruktionerna skulle bestå av enkel text så att läsaren snabbt skulle hitta den informationen de söker. Ett nytt Word dokument skapades och där skrevs manualen från grunden med det nya materialet men detta skulle ta alldeles för lång tid och bli alldeles för mycket arbete. Planen ändrades och original manualen som var i pappersformat skannades istället in och gjordes

till en PDF som sedan konverterades till ett Word dokument. Det var svårt att lägga in bilder samt redigera texten i programmet men trots detta fortsatte vi att använda Microsoft Word.

Första gången vi läste den ursprungliga manualen upptäcktes direkt vad som behövde förändras. Det var den svårlästa och invecklade texten. Emilsson Hammarberg (20.11.2002) hävdar i sin blogg att: "Användarvänlighet betyder att systemet är lätt och behagligt att använda. Ett användarvänligt system orsakar inte användaren onödiga problem eller grubblerier. Det är logiskt, konsekvent, effektivt och intuitivt. Användaren upplever det inte som jobbigt eller obehagligt att interagera med systemet." Nästa steg var då att förenkla texten. Det gjordes genom att använda ett enkelt språk som läsaren skulle förstå och att korta ner texten, byta ut ord som var för tekniska och andra estetiska förändringar. Dessa estetiska förändringar var till exempel att typsnittet ändrades, fet text sattes på rubriker och mellanrubriker samt att texten delades upp bättre med tydliga mellanrubriker och punktlista där behovet fanns. Alla dessa förändringar var för att texten skulle bli lättare för läsarens ögon och eftersom det saknades i originalet. Förbättringen av texten gjordes i ordningen kapitel ett till nio för att förändringarna skulle vara så konsekventa som möjligt. När ändringarna på den ursprungliga texten var gjorda så kunde det nya materialet läggas in.

Det första att uppdatera i manualen var den största delen vilket var manöverinstruktionerna, kapitel fyra och fem. Materialet hade samlats under besöket på Finlandia. Materialet bestod av dokument och manualer från tillverkarna av de nya öppningarna, original manualen, bilder, videoinspelningar samt anteckningar från diskussioner med besättningen. Manöverinstruktionerna skrevs med lite text, tydliga instruktioner och bilder till varje moment. Momenten i manövern för stängning och öppning eller manövrering av ro-ro utrustningen är beskriven steg för steg med vilka knappar och brytare som ska användas med bilder som ger en bra överblick för alla steg. Bilder lades in till varje manöverinstruktion, både för det ursprungliga materialet och det nya. Videoklipp och bilder som tagits under besöket har varit till stor hjälp under skrivandet av manöverinstruktionerna. Kapitel fyra i original manualen bestod av manöverinstruktioner för öppnings och stängningsprocedurer. Första steget i manöverinstruktionen var utgångsläget vilket ger en beskrivning av manöverpanelens omkopplares lägen, indikationsljus och signallampor som lyser, om någon hydraulikpump

ska startas, nödstopp är urkopplade och i vilket tillstånd skrovöppningen eller ro-ro utrustningen är innan den ska manövreras. Följande steg i manövrinstruktionen var manövern i stegvis ordning. Manövern beskriver vilka knappar, strömbrytare och omkopplare som ska tryckas eller vridas i rätt ordning för att manövern ska ske korrekt.

För varje knapptryck eller vridning av brytare finns en beskrivning för vad som sker i skrovöppningen eller ro-ro utrustningen samt vilka indikationsljus och signallampor som börjar lysa på manöverpanelen. Det finns även en beskrivning på när manövern är färdig.

De flesta skrovöppningar och ro-ro utrustning beskrivs på samma sätt men förstås olika innehåll beroende på vad som manövreras och vad dess syfte är. Stängning och öppningsproceduren är beskriven på samma sätt. Innehållet i den nya manualen är det samma som i originalet men under de år som har gått finns det små förändringar på de ursprungliga skrovöppningarna och ro-ro utrustningen. Dessa förändringar finns i den nya manualen. I den nya manualen har alla manöverinstruktioner skrivits om för att förenkla texten och instruktionerna men innehållet är det samma förutom de nya installationerna. Med hjälp av besättningens instruktioner och demonstrationer, tillverkarnas manualer och de videoklipp som filmats under manövreringen av skrovöppningarna samt ro-ro utrustningen har manöverinstruktionerna skrivits till de nya installationerna.

Kapitel 5 i originalet bestod av manöverinstruktioner för drift vid fel på hydrauliksystemet. I kapitlet beskrivs åtgärder vid fel på hydrauliska pumpenheten och fel på hela hydrauliska systemet, manövrering vid fel på elektriska solenoider och manöverinstruktioner för nödkörning av skrovöppningarna och ro-ro utrustningen. Manöverinstruktionerna beskrivs på samma vis som vid normal manövrering. Vid nödkörning används solenoider vid solenoidblocken för att manövrera istället för knappar och brytare i manöverpanelen eftersom det inte är möjligt att använda automatiken. Även manöverinstruktionerna då hela hydrauliksystemet felar så beskrivs instruktionerna på samma vis som ovan. Vid fel på hela hydrauliksystemet används en nödpumpenhet som pumpas för hand men som endast beskriver manövern då skrovöppningen eller ro-ro utrustningen är i stängt läge. I den nya manualen har kapitel 5 uppdaterats med de nya installationerna som saknades i originalet. Diagram eller ritningar på solenoidblocken har gjorts för att underlätta manövreringen. En instruktion för hur förliga pumpenheten och akterliga pumpenheten kan kopplas om, har skrivits. Materialet har samlats ombord på fartyget från tillverkarnas manualer, original manualen och andra dokument som funnits ombord.

Den andra delen, kapitel ett till tre bestod av introduktion, fartygets specifikationer, information om tillverkaren, allmän information och beskrivningar av skrovöppningarna och ro-ro utrustningen, maxvärden för drift och tillåtna belastningar av ro-ro utrustningen och skrovöppningarna. Informationen hittades i tillverkarens manualer men även i original manualen och dokument ombord på Finlandia. Den här delen består till största del av olika värden och beskrivningar vilket har presenterats på ett sätt som gör det enkelt och snabbt att hitta den information som sökes.

Kapitel ett i original manualen innehöll säkerhetsinstruktioner med fokus på personsäkerhet, fartygets säkerhetsföreskrifter, väderförhållanden, användningsområde för utrustningen, garanti och copyright. Det saknades en stor del av informationen som behövde finnas i den nya. Det som lades till i den nya manualen var fartygets detaljer, driftinstruktioner för befälhavaren, information om Finlandias klassningssällskap där det också beskrivs att den är skriven i enlighet med de relevanta regler som finns för denna typ av manual, tillverkarnas kontaktuppgifter samt tillverkarinformation till alla portar, ramper och dörrar i skrovet som funnits sedan fartyget byggdes men även alla nya installationer, manualens syfte och hur den vid behov uppdateras på ett korrekt sätt. Den sista delen som skrevs i kapitlet var information om säkerhetsåtgärder angående fartygets vattentäta integritet och vad som gäller ifall fartygets vattentäta integritet har skadats. Flera delar av det ursprungliga kapitlet kändes orelevanta då manualen skulle förnyas. Safety managern var av samma åsikt och bestämde att de inte skulle vara med i den nya manualen. De delar som togs bort var väderförhållanden som beskrev en temperaturskala av fartygets driftsområde, användningsområde för utrustning av tillverkaren Macor Neptun som även skrivit original manualen, garanti och copyright. Detta kapitel skrevs med hjälp av safety managerns kunskaper om fartygets rutiner vid rapportering vid eventuella skador eller vid haveri av utrustning. Informationen samlades från original manualen, tillverkarnas manualer, regelhänvisningarna som har nämnts ovan och från diskussioner med safety managern.

Kapitel två i original manualen innehöll allmänna beskrivningar av ro-ro utrustningen och skrovöppningarna. Den nya manualen innehöll också allmänna beskrivningar av ro-ro utrustningen och skrovöppningarna men den uppdaterades med de nya öppningarna och ro-ro utrustningar som har gjorts på fartyget sedan fartyget byggdes med information som samlats från tillverkarnas manualer. Kapitel två uppdaterades med information angående

fartygets dräneringsbrunnar med larmsystem för läckage i skrovöppningarna och var på fartyget dessa dräneringsbrunnar med larmsystem finns, information om fartygets dräneringssystem och larmsystem mellan bogvisir, ramp och inneport i fören vid eventuella läckage. Det sista som skrevs i kapitel två var fartygets indikationssystem och indikationspanel på bryggan. Denna del beskriver syftet med indikationssystemet samt hav och hamnläge på bryggpanelen och slutligen ett TV övervakningssystemet som visar skrovöppningarna på huvuddäck (däck 3) och övre bildäck (däck 4) och kan övervakas från bryggan och maskinkontrollrummet. Informationen till detta kapitel har hämtats från underhållssystemet Teomaki, original manual, tillverkarnas manualer och andra dokument från fartyget.

Det tredje kapitlet i original manualen bestod av drifttid och maxvärden för drift och tillåtna belastningar av ro-ro utrustningen och skrovöppningar. I denna del beskrivs maxvärden för skrovöppningar och ro-ro utrustning så som maximal slagsida och trim, maxvärden för trailerlast, axellast, axelavstånd, jämn belastning och mafi trailer. Det står även information om drifttid för ro-ro utrustning och skrovöppningar för öppning och stängning. Den nya manualen i kapitel tre innehåller drifttid och maxvärden för drift och tillåtna belastningar av ro-ro utrustning och skrovöppningar för de nya installationer men även de från original manual. Manualen har uppdaterats med de nya installationernas maxvärden för trim och slagsida samt maxvärden för axellast, designbelastning och drifttid för öppnande och stängande av sidoporten och rampen på däck 4, lucka och liftplattform på däck 3, alla nya sidopassagerardörrar samt landströmsluckan. Materialet har samlats från tillverkarnas manualer och original manualen.

Tredje delen, kapitel sex till nio i manualen bestod av beskrivningar av hydraulik och elektrisk styrning av ro-ro utrustningen, underhåll och service samt inspektion av skrov och ro-ro utrustning. Största delen av informationen kunde hittas i original manualen men för de nya installationerna så samlades materialet från tillverkarnas manualer. Det samlades även från Teomaki samt från dokument på kontoret och fartyget. Speciellt viktigt att få med i manualen var kapitlen för underhåll och inspektioner av skrovöppningarna. Det finns även information om hydraulik och elektrisk styrning men de kapitlen skrevs väldigt simpelt. Kapitel 6 och 7 i original manualen beskriver de olika hydrauliska delarna samt de elektriska delarna och var deras manöverskåp är. I den nya manualen så är typsnittet på texten omgjort så att alla kapitel i manualen följer samma typsnitt och storlek. I det sjunde kapitlet

så har vi även lagt in var de nya manöverskåpen är till de nya skrovöppningarna. Kapitel 8 i original manualen ger information angående underhåll och service av fartygets skrovöppningar. Vissa påståenden och rubriker i original manualen är skrivet på både tyska och engelska. I den nya versionen av manualen så har det lagts in de nya skrovöppningarna samt deras smörjscheman i ett Excel-dokument som sedan har lagts in i kapitel 8. Det dokumentet är skrivet enbart på engelska. Kapitel 9 i original manualen handlar om olika inspektioner som skall göras med förbestämda intervaller ombord på fartygets skrovöppningar. Den nya manualen är uppdaterad med de nya öppningarna samt inspektionerna som hör till varje öppning.

Arbetsfördelningen har försökt göras så jämn som möjligt mellan skribenterna. Eftersom båda två jobbar till sjöss och ofta jobbat mot varandra har skrivandet blivit rätt så självständigt men eftersom Word dokument kan delas sinsemellan har det underlättat jobbet då var och en kan vara uppdaterad vad den andra skrivit. Detta gäller både för manualen och examensarbetet. Besöket gjordes av båda två och samlandet av materialet likaså.

7.1 Respons

Då den första delen var skriven så skickades den till kontoret för genomgång. Safety managern tyckte att det var mycket bra manöverinstruktioner och uppbyggnad. Vi skickade även in de två andra delarna av manualen trots att dom ännu inte var färdiga men för att få synpunkter på det material som hittills samlats.

Presentationen av texten och uppbyggnaden var omtyckt. Safety managern tyckte att det behövdes någon typ av anvisning för underhållssystemet Teomaki i manualen men eftersom ingen av oss var särskilt insatta i systemet Teomaki så bestämdes det att endast göra ett underhållsschema som enkelt kunde uppdateras vid behov. Det var överlag god respons och endast små förbättringar som skulle göras.

7.2 Förbättringar och färdiga manualen

Förbättringarna gjordes enligt den respons som manualen hade fått. Det skapades ett nytt underhållsschema i Excel för de nya installationer som har gjorts som de kan uppdatera vid

behov i framtiden. De små förbättringarna var att göra om kapitel i manualen så att det stämde med original manualen, sidnumreringen skulle ändras och innehållsförteckningen uppdateras. Under denna tid så gjordes även andra förbättringar som skribenterna själva tyckte skulle vara bättre för manualen.

Då alla förbättringar var gjorda hölls en genomgång av hela manualen för att säkerställa att texten såg bra ut, all information fanns med och de sista justeringarna som behövdes för att lämna in manualen var gjorda. Den innehöll nu all information som den skulle, vilket var de tre delarna vi skrivit. Det finns förstås mer information som kunde skrivas i manualen men den innehöll det viktigaste och resterande text skulle endast göra den mer invecklad och tungsam. Även utomstående inom sjöfartsyrket läste genom manualen då den var så gott som färdig för att få synpunkter på innehållet. Eftersom manualen innehåller mycket information och många sidor så hade ingen utomstående grundligt läst igenom den men de kunde ge respons på hur manualen såg ut, uppbyggnad och presentation. Responsen var god vilket gjorde oss nöjda med resultatet. Nu var manualen färdig att tryckas i pappersformat.

8 Slutsats

Målet med detta arbete var att göra en funktionell och lättläst drift och underhållsmanual för skrovöppningar och ro-ro utrustning till M/S Finlandia (bilaga 1). Den nya manualen ska vara till hjälp för både ny besättningen och rutinerad i deras dagliga arbete då det hanterar skrovöppningar och ro-ro utrustning. Beställaren har varit nöjd med resultatet vilket är positivt. Säkerheten är väldigt viktig ombord på alla fartyg och vi känner att denna manual som vi skrivit kommer att vara till stor nytta ombord för att upprätthålla den. Vi har även haft möjligheten att arbeta tillsammans med kontorets safety manager och fartygets besättning. Med detta samarbete har vi fått se både kontorets och fartygets tänkesätt och idéer på hur manualen skulle var skriven och uppbyggd. Vi har även själva lärt oss mycket då vi har arbetat på manualen om sådant som rör skrovöppningar och ro-ro utrustning. Det har varit intressant att skriva manualen och en bra erfarenhet till framtida jobb då vi eventuellt kan få uppgiften att på nytt skriva en manual eller liknande. Vi är nöjda med den färdiga manualen och hoppas att den kommer att vara ett bra hjälpmedel för besättningen på Finlandia.

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Bilaga 1



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	I. Table of content	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page: 1 (1)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

TABLE OF CONTENTS

1 INTRODUCTION	1
1.1 Preface and operational instructions for the master	2
1.2 Ship's particulars	3
1.3 Manufacturer Information	4
2 GENERAL DESCRIPTION OF THE RO/RO EQUIPMENT	5
2.1 Bow doors	5
2.2 Bow ramp	6
2.3 Bulkhead Door	6
2.4 Internal Tilttable Ramp	7
2.5 Fixed Ramp Cover (Deleted)	7
2.6 Hoistable Car Deck/Ramps	7
2.6.1 Car deck platform	7
2.6.2 Car deck ramps	8
2.7 Stern Ramp/Doors (PS/SB)	9
2.8 Stern Passenger Ramp/Door	9
2.9 Pilot/Bunker Doors (PS/SB)	9
2.10 Side Passenger Door, Deck 6, Aft, PS(NOT IN USE)	10
2.11 Side Passenger Door, Deck 6, Midship, PS (installed in 2019)	10
2.12 Side Passenger Doors, Deck 6, Forward, PS/SB(Installed in 2012)	10
2.13 Side Passenger Door, Deck 4, Forward, PS(Installed in 2001)	11
2.14 Side Car Ramp, Deck 4, PS (Installed in 2025)	11
2.15 Hatch Cover for lift Platform Deck 3 (Installed in 2012)	11
2.16 Shore connection door Deck 3, Aft, PS (Installed in 2021)	12
2.30 Leakage well alarm system at shell openings	13
2.31 Drainage system between the bow door and ramp/bulkhead door	14
2.32 Open-Close indication system in wheelhouse	15
2.33 TV Surveillance System	16
3 MAXIMUM VALUES FOR OPERATION, PERMISSIBLE LOADS AND OPERATION TIMES	17
3.1 Permissible Maximum values for operation (list and trim)	17
3.2 Permissible load and operation times	18
3.2.1 Bow door	18
3.2.2 Bow ramp	18
3.2.3 Bulkhead Door	18
3.2.4 Internal Tilttable Ramp	18

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	I. Table of content	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page: 1 (1)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	


3.2.5 Fixed Ramp Cover(DELETED)	19
3.2.6 Hoistable Car Deck/Ramps	19
3.2.7 Stern Ramp/Doors (PS/SB)	19
3.2.8 Stern Passenger Ramp/Doors	20
3.2.9 Pilot/bunker Doors (PS/SB)	20
3.2.10 Side Passenger Door (Deck 6, Aft, PS)	20
3.2.11 Side Passenger Door (Deck 6, Midship, PS)	20
3.2.12 Side Passenger Door (Deck 6, FWD, PS/SB)	20
3.2.13 Side Passenger Door (Deck 4, FWD, PS)	20
3.2.14 Side Car Ramp (Deck 4, PS)	21
3.2.15 Hatch Cover	21
3.2.16 Lifting Platform	21
3.2.17 Shore Connection hatch	21

4 OPERATION OF THE RO/RO EQUIPMENT 22


4.1 Operation of the Bow Doors from combined Control Stand Bow	23
4.1.1 Bow doors OPEN	24
4.1.2 Bow doors CLOSE	27
4.1.3 Operation of the Bow Doors from portable Control Stand on Deck4	29
4.2 Operation of the Bow Ramp from combined Control Stand Bow	31
4.2.1 Bow ramp OPEN	31
4.2.2 Bow ramp CLOSE	33
4.2.3 Operation of the Bow Ramp from portable Control Stand on Deck4	34
4.3 Operation of the Bulkhead Door from combined Control Stand Bow	36
4.3.1 Bulkhead Door OPEN	37
4.3.2 Bulkhead Door CLOSE	39
4.3.3 Operation of the Bulkhead Door from portable Control Stand on Deck4	41
4.4 Operation of the Internal Tilttable Ramp	43
4.4.1 Internal Tilttable Ramp RAISE	43
4.4.2 Internal Tilttable Ramp LOWER	46
4.4.3 Operation of Internal Tilttable Ramp from portable Control Stand on Deck4	49
4.5 Operation of the Fixed Ramp Cover	51
4.5.1 Fixed Ramp Cover OPEN	51
4.5.2 Fixed Ramp Cover CLOSE	52
4.6 Operation of the Hoistable Car Deck/Ramps	53

I. Table of content	Version: 1	Date: 16-05-23	Approved:
	Previously updated:		
	Auth: HH/WA	Page: 1 (1)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019

4.6.1 Car Deck Platforms RAISE	53
4.6.2 Car Deck Platforms LOWER	56
4.6.3 Car Deck Ramps RAISE (Tilt up)	58
4.6.4 Car Deck Ramps LOWER (Tilt down)	61
4.7 Operation of the Stern Ramps (PS/SB)	63
4.7.1 Stern Ramps (PS/SB) OPEN	63
4.7.2 Stern Ramps (PS/SB) CLOSE	66
4.7.3 Operation of Stern Ramps (PS/SB) from portable Control Stand on Deck4	68
4.8 Operation of the Stern Passenger Ramp	70
4.8.1 Stern Passenger Ramp OPEN	70
4.8.2 Stern Passenger Ramp CLOSE	72
4.8.3 Operation of Stern Passenger Ramp from portable Control Stand on Deck4	73
4.9 Operation of the Pilot/Bunker Doors (PS/SB)	75
4.9.1 Pilot/Bunker Doors {PS /SB) OPEN	75
4.9.2 Pilot/Bunker Doors {PS/SB) CLOSE	77
4.10 Operation of the Side Passenger Door Deck 6, Aft, PS	79
4.10.1 Side Passenger Door OPEN	79
4.10.2 Side Passenger Door CLOSE	80
4.11 Operation of the Side Passenger Door Deck 6, Midship, PS	82
4.12 Operation of the Side Passenger Door Deck 6, FWD,PS/SB	83
4.12.1 Side Passenger Door OPEN	83
4.12.2 Side Passenger Door CLOSE	85
4.13 Operation of the Side Passenger Door Deck 4	87
4.13.1 Side Passenger Door OPEN	87
4.13.2 Side Passenger Door CLOSE	88
4.14 Operation of the Side Car Ramp (Deck 4, Aft, PS) from the local operation panel	90
4.14.1 Opening procedure from the operating panel	91
4.14.2 Closing procedure from the operating panel	92
4.14.3 Operation of the side ramp form the remote control	93
4.14.4 Opening procedure from the remote control	93
4.14.5 Closing procedure from the remote control	93
4.15 Operation of the Hatch cover	94
4.15.1 Hatch cover OPEN	95
4.15.2 Hatch cover CLOSE	96
4.15.3 Lifting Platform and fire door operation	97
4.16 Operation of Shore Connection Door Deck 3	99
4.16.1 Shore connection door OPEN	99
4.16.2 Shore connection door CLOSE	100

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	I. Table of content	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page: 1 (1)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

5 OPERATION IN THE EVENT OF FAILURE AT THE HYDR.SYSTEM	1
5.1 Failures at the Pump unit	1
5.1.1 Failure of one pump set	1
5.1.2 Oil min. Oil max.	1
5.1.3 Temperature max.	1
5.1.4 Filter blocked	1
5.1.5 Failure of the electrical solenoid valve Y 1 / Y 2	2
5.2 Failure of the solenoid valves at the hydr. control blocks	3
5.2.1 Operating of the Bow Door	3
5.2.2 Operating of the bow ramp	4
5.2.3 Operating of the Bulkhead Door	5
5.2.4 Operating of the Internal Tilttable Ramp	6
5.2.5 Operating of the Fixed Ramp Cover	7
5.2.6 Operating of the Hoistable Car Deck/Ramps	8
5.2.7 Operating of the Stern Ramps {PS/SB}	9
5.2.8 Operating of the Stern Passenger Ramp	10
5.2.9 Operating of the Pilot/Bunker Doors {PS/SB}	11
5.2.10 Operating of the Side Passenger Door	12
5.2.11 Operating of the Side Passenger Door (Deck 6, MS,PS)	12
5.2.14 Operating of the Side Car Ramp	13
5.3 Failure of the entire hydraulic system	16
5.3.1 General	16
5.3.2 Emergency operation by means of a hand pump-unit.	17
6 DESCRIPTION OF THE HYDRAULIC EQUIPMENT	1
6.1 General	1
6.2 Pump unit	1
6.2.1 General	1
6.2.2 Start/Stop of the pump unit	2
6.3 Hydraulic control block valves	3
6.3.1 General	3
6.3.2 Designation of the solenoid valves	3
7 DESCRIPTION OF THE ELECTRIC CONTROL	1
7.1 General	1
7.2 Motor starter control panels and main PLC control panels	1
7.3 Control stations	2
7.4 Bridge indication panel	6
7.5 Emergency Stop	8
7.6 Limit switches	9

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	I. Table of content	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page: 1 (1)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	


7.6.1 Designation of the limit switches	9
---	---

8 MAINTENANCE	1
----------------------	----------

8.1 Pipe lines for the hydraulic equipment	1
8.2 Checking the oil level at the pump unit and topping up	1
8.3 Hydraulic oil	2
8.4 Oil filter	2
8.5 Oil tank	2
8.6 Rust protection	3
8.7 Rubber sealings	3
8.8 Lubricating	3
8.8.1 Lubricating instructions Bow Door	4
8.8.2 Lubricating instructions Bow Ramp	5
8.8.3 Lubricating instructions Bulkhead Door	6
8.8.4 Lubricating instructions Internal Tilttable Ramp	7
8.8.5 Lubricating instructions Fixed Ramp Cover	8
8.8.6 Lubricating instructions Hoistable Car Deck/Ramps	9
8.8.7 Lubricating instructions Stern Ramp/Doors (PS/SB)	10
8.8.8 Lubricating instructions Stern Passenger Ramp/Door	11
8.8.9 Lubricating instructions Pilot/Bunk.er Doors (PS/SB)	12
8.8.10 Lubricating instructions Side Passenger Door	13
8.8.11 Lubricating instructions Side Passenger Door Deck 6,MS,PS	14
8.8.12 Lubricating instructions Side Passenger Doors Deck 6 FWD PS/STB	14
8.8.13 Lubricating instructions Side Passenger Door Deck 4 FWS PS	14
8.8.14 Lubricating instructions Side Car Ramp Deck 4 PS	14
8.8.15 Lubricating instructions for lift platform Deck 3	14
8.8.16 Lubricating instructions for Shore Connection door Deck 3	14

9 INSPECTION OF HULL CLOSURES	1
--------------------------------------	----------

9.1 GENERAL	1
9.2 INSPECTION REPORTS	1
9.3 INSPECTION OF BOW DOOR	2
9.3.1 INTERVALS OF VISUAL AND AUDIBLE INSPECTIONS I FUNCTION TESTS	2
9.3.2 MAX. PERMISSIBLE CLEARANCES	5
9.4 INSPECTION OF BULKHEAD DOOR	6
9.4.1 INTERVALS OF VISUAL AND AUDIBLE INSPECTIONS I FUNCTION TESTS	6
9.4.2 MAX. PERMISSIBLE CLEARANCES	9
9.5 Inspection of Fixed Ramp Cover	10
9.5.1 Intervals of visual and audible inspections I function tests	10
9.5.2 MAX. PERMISSIBLE CLEARANCES	12

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	I. Table of content	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page: 1 (1)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

9.6 Inspection of Stern Ramps PS/SB and Stern Passenger Ramp	13
9.6.1 Intervals of visual and audible inspections I function tests	13
9.6.2 MAX. PERMISSIBLE CLEARANCES	15
9.7 Inspection of Pilot/Bunker Roods PS/SB and Side Passenger Door	16
9.7.1 Intervals of visual and audible inspections I function tests	16
9.7.2 MAX. PERMISSIBLE CLEARANCES	18
9.8 Inspection of Side Car Ramp	19
9.8.1 Intervals of Visual and audible inspections I function tests	19
9.8.2 MAX: PERMISSABLE CLEARANCES	21
9.9 INSPECTION OF RUBBER SEALING (Sliding type PN70/PN96/PN120)	22
9.10 INSPECTION OF RUBBER SEALING (Sponge type)	23
9.11 INSPECTION OF PUMP UNITS FORE END/AFT END	24

10 APPENDIX

- 10.1 Technical data pump unit fore end
- 10.2 Technical data pump unit aft end
- 10.3 Technical data pump unit pilot and bunker door and side passenger doors
- 10.4 Record sheet of inspection and maintenance
- 10.5 Hydraulic oil recommendation
- 10.6 Lubricant recommendation


11 DRAWINGS AND LISTS

11.1 Drawings

- 11.1.1 System BOW DOOR
- 11.1.2 System BOW RAMP
- 11.1.3 System BULKHEAD DOOR
- 11.1.4 System Internal Tilttable Ram
- 11.1.5 System Fixed Ramp Cove
- 11.1.6 System Hoistable Car Deck/Ramps
- 11.1.7 System Stern Ramp/Doors(PS/SB) and Stern Passenger Ramp
- 11.1.8 System Pilot/Bunker Doors (PS/SB)
- 11.1.9 System Side Passenger Door

11.2 Lists

- 11.2.1 List of Parts
- 11.2.2 LIST OF SPARE PARTS
- 11.2.3 Instruction for ordering Spare parts

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Cover page	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page: 1 (1)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				




Operating and Maintenance Manual for Hydraulically operated RO-RO equipment



M/V FINLANDIA

Made in accordance with:

- SOLAS ch II-1
- IACS UR S8 Bow doors and inner doors requirements
- DNVGL Guidelines for the Preparation of Operating and Maintenance Manuals for Shell Doors 2005 Ed

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	1.Introduction	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page: 1 (1)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

1. INTRODUCTION

1.1 PREFACE AND OPERATIONAL INSTRUCTIONS FOR THE MASTER

Preface

The Operating and Maintenance Manual (OMM) for shell doors and hydraulic ro-ro equipment on mv FINLANDIA is made up in accordance with:


- SOLAS ch II-1
- IACS UR S8 Bow doors and inner doors requirements
- DNVGL Guidelines for the Preparation of Operating and Maintenance Manuals for Shell Doors 2005 Ed

The OMM is subject to approval and no revisions or modifications shall be made without Class approval

The approved OMM shall be available as follows:

- Onboard mv FINLANDIA
- Rederi Ab Eckerö, Shipmanagement
- BV Class regional office

OMM is made up in English language which also is working language onboard. OMM shall be reviewed onboard, normally in connection with yearly review of SMS annually, and any revisions or modifications needed shall be communicated to Rederi Ab Eckerö, Shipmanagement and dealt with as necessary.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	1.Introduction	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page: 2 (1)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

Operational instructions for the master

Safety precautions


It is of utmost importance that shell doors are kept closed and watertight to ensure the ships seaworthiness. If any shell door must be opened at sea in emergency or for other reason such as embarking pilot, it must be made with special care and with master's approval.

In case of damages or failures on shell doors which affects vessels seaworthiness it must always be reported according to company ISM routines. In case it concerns vessels watertight integrity below Deck 4, flag state administration and Port state administrations must be informed and normally also Class for any constructional deficiencies and advice.

Operational instructions for the master

Any operational limitations for vessels navigation are stated in PSSC cert "Operational limitations".

Arrival and departure routines with regards to maneuvering of shell doors are found in company SMS Company & Safety manual chapter 10.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Introduction 1.2 Ship's particulars	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				


1.2 Ship's particulars

IMO 9214379
 Reg.Nr 55247
 Built:
 Daewoo Shipbuilding and heavy mashinery LTD.
 Geoje, South Korea
 Yard: Kyung Nam-Do
 Built according to IMO SOLAS-74
 Keel laying date: 21.4.2000
 Delivered: sept 2001
 Class:
 Bureau Veritas Ro-Ro passenger ship, unrestricted navigation, ICE CLASS 1A
 COMF-NOISE 3, COMF-VIB 2, AUT-UMS, MON-SHAFT, CLEANSHIP

Dimensions

Gross tonnage 36 365
 Net tonnage 13 577
 Light Ship 14 196,7
 Deadweight 4583,6
 Displacement 18780,3
 Length o.a. 174,99m
 Length p.p. 162,1 m
 Breadth mld 27,60 m
 Depth mld to MD 9,80 m draught 6m
 Draught mld max 7,00 m
 Airdraught 40,84 m in light condition draught 6m

Car deck 1808 L m / 609 Pass. Cars
 car deck 3 941 L/m, 263 cars, height 4,9m
 car deck 4 867 L/m, 235 cars, height 4,6m
 car deck 5 112 cars, height on hoistable deck 2,2m

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Introduction 1.3 Manufacturer information	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

1.3 MANUFACTURER INFORMATION

MACOR NEPTUNE

Address and contact information:

Denmark-Cargo care solutions A/S
 Blokken 15
 DK-3460 Birkerød
 Tel: +45(0)44444455
 Fax: +45(0)44444485
 E-mail: ccs.dk@cargocaresolutions.com

Manufacturer of following equipment:

bow doors
 bow ramp
 bulkhead door
 tiltable ramp,
 car deck platforms/ramps
 pilot/bunker doors
 stern ramps
 stern passenger ramp
 side passenger door (deck 6 PS AFT)

MACGREGOR

Address and contact information:

Finland-Turku Office
 Tel: +358-2-41211
 Fax: +358-2-4121517
 24h: +358-400-824414

Estonia-Tallinn Office
 Tel: +372-6102200
 Fax: +372-6102400
 24h: +372-53-018716

Manufacturer of following information:

Side passenger door (deck 4 PS) installed 2001
 Oresund drydock
 Side passenger door (deck 6 PS/STB FWD) installed 2012
 Hatch cover and lift platform installed 2012
 Side car ramp installed 2015

SRC

Address and contact information:


SRC GROUP AS
 Kesk tee 31, 75305 Jüri, Estonia
 Tel: +372 6 684 670
 Fax: +372 6 684 671
src@src.ee

Manufacturer of following information:

Shore connection door (deck 3 PS AFT) installed 2021

MEBLOMOR

Side passenger door (deck 6 SP MIDSHP) Manually operateid in 2019

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.1 General description	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

2 GENERAL DESCRIPTION OF THE RO/RO EQUIPMENT

MACOR NEPTUN and MACGREGOR's cargo access equipment consists of the following hydraulically and electrically controlled equipment.

Bow Doors
Bow Ramp
Bulkhead Door
Internal Tilttable Ramp
~~Fixed Ramp Cover (removed)~~
Hoistable Car Deck/Ramps
Stern Ramp/Doors (PS/STB)
Stern Passenger Ramp/Door
Pilot/Bunker Doors (PS/STB)
Side Passenger Door (DECK 6 PS-AFT)
Side Passenger Door (DECK 6 PS-MIDSHIP)
Side Passenger Door (DECK 6 PS/STB-FWD)
Side Passenger Door (DECK 4 PS)
Side Car Ramp (DECK 4 PS)
Hatch Cover for Lift Platform (DECK 3)
Shore Connection Door (DECK 3)

2.1 Bow Doors

The bow doors form the first watertight closure of the bow and - in open position - gives access to the main deck hold. The bow doors -stb.- and ps.-side are operated by 2 hydraulic cylinders acting at the bow door arms, opening outwards and sliding back parallel to the shell plating.

In closed position, the bow doors are cleated and locked by hydraulically operated cleating and latching devices.


Watertightness is achieved by means of standard rubber packing.

The Bow Door can be operated by means of pushbuttons at the combined control stand BOW which is arranged near the bow part equipment on deck3 or from a portable control stand on deck4 as well.

Optical indications for monitoring the Bow Door operation are provided in the control stand and in the mimic panel on the bridge.

The bow doors electric control is connected to the bow ramp in such a way that prior to opening or closing the bow door, the bow ramp has to be completely closed.

When operating the bow door, a warning system is switched on (optical beacon, hooter).

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.1 General description	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

2.2 Bow Ramp

The bow ramp forms a weathertight closure of the bow and - in open position - gives access to the main deck hold. The ramp consists of three parts and flaps and opens out- upwards. The part 1 is operated via 2 direct-acting cylinders. The part 2 is hinge-connected to part 1 and will be stretched or lowered automatically via parallel guided arms. Part 3 will be unfolded and folded via a hydraulic linkage built-in into part2.

In closed position, the ramp part 1 is locked by ship-side arranged hydraulically operated locking devices, the ramp part 2 is secured by ship side arranged hydraulically operated securing devices and part 3 is secured by a bow ramp side arranged hydraulically operated securing device.

Weathertightness is achieved by means of standard rubber packing.

The Bow Ramp can be operated by means of pushbuttons at the combined control stand BOW which is arranged near the bow part equipment on deck3 or from a portable control stand on deck4 as well.

Optical indications for monitoring the Bow Ramp operation are provided in the control stand and in the mimic panel on the bridge.

The bow ramp's electric control is connected to the bow door and to the bulkhead door in such a way that prior to opening or closing the bow ramp, the bow door has to be completely opened and the bulkhead door has to be completely closed.

When operating the bow ramp, a warning system is switched on (optical beacon, hooter).

2.3 Bulkhead Door

The bulkhead door forms the second watertight closure of the bow and is arranged aft of the bow ramp and - in open position- gives access to the main deck hold. The bulkhead door is operated via 2 direct-acting cylinders.

In closed position, the door is locked by bulkhead door-side arranged hydraulically operated locking devices.

Watertightness is achieved by means of standard rubber packing of sliding type mounted in the door.


The bulkhead door can be operated by means of pushbuttons at the combined control stand

BOW which is arranged near the bow part equipment on deck3 or from a portable control stand on deck4 as well.

Optical indications for monitoring the bulkhead door operation are provided in the control stand and in the mimic panel on the bridge.

The bulkhead door's electric control is connected to the bow ramp in such a way that prior to opening or closing the bulkhead door, the bow ramp has to be opened at least

80°. When operating the bulkhead door, a warning system is switched on (optical beacon, hooter).

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.1 General description	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

2.4 Internal Tiltable Ramp

The tiltable ramp forms a weathertight closure at deck 4. - giving access to the deck 4 holds. The tiltable ramp is operated by 2 hydraulic pulling cylinder mounted ramp structure and wire system.

The ramps can be tilted up from the inclined position to the horizontal position and tilted down from the horizontal position to the inclined position to each side of fore or aft with trailers on it.

In closed position, the tiltable ramp part is locked by hydraulically operated latching devices and pivot locking pins.

Weathertightness is achieved by means of standard rubber packing.

When lowered, the ramp forms a continuous ramp from lower deck to upper deck to provide access from deck 3 to the deck 4.

The ramp is hoisted with loads.

To accommodate transverse forces during operations, the ramp is guided throughout its travel by means of a hull mounted guide rail.

The tiltable ramp can be operated by means of pushbuttons at the control stands which are arranged near the tiltable ramp fore and aft parts, equipment on the deck 3 or from the portable control stands on deck 4 as well.

Optical indication for monitoring the tiltable ramp operation are provided in the control stand and in the mimic panel on the bridge.

When operating the tiltable ramp, a warning system is switched on (optical beacon, hooter).

2.5 Fixed Ramp cover (Deleted)

2.6 Hoistable Car Deck/Ramps


The hoistable car deck consists of four car deck platforms and two car deck ramps (Platform 1 PS,1 SB, platform 2 PS,2 SB, ramp 3 PS,3 SB)

2.6.1 Car Deck Platform

The car drive on the car deck platforms via the aft inclined car deck ramps.

The platforms can be hoisted below the structure of deck 6, if there is no demand for stowage of cars on them.

Operation is achieved by one cylinder via steel wires which will be arranged inside of ship's side frames and under deck 6 (fixed deck).

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.1 General description	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

In horizontal loading position (deck 5) the platforms are resting on fixed stoppers arranged on shipside frames and center longitudinal wall.

In stowing position below deck 6, the platforms are secured by built-in securing hooks handled by remotely manual operation. Operation of the car deck platforms is as follow:

- Platform 1 PS, platform 2 PS via pushbuttons at the control station CARDECK PLATFORM PS.
- Platform 1 SB, platform 2 SB via pushbuttons at the control station CARDECK PLATFORM SB.

When operating the car deck ramps 1 PS, or 2 PS, the warning system on aft end of car deck ramp is switched on (optical beacon, hooter)

When operating the car deck ramps 1 SB, or 2 SB, the warning system on aft end of car deck ramp is switched on (optical beacon, hooter)

2.6.2 Car Deck Ramps

The car drive on the car deck platforms via the aft inclined car deck ramps.

The ramps can be tilted up from the inclined position to the horizontal position and tilted down from the horizontal position to the inclined position with cars on it.

The ramps can be hoisted below the structure of deck 5, if there is no demand for stowage of cars on them.

Operation is achieved by one cylinder via steel wires which will be arranged inside of deck 6 frame (fixed deck).

In horizontal operating position (deck 5), the ramps are resting on semi-auto stopper automatically arranged on shipside frames and center longitudinal wall.


In stowing position below deck 6, the ramps are secured by built-in securing hooks handled by remotely manual operation.

Operation of the car deck platforms is as follow:

- Platform 3 PS via pushbuttons at the control station CAR RAMP PS.
- Platform 3 SB via pushbuttons at the control station CAR RAMP SB.

When operating the car deck ramps 3 PS, the warning system on aft end of car deck ramp is switched on (optical beacon, hooter)

When operating the car deck ramps 3 SB, the warning system on aft end of car deck ramp is switched on (optical beacon, hooter)

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.1 General description	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

2.7 Stern Ramp/Doors (PS/STB)

The stern ramps form a watertight closure of the stern and - in open position - gives access to the main deck hold. The ramp consists of main part and flaps and opens out- upwards. The main part is operated via 2 direct-acting cylinders.

The flaps are hinge connected to main part and will be unfolded or folded via a hydraulic linkage built-in flap.

In closed position, the ramp part1 is locked ship-side arranged hydraulically operated securing devices.

Watertightness is achieved by means of standard rubber packing.

The Stern ramp can be operated by means of pushbuttons at each control stand which are arranged near the stern part equipment on deck 3 or each portable control stand on deck 4 as well.

Optical indication for monitoring the stern ramp operation are provided in the control stand and in the mimic panel on the bridge.

When operating the stern ramp, a warning system is switched on (optical beacon, hooter).

2.8 Stern Passenger Ramp/Door

The stern passenger ramp forms a watertight closure of the stern and - in open position

- gives access to the main deck hold. The ramp consists of main part and flaps and opens out- upwards.

The main part is operated via 2 direct-acting cylinders. The flaps are hinge connected to main part and will be unfolded or folded via a hydraulic linkage built- in flaps.

In closed position, the ramp part1 is locked ship-side arranged hydraulically operated securing devices.

Watertightness is achieved by means of standard rubber packing.

The Stern passenger ramp can be operated by means of pushbuttons at each control stand which are arranged near the stern part equipment on deck 3 or each portable control stand on deck 4 as well.

Optical indication for monitoring the stern passenger ramp operation are provided in the control stand and in the mimic panel on the bridge.


When operating the stern passenger ramp, a warning system is switched on (optical beacon, hooter).

2.9 Pilot/Bunker Doors (PS/STB)

The pilot/bunker doors form a watertight closure of the side shell and - in open position

- gives access to the main deck for pilot entrance and bunkering facilities. The door is operated via 1 direct-acting cylinder - opening of the door to inside.

In closed position, the door is locked by hydraulically locking devices arranged inside of door.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.1 General description	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

Watertightness is achieved by means of standard rubber packing mounted in the door with compression bar in door coaming.

The Pilot/bunker doors can be operated by means of pushbuttons at each control stand which are arranged near the door equipment on deck 3.

Optical indication for monitoring the pilot/bunker door operation are provided in the control stand and in the mimic panel on the bridge.

2.10 Side Passenger Door, Deck 6, Aft, PS (NOT IN USE)

The side passenger door forms a watertight closure of the side shell and - in open position - gives access to the deck 6 for passenger entrance. The door is operated via 1 direct-acting cylinder - opening of the door to outside/sidewards/parallel.

In closed position, the door is locked by hydraulically locking devices arranged inside of door.

Watertightness is achieved by means of standard rubber packing mounted in the door with compression bar in door coaming.

The Side passenger door can be operated by means of pushbuttons at each control stand which are arranged near the door equipment on deck 6.

Optical indication for monitoring the door operation are provided in the control stand and in the mimic panel on the bridge.

2.11 Side Passenger Door, Deck 6, Midship PS (Installed in 2019)

The side passenger doors forms a watertight closure of the side shell and - in open position - gives access to the deck 6 for passenger entrance.

The door is only manually operated by mechanical handles.

2.12 Side Passenger Doors, Deck 6 forward PS/SB (Installed in 2012)


The side passenger door forms a watertight closure of the side shell and - in open position - gives access to the deck 6 for passenger entrance. The door is operated via 1 direct-acting cylinder - opening of the door to outside/sidewards/parallel.

In closed position, the door is locked by hydraulically locking devices arranged inside of door.

Watertightness is achieved by means of standard rubber packing mounted in the door with compression bar in door coaming.

The Side passenger door can be operated by means of pushbuttons at each control stand which are arranged near the door equipment on deck 6.

Optical indication for monitoring the pilot/bunker door operation are provided in the control stand and in the mimic panel on the bridge.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.1 General description	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

2.13 Side Passenger Door, Deck 4, Forward PS (Installed in 2001)

The side passenger door forms a watertight closure of the side shell and - in open position - gives access to the deck 4 on car deck. The door is operated via 1 direct-acting cylinder -

opening of the door to inside.

In closed position, the door is locked by hydraulically locking devices arranged inside of door.

Watertightness is achieved by means of standard rubber packing mounted in the door with compression bar in door coaming.

The Side passenger door can be operated by means of pushbuttons at each control stand which are arranged near the door on deck 4. Optical indication for monitoring the door operation are provided in the control stand and in the mimic panel on the bridge.

2.14 Side Car Ramp, Deck 4, PS (Installed in 2015)

The door/ramp is described as "side ramp" in this manual. This because the labels on the operating panels says "RAMP" and "SIDE RAMP".

In the concept is also the land based ramp. To avoid confusion of what equipment we try to call the ramp on the ship "Side ramp" and the ramp on land "Land ramp"

The ramp is located on port side between deck 4 and deck 5 between frames no. 40 and 48. The ramp is hinged at deck 4 with bridge plates between ramp and hull.

The ramp is hydraulically operated and secured ensuring weather tightness in closed position. Compressed rubber packing of MacGregor standard.

The ramp is closed and lowered by means of direct operating hydraulic cylinders.

The ramp is secured in closed position by hydraulically operated cleat mechanisms located in the hull structure.

For more details, see MacGregor manual for this specific equipment, installed in 2015.

2.15 Hatch Cover for lift platform Deck 3 (Installed in 2012)


The hatch cover forms a watertight closure at main deck - flush with the main deck and stowing to the STBD side and secured in the open position.

The hatch cover is operated and cleated by means of hydraulic cylinder and is watertight in the closed position.

The hatch cover opens to the vertical position and is locked by hydraulically operated mechanisms.

In closed position, the ramp cover is secured by means of hydraulically operated cleat mounted in the ramp cover.

Watertightness is achieved by means of standard rubber packing.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.1 General description	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

The hatch cover is side hinging, hydraulic cylinders attached at the longitudinal coaming. The hatch cover is opened/closed from a control stand near the equipment. Optical indication for monitoring the hatch cover operation is provided in the

control stand and in the mimic panel on the bridge.

When operating the ramp cover, a warning system is switched on (optical beacon, hooter).

2.16 Shore connection door D3, Aft ,PS (Installed in 2021)

The shore connection door forms a watertight closure of the side shell and - in open position - gives access to the main deck, shore connection room, for electrical shore connection cables.


The door is operated via 1 direct-acting cylinder - opening of the door to inside.

In closed position, the door is locked by hydraulically locking devices arranged inside of door.

Watertightness is achieved by means of standard rubber packing mounted in the door with compression bar in door coaming.

The door can be operated by means of pushbuttons at control stand which are arranged near the door equipment on deck 3.

Optical indication for monitoring the pilot/bunker door operation is provided in the control stand and in the mimic panel on the bridge.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.30 Leakage well alarm system at shell openings	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
	Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

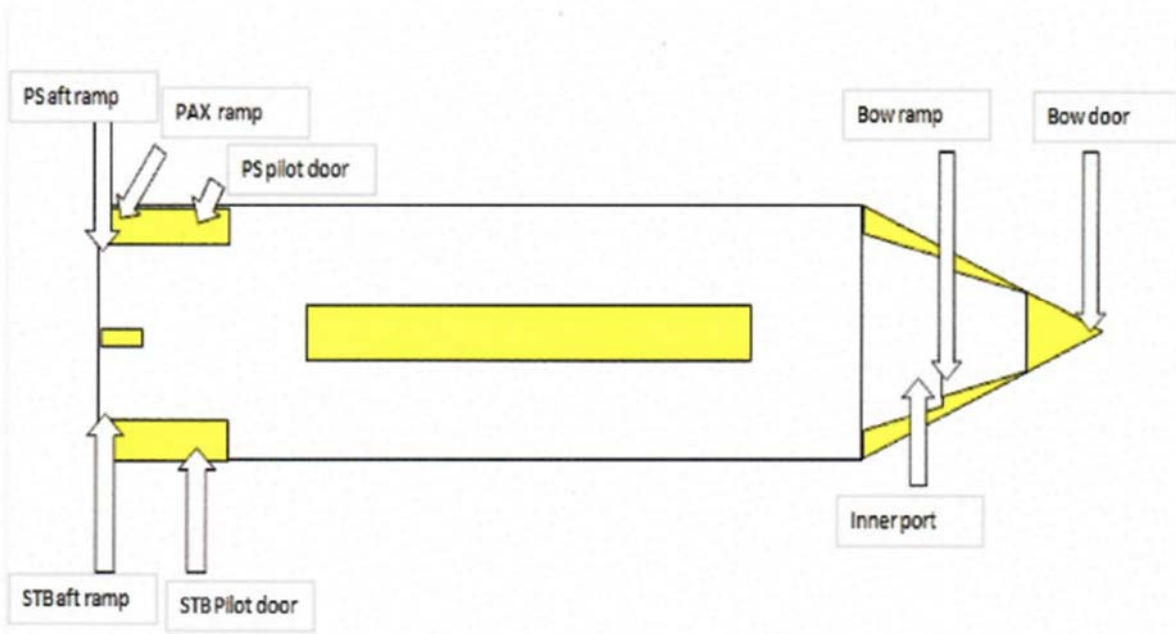
2.30 Leakage well alarm system at shell openings

On car deck (deck 3) and shell openings there are a water leakage detection system with audible alarm that is indicating on the navigation bridge and engine control room in case of high-water at the leakage wells.


Location of the leakage wells are listed below.

- 1 Bow Doors
- 2 Bow Ramp (between ramp and bulkhead door)
- 3 Bulkhead Door
- 4 STB Bunker Station
- 5 PS Bunker Station
- 6 STB Aft Ramp
- 7 PS Aft Ramp
- 8 Aft Passenger Ramp

Finlandia




Finlandia Leakage Well Alarm System Locations

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 2.31 Drainage system between bow door and ramp/bulkhead door	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

2.31 Drainage system between the bow door and ramp/bulkhead door.

A drainage system is arranged between the bow ramp and bulkhead door as mentioned in the section above.

water leakage detection system with an audible alarm function to the navigation bridge being set off when the water levels in these areas exceed 0.5 meters or less.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	Door and ramp system 2.32 Open-Close indication system in wheelhouse	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

2.32 Open-Close indication system in wheelhouse




This panel is located at the navigation bridge with the purpose of monitoring the shell openings and ro-ro equipment's Open-Close indications.

SELECTOR SWITCH: SHELL DOORS INHIBITED ON/OFF

MODE SELECTOR: SEA/HARBOUR

GREEN LIGHT: INDICATE CLOSED/LOCKED

RED LIGHT: INDICATE NOT CLOSED/NOT LOCKED

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
	2.33 TV surveillance system	Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

2.33 TV Surveillance System


In the bow section between bow door and bulkhead door, cameras are installed for monitoring the position of the doors, closing arrangement and for water leaking detection. Monitors are arranged on the navigation bridge and engine control room

Other shell openings such as Pilot/Bunker doors, Stern Ramps and Stern Passenger Ramp are monitored with monitors arranged on the navigation bridge and engine control room.

Deck 3 and deck 4 are equipped with cameras for TV surveillance.

At the BOW control stand, monitors are arranged for monitoring the opening and closing of the bow doors, bow ramp and bulkhead door. A separate monitor is installed at the BOW control stand which show the opening and closing sequence as well as locking and cleating computerized.

A monitor is arranged at the car deck (deck 4) control stand for monitoring the car deck platforms/ramps.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	Door and ramp system 3. Maximum values for operation	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

3 Maximum values for operation, permissible loads and operation times

3.1 Permissible Maximum values for operation (list and trim)

The below specified maximum values are the limiting values for operation of the systems, plants and constructional parts supplied. These values must not be exceeded.

Permissible list and trim when operating the equipment:

- List 2°
- Trim by the stern 2°
- Trim by the head 2°

The MacGregor equipment (side car ramp) can operate in these conditions:

- Heel: $\pm 3^\circ$ (max)
- Trim: $\pm 1.0^\circ$ (max)
- Slope Min. 0°
- Slope Max. $+8^\circ$

3.2 Permissible load and operation times

3.2.1 Bow door

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 120 sec.

Closing: approximately 120 sec.

3.2.2 Bow ramp

The Bow Ramp only serves as ramp for trailer loading and unloading and not as watertight bulkhead.

Loading: Ramp supported ashore

Trailer load (40' size) – 45 t (3 axles)

Axle load - 15 t / 4 wheels (2 double pneumatic wheels)

Axle distance - 1,300 mm

Uniform load – 3.0 t/m² (only for local scantling plates and secondary stiffeners, but max 45 t)

Mafi trailers – 2* 16 t / axle distance 0,7m / solid tires (tug master 21 t / axle / pneumatic tires)

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 120 sec.

Closing from -6 °: approximately 120 sec.

3.2.3 Bulkhead door

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 30 sec.

Closing from -6 °: approximately 30 sec.

3.2.4 Internal tiltable ramp

The Internal Tiltable Ramp only serves as Ramp for Trailer Loading and Unloading and as weathertight deck.

Loading:

Trailer load (40' size) – 45 t (3 axles)

Axle load - 15 t / 4 wheels (2 double pneumatic wheels)

Axle distance - 1,300 mm

Uniform load – 2.0 t/m²

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Lowering: approximately 180 sec.

Raising: approximately 180 sec.

3.2.5 Fixed Ramp Cover (DELETED)

3.2.6 Hoistable car deck/ramps

Loading:

Uniform load – 0.2 t/m²

Axle load – 1.3 t

Car weight – 1.8 t

Operation time: Ramps

Hoisting (from inclined to horizontal position) app. 60sec.

Lowering (from inclined to horizontal position): app. 60sec.

Hoisting (from horizontal to stowage position): app. 120sec.

Lowering (from horizontal to stowage position): app. 120sec.

Operation time: Platforms

Hoisting (from working to stowage position): app. 120sec.

Lowering (from working to stowage position): app. 120sec.

3.1.7 Stern ramp/doors (PS/STB)

The Stern Ramp/Doors serves as Ramp for Trailer Loading and Unloading and as weathertight bulkhead.

Loading:

Trailer load (40' size) – 45 t (3 axles)

Axle load - 15 t / 4 wheels (2 double pneumatic wheels)

Axle distance - 1,300 mm

Uniform load – 3.0 t/m² (only for local scantling plates and secondary stiffeners, but max 45 t)

Mafi trailers – 2* 16 t / axle distance 0,7m / solid tires (tug master 21 t / axle / pneumatic tires)

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 120 sec.

Closing from -6 °: approximately 120 sec.

3.2.8 Stern passenger ramp/doors

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 120 sec.

Closing from -6 °: approximately 120 sec.

3.2.9 Pilot/bunker doors (PS/STB)

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 60 sec.

Closing: approximately 60 sec.

3.2.10 Side Passenger door (Deck 6, AFT, PS)

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 60 sec.

Closing: approximately 60 sec.

3.2.11 Side Passenger Door (Deck 6 Midship PS)

This door is manually operated by mechanical handles.

3.2.12 Side Passenger door (Deck 6, FWD, PS/SB)

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 40 sec.

Closing: approximately 40 sec.

3.2.13 Side Passenger Door (Deck 4 FWD PS)

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 60 sec.

Closing: approximately 60 sec.

3.2.14 Side Car Ramp (Deck 4, PS)

Loading:

Axle load – 1 t

Further loads – snow and wind load according to local norm. Snow grinder within the parameters.

Design load:

Vehicle load: Cars and light trucks, each max 4250 kg, according to EU third Directive.

Loads from environment according to Classification Society Rules.

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 120 sec.

Closing: approximately 120 sec.

3.2.15 Hatch Cover

Loading:

Same vehicle loads as the surrounding deck 3 area.

3.2.16 Lifting platform

Loading:

Maximum axle load of 3.1t at deck 3 level caused by one axle of a counterbalanced forklift of type CAT DP25N loaded with max 1 ton.

SWL 8.5t located at the center of the platform.

Allowed asymmetrical loads:

-½ of SWL for 50% area longitudinally


-1/3 of SWL for 50% area transversally

3.2.17 Shore Connection hatch

Operation time: (excluding time for locking, unlocking, securing and unsecuring)

Opening: approximately 60 sec.

Closing: approximately 60 sec.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4. Operation of RO-RO equipment, shell doors and openings	Version: 1	Date: XX-XX-2019	Approved: Date: XX-XX-2019
		Previously updated:		
	Bow visor	Auth: HH/WA	Page: 22 (2)	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

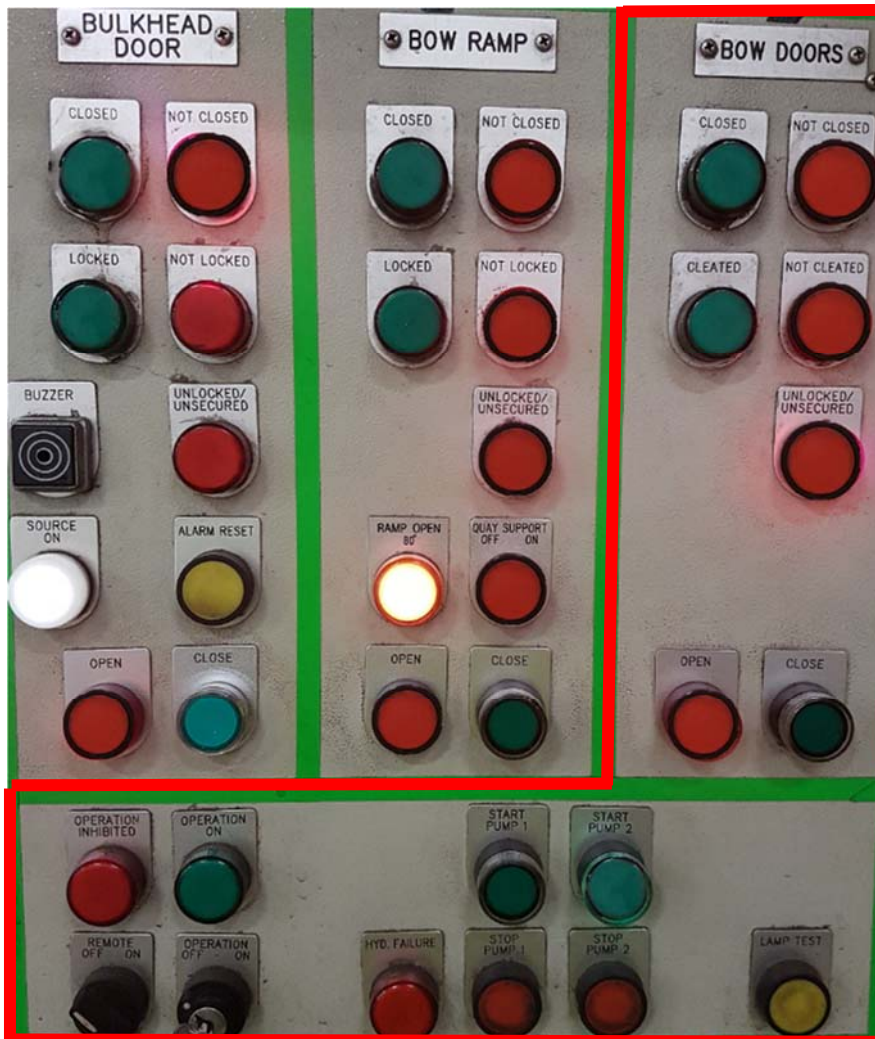
4. Operation of RO-RO equipment, shell doors and openings


4.1 Operation of the bow doors	Version: 1	Date: 16-05-23	Approved:
	Previously updated:		
	Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019

4.1 Operation of the Bow Doors from combined Control Stand Bow

NB!

Do not open the bow doors without permission from the bridge.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.1 Operation of the bow doors	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.1.1 Bow doors OPEN

Initial situation:

- Signal lamp OPERATION INHIBITED is lit.



- All Emergency-stop buttons are unlocked.

- The Bow Ramp is completely closed and locked. (Indicated by the indication lights CLOSED and LOCKED). If not, close the Bow Ramp completely (Indicated by the indication light CLOSED and LOCKED lights up).




- The selector switch REMOTE-CONTROL ON/OFF is switched to position OFF.



- The selector switch QUAY SUPPORT ON/OFF is switched to position OFF



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.1 Operation of the bow doors	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

- Bow doors signal lights CLOSED and CLEATED lights up



Opening procedure:

1. Ask permission from the bridge to open the bow doors. The switch SHELL DOORS INHIBITED is turned OFF and the signal lamp OPERATION INHIBITED extinguishes.



2. Press the pushbutton LAMP TEST to check all signal lamps.



3. Switch Key-operated switch to OPERATION ON (indicated by the indication light OPERATION ON lights up).



4. Press the pushbutton START PUMP 1 and START PUM 2 until the pushbuttons lights up.



5. WAIT 10 SECONDS.


6. Press the pushbutton OPEN. The warning system (optical and siren) will be activated, and the opening operation starts automatically. The pushbutton OPEN shall be pushed down until:



- Pushbutton OPEN lights up
- signal lamps NOT CLOSED and NOT CLEATED lights up.
- signal lamp UNLOCKED/UNSECURED lights up.



7. Release the pushbutton OPEN, the warning system on fore end (optical and siren) will be switched off.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.1 Operation of the bow doors	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.1.2 Bow doors CLOSE

Initial situation:


- Signal lamp OPERATION INHIBITED does not light.
- All Emergency-stop buttons are unlocked.
- The Bow Ramp is completely closed and locked. (Indicated by the indication lights CLOSED and LOCKED). If not, close the Bow Ramp completely (Indicated by the indication light CLOSED and LOCKED lights up).
- The selector switch REMOTE-CONTROL ON/OFF is switched to position OFF
- The selector switch QUAY SUPPORT ON/OFF is switched to position OFF
- Signal lamps of the Bow doors NOT CLOSED and NOT CLEATED lights up
- Key-operated switch OPERATION ON is switched to position ON.
- PUMP 1 and PUMP 2 on fore end are switched ON. The pushbutton PUMP 1 START and PUMP 2 START lights up.

Closing procedure:

1. Press the pushbutton LAMP TEST to check all signal lamps.
2. Press pushbutton CLOSE. The warning system (optical and siren) will be activated, and the closing operation starts automatically. Keep the pushbutton CLOSE pressed until:



- Pushbutton CLOSE lights up.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.1 Operation of the bow doors	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

-Signal lamps CLOSED and CLEATED lights up.



3. Release the pushbutton, the warning system (optical and siren) will be switched off.

4. Stop the pumps by pressing STOP PUMP 1&2




- Pushbutton PUMP 1 and PUMP 2 RUN extinguishes.

5. Switch OFF key-operated switch OPERATION ON/OFF



6. Double check that all bow doors are closed and locked. Inform the bridge that ALL BOW DOORS ARE CLOSED AND LOCKED. The switch SHELL DOORS INHIBITED is turned ON and the signal lamp OPERATION INHIBITED lit up at the combined control stand.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.1 Operation of the bow doors	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.1.3 Operation of the Bow Doors from portable Control Stand on Deck4

OPEN

Initial situation:

Pump 1 and pump 2 of the pump unit on forward end are switched on. All Emergency-stop buttons are unlocked.

The Bow Ramp is completely closed and locked. (Indicated if the illuminated push-button CLOSE of Bow Ramp control lights up. If not, close and lock first the Bow Ramp completely until the a.m. illuminated pushbutton lights up.)

REMOTE-CONTROL ON/OFF on control station main deck is switched ON.

- illuminated pushbutton Bow doors control CLOSE light up.

1. Press pushbutton LAMP TEST to check all signal lamps.
2. Press pushbutton OPEN, the warning system on fore end (hooter and optical beacon) will be switched on and the opening operation starts automatically, keep it pressed until:
 - Pushbutton OPEN light up
 - Pushbutton CLOSE is extinguished
3. Release pushbutton OPEN, the warning system on fore end (hooter and optical beacon) will be switched off.

CLOSE

Initial situation:


Pump 1 and pump 2 of the pump unit on forward end are switched on. All Emergency-stop buttons are unlocked.

The Bow Ramp is completely closed and locked. (Indicated if the illuminated push-button CLOSE of Bow Ramp control lights up. If not, close and lock first the Bow Ramp completely until the a.m. illuminated pushbutton lights up.)

REMOTE-CONTROL ON/OFF on control station main deck is switched ON.

- Pushbutton Bow doors control OPEN light up.

1. Press pushbutton LAMP TEST to check all signal lamps.

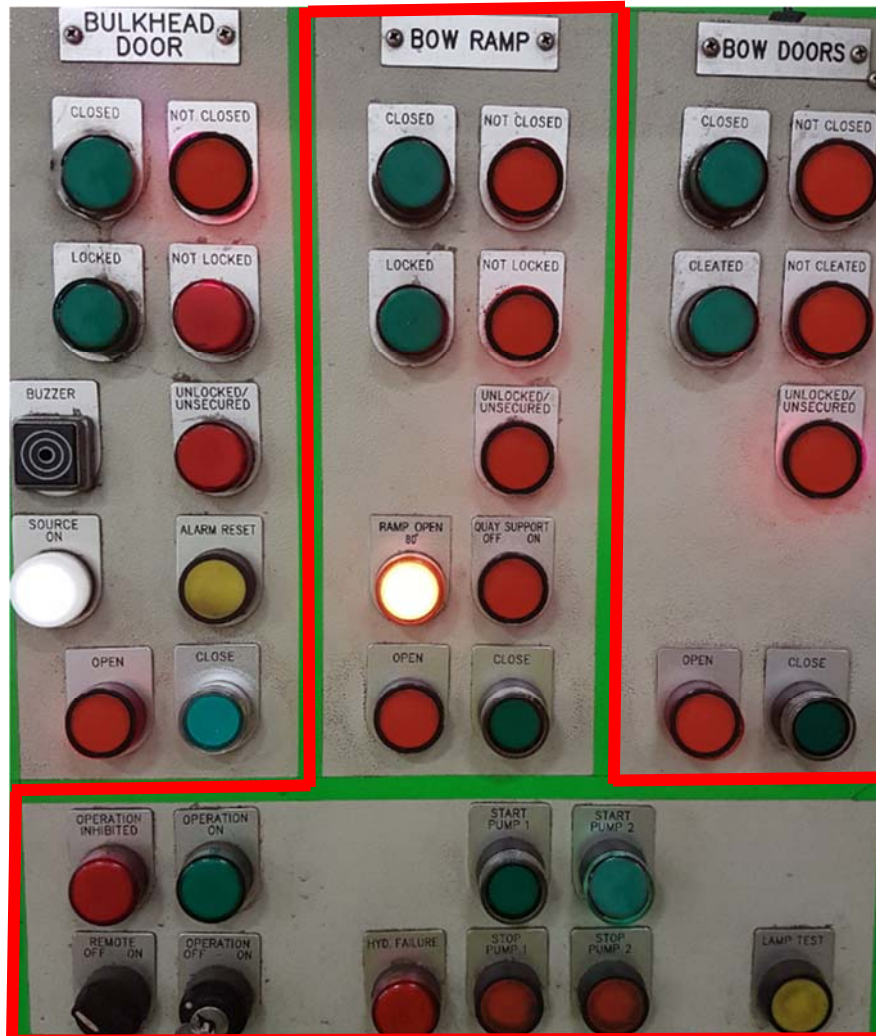
	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.1 Operation of the bow doors	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

2. Press pushbutton CLOSE, the warning system on fore end (hooter and optical beacon) will be switched on and the opening closing passes off automatically, keep it pressed until:

- Pushbutton CLOSE lights up
- Pushbutton OPEN is extinguished

3. Release pushbutton CLOSE, the warning system on fore end (hooter and optical beacon) will be switched off.


4.2 Operation of the Bow Ramp from combined Control Stand Bow



4.2.1 Bow ramp OPEN

Initial situation:

- Signal lamp OPERATION INHIBITED does not light
- All Emergency-stop buttons are unlocked.
- Both Bow Door wings must be completely open. (Indicated by the illuminated pushbutton OPEN of the Bow Door control. If not, open first the Bow Door wings completely until the illuminated pushbutton OPEN lights up.)
- The Bulkhead door must be completely closed. (Indicated by the illuminated push button CLOSE of the Bulkhead Door control. If not, close first the Bulkhead Door completely until the illuminated push button CLOSE lights up.)

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.2 Operation of the bow ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

- PUMP 1 and PUMP 2 on fore end are switched ON. Pushbutton PUMP 1 RUN and PUMP 2 RUN lights up.

- Key-operated switch OPERATION ON is switched ON.

- The selector switch REMOTE CONTROL ON/OFF is switched to position OFF

- The selector switch QUAY SUPPORT ON/OFF is switched to position OFF

1. Press the pushbutton LAMP TEST to check all signal lamps.

2. Press the pushbutton OPEN, the warning system on fore end (optical and siren) will be switched on and the opening operation passes off automatically, the pushbutton OPEN shall be pushed down until:



-the Bow Ramp rests with its flaps on the quay (visual checking) and stopped.

-signal lamps NOT CLOSED and NOT LOCKED lights up.


-signal lamp UNLOCKED/UNSECURED lights up.

- signal lamp RAMP OPEN 80° lights up (Possible to open the bulkhead door if needed).



3. If it is necessary to open the bulkhead door, do not switch ON the QUAY SUPPORT.

- Key-operated switch at control station BOW must be remain switched ON

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.2 Operation of the bow ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.2.2 Bow ramp CLOSE

Initial situation:

- Signal lamp OPERATION INHIBITED does not light
- All Emergency-stop buttons are unlocked.

- Both Bow Door wings must be completely opened. (Indicated by the illuminated push button OPEN of the Bow Door control. If not, open first the Bow Door wings completely until the illuminated push button OPEN lights up).

- The Bulkhead door must be completely closed. (Indicated by the illuminated push button CLOSE of the Bulkhead Door control. If not, close first the Bulkhead Door completely until the illuminated push button CLOSE lights up.)

- PUMP 1 and PUMP 2 on fore end are switched on. Pushbutton PUMP 1 RUN and PUMP 2 RUN lights up.

- The selector switch REMOTE CONTROL ON/OFF is switched to position OFF

- The selector switch QUAY SUPPORT ON/OFF is switched ON, signal lamp QUAY SUPPORT ON lights up

- 1. Press the pushbutton LAMP TEST to check all signal lamps
- 2. Switch OFF selector switch QUAY SUPPORT ON/OFF.




- signal lamp QUAY SUPPORT ON extinguishes. (The ramp's drive is connected).

3. Press the pushbutton CLOSE, the warning system on fore end (optical and siren) will be switched on and the closing operation passes off automatically, the pushbutton CLOSE shall be pushed down until:



- illuminated pushbutton CLOSE lights up.
- signal lamp CLOSED lights up
- signal lamps LOCKED lights up

4. Release the pushbutton, the warning system on fore end (optical and siren) will be switched of

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.2 Operation of the bow ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.2.3 Operation of the Bow Ramp from portable Control Stand on Deck4

OPEN

Initial situation:

Pump 1 and pump 2 of the pump unit on fore end are switched on. All Emergency-stop buttons are unlocked.

- Both Bow Door wings must be completely opened. (Indicated by the illuminated pushbutton OPEN of the Bow Door control lights up. If not, open first the Bow door wings completely until the illuminated pushbutton lights up.)

- The Bulkhead door must be completely closed. (Indicated by the illuminated push-button CLOSE of the Bulkhead Door control lights up. If not, close first the Bulkhead door completely until the illuminated pushbutton CLOSE lights up.)

REMOTE-CONTROL ON/OFF on control station main deck is switched ON.

- Pushbutton Bow ramp control CLOSE light up.

- The pushbutton (lock type) QUAY SUPPORT ON/OFF is switched OFF.

1. Press pushbutton LAMP TEST to check all signal lamps.

2. Press pushbutton OPEN, the warning system on fore end (hooter and optical beacon) will be switched on and the opening operation starts automatically, keep it pressed until:

- The Ramp rests with its flap on the quay (visual checking)
- Pushbutton CLOSE is extinguished


3. Switch ON pushbutton (lock type) QUAY SUPPORT ON/OFF, the hydraulic cylinders for driving the ramp are released and the ramp is free to adapt to the different heights between ship and quay.

-Pushbutton QUAY SUPPORT ON lights up.

(Key-operated switch at control station BOW on main deck must be remain switched ON indicated by the signal lamp OPERATION ON.)

Important!

With operation "QUAY SUPPORT ON" at least one pump of the pump unit on fore end remain switched ON for filling the drive-cylinders with hydraulic oil.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.2 Operation of the bow ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

CLOSE

Initial situation:

Pump 1 and pump 2 of the pump unit on fore end are switched on. All Emergency-stop buttons are unlocked.

- Both Bow Door wings must be completely opened. (Indicated by the illuminated push-button OPEN of the Bow Door control lights up. If not, open first the Bow door wings completely until the a.m. illuminated pushbutton lights up.)

- The Bulkhead door must be completely closed. (Indicated by the illuminated push-button CLOSE of the Bulkhead Door control lights up. If not, close first the Bulkhead door completely until the a.m. illuminated pushbutton CLOSE lights up.)

REMOTE-CONTROL ON/OFF on control station main deck is switched ON.

- The pushbutton (lock type) QUAY SUPPORT ON/OFF is switched ON.

1. Pres pushbutton LAMP TEST to check all signal lamps.

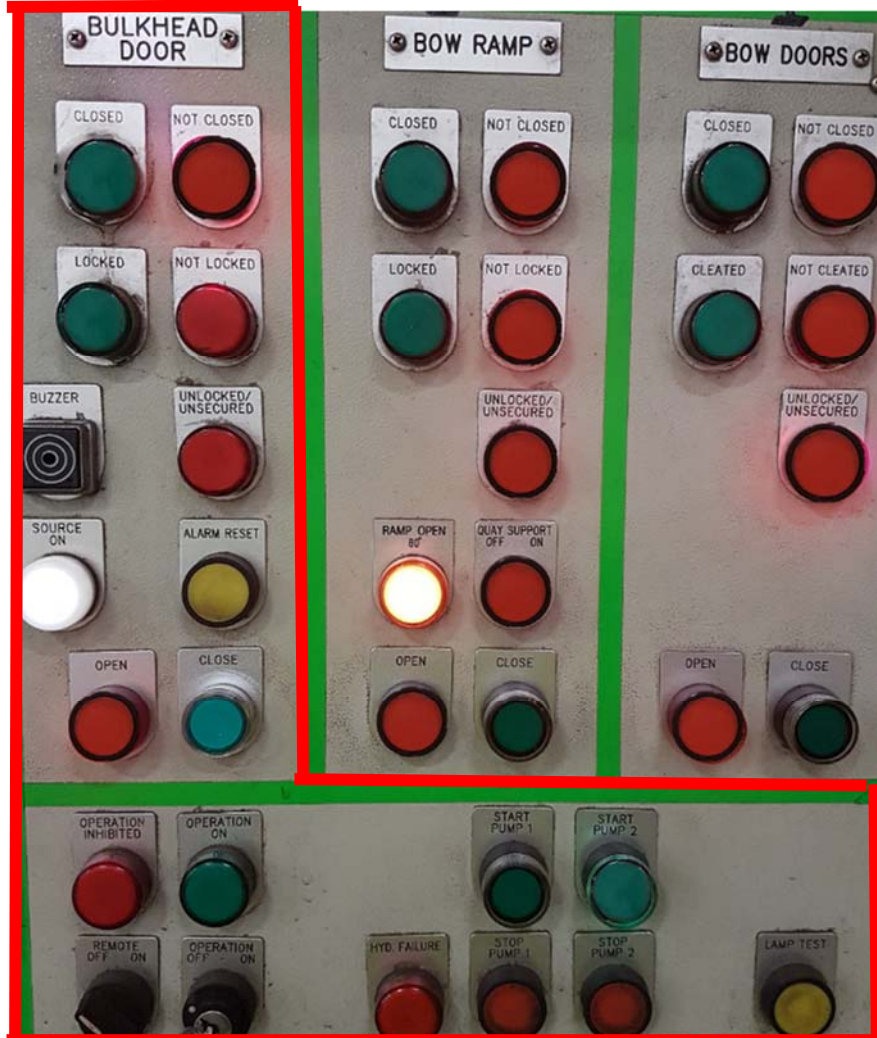
2. Switch OFF pushbutton (lock type) QUAY SUPPORT ON/OFF, the illuminated signal lamp QUAY SUPPORT ON is extinguished. (The ramp's drive is connected)


3. Press pushbutton CLOSE, the warning system on fore end (hooter and optical beacon) will be switched on and the closing operation passes off automatically, keep it pressed until:

- Pushbutton CLOSE lights up.

4. Release pushbutton, the warning system on fore end (hooter and optical beacon) will be switched off.

4.3 Operation of the Bulkhead Door from combined Control Stand Bow



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.3 Operation of the bulkhead door	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.3.1 Bulkhead Door OPEN

ATTENTION

For maneuvering the bulkhead door, the Bow Ramp must be opened at least 80°, to avoid any collision with the bow ramp during the maneuver.



Initial situation:

- Signal lamp OPERATION INHIBITED does not light

-All Emergency-stop buttons are unlocked.

- PUMP 1 and PUMP 2 on fore end are switched on. Pushbutton PUMP 1 RUN and PUMP 2 RUN lights up.

- Key-operated switch OPERATION ON is switched ON.

- The selector switch REMOTE CONTROL ON/OFF is switched to position OFF

1. Press the pushbutton LAMP TEST to check all signal lamps.


2. If the Bow Ramp rests on the quay the selector switch QUAY SUPPORT ON/OFF must be switched to position OFF.



-signal lamp QUAY SUPPORT ON extinguishes.

3. Press the pushbutton OPEN, the warning system on fore end (optical and siren) will be switched on and the opening operation passes off automatically. The pushbutton OPEN shall be pushed down until:



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.3 Operation of the bulkhead door	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

- illuminated pushbutton OPEN lights up
- signal lamp NOT CLOSED lights up.
- signal lamp LOCKED lights up.



4. Release pushbutton, the warning system on fore end (optical and siren) will be switched off.


5. If the Bow Ramp rests on the quay the selector switch QUAY SUPPORT ON/OFF must be switched to position ON.



- signal lamp QUAY SUPPORT ON lights up.

Important!

With operation QUAY SUPPORT ON, at least one pump of the pump unit on fore end must be remain switched ON for filling the drive-cylinders for the Bow Ramp with hydraulic oil.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.3 Operation of the bulkhead door	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.3.2 Bulkhead Door CLOSE

ATTENTION

For maneuvering the bulkhead door, the Bow Ramp must be opened at least 80°, to avoid any collision with the bow ramp during the maneuver.



Initial situation:

- Signal lamp OPERATION INHIBITED does not light.
- All Emergency-stop buttons are unlocked.
- PUMP 1 and PUMP 2 on fore end are switched on. Pushbutton PUMP 1 RUN and PUMP 2 RUN lights up.
- Key-operated switch OPERATION ON is switched ON.
- The selector switch REMOTE CONTROL ON/OFF is switched to position OFF


1. Press the pushbutton LAMP TEST to check all signal lamps.
2. If the Bow Ramp rests on the quay the selector switch QUAY SUPPORT ON/OFF must be switched to position OFF.



-signal lamp QUAY SUPPORT ON extinguishes.

3. Press the pushbutton CLOSE, the warning system on fore end (optical and siren) will be switched on and the closing operation passes off automatically. The pushbutton CLOSE shall be pushed down until:



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.3 Operation of the bulkhead door	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

- illuminated pushbutton CLOSE lights up
- signal lamp CLOSED lights up.
- signal lamp LOCKED lights up.



4. Release pushbutton, the warning system on fore end (optical and siren) will be switched off.


5. If the Bow Ramp rests on the quay the selector switch QUAY SUPPORT ON/OFF must be switched to position ON.



- signal lamp QUAY SUPPORT ON lights up.

Important!

With operation "QUAY SUPPORT ON" at least one pump of the pump unit on fore end must be remain switched ON for filling the drive-cylinders for the Bow Ramp with hydraulic oil.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.3 Operation of the bulkhead door	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
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4.3.3 Operation of the Bulkhead Door from portable Control Stand on Deck4

OPEN

ATTENTION

For maneuvering the bulkhead door, the Bow Ramp must be opened at least 80 degree, to avoid any collision with the bow ramp during the maneuver.

Initial situation:

All Emergency-stop buttons are unlocked.


Pump 1 and/or pump 2 of the pump unit are switched on.

REMOTE-CONTROL ON/OFF on control station main deck is switched ON.

1. Press button LAMP TEST to check all signal lamps.
2. If Bow Ramp rests on the quay the illuminated pushbutton QUAY SUPPORT ON/OFF must be switched to position OFF.
 - the illuminated signal lamp QUAY SUPPORT ON is extinguished.
3. Press pushbutton OPEN, the warning system on fore end (hooter and optical beacon) will be switched on and the opening operation starts automatically, keep it pressed until:
 - pushbutton OPEN lights up.
4. Release pushbutton, the warning system on fore end (hooter and optical beacon) will be switched off.
5. If the Bow Ramp rests on the quay the illuminated pushbutton (lock type) QUAY SUPPORT ON/OFF must be switched to position ON.
 - illuminated pushbutton QUAY SUPPORT ON lights up.

Important!

With operation "QUAY SUPPORT ON" at least one pump of the pump unit on fore end remain switched ON for filling the drive-cylinders with hydraulic oil.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.3 Operation of the bulkhead door	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

CLOSE

ATTENTION

For maneuvering the bulkhead door, the Bow Ramp must be opened at least 80 degree, to avoid any collision with the bow ramp during the maneuver.

Initial situation:

All Emergency-stop buttons are unlocked.


Pump 1 and/or pump 2 of the pump unit are switched on.

REMOTE-CONTROL ON/OFF on control station main deck is switched ON.

1. Press button LAMP TEST to check all signal lamps.
2. If Bow Ramp rests on the quay the illuminated pushbutton QUAY SUPPORT ON/OFF must be switched to position OFF.
 - the illuminated signal lamp QUAY SUPPORT ON is extinguished.
3. Press pushbutton CLOSE, the warning system on fore end (hooter and optical beacon) will be switched on and the closing operation passes off automatically, keep it pressed until:
 - illuminated pushbutton CLOSE lights up.
4. Release pushbutton, the warning system on fore end (hooter and optical beacon) will be switched off.
5. If the Bow Ramp rests on the quay the illuminated pushbutton (lock type) QUAY .. SUPPORT ON/OFF must be switched to position ON.
 - illuminated pushbutton QUAY SUPPORT ON lights - up.

Important!

With operation "QUAY SUPPORT ON" at least one pump of the pump unit on fore end remain switched ON for filling the drive-cylinders with hydraulic oil

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.4 Operation of the internal tiltable ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.4 Operation of the Internal Tilttable Ramp

4.4.1 Internal Tilttable Ramp RAISE

NB! Before raising the tilt ramp, make sure and check that it is clear and safe to raise the tilt ramp.

WARNING!

It is forbidden to stay under the tilt ramp when it is being maneuvered.

Initial situation:

- All Emergency-stop buttons are unlocked.
- The selector switch REMOTE CONTROL ON/OFF is switched OFF.
- Key-operated switch OPERATION ON/OFF is turned OFF.
 - signal lamp RAMP LOWERED is lit.
 - signal lamp LOCKING PIN SECURED lit up.
 - signal lamp LOCKING PIN UNSECURED lit up.
 - Latching device signaling lights turn RED

1. Press the pushbutton LAMP TEST to check all signal lamps



2. Switch ON key-operated switch OPERATION ON/OFF. The signal lamp OPERATION ON lights up.



3. Press the pushbutton START PUMP 1 and START PUMP 2. The signal lamp for PUMP 1&2 lights up.



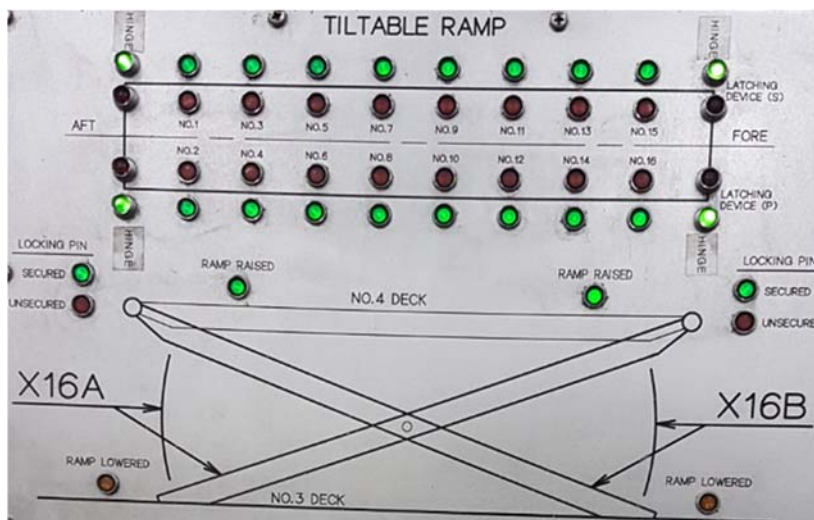
4. WAIT 10 SECONDS.


5. Press the pushbutton RAMP RAISE and keep it pressed - the warning system (optical and Siren) will be switched on and the raising operation passes off automatically.

Keep the pushbutton pressed until:



- Latching device signaling lights turn GREEN
- Both signal lights LOCKING PIN SECURED lights up.
- Both signal lights RAMP RAISED lights up.
- Ramp is in upper position (visual checking) and locked.
- Check that hinge pins are closed.




	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.4 Operation of the internal tiltable ramp	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

6. Release pushbutton, the warning system (optical and siren) will be switched off.

7. Press the pushbutton PUMP 1&2 STOP to stop the pumps.



7. Switch OFF key-operated switch OPERATION ON/OFF.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.4 Operation of the internal tiltable ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.4.2 Internal Tiltable Ramp LOWER

NB! Before lowering the tilt ramp, make sure and check that it is clear and safe to lower the tilt ramp.

WARNING!

It is forbidden to stay under the tilt ramp when it is being maneuvered.

Initial situation:

- All Emergency-stop buttons are unlocked.
- The selector switch REMOTE CONTROL ON/OFF is switched OFF.
- Key-operated switch OPERATION ON/OFF is switched OFF.


- signal lamp RAMP RAISED is lit up.
- signal lamp LOCKED is lit up.
- signal lamp AFT pivot SECURED is lit up.
- signal lamp FORE pivot SECURED is lit up.

1. Press the pushbutton LAMP TEST to check all signal lamps.

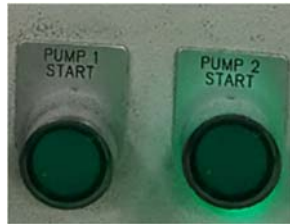


2. Switch ON key-operated switch OPERATION ON/OFF. The signal lamp OPERATION ON lights up.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.4 Operation of the internal tilttable ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

3. Press the pushbutton START PUMP 1 and START PUMP 2. The signal lamp for PUMP 1&2 lights up.



4. Press the pushbutton “Force up” (green button separate from control panel) and press the pushbutton RAMP LOWER. The warning system (optical and siren) will be switched on. Keep it pressed until:

- All locking is unlocked and Indication light for UNSECURED (red light) lights up.

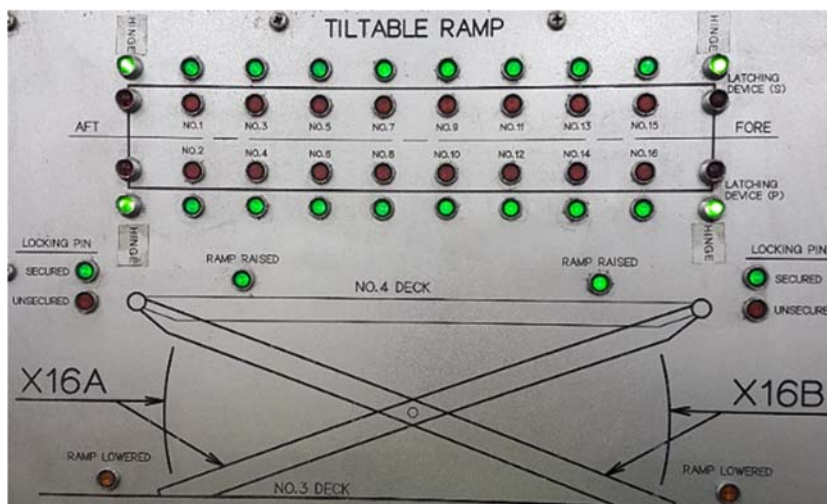


5. Release both pushbuttons at the same time.

6. Continue lowering by pressing the pushbutton RAMP LOWER and keep it pressed until:



- signal lamp LOWERED lights up.
- signal lamp UNLOCKED lights up.
- signal lamp pivot UNSECURED for tilted down part lights up.
- signal lamp pivot SECURED for pivot hinge part lights up.




7. Release pushbutton, the warning system (Optical and siren) will be switched off.

8. Press the pushbutton PUMP 1&2 STOP to stop the pumps.



9. Switch OFF key-operated switch OPERATION ON/OFF



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.4 Operation of the internal tiltable ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.4.3 Operation of Internal Tiltable Ramp from portable Control Stand on Deck4

RAISE

Initial situation:

- Pump 1 and pump 2 of the pump unit on forward end are switched on.
- All Emergency-stop buttons are unlocked.
- REMOTE-CONTROL ON/OFF on control station main deck is switched ON.

- signal lamp LOWER lights up.
- signal lamp UNLOCKED lights up.
- signal lamp pivot UNLOCKED for tilted down part lights up.
- signal lamp pivot LOCKED for pivot hinge part lights up.

1. Press pushbutton LAMP TEST to check all signal lamps

2. Press pushbutton RAISE and keep it pressed - the warning system (hooter and optical beacon) will be switched on and the raising operation starts automatically, keep it pressed until:

- signal lamp RAISE lights up.
- signal lamp aft pivot LOCKED lights up.
- signal lamp fore pivot LOCKED lights up.

3. Release pushbutton, the warning system (hooter and optical beacon) will be switched off.

4. After closing the tiltable ramp inspect visually that hinge pins are closed.


LOWER

Initial situation:

- Pump 1 and pump 2 of the pump unit on forward end are switched on.
- All Emergency-stop buttons are unlocked.
- REMOTE-CONTROL ON/OFF on control station main deck is switched ON.

- signal lamp RAISE lights up.
- signal lamp aft pivot LOCKED lights up.
- signal lamp fore pivot LOCKED lights up.


1. Press pushbutton LAMP TEST to check all signal lamps.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.4 Operation of the internal tiltable ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

2. Press pushbutton LOWER and keep it pressed- the warning system (hooter and optical beacon) will be switched on and the lowering operation passes off automatically, keep it pressed until:

- signal lamp LOWERED lights up.
- signal lamp pivot UNLOCKED for tilted down part lights up.
- signal lamp pivot LOCKED for pivot hinge part lights up.

3. Release pushbutton, the warning system (hooter and optical beacon) will be switched off.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.5 Operation of the fixed ramp cover (REMOVED)	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

~~4.5 Operation of the Fixed Ramp Cover~~ **REMOVED**

4.5.1 Fixed Ramp Cover OPEN

Initial situation:

- All Emergency-stop buttons are unlocked.

-signal lamp CLOSED lights up.

-signal lamp LOCKED lights up.

1. Actuate pushbutton LAMP TEST to check all signal lamps
2. Key-operated switch OPERATION ON/OFF is switched ON, indication light OPERATION ON lights up.
3. Actuate illuminated pushbutton P1 START and P2 START until the pushbuttons lights up.
4. Actuate pushbutton OPEN and keep it pressed - the warning system (hooter and optical beacon) will be switched on and the opening operation passes off automatically acc. the table 'Function of Fixed Ramp Cover' - until.

-signal lamp OPENED lights up.

-signal lamp NOT CLOSED and NOT LOCKED lights up.

-signal lamp cleat UNLOCKED lights up.

-signal lamp locking dev. LOCKED lights up.

5. Release pushbutton, the warning system (hooter and optical beacon) will be switched off.

6. Switch OFF key-operated switch-OPERATION ON/OFF,

-signal lamp OPERATION ON extinguished.


-signal lamp OPENED lights up.

-signal lamp NOT CLOSED and NOT LOCKED lights up.

-signal lamp cleat UNLOCKED lights up.

-signal lamp locking dev. LOCKED lights up.

-signal lamp PUMP 1 START /PUMP 2 START lights up.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.5 Operation of the fixed ramp cover (REMOVED)	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

4.5.2 Fixed Ramp Cover CLOSE. REMOVED

Initial situation:

- All Emergency-stop buttons are unlocked.

- signal lamp OPENED lights up.
- signal lamp NOT CLOSED and NOT LOCKED lights up.
- signal lamp cleat UNLOCKED lights up.
- signal lamp locking dev. LOCKED lights up.

1. Actuate pushbutton LAMP TEST to check all signal lamps

2. Key-operated switch OPERATION ON/OFF is switched ON, indication light OPERATION ON lights up.

3. Actuate illuminated pushbutton P1 START and P2 START until the pushbuttons lights up.


4. Actuate pushbutton CLOSE and keep it pressed - the warning system (hooter and optical beacon) will be switched on and the closing operation passes off automatically acc. the table 'Function of Fixed Ramp Cover' - until.

- signal lamp CLOSED and LOCKED lights up.
- signal lamp locking dev. UNLOCKED lights up.

5. Release pushbutton, the warning system (hooter and optical beacon) will be switched off.

6. Switch OFF key-operated switch-OPERATION ON/OFF,

- signal lamp OPERATION ON extinguished.
- signal lamp CLOSED and LOCKED lights up.
- signal lamp locking dev. UNLOCKED lights up.
- signal lamp PUMP 1 START /PUMP 2 START lights up.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.6 Operation of the hoistable car deck/ramps	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

4.6 Operation of the Hoistable Car Deck/Ramps

4.6.1 Car Deck Platforms RAISE

NB! Double check that you are maneuvering the correct part of the hoistable car deck.

NB! When operating the hoistable car deck, keep in mind that all locking devices must be opened/closed manually and that there are 2 locking on each side.

NB! Do not lower the hoistable car deck before double checking that it is safe to lower.

NB! It is absolutely forbidden to stay under the ramp when it is being operated.

Initial situation:

- All Emergency-stop buttons are unlocked.
- Key-operated switch OPERATION ON/OFF is turned OFF
- The hoistable car deck is in lower position.
- Rope handling system for semi-auto stowing hook must be released from locked in the button.

-signal lamp 5 DECK lights up. (Stopper level)


1. Press pushbutton LAMP TEST to check all signal lamps
2. Key-operated switch OPERATION ON/OFF is switched ON, indication light OPERATION ON lights up.



3. Press the pushbutton P1 START and P2 START to start the pumps.



WAIT 10 SECONDS

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.6 Operation of the hoistable car deck/ramps	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

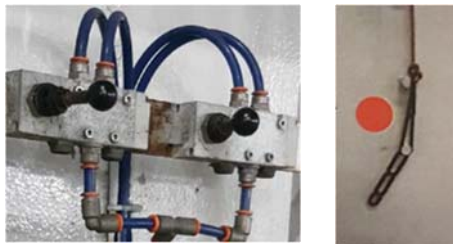
4. Press the pushbutton CAR DECK RAISE and keep it pressed



-signal lamp 6 DECK lights up. (Stowed level)



5. When the car deck is in upper position, pull the knob to close the locks (hooks). Keep in mind that there are four locking on each hoistable car deck, two on each side. If the hooks are not in closed position, do it manually.



6. Check visually whether all stowing hooks are in locked position.

7. Press the pushbutton CAR DECK LOWER - until.



-signal lamp 6 DECK lights up. {stowed level}



8. Release the pushbutton CAR DECK LOWER.



9. Switch OFF key-operated switch-OPERATION ON/OFF,




-signal lamp OPERATION ON extinguishes.

-signal lamp 6 DECK lights up.



10. Press the pushbutton PUMP 1&2 STOP to stop the pumps.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.6 Operation of the hoistable car deck/ramps	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

4.6.2 Car Deck Platforms LOWER

NB! Double check that you are maneuvering the correct part of the hoistable car deck.

NB! When operating the hoistable car deck, keep in mind that all locking devices must be opened/closed manually and that there are 2 locking on each side.

NB! Do not lower the hoistable car deck before double checking that it is safe to lower.

NB! It is absolutely forbidden to stay under the ramp when it is being operated.

Initial situation:

- All Emergency-stop buttons are unlocked.
- Key operated switch OPERATION ON/OFF is switched to OFF.
- The hoistable car deck is in upper position.
- Rope handling system for semi-auto stowing hook must be tensioned and locked in the button.

-signal lamp 6 DECK lights up. (Stowed level)


1. Press the pushbutton LAMP TEST to check all signal lamps
2. Key-operated switch OPERATION ON/OFF is switched ON, indication light OPERATION ON lights up.



3. Press the pushbutton PUMP 1 START and PUMP 2 START to start the pumps.



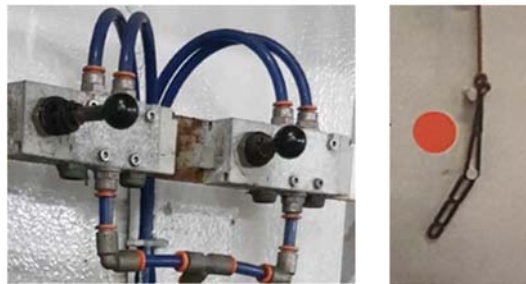
WAIT 10 SECONDS

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.6 Operation of the hoistable car deck/ramps	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

4. Press the pushbutton CAR DECK RAISE and raise it as high as possible.



5. When the car deck is in upper position, push the knob to open the locks (hooks). Keep in mind that there are four locking on each hoistable car deck, two on each side. Visually check that each hook is released. If the hooks are not released, do it manually.



6. Press the pushbutton CAR DECK LOWER. (Check the corners of the car deck platform when lowering). Keep it pressed until:




- Car deck is lowered into position and resting on supports.
- signal lamp 5 DECK lights up. (Stopper level)



7. Release the pushbutton CAR DECK LOWER.

8. Press the pushbutton PUMP 1 and PUMP 2 STOP to stop the pumps.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019
	4.6 Operation of the hoistable car deck/ramps	Version: 1	Date: 16-05-23	
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

9. Switch OFF key-operated switch-OPERATION ON/OFF.



- signal lamp OPERATION ON extinguished.
- signal lamp 5 DECK lights up.

4.6.3 Car Deck Ramps RAISE (Tilt up)

NB! Double check that you are maneuvering the correct part of the hoistable car deck.

NB! When operating the hoistable car deck, keep in mind that all locking devices must be opened/closed manually and that there are 2 locking on each side.

NB! Do not lower the hoistable car deck before double checking that it is safe to lower.

NB! It is absolutely forbidden to stay under the ramp when it is being operated.

Initial situation:

- All Emergency-stop buttons are unlocked.
- Key-operated switch OPERATION ON/OFF is switched OFF
- The ramp is in inclined/lowered position.
- Rope handling system for semi-auto stowing hook must be tensioned and locked in the button.


(From inclined access position on deck 4 to horizontal operating position on deck 4)

Rope handling system for semi-auto stowing hook must be released form locked in the button.

-signal lamp 4 DECK lights up. (Inclined stopper level)

1. Press the pushbutton LAMP TEST to check all signal lamps
2. Key-operated switch OPERATION ON/OFF is switched ON, indication light OPERATION ON lights up.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.6 Operation of the hoistable car deck/ramps	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

3. Press the pushbutton Pump 1 START and Pump 2 START until the pushbuttons lights up.



4. Select the height the ramp is being raised. Deck 6 if the ramp is lifted completely to the roof or deck 5 when the ramp is used as a platform.



5. Press the pushbutton RAISE and keep it pressed - the warning system (Optical and siren) will be switched on and the raising operation starts automatically. Keep it pressed until:




-signal lamp 5 DECK lights up or signal lamp 6 DECK.
(STOPPER LEVEL)



6. If the ramp is being used as a platform for vehicles, support locking must be in locked position for the ramp to lower on to. Manually lock the locking devices (Two locking on each side of the ramp).



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.6 Operation of the hoistable car deck/ramps	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

8. Press the pushbutton LOWER and keep it pressed. The warning system (Optical and siren) will be switched on and the lowering operation passes off automatically. Keep it pressed until:



-signal lamp 5 DECK lights up. (Stopper level)



9. Release pushbutton LOWER, the warning system (Optical and siren) will be switched off.

10. Press the pushbutton PUMP 1 and PUMP 2 STOP to stop the pumps.




11. Switch OFF key-operated switch-OPERATION ON/OFF,



-signal lamp OPERATION ON extinguished.

-signal lamp 5 DECK lights up.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.6 Operation of the hoistable car deck/ramps	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

4.6.4 Car Deck Ramps LOWER (Tilt down)

NB! Double check that you are maneuvering the correct part of the hoistable car deck.

NB! When operating hoistable car deck ramp, keep in mind that all locking devices must be opened/closed manually and that there are 2 lockings on each side.

NB! Do not lower the ramp before double checking that it is safe to do that.

NB! It is absolutely forbidden to stay under the ramp when it is being operated.

Initial situation:

- All Emergency-stop buttons are unlocked.
- Key-operated switch OPERATION ON/OFF is switched OFF
- The ramp is in upper position.
- Rope handling system for semi-auto stowing hook must be tensioned and locked in the button.

1. Press the pushbutton LAMP TEST to check all signal lamps
2. Key-operated switch OPERATION ON/OFF is switched ON, indication light OPERATION ON lights up.




3. Press the pushbutton PUMP 1 START and PUMP 2 START to start the pumps.



WAIT 10 SECONDS

4. Before raising the platform, use the switch DECK5/DECK6 to choose how high the platform will be raised. (When switch is on DECK 5, the ramp will only raise a few cm above the locking and will be automatically stopped when in position.)



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019
	4.6 Operation of the hoistable car deck/ramps	Version: 1	Date: 16-05-23	
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

5. Press the pushbutton CAR DECK RAMP RAISE and keep it pressed until the ramp is in upper position.

6. Open the locking devices (hooks) manually, keep in mind that there are four (4) locking devices on each ramp. Check visually whether all semi-auto stowing hooks are in released position.



6. Press the pushbutton LOWER and keep it pressed -the warning system (optical and siren) will be switched on and the lowering operation passes off automatically. Keep it pressed until:



-signal lamp 4 DECK lights up. (Inclined stopper level).



7. Release the pushbutton LOWER, the warning system (Optical and siren) will be switched off.


8. Press the pushbutton PUMP 1 and PUMP 2 STOP to stop the pumps.



9. Switch OFF key-operated switch-OPERATION ON/OFF.



-signal lamp OPERATION ON extinguished.
-signal lamp 4 DECK lights up.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.7 Operation of the stern ramps ps/stb	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

4. 7 Operation of the Stern Ramps (PS/SB).

4.7.1 Stern Ramps (PS/SB) OPEN

Initial situation:

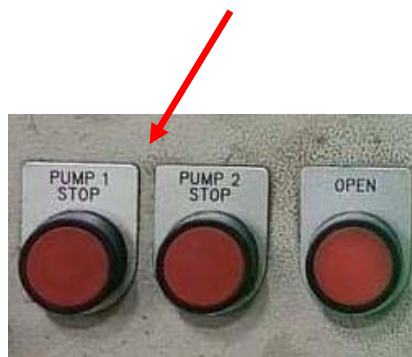
- All Emergency-stop buttons are unlocked.
- The select switch REMOTE-CONTROL ON/OFF is switched to position OFF.
- Signal lamp CLOSED and LOCKED lights up.
- The selector switch QUAY SUPPORT ON/OFF is switched to position OFF.


1. Press pushbutton LAMP TEST to check all signal lamps.

2. Key-operated switch OPERATION ON/OFF is switched ON.
- Signal lamp OPERATION ON lights up.



3. Start pump 1&2 by pressing PUMP 1 START and PUMP 2 START until the pushbuttons lights up. (10 seconds before you start to operate the ramps.)



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.7 Operation of the stern ramps ps/stb	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

4. Press pushbutton OPEN and keep it pressed - the warning system (hooter and optical beacon) will be switched on and the opening operation passes off automatically.



-signal lamp NOT LOCKED and UNLOCKED lights up.

-signal lamp NOT CLOSED lights up.



When the stern ramps are midway down, the flaps will unfold.

- signal lamp UNFOLDED lights up.


Release the OPEN button when the ramps are app. 2 meters above the quay and wait for confirmation to lower fully down.

-When permission is given to lower the ramps, do so by pressing OPEN.

5. Switch ON selector switch QUAY SUPPORT ON/OFF, the hydraulic cylinders for driving the ramp are released and the ramp is free to adapt to the different heights between ship and quay.

-signal lamp QUAY SUPPORT ON lights up.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.7 Operation of the stern ramps ps/stb	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

(key-operated switch at control station must be remain switched ON indicated by the signal lamp OPERATION ON.)

Important!

With operation "QUAY SUPPORT ON" at least one pump unit on aft end must be remain switched ON for filling the drive-cylinder with hydraulic oil.

4.7.2 Stern Ramps (PS/SB) CLOSE.

Initial situation:

- All Emergency-stop buttons are unlocked.
- Pump 1 and pump 2 of the pump unit of aft end are switched on, illuminated pushbutton P1 START and P2 START lights up.
- The select switch REMOTE-CONTROL ON/OFF is switched to position OFF.
- The selector switch QUAY SUPPORT ON/OFF is switched to position ON.
-signal lamp QUAY SUPPORT ON lights up.

1. Press pushbutton LAMP TEST to check all signal lamps
2. Switch OFF selector switch QUAY SUPPORT ON/OFF,
-signal lamp QUAY SUPPORT ON extinguishes. (the ramp's drive is connected)



3. Start pump 1 & 2 by pressing PUMP 1 START and PUMP 2 START until the pushbuttons lights up.
(10 seconds before you start to operate the ramps)



4. Press pushbutton CLOSE and keep it pressed down – the warning system (hooter and optical beacon) will be switched on and the opening operation passes off automatically.



- Signal lamp FOLDED lights up.
- Signal lamp CLOSED lights up.



- Signal lamp LOCKED lights up.




5. The key-operated switch OPERATION ON/OFF is switched off
- Signal lamp OPERATION ON extinguishes.



6. Inform the bridge that "ALL STERN RAMP DOORS ARE CLOSED AND LOCKED".
- The switch SHELL DOORS INHIBITED is turned ON
 - Signal lamp OPERATION INHIBITED lit up at the combined control stand.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.7 Operation of the stern ramps ps/stb	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.7.3 Operation of Stern Ramps (PS/SB) from portable Control Stand on Deck4

OPEN

Initial situation:

- Pump 1 and pump 2 of the pump unit on aft end are switched on.
- All Emergency-stop buttons are unlocked.
- REMOTE-CONTROL ON/OFF on control station main deck is switched ON.
 - illuminated pushbutton Stern Ramp CLOSE lights up.
 - illuminated pushbutton (lock type) QUAY SUPPORT ON/OFF is switched OFF.

1. Actuate pushbutton LAMP TEST to check all signal lamps

2. Actuate pushbutton OPEN and keep it pressed- the warning system (hooter and optical beacon) will be switched on and the opening operation passes off automatically. the table 'Function of Stern Ramp' - until.

-the Ramp rests with its flap on the quay (visual checking)


3. Switch ON illuminated push button (lock type) QUAY SUPPORT ON/OFF, the hydraulic cylinders for driving the ramp are released and the ramp is free to adapt to the different heights between ship and quay.

-signal lamp QUAY SUPPORT ON lights up.

(key-operated switch at control station must be remain switched ON indicated by the signal lamp OPERATION ON.)

Important!


With operation "QUAY SUPPORT ON" at least one pump unit on aft end must be remain switched ON for filling the drive-cylinder with hydraulic oil.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.7 Operation of the stern ramps ps/stb	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

CLOSE

Initial situation:

- Pump 1 and pump 2 of the pump unit on aft end are switched on.
 - All Emergency-stop buttons are unlocked.
 - REMOTE-CONTROL ON/OFF on control station main deck is switched ON.
 - illuminated pushbutton (lock type) QUAY SUPPORT ON/OFF is switched ON.
1. Actuate pushbutton LAMP TEST to check all signal lamps
 2. Switch OFF illuminated push button (lock type) QUAY SUPPORT ON/OFF, the illuminated signal lamp QUAY SUPPORT ON is extinguished. (the ramp's drive is connected.)
 3. Actuate pushbutton CLOSE and keep it pressed- the warning system (hooter and optical beacon) will be switched on and the closing operation passes off automatically acc. the table 'Function of Stern Ramp (PS/SB)' -until.
 - illuminated pushbutton CLOSE lights up.
 4. Release pushbutton, the warning system (hooter and optical beacon) will be switched off.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.8 Operation of the stern passenger ramp	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
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4.8 Operation of the Stern Passenger Ramp

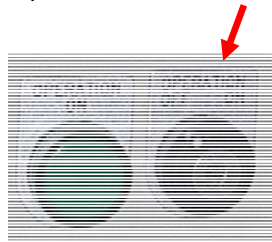
4.8.1 Stern Passenger Ramp OPEN

Initial situation:

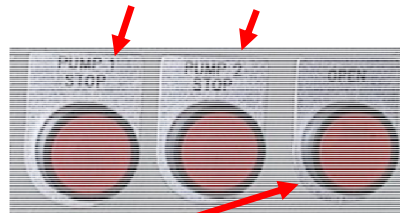
- All Emergency-stop buttons are unlocked.
- The select switch REMOTE-CONTROL ON/OFF is switched to position OFF.
- Signal lamp CLOSED and LOCKED lights up.
- The selector switch QUAY SUPPORT ON/OFF is switched to position OFF.

1. Actuate pushbutton LAMP TEST to check all signal lamps

2. Key-operated switch OPERATION ON/OFF is switched ON, indication light OPERATION ON lights up.

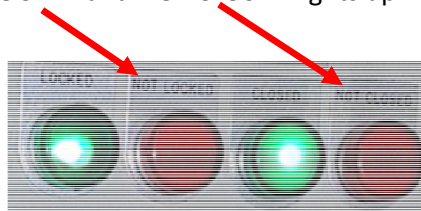



3. Actuate illuminated pushbutton P1 START and P2 START until the pushbuttons lights up.



4. Actuate pushbutton OPEN and keep it pressed - the warning system (hooter and optical beacon) will be switched on and the opening operation passes off automatically acc. the table 'Function of Stern Passenger Ramp' - until.

- the Ramp rests with its flap on the quay (visual checking)
- signal lamp NOT LOCKED and NOT CLOSED lights up.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.8 Operation of the stern passenger ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

5. Switch ON selector switch QUAY SUPPORT ON/OFF, the hydraulic cylinders for driving the ramp are released and the ramp is free to adapt to the different heights between ship and quay.


-signal lamp QUAY SUPPORT ON lights up.



(key-operated switch at control station must be remain switched ON indicated by the signal lamp OPERATION ON.)

Important!

With operation "QUAY SUPPORT ON" at least one pump unit on aft end must be remain switched ON for filling the drive-cylinder with hydraulic oil.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.8 Operation of the stern passenger ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.8.2 Stern Passenger Ramp CLOSE

Initial situation:

- All Emergency-stop buttons are unlocked.
- Pump 1 and pump 2 of the pump unit of aft end are switched on, illuminated pushbutton P1 START and P2 START lights up.
- The select switch REMOTE-CONTROL ON/OFF is switched to position OFF.
- The selector switch QUAY SUPPORT ON/OFF is switched to position ON.
-signal lamp QUAY SUPPORT ON lights up.

1. Actuate pushbutton LAMP TEST to check all signal lamps

2. Switch OFF selector switch QUAY SUPPORT ON/OFF,

- signal lamp QUAY SUPPORT ON extinguished. (the ramp's drive is connected)




3. Actuate pushbutton CLOSE and keep it pressed -the warning system (hooter and optical beacon) will be switched on and the closing operation passes off automatically acc. the table 'Function of Stern Passenger Ramp' -until.

- illuminated pushbutton CLOSE lights up.
- signal lamp CLOSED lights up.



- Signal lamp LOCKED lights up.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.8 Operation of the stern passenger ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	


4. Release pushbutton CLOSE, the warning system (hooter and optical beacon) will be switched off.

4.8.3 Operation of Stern Passenger Ramp from portable Control Stand on Deck4

OPEN

Initial situation:

- Pump 1 and pump 2 of the pump unit on aft end are switched on.
- All Emergency-stop buttons are unlocked.
- REMOTE-CONTROL ON/OFF on control station main deck is switched ON.
 - illuminated pushbutton Stern Ramp CLOSE lights up.
 - illuminated pushbutton (lock type) QUAY SUPPORT ON/OFF is switched OFF.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.8 Operation of the stern passenger ramp	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

1. Press pushbutton LAMP TEST to check all signal lamps
2. Press pushbutton OPEN and keep it pressed - the warning system (hooter and optical beacon) will be switched on and the opening operation starts automatically, keep it pressed until:

-the Ramp rests with its flap on the quay (visual checking)

3. Switch ON pushbutton (lock type) QUAY SUPPORT ON/OFF, the hydraulic cylinders for driving the ramp are released and the ramp is free to adapt to the different heights between ship and quay.

-signal lamp QUAY SUPPORT ON lights up.

(key-operated switch at control station must be remain switched ON indicated by the signal lamp OPERATION ON.)

Important!

With operation "QUAY SUPPORT ON" at least one pump unit on aft end must be remain switched ON for filling the drive-cylinder with hydraulic oil.

CLOSE


Initial situation:

- Pump 1 and pump 2 of the pump unit on aft end are switched on.
- All Emergency-stop buttons are unlocked.
- REMOTE-CONTROL ON/OFF on control station main deck is switched ON.
- illuminated pushbutton (lock type) QUAY SUPPORT ON/OFF is switched ON.

1. Press pushbutton LAMP TEST to check all signal lamps
2. Switch OFF push button (lock type) QUAY SUPPORT ON/OFF, the illuminated signal lamp QUAY SUPPORT ON is extinguished. (the ramp's drive is connected.)
3. Press pushbutton CLOSE and keep it pressed - the warning system (hooter and optical beacon) will be switched on and the closing operation starts automatically, keep it pressed until:

-illuminated pushbutton CLOSE lights up.

4. Release pushbutton, the warning system (hooter and optical beacon) will be switched off.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.9 Operation of the pilot/bunker doors ps/stb	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

4.9 Operation of the Pilot/Bunker Doors (PS/SB)

IMPORTANT!

Do not open the Pilot/Bunker door during sea voyage without permission from the bridge

4.9.1 Pilot/Bunker Doors (PS/SB) OPEN

Initial situation

- Main switch is switched ON.
- Pilot/Bunker Door is closed and locked
- The selector switch "EMERGENCY OPERATION "to set to "OFF"

1. Ask permission from the bridge to open the Pilot door. The switch SHELL DOORS INHIBITED is turned OFF and the signal lamp OPERATION INHIBITED extinguishes at the combined control stand.




2. Press the pushbutton LAMP TEST to check all signal lamps
3. Switch key-operated switch OPERATION ON/OFF to position ON.
 - signal lamp OPERATION ON lights up.
4. Press the pushbutton PUMP RUN/OFF.



- signal lamp PUMP RUN lights up.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.9 Operation of the pilot/bunker doors ps/stb	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

- Press the pushbutton DOOR OPEN and keep it pressed down. The opening will continue on automatically. Keep the button down until:



- the Door is fully opened (visual check) and the opening procedure stops.
- pushbutton DOOR OPEN and CLEAT UNLOCK lights up.




- Press pushbutton PUMP RUN/OFF, the pump is turned OFF.
 - signal lamp PUMP RUN extinguishes.



- Switch OFF key-operated switch OPERATION ON/OFF.
 - signal lamp OPERATION ON is extinguished.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019
	4.9 Operation of the pilot/bunker doors ps/stb	Version: 1	Date: 16-05-23	
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

4.9.2 Pilot/Bunker Doors (PS/SB) CLOSE

Initial situation

- Main switch is switched ON.
- Door is completely opened.
- The selector switch "EMERGENCY OPERATION " to set to "OFF"

1. Press pushbutton LAMP TEST to check all signal lamps
2. Switch ON key-operated switch OPERATION ON/OFF.
 - signal lamp OPERATION ON lights up.



3. Press pushbutton PUMP RUN/OFF, the pump is turned ON.
 - signal lamp PUMP RUN lights up.




4. Press the pushbutton DOOR CLOSE and keep it pressed down. The closing will continue on automatically. Keep the button pressed down until:



- The door is fully closed and locked (visual check)
- pushbutton DOOR CLOSE and CLEAT LOCK lights up.




	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.9 Operation of the pilot/bunker doors ps/stb	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

5. Press the pushbutton PUMP RUN/OFF, the pump is turned OFF.
 - signal lamp PUMP RUN is extinguished.



6. Switch OFF key-operated switch OPERATION ON/OFF.
 - signal lamp OPERATION ON is extinguished



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.10 Operation of the side Passenger door deck 6 AFT PS	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
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4.10 Operation of the Side Passenger Door deck 6 AFT PS (Not in use)

4.10.1 Side Passenger Door OPEN

Initial situation

- MAIN SWITCH is switched ON.



- The select switch EMERGENCY OPERATION is set to OFF.



1. Press the pushbutton "LAMP TEST".

2. Key-operated switch "OPERATION ON/OFF" is switched ON.




3. Press pushbutton "PUMP RUN/OFF" is switched to position RUN.



4. Actuate pushbutton "OPEN" and keep it pressed until:



- The door is fully opened and stop opening operation.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.11 Operation of the side Passenger door deck 6 midship Port-side	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

- Signal lamp "DOOR OPEN" and "CLEAT UNLOCK" lights up.



5. Switch OFF "PUMP RUN/OFF"



6. Key-operated switch "OPERATION ON/OFF" is switched OFF.



4.10.2 Side Passenger Door CLOSE


Initial situation

- MAIN SWITCH is switched ON.
- The select switch EMERGENCY OPERATION is set to OFF.



1. Actuate pushbutton "LAMP TEST".
2. Key-operated switch "OPERATION ON/OFF" is switched ON.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.11 Operation of the side Passenger door deck 6 midship Port-side	Version: 1	Date: 16-05-23	Approved: Date: XX-XX-2019
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

3. Press pushbutton "PUMP RUN/OFF" is switched to position RUN.



4. Press pushbutton "CLOSE" and keep it pressed until:



- Door is completely closed and closing operation stops
- Signal lamp "DOOR CLOSE" and "LOCK" lights up.




5. Switch OFF "PUMP RUN/OFF".




6. Key-operated switch "OPERATION ON/OFF" is switched OFF.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.11 Operation of the side Passenger door deck 6 midship Port-side	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

4.11 Side Passenger Door, Deck 6 midship PS

- The door is manually operated by mechanical handles. -

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019
	4.12 Operation of the side passenger door deck 6 ps/stb	Version: 1	Date: 16-05-23	
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships				

4.12 Operation of the Side Passenger Door deck 6, FWD PS/SB

4.12.1 Side Passenger Door OPEN



Initial situation


- Main switch is switched ON.
- Emergency-stop button is unlocked.
- Signal lamp CLOSED AND CLEATED is lit.

1. Set the key-switch POWER ON/OFF to ON.



2. Press the GREEN pushbutton PUMP START to start the pump.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.12 Operation of the side passenger door deck 6 ps/stb	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
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3. Press the pushbutton DOOR OPEN and keep it pressed until:



- Signal lamp CLOSED AND CLEATED extinguishes

- Door is fully open and signal lamp OPEN AND CLEATED lights up.




4. Press the RED pushbutton PUMP STOP to stop the pump.



5. Set the key-switch POWER ON/OFF to OFF.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.12 Operation of the side passenger door deck 6 ps/stb	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

4.12.2 Side Passenger Door Deck 6 CLOSE

Initial situation

- Main switch is switched ON
- Emergency-stop button is unlocked.
- Signal lamp OPEN and CLEATED is lit.

1. Set the key-switch POWER ON/OFF to ON.



2. Press the GREEN pushbutton PUMP START to start the pump.



3. Press the pushbutton DOOR CLOSE and keep it pressed until:




- Signal lamp OPEN and CLEATED extinguishes.
- Door is fully closed and signal lamp CLOSED and CLEATED lights up.




4. Press the RED pushbutton PUMP STOP to stop the pump.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.12 Operation of the side passenger door deck 6 ps/stb	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

5. Set the key-switch POWER ON/OFF to OFF.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.14 Operation of the side car ramp deck 4 PS AFT	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.13 Operation of the Side Passenger Door deck 4

4.13.1 Side Passenger Door Deck 4 OPEN

Note: By pushing “door operation available” makes operation available for 30 seconds.

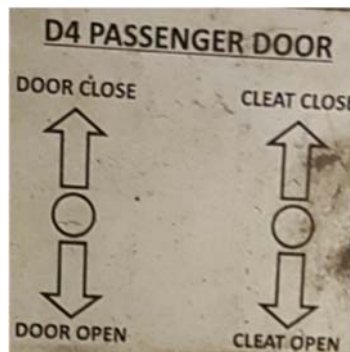
1. Press the pushbutton START pump 1&2 on car deck control cabinet.



2. Press the pushbutton DOOR OPERATION AVAILABLE on local cabinet.




3. Keep the handle DOOR CLOSE and operate CLEAT OPEN.

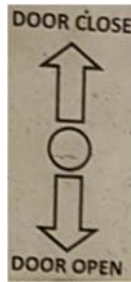


- Red light indicates CLEATS OPENED



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.14 Operation of the side car ramp deck 4 PS AFT	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships					

4. Operate handle DOOR OPEN until door is fully open



- Red light indicates DOOR OPENED



5. Press the pushbutton STOP pump 1&2 on the car deck control cabinet.



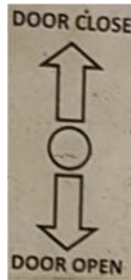
4.13.2 Side Passenger Door Deck 4 CLOSE

1. Press the pushbutton START pump 1&2 on car deck control cabinet.



2. Press the pushbutton DOOR OPERATION AVAILABLE on local cabinet.



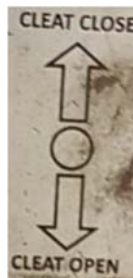


3. Operate DOOR CLOSE until door is closed.



- Green light indicates DOOR CLOSED.

4. Operate CLEAT CLOSE until cleats are closed.




- Green light indicates CLEATS CLOSED



5. Press the pushbutton STOP pump 1&2 on the car deck control cabinet.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.14 Operation of the side car ramp deck 4 PS AFT	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.14 Operation of the Side Car Ramp (Deck 4, Aft, PS) from local operation panel

From the local operation panel

WARNING

The switch LOCAL / RADIO must be in position RADIO when the crew is not present at the local control panel. This to prevent unauthorized persons to operate the ramp.

Note

Normally the operation takes place from the remote control.

The pumps are started in sequence when any of the push buttons for operating the ship ramp is pressed.

The pumps are started in sequence pump 1 – pump 2.

Pressure is activated three seconds after pump 2 is started.

When started from the control cabinet, the pumps stop after 30 minutes.

Float level valves

The float level valves switch automatically between operating mode and floating mode.



4.14.1 Opening procedure from the operating panel

1. Turn the key switch LOCAL / RADIO to LOCAL



2. Turn the key switch OPERATION ON / OFF to ON


3. Press button RAMP OPEN until the ramp hits the land ramp.



4. Press button FLAP DOWN until the flap hits the land ramp.



5. Indication FLOAT ON lighten up.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.14 Operation of the side car ramp deck 4 PS AFT	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.14.2 Closing procedure from the operating panel

1. Turn the key switch LOCAL / RADIO to LOCAL




2. Turn the key switch OPERATION ON / OFF to ON

3. Press button FLAP UP until the flap is completely up.



4. Press button RAMP CLOSE until the ramp is closed and cleared.

5. Indication light CLOSED AND SECURED lighten up.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.14 Operation of the side car ramp deck 4 PS AFT	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.14.3 Operation of the side ramp from remote control

From the remote control

Note

Normally the operation takes place from the remote control.

The key switch LOCAL / RADIO shall be in position RADIO

Activate the transmitter.

Press button ① Radio ON, on the transmitter.

The pumps are started in sequence when any of the push buttons for operating the ship ramp is pressed.

The pumps are started in sequence pump 1 – pump 2.

Pressure is activated three seconds after pump 2 is started.

When started from the transmitter, the pumps stop five minutes after latest operation.

Float level valves

The float level valves switch automatically between operating mode and floating mode.

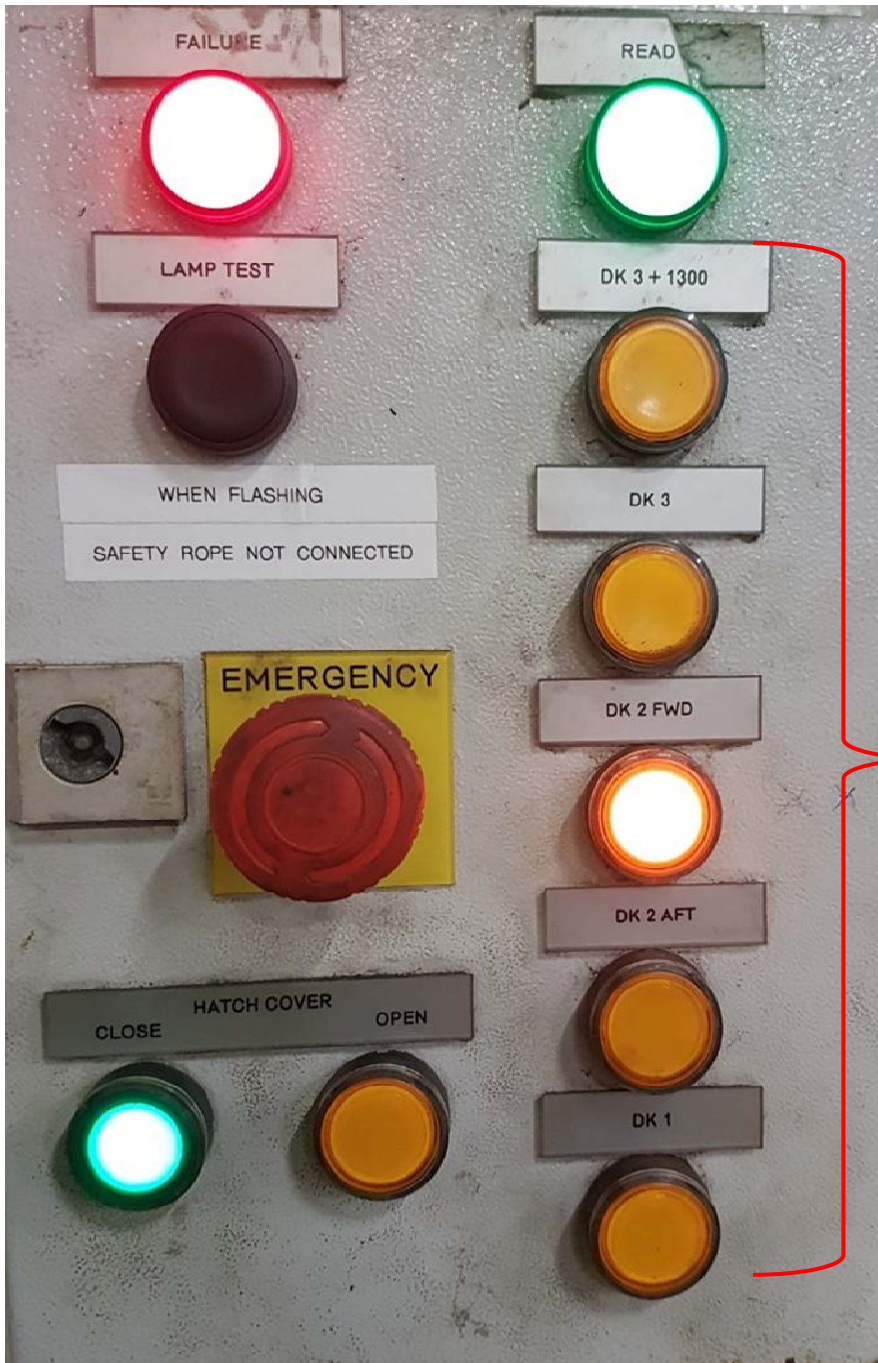
4.14.4 Opening procedure from the remote control

1. Press button SIDE RAMP ←→ until the ramp hits the land ramp.
2. Press button FLAP ↓ until the flap hits the land ramp.
3. Indication light FLOAT ON lighten up.


4.14.5 Closing procedure from the remote control

1. Press button FLAP ↑ until the flap is completely up.
2. Press button SIDE RAMP →← until the ramp is closed and cleated.

4.15 Operation of Hatch cover



Call/send Lift platform operation

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.15 Operation of hatch cover and lifting platform	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.15.1 Hatch cover OPEN

Initial situation

- Emergency-stop button is unlocked
- Signal lamp HATCH COVER CLOSE is lit.
- Hatch cover is free of persons and objects.
- Safety equipment's are attached.

safety equipment shall be fitted such as:

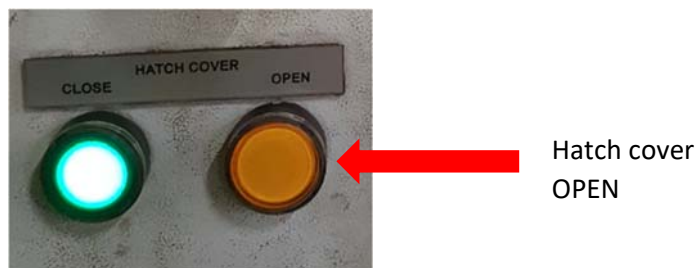
- Safety rope on deck 3 is always connected when the platform is not in final supported position during operation.
- Safety rails shall be kept attached whenever the platform is not parked on deck 3.

Opening procedure


1. Press the pushbutton "LAMP TEST" to check all signal lamps.



2. Press down and keep down the pushbutton HATCH COVER OPEN at deck 3. The warning system (optical and siren) will be activated, and the opening operation starts automatically. The pushbutton OPEN shall be pushed down until:



- Signal lamp HATCH COVER CLOSED extinguishes and the warning siren will stop.
- The hatch cover is fully OPEN, and operation stops.
- Signal lamp HATCH COVER OPEN lights up.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.15 Operation of hatch cover and lifting platform	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	

4.15.2 Hatch cover CLOSE

Initial situation

- Emergency-stop button is unlocked.
- Signal lamp of the HATCH COVER “OPEN” is lit.
- Lifting platform is lowered below deck 3.
- No obstacles blocking the hatch cover opening.
- Ensure the sill plates around the hatch cover are in open (vertical) position.

1. Press the pushbutton “LAMP TEST” to check all signal lamps.



2. Press down and keep down the pushbutton HATCH COVER CLOSE at deck 3. The warning system (optical and siren) will be activated, and the closing operation starts automatically. The pushbutton CLOSE shall be pushed down until:

Hatch cover
CLOSE




- signal lamp HATCH COVER “OPEN” extinguishes and the warning siren will stop.
- The hatch cover is fully CLOSED, and operation stops.

- Signal lamp HATCH COVER CLOSE lit up

3. Turn down the sill plates around the hatch cover.

4. Remove and secure the safety railings and safety rope.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.15 Operation of hatch cover and lifting platform	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	


4.15.3 Lifting Platform and fire door operation

NOTE!

- Transportation of persons is not allowed.
- Always ensure the load is inside the platform.
- In the uppermost position railings in the platform shall always be attached.
- Do not operate the lifting platform in heavy seas or if the vessel heel/rolling angle exceeds 2.5 degrees.

General instructions

- In case the hatch cover is open the safety railings on deck 3 shall be applied.
 - The platform can only be operated downwards from the uppermost position (Deck 3 +1,3m) from deck 3 at control stand C4.
 - For other operation positions (deck 1, deck 2 aft, deck 2 fwd and deck 3) the platform can be operated from any control stand.
 - When hatch cover is closed interlocking prevents the platform to be operated to (deck 3 and deck 3 + 1,3m).
 - The platform can be operated during voyage between (deck 1, deck2 aft and deck 2 fwd).
1. Press the pushbutton "LAMP TEST" to check all signal lamps.

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			
	4.15 Operation of hatch cover and lifting platform	Version: 1	Date: 16-05-23	Approved:
		Previously updated:		
		Auth: HH/WA	Page:	
This page applies to: <input checked="" type="checkbox"/> Office <input checked="" type="checkbox"/> Pax Ships <input type="checkbox"/> Cargo Ships			Date: XX-XX-2019	


2. Press the (call/send) button for the preferred operating position of the lifting platform.
3. Press the button DOOR OPEN to open the fire door.
4. LOAD/DISCHARGE the platform.
5. Press the button DOOR CLOSE to close the fire door.
6. Press the (call/send) button for the preferred operating position of the lifting platform.

NOTE! Control panel on deck where the platform is located has priority for approx. 10s after the fire door has been closed

Fire door general information

- Fire doors may be opened from the local control stands (C1, C2 and C3) when the platform is at the corresponding operating level.
- The fire door is opened and closed at the same control stand.
- The fire door is closed automatically if the temperature rises above +70°C.
- The door can be manually opened with door handle outside the platform trunk and closes automatically after approx. 20s.
- Each fire door is equipped with emergency opening button inside of the platform trunk.
- In case of power supply failure, the door can be opened with handle from the inside.



	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.16 Operation of shore connection door deck 3	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
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4.16 Operation of Shore Connection Door deck 3

IMPORTANT!

Do not open the Shore Connection Door during sea voyage without permission from the bridge

4.16.1 Shore connection door OPEN

Initial situation

- Main Switch is switched ON
- Shore Connection Door is closed and locked
- The Selector switch "EMERGENCY OPERATION" is set to OFF

1. Ask permission from the bridge to open the shore connection door. The Switch SHELL DOOR INIBITED is turned OFF and the signal lamp OPERATION INHIBITED extinguishes at the combined control stand.

2. Press the pushbutton LAMP TEST to check all signal lamps.

3. Switch key-operated switch OPERATION ON/OFF to ON

- Signal lamp OPERATION ON lights up.

4. Press the pushbutton PUMP RUN/OFF

- Signal lamp PUMP RUN lights up.

5. Press the pushbutton DOOR OPEN and keep it pressed down. The opening will continue on automatically. Keep the button until:


- The Door is fully opened (visual check) and the opening procedure stops.
- Pushbutton DOOR OPEND and CLEAT UNLCOK lights up.

6. Press the pushbutton PUMP RUN/OFF, the pump is turned OFF.

- Signal lamp PUMP RUN extinguishes

7. Switch OFF key-operated switch OPERATION ON/OFF.

- Signal lamp OPERATION ON is extinguished

	OPERATING AND MAINTENANCE MANUAL SHELL DOORS			Approved: Date: XX-XX-2019	
	4.16 Operation of shore connection door deck 3	Version: 1	Date: 16-05-23		
		Previously updated:			
		Auth: HH/WA	Page:		
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4.16.2 Shore connection door CLOSE

Initial Situation

- Main switch is switched ON
 - Door is completely opened.
 - The selector switch “EMERGENCY OPERATION” is set to OFF
1. Press the pushbutton LAMP TEST to check all signal lamps
 2. Switch ON key-operated switch OPERATION ON/OFF
 - Signal lamp OPERATION ON lights up.
 3. Press the pushbutton PUMP RUN/OFF, the pump is turned ON
 - Signal lamp PUMP RUN lights up.
 4. Press the pushbutton DOOR CLOSE and keep it pressed down. The closing will continue on automatically. Keep the button pressed down until:
 - The door is fully closed and locked (visual check)
 - Pushbutton DOOR CLOSE and CLEAT LOCK lights up.
 5. Press the pushbutton PUMP RUN/OFF, the pump is turned OFF
 - Signal lamp PUMP RUN is extinguished
 6. Switch OFF key-operated switch OPERATION ON/OFF
 - Signal lamp OPERATION ON is extinguished.

5 Operation in the event of failure at the hydr.System

5.1 Failures at the Pump unit

5.1.1 Failure of one pump set

In case that the signal lamp at the motor starter 'Pump 1 fault' or 'Pump 2 fault' (failure of one pump or one electric motor) or at the control stations BOW, STERN RAMPS, STERN PASSENGER RAMP, TILTABLE RAMP, RAMP COVER and HOISTABLE CAR DECK/RAMPS the signal lamps 'HYDRAULIC FAILURE' lights up it is not possible to start the respective pump.

In case of failure the operation can be carried out by means of the remaining intact pump unit.

The defective pump unit has to be disconnected from the electric mains.

Attention

Since only half of the oil is supplied, the operating time will be take as twice as long as under normal operating conditions.

5.1.2 Oil min. | Oil max.

In case that the signal lamp at the motor starter 'Oil level too low ', 'Oil level too high' or at the control stations BOW, STERN RAMPS, STERN PASSENGER RAMP, TILTABLE RAMP, RAMP COVER and HOISTABLE CAR DECK/RAMPS the signal lamps 'HYDRAULIC FAILURE' lights up the float switch at the pump unit has switched off the pumps.

= => oil must be let off.

5.1.3 Temperature max.

In case that the signal lamp at the motor starter 'Oil temp. too high' or at the control stations BOW, STERN RAMPS, STERN PASSENGER RAMP, TILTABLE RAMP, RAMP COVER and HOISTABLE CAR DECK/RAMPS the signal lamps 'HYDRAULIC FAILURE' lights up the pump unit will be switched off the pumps after 10 min. reaching the max. temperature, so that the current operation can be finished until the part reaches its final position.

For re-starting, the oil in the tank has to be cooled by natural heat dissipation.

5.1.4 Filter blocked

In case that the signal lamp at the motor starter 'Oil Filter clogged' or at the control stations BOW, STERN RAMPS, STERN PASSENGER RAMP, TILTABLE RAMP,

RAMP COVER and HOISTABLE CAR DECK/RAMPS the signal lamps 'HYDRAULIC FAILURE' lights up the pump unit will not be switched off, so that current operation can be finished until the part reaches its final position.

The filter element in the return filter has to be replaced immediately then.

5.1.5 Failure of the electrical solenoid valve Y1/Y2

In case of failure of the electric control for the solenoid valves Y1 and/or Y2 at the pum.p unit, these can also be operated by hand, for that

Press in the solenoid at the corresponding solenoid valve means of a screw drive or similar tools with a dia 6mm until the respective operation is finished.

This manoeuvre requests special attention of the operating personnel. It should absolutely be tried to find the cause for the failure and to eliminate it.

5.2 Failure of the solenoid valves at the hydr. control blocks

In case of failure of the electric control for the solenoid valves, the solenoid valves can also be operated by hand, for that

Press in the solenoid at the corresponding solenoid valve by means of a screw driver or similar tool with a dia of Ø 6 mm until the respective operation is finished.

This manoeuvre requires special attention of the operating personnel. It should absolutely be tried to find the cause for the failure and to eliminate it.

5.2.1 Operating of the Bow Door

5.2.1.1 Opening

1. Press solenoid YO'Pressure on' at valve block 'BOW DOOR' and simultaneously Y5'Uncleat' and Y3'Unlock', until all cleating devices are cpl. uncleated, indicated at the combined control stand 'BOW '.

-signal lamp UNCLEATED/UNLOCKED lights up
-signal lamp NOT LOCKED lights up

2. Press solenoid YO'Pressure on' at valve block 'BOW DOOR' and simultaneously Y7'Open SB' and Y1'Open PS' until both Bow Door Wings are cpl. opened, indicated at the combined control stand 'BOW '.

-illuminated puchbutton OPEN lights up

5.2.1.2 Closing

1. Press solenoid YO'Pressure on' at valve block 'BOW DOOR' and simultaneously Y2'Ciöse PS' and Y8'Ciöse SB', until both Bow Door Wings are cpl closed, indicated at the combined control stand 'BOW '.

-signal lamp CLOSED lights up

2. Press solenoid YO'Pressure on' at valve block 'BOW DOOR' and simultaneously Y4'Lock' and Y6'Ciöeat', until all latching and cleating devices are cpl. locked, indicated at the combined control stand 'BOW '.

-signallamp LOCKED lights up
-illuminated puchbutton CLOSE lights up

Both Bow Door Wings are now closed , locked and cleated.

5.2.2 Operating of the bow ramp

5.2.2.1 Opening

1. Press solenoid YO'Pressure on' at valve block 'BOW RAMP' and simultaneously Y4'Unlock/Unsecure' until all locking devices and the securing device are cpl. unlocked/unsecured , indicated at the combined control stand 'BOW '.

- signal lamp UNLOCKED/UNSECURED lights up
- signal lamp NOT LOCKED lights up

2. Press solenoid YO'Pressure on' at valve block 'BOW RAMP' and simultaneously Y1'Open', until the Bow Ramp is resting on the quay (visual control)

3. Press solenoid Y5 'QUAY SUPPORT ON' at valve block 'BOW RAMP' and fix it manually.

- the hydraulic cylinders for driving the ramp are released,
- the ramp is free to adapt to the different heights between ship and quay.

Important!

With operation "QUAY SUPPORT ON" at least one pump remain switched ON for filling the drive-cylinders with hydraulic oil.

5.2.2.2 Closing

1. Release solenoid Y5 'QUAY SUPPOHT ON' at valve block 'BOW RAMP'

2. Press solenoid YO'Pressure on' at valve block 'BOW RAMP' and simultaneously Y2'Ciose' until the Bow Ramp is cpl. closed , indicated at the combined control stand 'BOW'.

- signal lamp CLOSED lights up

3. Press solenoid YO'Pressure on' at valve block 'BOW RAMP' and simultaneously Y3'Lock/Secure' until all locking devices and the securing devices are cpl. locked/secured , indicated indicated at the combined control stand 'BOW '.

- signal lamp LOCKED lights up
- illuminated pushbutton CLOSE lights up

The Bow Ramp is now closed and locked.

5.2.3 Operating of the Bulkhead Door

To avoid any collision during the Bulkhead Door operation with the Bow Ramp, take care that the Bow Ramp is opened at least 80°.

5.2.3.1 Opening

1. Press solenoid YO'Pressure on' at valve block 'BULKHEAD DOOR' and simultaneously Y5'Unlock', until all locking devices are cpl. unlocked, indicated at the combined control stand 'BOW'.

- signal lamp UNLOCKED/UNSECURED lights up
- signal lamp NOT LOCKED lights up

2. Press solenoid YO'Pressure ON' at valve block 'BULKHEAD DOOR' and simultaneously Y1'Open ' until the Bulkhead Door is cpl. opened.

3. Press solenoid YO'Pressure ON' at valve block 'BULKHEAD DOOR' and simultaneously Y4'Lock' until all locking devices are cpl. locked, indicated at the combined control stand 'BOW '.

- illuminated pushbutton OPEN lights up
- signal lamp LOCKED lights up

The Bulkhead Door is now Secured in the opened position

5.2.3.2 Closing

1. Press solenoid YO'Pressure on' at valve block 'BULKHEAD DOOR' and simultaneously Y5'Unlock', until all locking devices are cpl. unlocked, indicated at the combined control stand 'BOW '.

- signal lamp UNLOCKED/UNSECURED lights up
- signal lamp NOT LOCKED lights up

2. Press solenoid YO'Pressure ON' at valve block 'BULKHEAD DOOR' and simultaneously Y2'Close ' until the Bulkhead Door is cpl. closed indicated at the combined control stand 'BOW '.

- signallamp CLOSED lights up

3. Press solenoid YO'Pressure ON' at valve block 'BULKHEAD DOOR' and simultaneously Y4'Lock' until all locking devices are cpl. locked, indicated at the combined control stand 'BOW'.

- signal lamp LOCKED lights up
- illuminated pushbutton CLOSE lights up

The Bulkhead Door is now closed and locked.

5.2.4 Operating of the Internal Tilttable Ramp

5.2.4.1 Raising

1. Press solenoid YO 'Pressure on' at valve block 'Internal Tilttable Ramp' and simultaneously Y2 'RAISE' until Internal Tilttable Ramp completely raised, indicated at the control stand 'Internal Tilttable ramp'.

- signal lamp RAISED lights up.

2. Press solenoid YO 'Pressure on' at valve block 'Internal Tilttable Ramp' and simultaneously Y4 'LOCK' until all latching devices are completely locked, indicated at the control stand 'Internal Tilttable ramp'.

- signal lamp latching device LOCKED lights up.

3. Press solenoid YO 'Pressure on' at valve block 'Internal Tilttable Ramp' and simultaneously Y6(Y8) 'LOCK' until aft locking devices (fore locking devices) are completely locked, indicated at the control stand 'Internal Tilttable ramp'.

- signal lamp aft locking pin (fore locking pin) LOCKED lights up. The

Internal Tilttable Ramp is now raised and locked.

5.2.4.2 Lowering

1. Press solenoid YO 'Pressure on' at valve block 'Internal Tilttable Ramp' and simultaneously Y2 'RAISE' until steel wires come taut.

2. Press solenoid YO 'Pressure on' at valve block 'Internal Tilttable Ramp' and simultaneously Y7(Y9) 'UNLOCK' until aft locking devices (fore locking devices) are completely unlocked, indicated at the control stand 'Internal Tilttable ramp'.

- signal lamp aft locking pin (fore locking pin) UNLOCKED lights up.

3. Press solenoid YO 'Pressure on' at valve block 'Internal Tilttable Ramp' and simultaneously Y3 'UNLOCK' until all latching devices are completely unlocked, indicated at the control stand 'Internal Tilttable ramp'.

- signal lamp latching device UNLOCKED lights up.

4. Press solenoid YO 'Pressure on' at valve block 'Internal Tilttable Ramp' and simultaneously Y1 'LOWER' until Internal Tilttable Ramp completely lowered, indicated at the control stand 'Internal Tilttable ramp'.

- signal lamp LOWERED lights up

The Internal Tilttable Ramp is now lowered.

5.2.5 Operating of the Fixed Ramp Cover (DELETED)

5.2.5.1 Opening

1. Press solenoid YO 'Pressure on' at valve block 'Fixed Ramp Cover' and simultaneously Y3 'UNLOCK' until all cleating devices are completely unlocked, indicated at the control stand 'Fixed Ramp Cover'.

- signal lamp cleating device UNLOCKED lights up.

2. Press solenoid YO 'Pressure on' at valve block 'Fixed Ramp Cover' and simultaneously Y1 'OPEN' until Fixed Ramp Cover completely closed, indicated at the control stand 'Fixed Ramp Cover'.

- signal lamp OPENED lights up.

3. Press solenoid YO 'Pressure on' at valve block 'Fixed Ramp Cover' and simultaneously Y6 'LOCK' until all locking devices are completely secured, indicated at the control stand 'Fixed Ramp Cover'.

- signal lamp locking device LOCKED lights up. The

Fixed Ramp Cover is now opened and secured.

5.2.5.2 Closing

1. Press solenoid YO 'Pressure on' at valve block 'Fixed Ramp Cover' and simultaneously Y5 'UNLOCK' until all locking devices are completely unlocked, indicated at the control stand 'Fixed Ramp Cover'.

- signal lamp locking device UNLOCKED lights up.

2. Press solenoid YO 'Pressure on' at valve block 'Fixed Ramp Cover' and simultaneously Y2 'CLOSE' until Fixed Ramp Cover completely closed, indicated at the control stand 'Fixed Ramp Cover'.

- signal lamp CLOSED lights up.

3. Press solenoid YO 'Pressure on' at valve block 'Fixed Ramp Cover' and simultaneously Y4 'LOCK' until all cleating devices are completely locked, indicated at the control stand 'Fixed Ramp Cover'.

- signal lamp cleating device LOCKED lights up.

The Fixed Ramp Cover is now closed and locked.

5.2.6 Operating of the Hoistable Car Deck/Ramps

5.2.6.1 Raising

1. Press solenoid valve 'Pressure on' at valve block 'Hoistable Car Deck/Ramps' Y2 'RAISE'(No 3 Car Ramp(PS/SB) or Y4 'RAISE'(No 1 Car Deck(PS/SB) or Y6 'RAISE'(No 2 Car Deck(PS/SB) until Car Deck/Ramp is in stopping or stowing position, indicated at the control stand 'Car Deck/Ramp'.

- signal lamp Deck 5(stopper position) lights up or
- signal lamp Deck 6(stowing position) lights up.

2. Check visually whether all semi-auto stoppers or Hooks are in locked position.

3. Press solenoid valve 'Pressure on' at valve block 'Hoistable Car Deck/Ramps' Y1 'LOWER'(No 3 Car Ramp(PS/SB) or Y3 'LOWER'(No 1 Car Deck(PS/SB) or Y5 'LOWER'(No 2 Car Deck(PS/SB) until Car Deck/Ramp rest in stopper or stowing bolt. indicated at the control stand 'Car Deck/Ramp'.

- signal lamp Deck 5(stopper position) lights up or
- signal lamp Deck 6(stowing position) lights up.

The Hoistable Car Deck/Ramp is now stowed.

5.2.6.2 Lowering

1. Press solenoid valve 'Pressure on' at valve block 'Hoistable Car Deck/Ramps' Y2 'RAISE'(No 3 Car Ramp(PS/SBI or Y4 'RAISE'(No 1 Car Deck{PS/SB) or Y6 'RAISE'(No 2 Car Deck{PS/SB) until Car Deck/Ramp is in release position of semi-auto stopper or stowing hooks,
2. Check visually whether all semi-auto stoppers or Hooks are in released position.
3. Press solenoid valve 'Pressure on' at valve block 'Hoistable Car Deck/Ramps' Y1 'LOWER'(No 3 Car Ramp(PS/SB) or Y3 'LOWER'(No 1 Car Deck{PS/SB) or Y5 'LOWER'(No 2 Car Deck(PS/SBI until Car Deck/Ramp rest in stoppers. indicated at the control stand 'Car Deck/Ramp".

- signal lamp Deck 5(stopper position) lights up or
- signal lamp Deck 4(inclined stopper position) lights up.

The Hoistable Car Deck/Ramp is now positioned for working.

5.2.7 Operating of the Stern Ramps(PS/SB)

5.2.7.1 Opening

1. Press solenoid YO 'Pressure on' at valve block 'Stern Ramp' and simultaneously Y8 'UNLOCK' until all cleating devices are completely unlocked, indicated at the control stand 'Stern Ramp'.

- signal lamp cleating device UNLOCKED lights up.
- signal lamp cleating device NOT LOCKED lights up.

2. Press solenoid YO 'Pressure on' at valve block 'Stern Ramp' and simultaneously Y1 'OPEN' until Stern Ramp is resting on the quay (visual control).

3. Press solenoid Y9 'QUAY SUPPORT ON' at valve block 'Stern Ramp' and fixed it manually.

- the hydraulic cylinders for the ramp are released,
- the ramp is free to adapt to the different heights between ship and quay.

Important!

With operation "QUAY SUPPORT ON" at least one pump remain switched ON for filling the drive-cylinders with hydraulic oil.

5.2.7.2 Closing

1. Release solenoid Y9 'QUAY SUPPORT ON' at valve block 'Stern Ramp'.
2. Press solenoid YO 'Pressure on' at valve block 'Stern Ramp' and simultaneously Y2 'CLOSE' until Stern Ramp is completely closed, indicated at the control stand 'Stern Ramp'.
 - signal lamp CLOSED lights up.
3. Press solenoid YO 'Pressure on' at valve block 'Stern Ramp' and simultaneously Y7 'LOCK' until all cleating devices are completely locked, indicated at the control stand 'Stern Ramp'.
 - signal lamp LOCKED lights up.
 - illuminated pushbutton CLOSE lights up.

The Stern Passenger Ramp is now closed and locked.

5.2.8 Operating of the Stern Passenger Ramp

5.2.8.1 Opening

1. Press solenoid YO 'Pressure on' at valve block 'Stern Passenger Ramp' and simultaneously Y8 'UNLOCK' until all cleating devices are completely unlocked, indicated at the control stand 'Stern Passenger Ramp'.
 - signal lamp cleating device UNLOCKED lights up.
 - signal lamp cleating device NOT LOCKED lights up.
2. Press solenoid YO 'Pressure on' at valve block 'Stern Passenger Ramp' and simultaneously Y1 'OPEN' until Stern Passenger Ramp is resting on the quay (visual control).
3. Press solenoid Y9 'QUAY SUPPORT ON' at valve block "Stern Passenger Ramp' and fixed it manually.
 - the hydraulic cylinders for the ramp are released,
 - the ramp is free to adapt to the different heights between ship and quay.

Important!

With operation "QUAY SUPPORT ON" at least one pump remain switched ON for filling the drive-cylinders with hydraulic oil.

5.2.8.2 Closing

1. Release solenoid Y9 'QUAY SUPPORT ON' at valve block 'Stern Passenger Ramp'.
2. Press solenoid YO 'Pressure on' at valve block 'Stern Passenger Ramp' and simultaneously Y2 'CLOSE' until Stern Passenger Ramp is completely closed, indicated at the control stand 'Stern Passenger Ramp'.

- signal lamp CLOSED lights up.

3. Press solenoid YO 'Pressure on' at valve block 'Stern Passenger Ramp' and simultaneously Y7 'LOCK' until all cleating devices are completely locked, indicated at the control stand 'Stern Passenger Ramp'.

- signal lamp LOCKED lights up.

- illuminated pushbutton CLOSE lights up.

The Stern Passenger Ramp is now closed and locked.

5.2.9 Operating of the Pilot/Bunker Doors(PS/SB)

5.2.9.1 Opening

1. Press solenoid YO 'Pressure on' at valve block 'Pilot/bunker Door' and simultaneously Y3 'UNLOCK' until all cleating devices are completely unlocked, indicated at the control stand 'Pilot/bunker Door' .

- illuminated pushbutton UNLOCK lights up :

2. Press solenoid YO 'Pressure on' at valve block 'Pilot/bunker Door' and simultaneously Y1 'OPEN' until Pilot/bunker Door is completely opened (visual control) .

The Pilot/bunker Door is now in the opened position.

5.2.9.2 Closing

1. Press solenoid YO 'Pressure on' at valve block 'Pilot/bunker Door' and simultaneously Y2 'CLOSE' until Pilot/bunker Door is completely closed,

- illuminated pushbutton CLOSE lights up.

2. Press solenoid YO 'Pressure on' at valve block 'Pilot/bunker Door' and simultaneously Y4 'LOCK' until all cleating devices are completely unlocked, indicated at the control stand 'Pilot/bunker Door'.

- illuminated pushbutton LOCK lights up.

The Pilot/bunker Door is now closed and locked.

5.2.10 Operating of the Side Passenger Door

5.2.10.1 Opening

1. Press solenoid YO 'Pressure on' at valve block 'Side Passenger Door' and simultaneously Y3 'UNLOCK' until all cleating devices are completely unlocked, indicated at the control stand 'Side Passenger Door'.

- illuminated pushbutton UNLOCK lights up.

2. Press solenoid YO 'Pressure on' at valve block 'Side Passenger Door' and simultaneously Y1 'OPEN' until Side Passenger Door is completely opened (visual control).

The Side Passenger Door is now in the opened position.

5.2.10.2 Closing

1. Press solenoid YO 'Pressure on' at valve block 'Side Passenger Door' and simultaneously Y2 'CLOSE' until Side Passenger Door is completely closed,

- illuminated pushbutton CLOSE lights up.

2. Press solenoid YO 'Pressure on' at valve block 'Side Passenger Door' and simultaneously Y4 'LOCK' until all cleating devices are completely unlocked, indicated at the control stand 'Side Passenger Door'.

- illuminated pushbutton LOCK lights up.

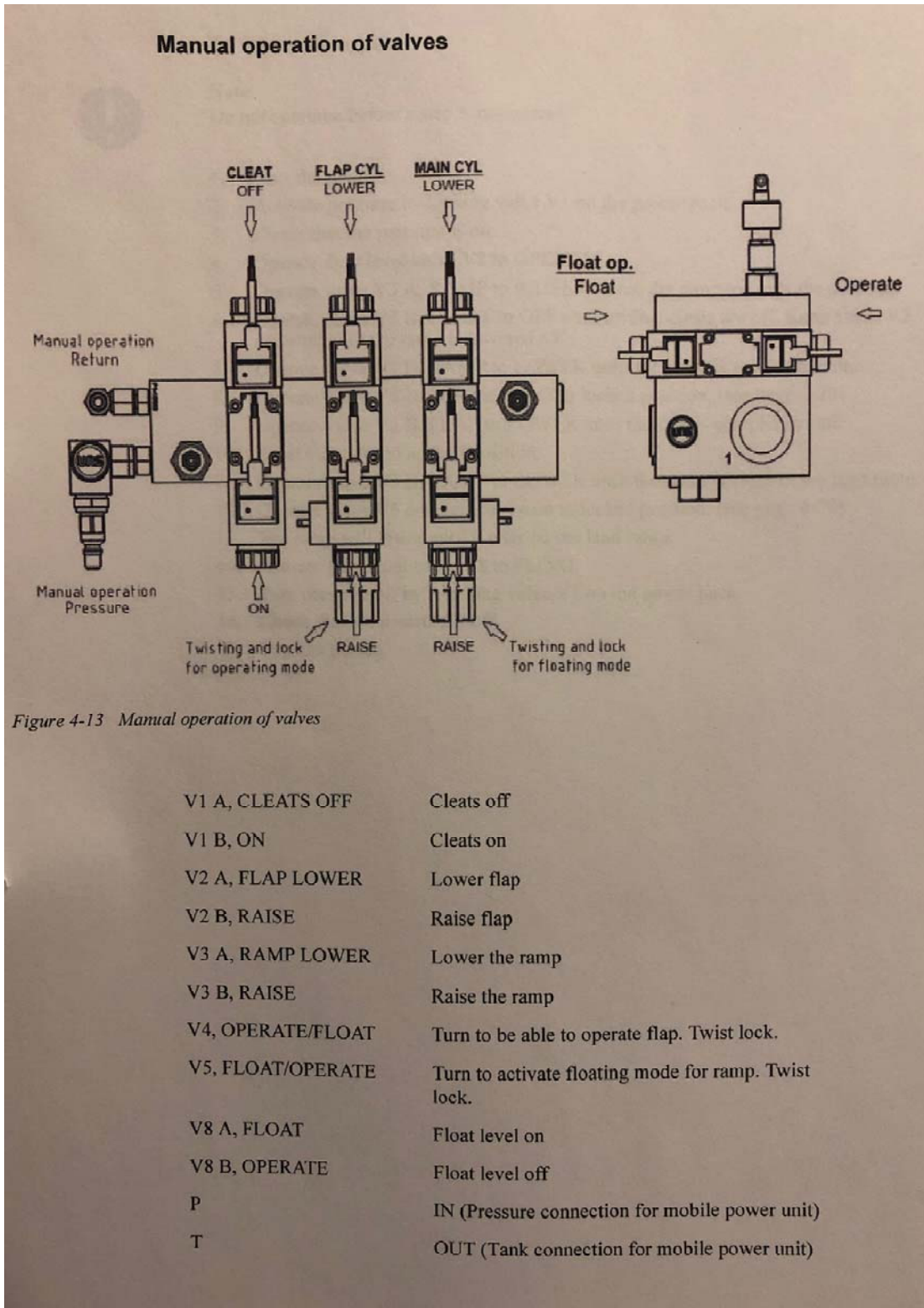
The Side Passenger Door is now closed and locked.

5.2.11 Operating of the Side Passenger Door (Deck 6, MS, PS)

- non -

5.2.14 Operating of the Side Car Ramp

See instructions below.



5.2.14.1 Opening

To manually open

Note

Do not continue before a step is completed.

1. Start the pumps.
2. Activate pressure by locking valve V1 on the power pack.
3. Check that the pressure is on.
4. Operate float level valve V8 to OPERATE.
5. Operate valve V3 A, RAMP to RAISE to force the ramp towards the packing.
6. Operate valve V2 B, CLEAT to OFF until all five cleats are off. Keep valve V2 actuated until the ramp is lowered 45°.
7. Operate valve V3 B, RAMP to LOWER until the ramp is in 45° elevation.
8. Operate valve V4 counter clockwise to locked position. (see page 4-20)
9. Operate valve V2 B, FLAP to LOWER until the flap is completely out.
10. Reset valve V4 to normal position.
11. Operate valve V3 B, RAMP to LOWER until the ramp is close to the land ramp.
12. Operate valve V5 counter clockwise to locked position. (see page 4-20)
13. The ramp will lower until it rests on the land ramp.
14. Operate float level valve V8 to FLOAT.
15. Turn pressure off by releasing valve V1 on the power pack.
16. Check that the pressure is off.
17. Stop the pumps.

5.2.14.2 Closing

To manually close

Note

Do not continue before a step is completed.

Note

Operate all the valves included in a step at the same time.

1. Start the pumps.
2. Activate pressure by locking valve V1 on the power pack.
3. Check that the pressure is on.
4. Operate the float level valve V8 to OPERATE.
5. Operate valve V4 counter clockwise to locked position. (see page 4-20)
6. Operate valve V2 A, FLAP to RAISE until the flap is completely up.
7. Operate valve V2 B, CLEAT to OFF to make sure that all five cleat are off.
8. Operate valve V3 B, RAMP to RAISE until the ramp is in 45° elevation.
9. Reset valve V4 to normal position.
10. Operate valve V3 A, RAMP to RAISE and V2 B, CLEAT to OFF until the ramp is completely raised.
11. Operate valve V3 A, RAMP to RAISE and V2 A, CLEAT to ON until all five cleats are completely on.
12. Turn pressure off by releasing valve V1 on the power pack.
13. Check that the pressure is off.
14. Stop the pumps.

5.3 Failure of the entire hydraulic system

5.3.1 General

In case the entire hydraulic system fails, no special features of design or construction have been provided to enable the heavy constructional parts to be operated with auxiliary means. In view of the high risk of accident involved in handling the constructional parts with auxiliary means, MACOR considers such a procedure NOT RECOMMENDABLE.

MACOR only recommends to cleat, lock and/or secure the constructional parts by means of an EMERGENCY HAND-PUMP UNIT when the constructional parts are in closed position. Like this it is possible that the ship can leave the port with its constructional parts locked in a proper manner acc. to the rules.

It should absolutely be tried to find the cause for the failure and to eliminate it before starting any operation with auxiliary means !

5.3.2 Emergency operation by means of a hand pump-unit.

5.3.2.1 Bow Door

5.3.2.1.1 Locking and Cleating

LOCK

1. Connect the EMERGENCY PUMP UNIT to the block-ball-valve EV1 and EV2.
2. Open block-ball-valve EV1 and EV2.
3. Put the respective hand operated control valve of the EMERGENCY PUMP UNIT to LOCK and pump as long as all cylinder piston rods of the latching devices are in LOCKED position.
4. Close EV1 and EV2 and disconnect the EMERGENCY PUMP UNIT

CLEAT

5. Connect the EMERGENCY PUMP UNIT to the block-ball-valve EV3 and EV4.
6. Open block-ball-valve EV3 and EV4.
7. Put the respective hand operated control valve of the EMERGENCY PUMP UNIT to LOCK and pump as long as all cylinder piston rods of the cleating devices are in CLEATED position.
8. Close EV3 and EV4 and disconnect the EMERGENCY PUMP UNIT

5.3.2.2 Bow Ramp

5.3.2.2.1 Locking/Securing

1. Connect the EMERGENCY PUMP UNIT to the block-ball-valve EV1 and EV2.
2. Open the block-ball-valve EV1 and EV2.
3. Put the respective hand operated control valve of the EMERGENCY PUMP UNIT to LOCK and pump as long as all cylinder piston rods of the locking devices are in LOCKED position and the cylinder piston rod of the securing device is in SECURED position.
4. Close the block-ball-valve EV1 and EV2 and disconnect the EMERGENCY PUMP UNIT.

5.3.2.3 Bulkhead Door

5.3.2.3.1 Locking

1. Connect the EMERGENCY PUMP UNIT to the block-ball-valve EV1 and EV2.
2. Open the block-ball-valve EV1 and EV2.
3. Put the respective hand operated control valve of the EMERGENCY PUMP UNIT to LOCK and pump as long as all cylinder piston rods of the locking devices are in LOCKED position.
4. Close the block-ball-valve EV1 and EV2 and disconnect the EMERGENCY PUMP UNIT.

5.3.2.4 Internal Tiltable Ramp

5.3.2.4.1 Locking (pivot locking devices - aft part)

1. Connect the EMERGENCY PUMP UNIT to the block-ball-valve EV1 and EV2.
2. Open the block-ball-valve EV1 and EV2.
3. Put the respective hand operated control valve of the EMERGENCY PUMP UNIT TO LOCK and pump as long as all cylinder piston rods of the locking devices are in LOCKED position.

5.3.2.4.2 Locking (pivot locking devices- fore part)

1. Connect the EMERGENCY PUMP UNIT to the block-ball-valve EV3 and EV4.
2. Open the block-ball-valve EV3 and EV4.
3. Put the respective hand operated control valve of the EMERGENCY PUMP UNIT TO LOCK and pump as long as all cylinder piston rods of the locking devices are in LOCKED position.

5.3.2.5 Fixed Ramp Cover (DELETED)

5.3.2.5.1 Locking

1. Connect the EMERGENCY PUMP UNIT to the block-ball-valve EV1 and EV2.
2. Open the block-ball-valve EV1 and EV2.
3. Put the respective hand operated control valve of the EMERGENCY PUMP UNIT TO LOCK and pump as long as all cylinder piston rods of the locking devices are in LOCKED position.

5.3.2.6 Hoistable Car Deck/Ramps

-non -

5.3.2.7 Stern Ramps (PS/SB)

5.3.2.7.1 Locking

1. Connect the EMERGENCY PUMP UNIT to the block-ball-valve EV1 and EV2.
2. Open the block-ball-valve EV1 and EV2.
3. Put the respective hand operated control valve of the EMERGENCY PUMP UNIT TO LOCK and pump as long as all cylinder piston rods of the locking devices are in LOCKED position.

5.3.2.8 Stern Passenger Ramp

5.3.2.8.1 Locking

1. Connect the EMERGENCY PUMP UNIT to the block-ball-valve EV1 and EV2.
2. Open the block-ball-valve EV1 and EV2.
3. Put the respective hand operated control valve of the EMERGENCY PUMP UNIT TO LOCK and pump as long as all cylinder piston rods of the locking devices are in LOCKED position.

5.3.2.9 Pilot/Bunker Doors (PS/SB)

Failure of the entire control voltage supply

Even with failure of entire voltage supply (hydraulic pump unit and control), an operation of the door is possible by means of the hand pump mounted on the pump unit.

Two persons are necessary for operation:

- One person for operation of the hand pump.
- One person for operation of the solenoid valves.

The pump unit is equipped with solenoid valves which can be used for emergency operation. To operate a solenoid valve, the built-in slide valve has to be operated externally.

Operation is by inserting and pressing in with a screw driver in the solenoid valve.

5.3.2.9.1 Opening

1. Slip operation rod on the lever of the hand pump.
2. Press solenoid Y0 and simultaneously Y3 'UNLOCK' until cleating devices are entirely unlocked.
3. Press solenoid Y0 and simultaneously Y1 'OPEN' until pilot/bunker door is completely opened.
4. Remove operating rod from hand pump.

5.3.2.9.2 Closing

1. Slip operation rod on the lever of the hand pump.
2. Press solenoid Y0 and simultaneously Y2 'LOCK' until pilot/bunker door is completely closed.
3. Press solenoid Y0 and simultaneously Y4 'LOCK' until cleating devices are entirely locked.
4. Remove operating rod from hand pump.

5.3.2.10 Side Passenger Door

Failure of the entire control voltage supply

Even with failure of entire voltage supply (hydraulic pump unit and control), an operation of the door is possible by means of the hand pump mounted on the pump unit.

Two persons are necessary for operation:

- One person for operation of the hand pump.
- One person for operation of the solenoid valves.

The pump unit is equipped with solenoid valves which can be used for emergency operation. To operate a solenoid valve, the built-in slide valve has to be operated externally.

Operation is by inserting and pressing in with a screw driver in the solenoid valve.

5.3.2.10.1 Opening

1. Slip operation rod on the lever of the hand pump.
2. Press solenoid YO and simultaneously Y3 'UNLOCK' until cleating devices are entirely unlocked.
3. Press solenoid YO and simultaneously Y1 'OPEN' until side passenger door is completely opened.
4. Remove operating rod from hand pump.

5.3.2.10.2 Closing

1. Slip operation rod on the lever of the hand pump.
2. Press solenoid YO and simultaneously Y2 'LOCK' until side passenger door is completely closed.
3. Press solenoid YO and simultaneously Y4 'LOCK' until cleating devices are entirely locked.
4. Remove operating rod from hand pump.

6 Description of the hydraulic equipment

See drawing Nos:

S18800101-RO	RO /RO EQUIPMENT GENERAL ARRANGEMENT
S1 8811105-R3	BOW DOORS PS/SB, HYDRAULIC OPERATING PLAN
S18811106-R3	BOW RAMP, HYDRAULIC OPERATING PLAN
S18811107-R3	COLLISION BHD DOOR, HYDRAULIC OPERATING PLAN
S1 88-11108-R3	TILTABLE RAMP, HYDRAULIC OPERATING PLAN
S18811109-R3	FIXED RAMP COVER, HYDRAULIC OPERATING PLAN
S18811110-R3	HOISTABLE CAR DECK /RAMPS, HYDRAULIC OPERATING PLAN
S18811111-R3	STERN RAMPS PS/SB, HYDRAULIC OPERATING PLAN
S18811112-R3	STERN PASSENGER RAMP, HYDRAULIC OPERATING PLAN
S18809301-RO	PILOT/BUNKER DOORS PS/S, HYDRAULIC OPERATION PLAN
S18810301-RO	PASSENGER DOOR, HYDRAULIC OPERATING PLAN

6.1 General

The constructional parts on fore end as bow doors, bow ramp, collision bulkhead door, internal tiltable ramp and hoistable car deck/ramps are driven via one common hydraulic pump unit, arranged on deck 3 fore end.

The constructional parts on aft end as stern ramps ps/sb, stern passenger ramp, and fixed ramp cover are driven via one common hydraulic pump unit, arranged on deck 3 aft end.

The pumps supply oil into a common pressure line to all respective hydraulic control block valves which are connected in parallel.

When pressing the respective pushbutton at any control station, the solenoid valves of the respective control block valve and at the same time the solenoid valves Y1/Y2 at the pump units are energized. The nearly pressureless circulation is interrupted and the variable displacement pumps are set to pressure.

6.2 Pump unit

6.2.1 General

The hydraulic pump unit on fore end and aft end mainly consists of the following components, technical data see. chapter 10.1 - 10.3:

- one oil tank
- two variable displacement pumps P1 and P2 built on top of the tank
- two motors M1 and M2 flange-mounted to the pumps
- one fan oil cooler
- one return filter with optoelectrical indication of contamination
- two electromagnetic directional control valves with mechanical emergency operation which set the pump to nearly pressureless circulation if no consumer will be operated.
- two pressure relief valves protecting the pump unit from overload
- one level switch checking the oil level and switching off the pump unit in case the oil level has fallen below the minimum level or exceeded the maximum level
- one temperature switch switching off the pumps in case the oil temperature is too high
- one tank vent with air filter
- one oil gauge for optical indication of the min/max oil level
- two check valves connected in such a way that in case of failure of one pump, operation can be carried out by means of the other pump
- four metal shock-absorbers as elastic supports for the pump unit
- two block-ball valves

6.2.2 Start/Stop of the pump unit

One button LAMP TEST

If the button LAMP TEST is actuated, all signal lamps light up for inspection.

One latched pushbutton EMERGENCY STOP is actuated the pump unit will be switched off. The emergency-stop pushbutton must be released for restarting the pump unit.

One signal lamp and pushbutton 'PUMP1 ON' and one signal lamp and pushbutton 'PUMP2 ON', which indicates that the pump unit is switched on and each pumps are running.

One pushbutton 'PUMP 1 STOP' and one pushbutton 'PUMP 2 STOP' is actuated, the pump unit will be switched off when each pump is stopped.

in case only pump unit has started from control station via PLC, must be used EMERGENCY STOP to stop the pump running at motor starter panel.

If pump will be stop without pressure of pump stop or emergency stop pushbutton, which kind of failure occurred, is indicated at the 'Motor starter' i.e.

Pump 1 fault	Pump 2 fault
Oil level min.	Oil level max.
Temperature max.	

6. 3 Hydraulic control block valves

6.3.1 General

Each MACOR Neptun part is electro-hydraulically controlled via a respective control block. The hydraulic control blocks consist of:

- electrical solenoid valves (24 V DC) for operation of the hydraulic cylinders. The valves are equipped with a manual emergency operation.
- pressure relief valves for protection of pipes, hoses and cylinders against excessive pressure
- throttling check valves and lowering brake valves for setting of velocities
- hydraulic pilot-operated check valves to keep the parts in position without leakage
- pressure gauge G1/4 I M 16x2

When actuating the pushbutton at the control stations, the electrical solenoid valves are energized following a fixed program.

6.3.2 Designation of the solenoid valves

6.3.2.1 Bow Door

Y0	Pressure ON
Y1	Open PS
Y2	Close PS
Y3	Unlock
Y4	Lock
Y5	Uncleat
Y6	Cleat
Y7	Open SB
Y8	Close SB

6.3.2.2 Bow Ramp

Y0	Pressure ON
Y1	Open
Y2	Close
Y3	Lock
Y4	Unlock
Y5	Quay support ON

6.3.2.3 Bulkhead Door

Y0	Pressure ON
Y1	Open
Y2	Close
Y3	Unlock
Y4	Lock
Y5	Quay support ON

6.3.2.4 Internal Tilttable Ramp

Y0	Pressure ON
Y1	Lower
Y2	Raise
Y3	latching dev. Unlock
Y4	latching dev. Lock
Y5	fore pivot locking dev. Unlock
Y6	fore pivot locking dev. Lock
Y7	aft pivot locking dev. Unlock
Y8	aft pivot locking dev. Lock

6.3.2.5 Fixed Ramp Cover

Y0	Pressure ON
Y1	Open
Y2	Close
Y3	cleat Unlock
Y4	cleat Lock
Y5	locking dev. Unlock
Y6	locking dev. Lock

6.3.2.6 Hoistable Car Deck/Ramps

Y1	Lower (car deck 3 (ps/stb))
Y2	Raise (car deck 3 (ps/stb))
Y3	Lower (car deck 1 (ps/stb))
Y4	Raise (car deck 1 (ps/stb))
Y5	Lower (car deck 2 (ps/stb))
Y6	Raise (car deck 2 (ps/stb))

6.3.2. 7 Stern Ramps (PS/SB)

Y0	Pressure on
Y1	Open
Y2	Close
Y3	Flap unfold
Y4	Flap fold
Y5	Preventer lower
Y6	Preventer lift
Y7	Lock
Y8	Unlock
Y9,Y10	Quay support ON

6.3.2.8 Stern Passenger Ramp

Y0	Pressure ON
Y1	Open
Y2	Close
Y3	flap Unfold
Y4	flap Fold
Y5	preventer Lower
Y6	preventer Lift
Y7	Lock
Y8	Unlock
Y9,Y10	Quay support ON

6.3.2.9 Pilot/Bunker Doors (PS/SB)

Y0	Pressure ON
Y1	Open
Y2	Close
Y3	Lock
Y4	Unlock

6.3.2. 10 Side passenger Door

Y0	Pressure ON
Y1	Open
Y2	Close
Y3	Unlock
Y4	Lock

7 Description of the electric control

7.1 General

The constructional parts on fore end as bow doors, bow ramp, collision bulkhead door, internal tiltable ramp and hoistable car deck/ramps are controlled via PLC unit(X12), arranged on deck 3 fore end.

The constructional parts on aft end as stern ramps ps/sb, stern passenger ramp, and fixed ramp cover are controlled via PLC unit(X22), arranged on deck 3 aft end.

7.2 Motor starter control panels and main PLC control panels

The Motor starter control panels and main PLC control panels mainly consists of the following :

X11	fore end pump unit Motor starter control panel
X12	fore end PLC control panel
X21	aft end pump unit Motor starter control panel
X22	aft end PLC control panel

The two power supplies will be supplied by the yard.

- control source : normal power 230V/1Phase/50H
- indicator and sensors : un-interruptible power supply (UPS)

The main PLC panel is equipped with an indication and alarm system;

- a selector switch 'MAIN SWITCH' a
- signal lamp 'Source ON'
- a signal lamp 'PLC Running'
- a signal lamp 'Hydraulic Failure'
- a signal lamp 'Power failure' (UPS)
- a signal lamp 'Pump1 Run' a
- signal lamp 'Pump2 Run'
- a signal lamp 'Emergency Stop'
- a low insulation alarm device (alarm, lamp, buzzer and meter)

7.3 Control stations

The Bow Doors, Bow Ramp and Bulkhead Door can be operated from a fixed control station arranged on main deck and a portable pushbutton control station arranged on deck4.

The Internal Tilttable Ramp can be operated from two fixed control stations arranged on main deck fore and aft of tilttable ramp and two portable pushbuttons control stations arranged on deck4.

The Hoistable Car Deck/Ramp can be operated from four fixed control stations arranged on deck4.

The Stern Ramp PS and SB can be operated from the fixed control stations arranged on main deck and the portable pushbutton control stations arranged on deck4.

The Stern Passenger Ramp can be operated from a fixed control station arranged on main deck and a portable pushbutton control station arranged on deck4.

The Fixed Ramp Cover can be operated from a fixed control station arranged on main deck.

Each part is electrically controlled via pushbutton operation at the respective control station and hydraulically controlled at the respective control valve block.

The electric control for the fore end parts is located in a common motor starter / control cabinet on fore end.

The electric control for the aft end parts is located in a common motor starter / control cabinet on aft end.

The BOW DOOR , BOW RAMP and COLLISION BHD DOOR is operated from the control station BOW(X13), arranged on deck 3 in a lockable steel control panel.
In addition this station is equipped with a remote control portable pushbutton.

The INTERNAL TILTTABLE RAMP is operated from the two control stations(X16A, X16B), arranged on deck3 in a lockable steel control panel.
In addition this station is equipped with two remote control portable pushbuttons.

The FIXED RAMP COVER is operated from the control station (X24), arranged on deck 3 in a lockable steel control panel.

The HOISTABLE CAR DECK PLATFORM 1 +2 PS are operated from the control station (X17A), arranged on deck 4 in a lockable steel control panel.

The HOISTABLE CAR DECK PLATFORM 1 +2 SB are operated from the control station (X17B), arranged on deck 4 in a lockable steel control panel.

The HOISTABLE CAR DECK RAMPS 3 PSis operated from the control station (X17C), arranged on deck 4 in a lockable steel control panel.

The HOISTABLE CAR DECK RAMPS 3 SB is operated from the control station (X17D) , arranged on deck 4 in a lockable steel control panel.

The STERN RAMP PSis operated from the control station (X23A),arranged on deck 3 in a lockable steel control panel.

In addition this station is equipped with a remote control portable pushbutton.

The STERN RAMP SB is operated from the control station (X23B),arranged on deck 3 in a lockable steel control panel.

In addition this station is equipped with a remote control portable pushbutton.

The STERN PASSENGER RAMP is operated from the control station (X23C), arranged on deck 3 in a lockable steel control panel.

In addition this station is equipped with a remote control portable pushbutton.

The PILOT/BUNKER DOORS PS/SB are operated from the control station (X1), arranged on deck 3 in a lockable steel control panel.

The SIDE PASSENGER DOOR (Deck 6,AFT,PS)is operated from the control station (X1), arranged on deck 6 in a lockable steel control panel.

The SIDE PASSENGER DOOR (Deck 6,MS, PS) is manually operated with the levers on the door.

The SIDE PASSENGER DOORS (Deck 6,FWD,PS/SB) is operated from the control stations next to the named doors on Deck 6.

The SIDE PASSENGER DOOR (Deck 4, FWD,PS) is operated from the control station next to the named door.

The SIDE CAR RAMP is operated from the control station, arranged on deck 4 in a steel cabinet. In addition this station is equipped with a remote control portable pushbutton.

The HATCH COVER FOR LIFT PLATFROM is operated from the control station, located on Deck 3.

The SHORE CONNECTION is operated from the control station in the same room as the PILOT/BUNKER DOORS on deck 3.

The controlstation is mainly equipped with:

One Key switch OPERATION OFF/ON

One signal lamp OPERATION ON

If the Key switch OPERATION OFF/ON is set to ON the control station is switched on, the signal lamp OPERATION ON lights up at the control station.

The operation can now be started .

One button LAMP TEST

If the button LAMP TEST is actuated, all signal lamps lights up for inspection.

One switch REMOTE CONTROL OFF/ON enable the remote control station (BOW, Tiltable Ramp, Stern Ramps and Stern Passenger Ramp) . In position OFF no operation at remote pushbutton control station.

One signal lamp OPERATION INHIBITED is indicated disable the operation at control station. (Shell Doors only)

One Buzzer and one pushbutton Buzzer reset.

One latched pushbutton EMERGENCY STOP,

If the latched pushbutton EMERGENCY STOP is actuated the pump unit will be switched off. The equipment stops immediately in its present position and cannot be moved, even when continuing to actuate the pushbutton for operation.

The emergency-stop pushbutton must be released for restarting the pump unit.

One signal lamp and pushbutton 'PUMP1 START' and one signal lamp and pushbutton 'PUMP2 START', which indicates that the pump unit is switched on and each pump is running.

One pushbutton 'PUMP1 STOP' and/or one pushbutton 'PUMP2 STOP' is actuated, the respective pump unit will be switched off

Normally pump unit has started from control station via PLC, if pump unit has started from local motor starter, must be used pushbutton 'EMERGENCY-STOP' to stop the pump running.

One signal lamp 'Hydraulic Failure', indicates, that there is a failure of the pump unit. Which kind of failure occurred is indicated at the 'Motor switch cabinet' i.e.

Pump 1 fault	Pump 2 fault
Temperature max.	Filter blocked
Oil level min.	Oil level max.

The Bow Doors, Bow Ramp, Collision Bulkhead Door, Fixed Ramp Cover, Stern Ramp PS, Stern Ramp SB and Stern Passenger Ramp are equipped indicators;

Two signal lamps 'Closed' / 'Locked' which indicates the completely and correct locked or closed state of the equipment.

The signal lamp and the safety relevant limit switches 'closed' and 'locked' belonging to this circuit must be provided by the uninterruptible power supply of the ship (UPS).

The locked and closed state of the equipment will be indicated on the Bridge panel as well.

Two signal lamp 'Not Closed' / 'Not Locked' which indicates any deviation from the correct closed and/or locked state of the equipment (that means as soon as the safety relevant limit switches 'locked' and 'closed' is not activated the signal lamp lights up.)

The signal lamp must be provided by the uninterruptible power supply of the ship (UPS) as well.

The Not Locked / Not Closed state of the equipment will be indicated on the Bridge panel as well.

7.4 Bridge indication panel

The bridge panel is equipped with an indication and alarm system for the equipment supplied by MACOR and will be integrated in the bridge control desk in the wheel-house. The uninterruptible power supply (UPS) for the bridge panel will be provided by the yard.

The bridge panel for the bow door, bow ramp, collision bulkhead door, internal tiltable ramp, stern ramps, stern passenger ramp, fixed ramp cover, pilot/bunker doors and passenger door must be equipped with:

- a selector switch 'Harbour/Sea voyage' (acc. IACS-rules)
- a selector switch 'Shell Door Inhibited'

- a signal lamp 'Closed' Bow Door (green)
- a signal lamp 'Not Closed' Bow Door (red)
- a signal lamp 'Locked' Bow Door (green)
- a signal lamp 'Not Locked' Bow Door (red)

- a signal lamp 'Closed' Bow Ramp (green)
- a signal lamp 'Not Closed' Bow Ramp (red)
- a signal lamp 'Locked' Bow Ramp (green)
- a signal lamp 'Not Locked' Bow Ramp (red)

- a signal lamp 'Closed' Collision BHD Door (green)
- a signal lamp 'Not Closed' Collision BHD Door (red)
- a signal lamp 'Locked' Collision BHD Door (green)
- a signal lamp 'Not Locked' Collision BHD Door (red)

- a signal lamp 'Raised/Locked' Tiltable ramp (green)
- a signal lamp 'Not Fully Raised/Locked' Tiltable ramp (red)

- a signal lamp 'Closed' Stern Ramp PS (green)
- a signal lamp 'Not Closed' Stern Ramp PS (red)
- a signal lamp 'Locked' Stern Ramp PS (green)
- a signal lamp 'Not Locked' Stern Ramp PS (red)

- a signal lamp 'Closed' Stern Ramp SB (green)
- a signal lamp 'Not Closed' Stern Ramp SB (red)
- a signal lamp 'Locked' Stern Ramp SB (green)
- a signal lamp 'Not Locked' Stern Ramp SB (red)

- a signal lamp 'Closed' Stern Passenger Ramp (green)
- a signal lamp 'Not Closed' Stern Passenger Ramp (red)
- a signal lamp 'Locked' Stern Passenger Ramp (green)
- a signal lamp 'Not Locked' Stern Passenger Ramp (red)

- a signal lamp 'Closed' Fixed Ramp Cover (green)

a signal lamp 'Not Closed' Fixed Ramp Cover (red)
a signal lamp 'Locked' Fixed Ramp Cover (green)
a signal lamp 'Not Locked' Fixed Ramp Cover (red)

a signal lamp 'Closed' Pilot/Bunker Door PS (green)
a signal lamp 'Not Closed' Pilot/Bunker Door PS (red)
a signal lamp 'Locked' Pilot/Bunker Door PS (green)
a signal lamp 'Not Locked' Pilot/Bunker Door PS (red)

a signal lamp 'Closed' Pilot/Bunker Door SB (green)
a signal lamp 'Not Closed' Pilot/Bunker Door SB (red)
a signal lamp 'Locked' Pilot/Bunker Door SB (green)
a signal lamp 'Not Locked' Pilot/Bunker Door SB (red)

a signal lamp 'Closed' Side Passenger Door (green)
a signal lamp 'Not Closed' Side Passenger Door (red)
a signal lamp 'Locked' Side Passenger Door (green)
a signal lamp 'Not Locked' Side Passenger Door (red)

a signal lamp 'Power Failure' No.1 PLC UPS (red)
a signal lamp 'Power Failure' No.2 PLC UPS (red)
a signal lamp 'Power Failure' Pilot/Bunker Door PS (red)
a signal lamp 'Power Failure' Pilot/Bunker Door SB (red)
a signal lamp 'Power Failure' Side Passenger Door (red)

a buzzer
a buzzer reset
a lamp test
a dimmer

Selector switch in position 'Harbour'

- Green signal lamp 'Closed' / 'Locked' indicates that the respective part is closed / locked.
- Red signal lamp (steady light) 'Not Closed' / 'Not Locked' lights up as soon as the limit switches 'Part closed' / 'Locked' is no longer activated.
An acoustic alarm (buzzer) is not activated.

Selector switch in position 'Sea voyage'

- Green signal lamp 'Closed' / 'Locked' indicates that the part is closed / locked.
- Red signal lamp (flashing light) 'Not Closed' / 'Not Locked' indicates deviations from the correct closing or locking state of the constructional part, that means that the limit switches 'closed' / 'Locked' is no longer activated.

In addition, an acoustic alarm (buzzer) is activated. The buzzer can be acknowledged. After acknowledgement the red flashing light stops to flash and starts to light steadily.

The buzzer can be acknowledged. After acknowledgement the red flashing light stops to flash and starts to light steadily.

For checking the signal lamps, a pushbutton 'Lamp test' is installed. When pressing this pushbutton, all lamps have to light up.

The installed dimmer dims the signal lamps but not the buzzer.

Selector switch Shell door inhibited in position'ON'

Shell door inhibited 'ON' will be inhibited the operation of the shell doors at local station (Bow doors, Bow ramp, Bulkhead door, Stern ramp/doors, Stern passenger ramp/door, pilot/bunker doors and side passenger door) .

Red signal lamp 'Operation inhibited' at respective local control station lights up.

Selector switch Shell door inhibited in position'OFF'

Shell door inhibited 'OFF' will be enable the operation of the shell doors at local station (Bow doors, Bow ramp, Bulkhead door, Stern ramp/doors, Stern passenger ramp/door, pilot/bunker doors and side passenger door).

Red signal lamp 'Operation inhibited' at respective local control station lights up.

7.5 Emergency Stop

EMERGENCY-STOP buttons are installed in:

- X11	Motor starter control panel fore end	
- X13	Control station BOW Deck 3	
- X13	Remote control station BOW Deck 4	
- X16A	Control station Tilttable Ramp aft end Deck 3	
- X16B	Control station Tilttable Ramp fore end Deck 3	
- X17C	Control station Hoistable Car Deck/Ramp PS	Deck 4
- X17D	Control station Hoistable Car Deck/Ramp SB	Deck 4
- X21	Motor starter control panel aft end	
- X23A	Control station Stern Ramp PS	Deck 3
- X23B	Control station Stern Ramp SB	Deck 3
- X23C	Control station Stern passenger Ramp	Deck 3
- X23	Remote control station Stern	Deck 4
- X24	Control station Fixed Ramp Cover	Deck 3

If any Emergency-stop button of a.m. control stations is actuated during hydraulic operation of any consumer, the electric motors of the corresponding pump unit are switched off the oil flow of the pumps is immediately interrupted.

Thus the respective manoeuvre is interrupted as well. The parts moves remain in their current position. To continue normal operation, take care that all EMERGENCY-STOP buttons are Unlocked.

The EMERGENCY-STOP buttons must be manipulated.

7.6 Limit switches

7.6.1 Designation of the limit switches

7.6.1.1 Bow Door

Limit switches (proximity magnet switches 24 V DC)

S1	Opened PS
S2	Closed PS
S3.1-S3.10	Unlocked --7 (proximity inductive switches 24 V DC S4.1-
S4.10	Locked --7 (proximity inductive switches 24 V DC
55.1 - 55.5	Uncleated
56.1 - 56.5	Cleated
S7	Opened SB
S8	Closed SB

7.6.1.2 Bow Ramp

Limit switches (proximity magnet switches 24 V DC)

S1.1	Bow Ramp Stops at 25 ° opening angle
S1.2	Bow Ramp enable at 80°Opening angle Bulkhead door control Bow
S1.3	Ramp disable at 60°Opening angle Bulkhead door control Closed
S2	Locked Unlocked
S3.1 - 3.5	Folded (Part 3)
S4.1 - 4.5	Unfolded (Part 3)
S5.1	
S5.2	

7.6. 1.3 Bulkhead Door

Limit switches (proximity magnet switches 24 V DC)

S1	Opened
S2	Closed
S3.1 - 3.2	Locked
S4.1 - 4.2	Unlocked

7.6.1.4 Internal Tilttable Ramp

Limit switches (proximity magnet switched 24V DC)

53.1	ramp (aft)	Raised
53.1-1	ramp (aft)	Lowered
53.2	ramp (fore)	Raised
53.3	ramp (fore)	Lowered
53.4	pivot locking dev. (aft PS)	Locked
53.5	pivot locking dev. (aft PS)	Unlocked
53.6	pivot locking dev. (aft SB)	Locked
53.7	pivot locking dev. (aft SB)	Unlocked
53.8	pivot locking dev. (fore PS)	Locked
53.9	pivot locking dev. (fore PS)	Unlocked
53.10	pivot locking dev. (fore SB)	Locked
53.11	pivot locking dev. (fore SB)	Unlocked
53.12, 3.14, 3.42	latching dev.	Locked
53.13, 3.15, 3.43	latching dev.	Unlocked

7.6.1.5 Fixed ramp Cover

Limit switches (Explosion proof type proximity magnet switched 24V DC)

54.1	Closed
54.2	Opened
54.3, 4.5, 4.17	cleat Locked cleat
54.4, 4.6, 4.18	Unlocked locking dev.
54.19, 4.21	Locked
54.20, 4.22	locking dev. Unlocked

7.6.1.6 Hoistable Car Deck/Ramps

Limit switches (proximity magnet switched 24V DC)

55.1p	no.1 car deck PS	Oeck5
55.2P	no.1 car deck PS	Oeck6
55.3P	no.2 car deck PS	Oeck5
55.4P	no.2 car deck PS	Deck6
55.1S	no.1 car deck SB	Oeck5
55.2S	no.1 car deck SB	Deck6
55.3S	no.2 car deck SB	Deck5
55.4S	no.2 car deck SB	Oeck6
55.5P	no.3 car deck PS	Oeck4
55.6P	no.3 car deck PS	Oeck5
55.7P	no.3 car deck PS	Deck6
55.5S	no.3 car deck SB	Deck4
55.6S	no.3 car deck SB	Deck5
55.7S	no.3 car deck SB	Deck6

7.6. 1.7 Stern ramp PS

Limit switches (proximity magnet switched 24V DC)

51.1p	Closed	
51.2P1 1.4PI 1.6P	Locked	
51.SPI 1.10P	Locked	
51.3P1 1.5PI 1.7P	Unlocked	
51.9PI 1.11P	Unlocked	
51.12P	ramp open 30o	(proximity inductive switched 24V DC)
51.13P	open So flap Folded	(proximity inductive switched 24V DC)
51.14P	flap Unfolded	
51.15P		

7.6. 1.8 Stern ramp SB

Limit switches (proximity magnet switched 24V DC)

51.15	Closed	
51.251 1.451 1.65	Locked	
51.S51 1.105	Locked	
51.351 1.551 1.75	Unlocked	
51.951 1.115	Unlocked	
51.125	ramp open 30o	(proximity inductive switched 24V DC)
51.135	ramp open So	(proximity inductive switched 24V DC)
51.145	flap Folded	
51.155	flap Unfolded	

7.6. 1.9 Stern Passenger Ramp

Limit switches (proximity magnet switched 24V DC)

52.1	Closed	
52.21 2.41 2.6, 2.5	Locked	
52.31 2.5, 2.7, 2.9	Unlocked	
52.10	ramp open 30o	(proximity inductive switched 24V DC)
52.11	ramp open So	(proximity inductive switched 24V DC)
52.12	flap Folded	
52.13	flap Unfolded	

7.6. 1.10 Pilot/Bunker door

Limit switches (proximity magnet switched 24V DC)

L51	Closed
L52	Opened
L53.11 3.2	Locked
L54.11 4.2	Unlocked

7.6.1.11 Side Passenger door

Limit switches (proximity magnet switched 24V DC)

LS1	Closed
LS2	Opened
LS3.1, 3.2	Locked
LS4.1	Unlocked

7.6.1.12 Pump unit fore end and aft end

81.1	oil temperature too high (fore end pump unit)
81.2	oil temperature too low (fore end pump unit)
81.3	oil level too high (fore end pump unit)
81.4	oil level too low(fore end pump unit)
81.5	oil filter clogged (fore end pump unit)
82.1	oil temperature too high (aft end pump unit)
82.2	oil temperature too low (aft end pump unit)
82.3	oil level too high (aft end pump unit)
82.4	oil level too low(aft end pump unit)
82.5	oil filter clogged (aft end pump unit)



8 Maintenance

Regular maintenance of the equipment and systems supplied by MACOR Neptun increases operational reliability and service life of the corresponding components and constructional parts.

8.1 Pipe lines for the hydraulic equipment

The couplings of the pipes must be checked from time to time and retightened, if necessary.

During the first few months after commissioning of the vessel, the checks should be carried out at shorter intervals, as the screw-type couplings may have loosened slightly as a result of the high oil pressure (settling period).

When fitting high-pressure hoses, take care that the hoses do not twist when tightening the couplings.

8.2 Checking the oil level at the pump unit and topping up

Prior to switching on the hydraulic pumps for operation make sure that there is sufficient oil in the tank of the respective pump unit.

Only if the position of the hydraulic cylinders generates the maximum oil level, it is sensible to check the oil level:

The highest oil level in the tank of the pump unit on fore end is given with the following operating positions of the constructional parts:

-BOW DOOR, BOW RAMP, BULKHEAD DOOR are closed, TILTABLE RAMP;
HOISTABLE CAR DECK/RAMPS must be in raised and stowed position.

The highest oil level in the tank of the pump unit on aft end is given with the following operating positions of the constructional parts:

-STERN RAMP PS and SB are closed, STERN PASSENGER RAMP/DOOR and RAMP COVER are in closed position.

In case the oil level is checked during another operating status it may happen that when moving the connected consumers (doors etc.) after, the oil has been topped up, the tank overflows due to the oil flowing back from the cylinders.

In this case the system is switched off by the max. switch 'Max.oil' indicated on the control cabinet.



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Check the oil level from level gauge in front of the tank.

The oil level has two marks: *MIN* and *MAX*. If the oil level has fallen below the mark *MIN*, oil has to be topped up until the oil level lies between the marks *MIN* and *MAX*.

To protect the pump unit against a possible damage due to lack of oil, it is equipped with a level switch 'Min. oil' which switches off the pump unit in case the oil level has fallen below a certain minimum level indicated on the control cabinet.

8.3 Hydraulic oil

Hydraulic oil recommendation see chapter 10.5 Technical data.

8.4 Oil filter

The filter element of the hydraulic pump unit cannot be cleaned (throw-away element). It has to be replaced at the following intervals:

- after commissioning of the hydraulic equipment,
- all further 2,000 operating hours or once a year,
- if all present contamination indications are RED.

8.5 Oil tank

The hydraulic oil in the tank must be checked once a year by an expert from the oil supplier for ageing and contamination. If necessary, the oil must be replaced.

It is not necessary to drain the oil from the remaining parts of the hydraulic system as this will mix with the new oil in the tank during further operation.

Attention!

If the oil level has fallen below the minimum mark of the oil gauge, oil must be topped up. The oil may only be topped up when the present hydraulically operated consumers are in a certain position (s. chapter 8.2 Checking the oil level).

If a different oil than the initial filling is used for topping up or when completely replacing the oil, make sure that only an oil with the same viscosity and basis is used.

The MACOR Neptun oil specification lists a number of oils of different companies along with details about their viscosities.

All oils listed in this specification can be mixed with each other.

If you wish to use an oil with a different viscosity to that of the oil used for the initial filling, please obtain the prior advice of MACOR Neptun.



8.6 Rust protection

Pipes, couplings and fittings must be provided with oil-resistant coats at regular intervals.

The present covers/ramps have to be maintained like all other parts on upper deck.

Special attention has to be paid to the draingage rims running in athwardship direction (e.g. between the hatch covers). These areas are particularly susceptible to rust formation. They have to be derusted at least once a year and provided with an appropriate surface treatment.

When rubber sealings are renewed, the metal retaining angles have to be derusted and furnished with several (at least 3) coats of paint.

8.7 Rubber sealings

To preserve the sealing effect, the rubber sealings have to be regularly maintained. This maintainance is particularly recommendable in connection with loading/unloading of the vessel.

French chalk, vaseline or - in an emergency - potassium soap can be used for this purpose.

8.8 Lubricating

Lubrication is to be carried out as specified in the following chapters *Lubricating Instructions*.



8.8.1 Lubricating instructions Bow Door

Grease: EXXON multi-purpose grease*

Zeichnungs-Nr. Drawing No.	Bezeichnung Designation	Schmierstellen points of lubrication		Abschmier-Intervalle Greasing intervals
		je Stück per unit	gesamt total	
0241 702.ZB	Bow door Support Arm PS/SB	8	16	to apply grease every 3 Months

* Es können auch gleichwertige Schmierfette verwendet werden. Siehe hierzu Extra-Blatt.
 * Equivalent grease may be used. See separate sheet.

8.8.2 Lubricating instructions Bow Ramp

Grease: EXXON multi-purpose grease*

Zeichnungs-Nr. Drawing No.	Bezeichnung Designation	Schmierstellen points of lubrication		Abschmier-Intervalle Greasing intervals
		je Stück per unit	gesamt total	

2130 122.Z.D	Locking bolt 90 x 90	1	4	to apply grease every 3 Months by brush

* Es können auch gleichwertige Schmierfette verwendet werden. Siehe hierzu Extra-Blatt.

* Equivalent grease may be used. See separate sheet.



8.8.3 Lubricating instructions Bulkhead Door

Grease: EXXON multi-purpose grease*

Zeichnungs-Nr. Drawing No.	Bezeichnung Designation	Schmierstellen points of lubrication		Abschmier-Intervalle Greasing intervals
		je Stück per unit	gesamt total	
1210 037.Z.D	Enbearing dia. 90	1	2	to apply grease every 3 Months by brush
1210 038.Z.D	Enbearing dia. 80	1	2	to apply grease every 3 Months by brush
1106 450.ZC	Locking device cpl.	1	2	to apply grease every 3 Months

* Es können auch gleichwertige Schmierfette verwendet werden. Siehe hierzu Extra-Blatt.

* Equivalent grease may be used. See separate sheet.



MACOR NEPTUN

8.8.4 Lubricating instructions Internal Tilttable Ramp

Grease: EXXON multi-purpose grease*

Zeichnungs-Nr. Drawing No.	Bezeichnung Designation	Schmierstellen points of lubrication		Abschmier-Intervalle Greasing intervals
		je Stück per unit	gesamt total	

S1880 4321	Locking device	1	4	to apply grease every 3 Months
S1880 4309	Sheave	1	36	to apply grease every 3 Months
S1880 4309	Wire end fitting	1	2	to apply grease every 3 Months
S1880 4331	Guide roller	1	2	to apply grease every 3 Months

* Es können auch gleichwertige Schmierfette verwendet werden. Siehe hierzu Extra-Blatt.
 * Equivalent grease may be used. See separate sheet.



8.8.5 Lubricating instructions Fixed Ramp Cover

Grease: EXXON multi-purpose grease*

Zeichnungs-Nr. Drawing No.	Bezeichnung Designation	Schmierstellen points of lubrication		Abschmier-Intervalle Greasing intervals
		je Stück per unit	gesamt total	
S1880 5301	Main hinge	1	4	to apply grease every 3 Months
S1880 5302	Lifting cyl.&device	1	4	to apply grease every 3 Months
S1880 5305	Locking device	1	4	to apply grease every 3 Months

* Es können auch gleichwertige Schmierfette verwendet werden. Siehe hierzu Extra-Blatt.
* Equivalent grease may be used. See separate sheet.



8.8.6 Lubricating instructions Hoistable Car Deck/Ramps

Grease: EXXON multi-purpose grease*

Zeichnungs-Nr. Drawing No.	Bezeichnung Designation	Schmierstellen points of lubrication		Abschmier-Intervalle Greasing intervals
		je Stück per unit	gesamt total	
S1880 6410	Jigger winch(Ramp)	1	2	to apply grease every 3 Months
S1880 6407	Jigger winch(Deck)	4	8	to apply grease every 3 Months
S1880 6415	Sheave(Ramp)	1	36	to apply grease every 3 Months
S1880 6416	Sheave(Deck)	1	36	to apply grease every 3 Months
S1880 6507	Guide roller	1	2	

* Es können auch gleichwertige Schmierfette verwendet werden. Siehe hierzu Extra-Blatt.
 * Equivalent grease may be used. See separate sheet.



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8.8.8 Lubricating instructions Stern Passenger Ramp/Door

Grease: EXXON multi-purpose grease*

Zeichnungs-Nr. Drawing No.	Bezeichnung Designation	Schmierstellen points of lubrication		Abschmier-Intervalle Greasing intervals
		je Stück per unit	gesamt total	

S1880 7304	Main hinge	1	2	to apply grease every 3 Months
S1880 7305	Main cyl. mount	1	2	to apply grease every 3 Months
S1880 7306	Locking hook	1	6	to apply grease every 3 Months
S1880 7309	Preventer cyl. mount	1	2	to apply grease every 3 Months
S1880 7310	Hydr. Linkage	1	8	to apply grease every 3 Months

* Es können auch gleichwertige Schmierfette verwendet werden. Siehe hierzu Extra-Blatt.
 * Equivalent grease may be used. See separate sheet.



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8.8.10 Lubricating instructions Side Passenger Door

Grease: EXXON multi-purpose grease*

Zeichnungs-Nr. Drawing No.	Bezeichnung Designation	Schmierstellen points of lubrication		Abschmier-Intervalle Greasing intervals
		je Stück per unit	gesamt total	
S1881 0201	Main cyl.mount&hinge assembly	1	10	to apply grease every 3 Months
S1881 0203	Link arm assembly	1	2	to apply grease every 3 Months
S1881 0204	Cleat linkage mount	2	8	to apply grease every 3 Months

* Es können auch gleichwertige Schmierfette verwendet werden. Siehe hierzu Extra-Blatt.
* Equivalent grease may be used. See separate sheet.

8.8.11 Side Passenger Door, Deck 6 midship Port-side (Installed in 2019)

Grease: Multi purpose grease

Description		Greasing intervals
Hinge assembly		Apply grease every 3 months
Handle with cleat linkage mount		Apply grease every 3 months

8.8.12 Side Passenger Doors, Deck 6 forward Port- and Stb side

Grease: Multi purpose grease

Description		Greasing intervals
Main cyl. mount & Hinge assembly		Apply grease every 3 months
Link arm assembly		Apply grease every 3 months
Cleat linkage mount		Apply grease every 3 months

8.8.13 Side Passenger Door, Deck 4 forward Port side

Grease: Multi purpose grease

Description		Greasing intervals
Main cyl. mount & Hinge assembly		Apply grease every 3 months
Link arm assembly		Apply grease every 3 months
Cleat linkage mount		Apply grease every 3 months

8.8.14 Side Car Ramp - Deck 4, Port-side (Installed 2015)

Grease: Multi purpose grease

Description		Greasing intervals
Main cyl. mount & Hinge assembly		Apply grease every 3 months
Link arm assembly		Apply grease every 3 months
Cleat linkage mount		Apply grease every 3 months

8.8.15 Hatch Cover for lift platform D3, (Installed in 2012)

Grease: Multi purpose grease

Description		Greasing intervals
Main cyl. mount & Hinge assembly		Apply grease every 3 months
Link arm assembly		Apply grease every 3 months
Cleat linkage mount		Apply grease every 3 months

8.8.16 Shore connection door D3, aft Port-side (Installed in 2021)

Grease: Multi purpose grease

Description		Greasing intervals
Main cyl. mount & Hinge assembly		Apply grease every 3 months
Link arm assembly		Apply grease every 3 months
Cleat linkage mount		Apply grease every 3 months

9 INSPECTION OF HULL CLOSURES

9.1 GENERAL

The entire ramps and doors (Bow doors, Bulkhead door, Fixed ramp ever, Stern ramps, Stern passenger ramp, Side passenger door, Pilot and Bunker door) including the steel structures, the driving cylinders, the securing-, locking-, latching- and cleating devices, the supporting devices, the rubber gasket, the hydraulic system (pump unit, pipes, hoses, valves, couplings), the electrical system (control panel, indication panels, lamps, alarms, limit switches, cabling, connections) etc. have to

be thoroughly checked, tested and maintained at certain intervals as described in the following and in full compliance with the Rules ' regulations.

The Bow ramp is in this case no watertight hull closure and in so far not included in the following description of the Inspection procedures.

9.2 INSPECTION REPORTS

Inspection reports have to be prepared by the attending ship 's staff

- At regular intervals as specified in the following
- After a damage
- Following incidents that could result in damages using the 'Record sheet of Inspection and maintenance' ace. to chapter 10.3.

The inspection interval schedules are specified for each single item and must be strictly followed.

Each inspection has to be documented by the attending crew and each report has to be confirmed with date and signature of the officer in charge, responsible for the

inspection procedures.

9.3 INSPECTION OF BOW DOOR

9.3.1 INTERVALS OF VISUAL AND AUDIBLE INSPECTIONS I FUNCTION TESTS

- function test of all pushbutton illumination lights, indication lights and control lamps of the control station (pushbutton LAMP TEST)

the bulb should be checked before other causes are investigated (for example testing of the limit switches)

- audible check concerning abnormal noises during bow door operations.
- check of visible and audible alarm devices
- hydraulic pump unit condition (working pressure, oil level)
- inspection of bridge indication control: Function of signal lamps and warning system on the bridge.

A report has to prepared only if one of the a.m. checks is negative.

After two (2) weeks:

- visual inspection of the bow door movements during the opening and closing procedures. Movements must be smooth without any interferences, i.e. the door wings must not tilt in any direction (clearances of hinges may have succeeded the permissible values). The bow door movements to be attentively observed from the pier as appropriate.
- visual inspection of rubber sealing tightness. If the doors are fully closed and locked, no light from outside must be visible.

After three (3) months

- visual inspection concerning cracks and I or other damages of:
 - main bearings incl. adjacent steel structures
 - thrust bearings incl. adjacent steel structures
 - bearings of drive cylinders incl. adjacent steel structures
 - cleating devices incl. adjacent steel structures
 - latching devices incl. adjacent steel structures
- visual inspection concerning tightness of:
 - packings and connections of ill! drive-, cleating and latching cylinders
 - hydraulic pipes, hoses and couplings
- visual inspection of general condition of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - electric cabling incl. plugs and sockets, fastening devices etc.
 - rubber sealing profile (grade of remaining impression after four (4) hours in released condition)
 - rubber sealing compression bars
 - lubricating points ace. to chapter 'Lubricating Instructions'
- function test of:
 - limit switches (switching distances)
 - solenoid valves
 - hydr. pump unit low level alarms and shutdown

After twelve (12) months (Annual Class Inspection):

- visual inspection on cracks, deformations and corrosion of following bow door steel structure members.
- primary structures (longitudinal & transverse girders and frames)
- secondary stiffeners
- check of the max. permissible clearances of:
 - main bearings
 - thrust bearings
 - bearings of drive cylinders
 - cleating- and latching devices
- test of the hydraulic oil on ageing and contamination
- visual inspection of rubber sealing profiles on rents, folds, blisters and holes, hose test in closed condition.

9.3.2 MAX. PERMISSIBLE CLEARANCES

9.3.2.1 Hinges and Bearings of Bow Door

In general, the maximum clearances of the:

- main bearings
- bearings of the drive cylinders

must not exceed the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected hinge or bearing has to be dismantled and both the actual bolt diameter as well as the bore diameter have to be measured.

- If the original bolt diameter is decreased by 2 mm, the bolt must be replaced.
- If the original bore diameter of one or more of the bearing eye plates is increased more than 2mm, the respective eye plate(s) must be replaced.

In any case, after a thorough inspection the repair or replacement of one or more affected components must be agreed upon with the local surveyor of the Classification Society.

9.3.2.2 Hinges and bearings of Bow Door Cleating- and Latching Devices

In general, the maximum clearances of the cleating- and latching devices must not exceed the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected device must be dismantled and both the actual bolt diameter as well as the bore diameter has to be measured.

- If the original bolt diameter is decreased by 2 mm, the bolt must be replaced.
- If the original bore diameter of the rectangular steel tube profile is increased more than 2mm, the respective profile must be replaced.

9.4 INSPECTION OF BULKHEAD DOOR

9.4.1 INTERVALS OF VISUAL AND AUDIBLE INSPECTIONS I FUNCTION TESTS

- function test of all pushbutton illumination lights, indication lights and control lamps of the control station (pushbutton LAMP TEST) the bulb should be checked before other causes are investigated (for example testing of the limit switches)
- audible check concerning abnormal noises during bulkhead door operations.
- check of visible and audible alarm devices
- hydraulic pump unit condition (working pressure, oil level)
- inspection of bridge indication control: Function of signal lamps and warning system on the bridge. A report has to prepared only if one of the a.m. checks is negative.

After two (2) weeks

- visual inspection of the stern ramp movements during the opening and closing procedures.
Movements must be smooth without any interferences. The bulkhead door movements to be attentively observed from inside and/or from the pier as appropriate.
- visual inspection of rubber sealing tightness. If the bulkhead door is fully closed and locked, no light from outside must be visible.

After three (3) months

- visual inspection concerning cracks and I or other damages of:
 - main bearings incl. adjacent steel structures
 - thrust bearings incl. adjacent steel structures
 - bearings of drive cylinders incl. adjacent steel structures
 - locking devices incl. adjacent steel structures
 - supporting devices incl. adjacent steel structures
- hydraulic pipes, hoses and couplings

- visual inspection concerning tightness of:
 - packings and connections of all drive- and locking cylinders
 - hydraulic pipes, hoses and couplings

- visual inspection of general condition of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - electric cabling incl. plugs and sockets, fastening devices etc.
 - rubber sealing profile (grade of remaining impression after four (4) hours in released condition)
 - rubber sealing compression bars
 - lubricating points acc. to chapter 'Lubricating Instructions'

- function test of:
 - limit switches (switching distances)
 - solenoid valves
 - hydr. pump unit low level alarms and shutdown

After twelve (12) months (Annual Class Inspection)

- visual inspection on cracks, deformations and corrosion of following bulkhead door steel structure members.
 - primary structures (longitudinal & transverse girders and frames)
 - secondary stiffeners
- check of the max. permissible clearances of:
 - main bearings
 - thrust bearings
 - bearings of drive cylinders
 - locking devices
- test of the hydraulic oil on ageing and contamination
- visual inspection of rubber sealing profiles on rents, folds, blisters and holes, hose test in closed condition.

9.4.2 MAX PERMISSIBLE CLEARANCES

9.4.2.1 Hinges and Bearings of Bulkhead Door

In general, the maximum clearances of the:

- main bearings
- bearings of the drive cylinders

must not exceed the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected hinge or bearing must be dismantled and both the actual bolt diameter as well as the bore diameter have to be measured.

- If the original bolt diameter is decreased by 2 mm, the bolt must be replaced.
- If the original bore diameter of one or more of the bearing eye plates is increased more than 2mm, the respective eye plate(s) must be replaced.

In any case, after a thorough inspection the repair or replacement of one or more affected components must be agreed upon with the local surveyor of the Classification Society.

9.4.2.2 Hinges and bearings of Bulkhead Door Locking Devices

In general, the maximum clearances of the locking devices must not exceed the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected locking device must be dismantled and both the actual wedge diameter as well as the bore diameter must be measured.

The theoretical allowance in the locking device must not exceed 2 mm.

- If the original wedge dim. is decreased by 2 mm, the wedge must be replaced.
- If the original bore dim. is increased more than 2mm, the respective profile must be replaced.

~~9.5 Inspection of Fixed Ramp Cover~~ **DELETED**

9.5.1 Intervals of visual and audible inspections I function tests

- function test of all pushbutton lights, indication lights and control lamps of the control station (push button LAMP TEST)
the bulb should be checked before other causes are investigated (for example testing of the limit switches)
- audible check concerning abnormal noises during fixed ramp cover operations.
- check of visible and audible alarm devices.
- hydraulic pump unit condition (working pressure, oil level)
- inspection of bridge indication control: function of signal lamps and warning system on the bridge

A report must be prepared only if one of the a.m. checks is negative.

After two (2) weeks

- visual inspection of the fixed ramp cover movements during the opening and closing procedures.
movements must be smooth without any interferences.
The fixed ramp cover movements to be attentively observed.
- visual inspection of rubber sealing tightness, if the fixed ramp cover is fully closed and locked, no light from outside must be visible.

After three (3) months

- visual inspection concerning cracks and/or other damaged of:
 - main bearing incl. adjacent steel structures
 - thrust bearing incl. adjacent steel structures
 - bearing of driving cylinders incl. adjacent steel structures
 - locking devices incl. adjacent steel structures
 - supporting devices incl. adjacent steel structures

- visual inspection concerning tightness of:
 - packings and connections of all drive-and locking cylinders.
 - hydraulic pipes, hoses and couplings
- visual inspection of general condition of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - electric cabling incl. plugs and sockets, fastening device etc.
 - rubber sealing profile (grade of remaining impression after four (4) hours in released condition)
 - rubber sealing compression bars
 - lubricating points acc. to chapter 'Lubricating Instructions'
- function test of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - hydraulic pump unit low level alarms and shutdown

After twelve (12) months (Annual Class Inspection)

- visual inspection on cracks, deformations and corrosion of following fixed ramp cover steel structure members.
 - primary structures (longitudinal & transverse girders and frames)
 - secondary stiffeners
- check of the max. permissible clearance of:
 - main bearings
 - trust bearings
 - bearings of drive cylinders
 - locking devices
- test of the hydraulic oil on ageing and contamination
- visual inspection of rubber sealing profiles on rents, folds, blisters, and holes, hose test closed condition.

9.5.2 MAX. PERMISSIBLE CLEARANCES

9.5.2.1 Hinges and Bearings of Fixed Ramp Cover

In general, the maximum clearances of the:

- main bearings
- bearings of the drive cylinders

must not exceed the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected hinge or bearing must be dismantled and both the actual bolt diameter as well as the bore diameter have to be measured.

- If the original bolt diameter is decreased by 2mm. the bolt must be replaced
- If the original bolt diameter of one or more of the bearing eye plates is increased more than 2mm. the respective eye plate(s) must be replaced

In any case, after a thorough inspection the repair or replacement of one or more affected components has to be agreed upon with the local surveyor of the Classification Society.

9.5.2.2 Hinges and Bearings of Fixed Ramp Cover Locking Devices

In general, the maximum clearances of the locking devices must not exceed the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected locking devices must be dismantled and both the actual wedge dimension as well as the bore dimension have to be measured.

The theoretical allowance in the locking device between rectangular steel tube profile $a \times b$ and the locking wedge $c \times d$ amounts

to x mm (as stated in the relevant drawings) and must not exceed $(x + 2)$ mm.

- If the original wedge dim. $c \times d$ is decreased by 2mm. the wedge must be replaced.
- If the original bore dim. $a \times b$ of the rectangular steel tube profile is increased more than 2mm, the respective profile must be replaced

9. 6 Inspection of Stern Ramps PS/SB and Stern Passenger Ramp

9.6.1 Intervals of visual and audible inspections I function tests

- function test of all pushbutton lights,
indication lights and control lamps of the control station (push button LAMP TEST)
the bulb should be checked before other causes are investigated (for example testing of the limit switches)
- audible check concerning abnormal noises during fixed ramp cover operations.
- check of visible and audible alarm devices.
- hydraulic pump unit condition (working pressure, oil level)

- inspection of bridge indication control: function of signal lamps and warning system on the bridge

A report must be prepared only if one of the a.m. checks is negative.

After two (2) weeks

- visual inspection of the stern ramps movements during the opening and closing procedures. movements must be smooth without any interferences.

The stern ramps movements to be attentively observed from inside and/or from the pier as appropriate.

- visual inspection of rubber sealing tightness, if the stern ramps are fully closed and locked, no light from outside must be visible.

After three (3) months

- visual inspection concerning cracks and/or other damaged of:
 - main bearing incl. adjacent steel structures
 - thrust bearing incl. adjacent steel structures
 - bearing of driving cylinders incl. adjacent steel structures
 - locking devices incl. adjacent steel structures
 - supporting devices incl. adjacent steel structures

- visual inspection concerning tightness of:
 - packings and connections of all drive-and locking cylinders.
 - hydraulic pipes, hoses and couplings
- visual inspection of general condition of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - electric cabling incl. plugs and sockets, fastening device etc.
 - rubber sealing profile (grade of remaining impression after four (4) hours in released condition)
 - rubber sealing compression bars
 - lubricating points acc. to chapter 'Lubricating Instructions'
- function test of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - hydraulic pump unit low level alarms and shutdown

After twelve (12) months (Annual Class Inspection)

- visual inspection on cracks, deformations and corrosion of following stern ramps steel structure members.
 - primary structures (longitudinal & transverse girders and frames)
 - secondary stiffeners
- check of the max. permissible clearance of:
 - main bearings
 - trust bearings
 - bearings of drive cylinders
 - locking devices
- test of the hydraulic oil on ageing and contamination
- visual inspection of rubber sealing profiles on rents, folds, blisters, and holes, hose test closed condition.

9.6.2 MAX. PERMISSIBLE CLEARANCES

9.6.2.1 Hinges and Bearings of Stern Ramps and Stern Passenger Ramp

In general, the maximum clearances of the:

- main bearings
- bearings of the drive cylinders

must not exceed the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected hinge or bearing must be dismantled and both the actual bolt diameter as well as the bore diameter have to be measured.

- If the original bolt diameter is decreased by 2mm. the bolt must be replaced
- If the original bolt diameter of one or more of the bearing eye plates is increased more than 2mm. the respective eye plate(s) must be replaced

In any case, after a thorough inspection the repair or replacement of one or more affected components has to be agreed upon with the local surveyor of the Classification Society.

9.6.2.2 Hinges and Bearings of Stern Ramps and Stern Passenger Ramp Locking Devices

In general, the maximum clearances of the locking devices must not exceed the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected locking devices must be dismantled and both the actual wedge dimension as well as the bore dimension must be measured

The theoretical allowance in the locking device between rectangular steel tube profile $a \times b$ and the locking wedge $c \times d$ amounts to x mm (as stated in the relevant drawings) and must not exceed $(x + 2)$ mm.

- If the original wedge dim. $c \times d$ is decreased by 2mm. the wedge must be replaced
- If the original bore dim. $a \times b$ of the rectangular steel tube profile is increased more than 2mm, the respective profile must be replaced

9. 7 Inspection of Pilot/Bunker Doors PS/SB, Side Passenger Doors and Shore Connection

9.7.1 Intervals of visual and audible inspections I function tests

- function test of all pushbutton lights, indication lights and control lamps of the control station (push button LAMP TEST) the bulb should be checked before other causes are investigated (for example testing of the limit switches)
- audible check concerning abnormal noises during fixed ramp cover operations.
- check of visible and audible alarm devices.
- hydraulic pump unit condition (working pressure, oil level)
- inspection of bridge indication control: function of signal lamps and warning system on the bridge

A report has to prepared only if one of the a.m. checks is negative.

After two (2) weeks

- visual inspection of the pilot/bunker doors, side passenger doors and shore connection movement during the opening and closing procedures. movements must be smooth without any interferences. The side door movements to be attentively observed from inside and/or from the pier as appropriate.
- visual inspection of rubber sealing tightness, if the side doors are fully closed and locked, no light from outside must be visible.

After three (3) months

- visual inspection concerning cracks and/or other damaged of:
 - main bearing incl. adjacent steel structures
 - thrust bearing incl. adjacent steel structures
 - bearing of driving cylinders incl. adjacent steel structures
 - locking devices incl. adjacent steel structures
 - supporting devices incl. adjacent steel structures

- visual inspection concerning tightness of:
 - packings and connections of all drive-and locking cylinders.
 - hydraulic pipes, hoses and couplings
- visual inspection of general condition of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - electric cabling incl. plugs and sockets, fastening device etc.
 - rubber sealing profile (grade of remaining impression after four (4) hours in released condition)
 - rubber sealing compression bars
 - lubricating points acc. to chapter 'Lubricating Instructions'
- function test of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - hydraulic pump unit low level alarms and shutdown

After twelve (12) months (Annual Class Inspection)

- visual inspection on cracks, deformations and corrosion of following side doors steel structure members.
 - primary structures (longitudinal & transverse girders and frames)
 - secondary stiffeners
- check of the max. permissible clearance of:
 - main bearings
 - trust bearings
 - bearings of drive cylinders
 - locking devices
- test of the hydraulic oil on ageing and contamination
- visual inspection of rubber sealing profiles on rents, folds, blisters, and holes, hose test closed condition.

9.7.2 MAX. PERMISSIBLE CLEARANCES

9.7.2.1 Hinges and Bearings of Pilot/Bunker Door, Side Passenger Doors and Shore Connection

In general, the maximum clearances of the:

- main bearings
- bearings of the drive cylinders

must be exceeded the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected hinge or bearing has to be dismantled and both the actual bolt diameter as well as the bore diameter have to be measured.

- If the original bolt diameter is decreased by 2mm. the bolt must be replaced
- If the original bolt diameter of one or more of the bearing eye plates is increased more than 2mm. the respective eye plate(s) must be replaced

In any case, after a thorough inspection the repair or replacement of one or more affected components has to be agreed upon with the local surveyor of the Classification Society.

9.7.2.2 Hinges and Bearings of Pilot/Bunker Doors, Side Passenger Doors and Shore Connection Locking Devices

In general, the maximum clearances of the locking devices must be exceeding the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected locking devices must be dismantled and both the actual wedge dimension as well as the bore dimension have to be measured.

- If the original wedge dimension is decreased by 2mm. the wedge must be replaced
- If the original bore dimension is increased more than 2mm, the respective profile must be replaced

9.8 Inspection of Side Car Ramp

9.8.1 Intervals of Visual and audible inspections I function tests

- function test of all pushbutton lights, indication lights and control lamps of the control station (push button LAMP TEST) the bulb should be checked before other causes are investigated (for example testing of the limit switches)
- audible check concerning abnormal noises during fixed ramp cover operations.
- check of visible and audible alarm devices.
- hydraulic pump unit condition (working pressure, oil level)
- inspection of bridge indication control: function of signal lamps and warning system on the bridge

A report has to prepared only if one of the a.m. checks is negative.

After two (2) weeks

- visual inspection of the pilot/bunker doors, side passenger doors and shore connection movement during the opening and closing procedures. movements must be smooth without any interferences. The side door movements to be attentively observed from inside and/or from the pier as appropriate.
- visual inspection of rubber sealing tightness, if the side doors are fully closed and locked, no light from outside must be visible.

After three (3) months

- visual inspection concerning cracks and/or other damaged of:
 - main bearing incl. adjacent steel structures
 - thrust bearing incl. adjacent steel structures
 - bearing of driving cylinders incl. adjacent steel structures
 - locking devices incl. adjacent steel structures
 - supporting devices incl. adjacent steel structures

- visual inspection concerning tightness of:
 - packings and connections of all drive-and locking cylinders.
 - hydraulic pipes, hoses and couplings
- visual inspection of general condition of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - electric cabling incl. plugs and sockets, fastening device etc.
 - rubber sealing profile (grade of remaining impression after four (4) hours in released condition)
 - rubber sealing compression bars
 - lubricating points acc. to chapter 'Lubricating Instructions'
- function test of:
 - limit switches (switching distances)
 - solenoid valves (corrosion)
 - hydraulic pump unit low level alarms and shutdown

After twelve (12) months (Annual Class Inspection)

- visual inspection on cracks, deformations and corrosion of following side doors steel structure members.
 - primary structures (longitudinal & transverse girders and frames)
 - secondary stiffeners
- check of the max. permissible clearance of:
 - main bearings
 - trust bearings
 - bearings of drive cylinders
 - locking devices
- test of the hydraulic oil on ageing and contamination
- visual inspection of rubber sealing profiles on rents, folds, blisters, and holes, hose test closed condition.

9.8.2 MAX. PERMISSABLE CLEARANCES

9.8.2.1 Hinges and Bearings of Side Car Ramp

In general, the maximum clearances of the:

- main bearings
- bearings of the drive cylinders

must be exceed the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected hinge or bearing has to be dismantled and both the actual bolt diameter as well as the bore diameter have to be measured.

- If the original bolt diameter is decreased by 2mm. the bolt must be replaced
- If the original bolt diameter of one or more of the bearing eye plates is increased more than 2mm. the respective eye plate(s) must be replaced

In any case, after a thorough inspection the repair or replacement of one or more affected components has to be agreed upon with the local surveyor of the Classification Society.

9.8.2.2 Hinges and Bearings of Side Car Ramp Locking devices

In general, the maximum clearances of the locking devices must be exceeding the design values as stated in the relevant drawings by more than two (2) mm.

If one of the actual clearance values is exceeded, the affected locking devices must be dismantled and both the actual wedge dimension as well as the bore dimension have to be measured.

- If the original wedge dimension is decreased by 2mm. the wedge must be replaced
- If the original bore dimension is increased more than 2mm, the respective profile must be replaced

9.9 INSPECTION OF RUBBER SEALING (Sliding type PN70/PN96/PN120)

The a.m. rubber sealing is installed in the Bow Door, Bow ramp, Stern ramp and Bulkhead door.

Due to environmental influences (temperature, sea water) the rubber sealing material ages gradually, which results in the decrease of elasticity of the rubber compound, i.e. after a certain time the rubber is not fully released anymore caused by the permanent impression in the closed condition, and the weathertightness is no longer ensured.

Visual inspections and function tests must be carried out on the complete rubber seal at regular intervals.

Visual inspection

The steel flat bar and the rubber surface-contact seal must be visually checked for deformities and damage while the ramp/door is open. In the case of the rubber surface- contact seal, particular attention should be paid to cracks, creases and holes in the rubber which are larger than 1 mm.

If the seal displays no unacceptably large cracks, creases, blisters, holes or damage, this must be recorded in the Inspection Report by entering the remark "No irregularities". Should damage or deformities to the steel flat bar, and/or cracks, creases, blisters or

holes in the rubber seal be found to an extent which could adversely affect the efficiency of the equipment seal, the damaged steel flat bar or rubber seal section must be replaced.

Functional test

Watertightness of the seal must be tested in accordance with classification regulations.

9.10 INSPECTION OF RUBBER SEALING (Sponge type)

The a.m. rubber sealing is installed in the Fixed ramp cover.

Due to environmental influences (temperature, sea water) the rubber sealing material ages gradually, which results in the decrease of elasticity of the rubber compound, i.e. after a certain time the rubber is not fully released anymore caused by the permanent impression of the compression bars in the closed condition, and the weathertightness is no longer ensured.

Therefore, in periodical intervals the permanent impression has to be thoroughly measured. Since due to the impression the rubber profile is concavely bent after a certain time, the real thickness I impression can be determined by a needle test only.

This test must be carried out by stabbing a needle into the rubber at the position of the deepest impression as well as just beside the region of impression. To get a reasonable result, the rubber must be unloaded for at least four (4) hours.

The difference between the lowest and the highest thickness values must not exceed seven (7) mm. Otherwise the affected part of the rubber sealing must be renewed.

The impression checks have to be carried out all around the rubber sealing at distances between the points of not more than one (1) meter

In any case. parts of the rubber sealing which have not been renewed, must be replaced after four (4) years at the latest.

Note: No paint must be applied to the rubber sealing since it glues the surface and accelerates the degree of permanent impression!

9.11 INSPECTION OF PUMP UNITS FORE END/AFT END

Oil Filter of Hydraulic Pump Unit:

The filter element of the hydraulic pump unit cannot be cleaned (throw-away element). It must be replaced at the following intervals:

- after commissioning of the hydraulic equipment,
- all further 2,000 operating hours or once a year,
- if all present contamination indications are RED.

Hydraulic oil:

The hydraulic oil in the tank must be checked once a year by an expert from the oil supplier for ageing and contamination. If necessary, the oil must be replaced.

It is not necessary to drain the oil from the remaining parts of the hydraulic system as this will mix with the new oil in the tank during further operation.

Initially, the hydraulic system was filled up with the following hydraulic oil described in chapter and
Technical data.

If a different oil than the initial filling is used for topping up or when completely replacing the oil, make sure that only an oil with the same viscosity and basis is used.

If you wish to use an oil with a different viscosity to that of the oil used for the initial filling, please obtain the prior advice of MACOR Neptun.

Electric motors (operation and checks):

cleaning

check of cables, cable entries, safety guards, fan covers and anchoring bolts

check bearings for abnormal sounds, vibrations, or too high temperature megger test of the motor

clamp test of all phases if motor is running