Transportstyrelsens författningssamling

TRANSPORT STYRELSEN

Transportstyrelsens föreskrifter om ändring i Sjöfartsverkets föreskrifter (SJÖFS 2002:17) om säkerheten på passagerarfartyg i inrikes trafik;

TSFS 2011:47

Utkom från trycket den 1 juni 2011

SJÖFART

beslutade den 11 maj 2011.

Transportstyrelsen föreskriver[1] med stöd av 2 kap. 1 § fartygssäkerhetsförordningen (2003:348) i fråga om Sjöfartsverkets föreskrifter (SJÖFS 2002:17) om säkerheten på passagerarfartyg i inrikes trafik

dels att regel III/2.1-3 i bilaga 1, bilaga 2, resolution A.229(VII), A.654(16), A.562(14), A.686(17), A.691(17) och cirkulär MSC/Circ.914 i bilaga 3 ska upphävas,

dels att 1, 3, 4, 8, 10 och 11 §§, kap. I, regel II-1/C/9, II-1/D/3.5.2, II-2/A/5.3, II-2/A/6.1.1, II-2/A/6.2, II-2/A/6.4, II-2/A/6.6, II-2/A/10.2.16, II-2/A/12.9.1, II-2/A/12.9.1.4, II-2/A/13.1, II-2/A/14.1.1.2, II-2/A/4.a, II-2/B/6.1.4, II-2/B/9.1.1, II-2/B/14/1.3.4, II-2/B/16/1.3.8, III/1, III/2, III/3.2.4.2, III/3.3, III/5-1, III/5-2, III/5-3, III/5.8, III/7.1.e, III/8.1, III/13.3, III/13.4, tabell II-2/B/4.2 och tabell II-2/B/5.1 i bilaga 1 samt att rubrikerna närmast före regel II-1/C/9, II-2/A/6.6 och II-2/A/15.1 i bilaga 1 ska ha följande lydelse,

dels att det ska införas en ny paragraf, 1 a §, nio nya regler, II-1/C/12.5, II-1/D/2.4, II-1/D/3.1.1, II-1/D/5.10, II-2/A/10.2.5.1, II-2/A/10.2.5.2, II-2/A/10.2.5.3, II-2/A/11.6 och III/3.3 a samt ett nytt kapitel, kap. IV i bilaga 1, fyra nya resolutioner, A.830(19), A.894(21), A.952(23) och MSC.82(70), och nio nya cirkulär, MSC.1/ Circ.808, MSC/Circ.810, MSC/Circ.850, MSC/Circ.895, MSC/Circ.913, MSC/Circ.1046, MSC/-Circ.1165, MSC.1/Circ.1206/Rev.1 och MSC.1/ Circ.1272 i bilaga 3 av följande lydelse.

1 § Dessa föreskrifter ska tillämpas på passagerarfartyg som kölsträcktes eller som befann sig på motsvarande byggnadsstadium den 1 juli 1998 eller senare och övriga passagerarfartyg med en längd av 24 meter och däröver, oberoende av vilken flagga de för när de används på inrikes resor i Sverige.

[1] Jfr Europaparlamentets och rådets direktiv 2009/45/EG av den 6 maj 2009 om säkerhetsbestämmelser och säkerhetsnormer för passagerarfartyg (EUT L 163, 26.6.2009, s. 1, Celex 32009L0045) senast ändrat genom kommissionens direktiv 2010/36/EU av den 1 juni 2010 (EUT L 162, 29.6.2010, s. 1, Celex 32010L0036).

Fartygen ska uppfylla tillämpliga krav enligt bilaga 1 till dessa föreskrifter förutom vad som framgår av 1 a §.

För ro-ro-passagerarfartyg som nyttjas i reguljär tidtabellsbunden inrikes trafik ska i relevanta delar Sjöfartsverkets kungörelse (SJÖFS 1997:2) med föreskrifter om stabilitetskrav för ro-ro-passagerartrafik tillämpas.

Resolutionerna och cirkulären, som nämns i eller hänvisas till i bilaga 1, finns på engelska i bilaga 3. De resolutioner som översatts till svenska[2] finns i bilaga 4.

1 a § I kapitel IV i bilaga 1 till dessa föreskrifter finns undantag från SOLAS kap. IV för fartyg av klass D. Fartyg av klass D som har en VHF med DSC av klass D installerad ombord får fortsättningsvis använda den utrustningen till dess att en ny utrustning installeras. Utrustningen ska dock senast den 29 juni 2016 uppfylla kraven i kapitel IV i bilaga 1.

För nya fartyg av klass C och D finns det möjlighet till undantag från regel II-1/C/9, II-2/A/5.6, II-2/A/6.1.3 och II-2/A/6.6 i bilaga 1, vilket framgår av respektive regel.

3 § Dessa föreskrifter ska inte tillämpas på

– passagerarfartyg som är örlogsfartyg,

– passagerarfartyg som inte drivs mekaniskt,

– passagerarfartyg som är byggda av andra material än stål eller likvärdigt material,

– träfartyg av primitiv konstruktion,

– ursprungliga historiska passagerarfartyg konstruerade före 1965 och kopior av sådana, företrädesvis byggda i de ursprungliga materialen,

– passagerarfartyg som uteslutande används i fartområde E,

– höghastighetspassagerarfartyg som omfattas av Transportstyrelsens föreskrifter och allmänna råd (TSFS 2009:101) om säkerheten på höghastighetsfartyg (HSC-koden 1994), eller

– höghastighetspassagerarfartyg som omfattas av Transportstyrelsens föreskrifter och allmänna råd (TSFS 2009:102) om säkerheten på höghastighetsfartyg (HSC-koden 2000).

4 § I dessa föreskrifter används följande definitioner:

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GMDSS: det globala maritima nödsignal- och säkerhetssystemet till sjöss enligt kapitel IV i 1974 års SOLAS-konvention, i gällande version;

HSC-koden: den internationella koden för höghastighetsfartyg (*International Code of Safety for High-Speed Craft*), i gällande version[3];

[2] Vid en eventuell tvist ska den engelska texten ha företräde.

[3] Införlivad genom Transportstyrelsens föreskrifter och allmänna råd (TSFS 2009:101) om säkerheten på höghastighetsfartyg (HSC-koden 1994) och Transportstyrelsens föreskrifter och allmänna råd (TSFS 2009:102) om säkerheten på höghastighetsfartyg (HSC-koden 2000).

Höghastighetspassagerarfartyg: ett höghastighetsfartyg enligt definitionen i regel X/1 i 1974-års SOLAS-konvention i gällande version, dvs. ett fartyg som kan drivas fram med en högsta fart i meter per sekund lika med eller större än

$$3{,}7 \ \nabla^{0.1667}$$

där:

∇ = deplacement som svarar mot konstruktionsvattenlinjen (kubikmeter) och som medför fler än tolv passagerare.

Ett passagerarfartyg som används på inrikes resor och som tilldelats klass B, C eller D enligt dessa föreskrifter ska inte betraktas som höghastighetspassagerarfartyg när:

– dess konstruktionsvattenlinje motsvarar ett deplacement som är mindre än 500 m^3 och

– dess högsta hastighet är under 20 knop. Med högsta hastighet avses den fart som uppnås vid största kontinuerliga framdrivningseffekt för vilken fartyget vid största driftvikt och i lugnt vatten är certifierat.

8 § För existerande passagerarfartyg gäller följande:

– Ett passagerarfartyg som tilldelats klass A ska uppfylla kraven för existerande passagerarfartyg som fastställts i SOLAS 1974 och i bilaga 1 till dessa föreskrifter. Vid oklarheter angående tolkningen av SOLAS 1974 ska bestämmelserna i bilagan tillämpas.

– Ett passagerarfartyg som tilldelats klass B ska uppfylla kraven i bilaga 1 till dessa föreskrifter.

– Ett passagerarfartyg som tilldelats klass C eller D ska, förutom kraven i dessa föreskrifter, följa Sjöfartsverkets, Transportstyrelsens eller – för utländska fartyg – flaggstatens tillämpliga bestämmelser som ger en säkerhetsnivå som är likvärdig med den i kap. II-1 och II-2 i bilaga 1.

10 § Utrustning som installeras på fartyg och som uppfyller kraven i Transportstyrelsens föreskrifter (TSFS 2009:52) om marin utrustning, ska, om inte annat anges, anses uppfylla bestämmelserna om utrustning i dessa föreskrifter.

11 § Föreskrifter om tillsyn och certifiering av fartyg som omfattas av dessa föreskrifter finns i Transportstyrelsens föreskrifter och allmänna råd (TSFS 2009:2) om tillsyn inom sjöfartsområdet.

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Denna författning träder i kraft den 29 juni 2011.

På Transportstyrelsens vägnar

STAFFAN WIDLERT

Gabor Szemler
(Sjöfartsavdelningen)

Utgivare: Kristina Nilsson, Transportstyrelsen, Norrköping ISSN 2000-1975

Bilaga 1

KAPITEL I * ALLMÄNNA BESTÄMMELSER

1. Där så uttryckligen anges ska reglerna i denna bilaga tillämpas på nya och existerande passagerarfartyg av klass A, B, C och D i inrikes trafik med beaktande av detta direktivs tillämpningsområde enligt artikel 3.

2. Nya fartyg av klass B, C och D med en längd mindre än 24 meter ska uppfylla kraven i reglerna II-1/B/2 t.o.m. II-1/B/8 och II-1/B/10 i denna bilaga om inte administrationen i en flaggstat, vars flagg sådana fartyg är godkända att föra, säkerställer att de uppfyller flaggstatens nationella bestämmelser och att dessa bestämmelser garanterar en likvärdig säkerhetsnivå.

3. När bestämmelserna i denna bilaga inte gäller nya fartyg med en längd mindre än 24 meter ska flaggstatens administration säkerställa en likvärdig säkerhetsnivå genom att kräva att sådana fartyg ska uppfylla flaggstatens nationella bestämmelser.

4. Existerande fartyg av klass C och D behöver inte uppfylla reglerna i kapitel II-1 och II-2 i denna bilaga, under förutsättning att administrationen i en flaggstat, vars flagg de är godkända att föra, säkerställer att de uppfyller flaggstatens nationella bestämmelser och att dessa bestämmelser garanterar en likvärdig säkerhetsnivå.

5. Om det befinns vara praktiskt omöjligt och/eller oskäligt behöver inte heller fartyg av klass B, C och D med en längd mindre än 24 meter uppfylla följande regler i kapitel II-1: Del B regel 10, del C reglerna 4, 9 och 10, del E reglerna 1 till och med 9. Administrationen i flaggstaten ska säkerställa att sådana fartyg har en likvärdig säkerhetsnivå genom att de uppfyller flaggstatens nationella bestämmelser.

6. Oberoende av vad som anges i artikel 6.1 b behöver fartyg av klass D som inte reser utanför fartområde A 1, enligt definitionen i regel IV/2.12 i 1974 års SOLAS-konvention, inte uppfylla transportkraven i kapitel IV i 1974 års SOLAS-konvention, men ska åtminstone uppfylla bestämmelserna i kapitel IV i denna bilaga.

7. Bestämmelserna om sikten på bryggan i regel V/22 i 1974 års SOLAS-konvention ska så långt det är praktiskt möjligt och skäligt gälla även fartyg med en längd mindre än 55 meter enligt definitionen av ”längd” i regel V/2 i 1974 års SOLAS-konvention.

8. Närhelst tillämpning av en IMO-resolution krävs i denna bilaga för existerande fartyg, behöver fartyg byggda upp till två år efter det att en sådan resolution antogs av IMO inte uppfylla kraven i en sådan resolution, förutsatt att de är i överensstämmelse med de eventuella tidigare tillämpliga resolutionerna.

9. Med reparationer, ombyggnader och ändringar i väsentligt avseende avses t.ex. följande:

– Ändringar som innebär en väsentlig förändring av ett fartygs dimensioner.

– Exempel: Fartyget förlängs genom att en ny mittsektion sätts in.

– Ändringar som innebär en väsentlig förändring av fartygets kapacitet att transportera passagerare.

– Exempel: Fordonsdäcket byggs om till passagerarutrymmen.
– Ändringar som innebär en väsentlig förlängning av fartygets livslängd.
– Exempel: Renovering av passagerarutrymmena på ett helt däck.

10. Angivelsen ”(R…)” som följer på flera regeltitlar i denna bilaga hänvisar till de regler i 1974 års SOLAS-konvention som ligger till grund för bestämmelserna i denna bilaga.

1. Kapitel II-1: Del A-1, hänvisningar till SOLAS inklusive 2006 års ändringar.

2. Kapitel II-1: Del A och B, hänvisningar till SOLAS inklusive 96/98 års ändringar.

3. Kapitel II-2: Del A regel 1 och 2, hänvisningar till SOLAS inklusive 1999/2000 års ändringar. Regel 1.3, se del F (alternativa konstruktioner och anordningar) i det reviderade kapitel II-2 (2000 års ändringar) i SOLAS 1974, för nya fartyg som är byggda den 1 januari 2003 eller efter detta datum. Kapitel II-2: Del A regel 3–16 och del B regel 1–18, hänvisningar till SOLAS inklusive 96/98 års ändringar.

4. Kapitel III: Hänvisningar till SOLAS med 96/98 års ändringar och 2001–2003 års ändringar.

11. Bestämmelser tillämpliga på FARTYG AV KLASS A finns i:
– Kapitel II-1/A-1, regel 1.
– Kapitel II-1/B, regel 1, 23 och 24.
– Kapitel II-1/C, regel 1, 3 och 16.
– Kapitel II-2/A, regel 4, 9 och 12.
– Kapitel II-2/B, regel 6.

12. Bestämmelser tillämpliga på RO-RO-PASSAGERARFARTYG AV KLASS A:
Kapitel II-1/B, regel 17–2 och 20.

KAPITEL II-1 * KONSTRUKTION - INDELNING OCH STABILITET, MASKINER OCH ELEKTRISKA INSTALLATIONER

Del C – Maskineri

9. Kommunikation mellan brygga och maskineriutrymme (R 37)

NYA FARTYG AV KLASS B, C OCH D SAMT EXISTERANDE FARTYG AV KLASS B:

Minst två oberoende kommunikationssystem ska finnas för överföring av order från bryggan till den plats i maskineriutrymmet eller kontrollrummet från vilket propellrarnas varvtal och rotationsriktning normalt kontrolleras. Ett av dessa ska vara en maskintelegraf som ger visuell indikering av order och svar både i maskineriutrymmet och på bryggan. Lämpliga kommunikationssystem ska finnas för överföring till varje annan plats från vilken propellrarnas varvtal och rotationsriktning kan kontrolleras.

Nya fartyg av klass C och D behöver inte uppfylla första stycket.

12. Anordningar för manövrering av maskineri (R 31)

FARTYG AV KLASS B, C OCH D MED EN LÄNGD AV MINST 24 METER BYGGDA FRÅN OCH MED DEN 1 JANUARI 2012:

5. På nya fartyg av klass B, C och D byggda från och med den 1 januari 2012 ska automationssystemen konstrueras så att vakthavande fartygsbefäl på bryggan får en varning om ett nära förestående avstannande eller stopp i framdrivningssystemet i tid, för att kunna bedöma navigeringsförhållandena vid ett nödläge. Systemen ska särskilt kontrollera, övervaka, rapportera, varna och vidta säkerhetsåtgärder för att sakta ned eller stoppa framdrivningen samtidigt som vakthavande befäl på bryggan får en möjlighet att ingripa manuellt, förutom då ett manuellt ingripande medför att motorn och/eller framdrivningsutrustningen upphör att fungera inom en kort tid, till exempel vid överhastighet.

Del D - Elektriska anläggningar

2. Elektrisk huvudkraftkälla och belysning (R 41)

FARTYG AV KLASS B, C OCH D, BYGGDA FRÅN OCH MED DEN 1 JANUARI 2012

4. I nya fartyg av klass B, C och D, byggda från och med den 1 januari 2012, ska extra belysning finnas i alla hytter för att tydligt markera utgången så att passagerarna hittar till dörren. En sådan belysning, som kan anslutas till en nödkraftkälla eller ha en självständig elektrisk nödkraftkälla i varje hytt, ska automatiskt

tändas när strömförsörjningen till den normala hyttbelysningen försvinner och lysa i minst 30 minuter.

3. Elektrisk nödkraftkälla (R 42)

1.

1. Kravet i punkt 1 ska inte gälla om fartygen har konstruerats med två redundanta maskinrum, åtskiljda med minst en vattentät och brandsäker avdelning och två skott eller en alternativ konstruktion som ger samma säkerhetsnivå, och att det finns minst en generator med tillhörande instrumenttavla i varje maskineriutrymme.

5.

2. i synnerhet samtidigt kunna försörja de förbrukare som identifieras för följande funktioner och som krävs för respektive fartygsklass under de ovan angivna tidsperioderna:

a) en oberoende motorlänspump och en av brandpumparna.

b) nödbelysning

1. vid varje samlings- eller embarkeringsstation och på fartygssidorna enligt regel III/5.3,

2. i alla gångar, trappor och utgångar som leder till samlings- eller embarkeringsstationer,

3. i maskineriutrymmen och på den plats där nödgeneratorn finns,

4. vid de kontrollstationer där radio- och huvudutrustning för navigering finns,

5. enligt kraven i reglerna II-2/B/16.1.3.7 och II-2/B/6.1.7,

6. på alla platser där brandmansutrustningar förvaras,

7. vid en oberoende nödlänspump och en av brandpumparna enligt punkt a och vid platsen för start av deras motorer.

c) fartygets navigationsljus.

d) 1. All kommunikationsutrustning,

2. huvudlarmsystemet,

3. anläggningen för upptäckande av brand,

4. alla signalsystem som kan behövas i en nödsituation, om de drivs elektriskt från fartygets huvudgeneratoranläggning.

e) fartygets sprinklerpump, om sådan finns och drivs elektriskt, och SV 29.6.2010 Europeiska unionens officiella tidning L 162/41.

f) fartygets dagsignallampa om den drivs från fartygets elektriska huvudkraftkälla.

5. Skyddsåtgärder mot elektrisk stöt, brand och andra risker av elektriskt ursprung (R 45)

NYA FARTYG AV KLASS B, C OCH D, BYGGDA FRÅN OCH MED DEN 1 JANUARI 2012:

10. Ingen elektrisk utrustning ska installeras i något utrymme där flambara blandningar kan tänkas samlas, t.ex. avdelningar som främst är avsedda för ackumulatorbatterier, förvaringsskåp för

målarfärg, acetylenförråd eller liknande utrymmen, såvida inte Transportstyrelsen finner att sådan utrustning är

1. nödvändig för driftsändamål,

2. av en typ som inte antänder den berörda blandningen,

3. lämplig för det berörda utrymmet, och

4. korrekt certifierade för säker användning i de damm, ångor eller gaser som kan förmodas finnas i utrymmet.

KAPITEL II-2 * BRANDSKYDD, UPPTÄCKANDE AV BRAND OCH BRANDSLÄCKNING

Del A - Allmänt

5. Bärbara brandsläckare (R 6)

3. Reservladdningar ska medföras för 50 procent av det totala antalet av varje typ av brandsläckare ombord. En annan brandsläckare av samma typ betraktas som reservladdning till en brandsläckare som inte lätt kan laddas om ombord.

Nya fartyg av klass C och D behöver inte uppfylla första stycket.

6. Brandsläckningsanordningar i maskineriutrymmen (R 7)

1. Någon av följande fasta brandsläckningsanläggningar:

1. En anläggning för släckning med gas som uppfyller de relevanta bestämmelserna i punkt 1 och 2 i regel II-2/A/4 eller ett motsvarande vattenbaserat system som uppfyller bestämmelserna i MSC/Circ. 1165[4] med beaktande av fartygets byggnadsdatum.

2. Minst en bärbar utrustning för luftskum bestående av ett munstycke för luftskum av induktortyp, som kan anslutas till huvudbrandledningen genom en brandslang, tillsammans med en bärbar behållare som innehåller minst 20 l skumproducerande vätska och en reservbehållare. Munstycket ska kunna avge effektivt skum lämpligt för släckning av en oljebrand med en hastighet av minst 1,5 m3 per minut.

Nya fartyg av klass C och D behöver inte uppfylla första stycket.

4. En av de fasta brandsläckningsanläggningar som föreskrivs i punkt 1 ovan, och därutöver ska det finnas, i alla utrymmen som innehåller förbränningsmotorer eller settlingtankar för brännoljor eller brännoljeenheter, en skumsläckare med minst 45 liters kapacitet eller likvärdiga brandsläckare till ett sådant antal att skum eller likvärdigt släckmedel kan riktas mot varje del av bränn- och smörjoljetrycksystemen, växlar och andra brandfarliga anordningar.

[4] MSC/Circ.1165. Revised guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms.

Cirkuläret har ändrats genom MSC/Circ.1237, Amendments to the revised guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms, och MSC/Circ.1269, Amendments to the revised guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms.

NYA FARTYG AV KLASS B, C OCH D SAMT EXISTERANDE FARTYG AV KLASS B MED EN LÄNGD AV MINST 24 METER:

6. Varje maskineriutrymme ska vara utrustat med två lämpliga vattendimspridare som kan bestå av ett L-format rör av metall vars långa ben, med en längd av cirka 2 m, kan kopplas till en brandslang och vars korta ben, med en längd av cirka 250 mm, har ett fast dimspridarmunstycke eller kan förses med ett vattenspridningsmunstycke.

Nya fartyg av klass C och D behöver inte uppfylla första stycket.

10. Anordningar för brännolja, smörjolja och andra flambara oljor (R 15)

2.

5.

1. I fartyg byggda från och med den 1 januari 2003 ska kontrollerna för fjärrmanövreringen av ventilen till nödgeneratorns bränsletank finnas på en annan plats än den där kontrollerna finns för fjärrmanövrering av andra ventiler i maskineriutrymmena.

2. I fartyg byggda från och med den 1 januari 2012 med en bruttodräktighet under 500 ska oljetankar ovanför dubbelbottnen ha en kran eller en ventil.

3. I fartyg byggda före den 1 januari 2012 med en bruttodräktighet under 500 ska kranen eller ventilen som avses i första stycket även finnas i oljetankar med en kapacitet på mindre än 500 liter som är belägna ovanför dubbelbottnen. Kranen eller ventilen ska senast finnas på plats vid den första periodiska besiktningen den 1 januari 2012 eller efter detta datum.

16. Existerande fartyg av klass B ska uppfylla bestämmelserna i punkt 2.9–2.11. En lämplig inneslutning av motorer med en effekt av högst 375 kW, med bränsleinsprutningspumpar som betjänar mer än en injektor, får användas som ett alternativ till ett mantelskyddat rörsystem enligt punkt 2.9.

11. Brandmansutrustning (R 17)

6. När Transportstyrelsen finner att transportbestämmelserna i denna regel är oskäliga och/eller tekniskt olämpliga ombord på ett fartyg kan sådana fartyg undantas från en eller flera av bestämmelserna i denna regel, i enlighet med bestämmelserna i artikel 9.3 i det här direktivet.

12. Diverse bestämmelser (R 18)

9.

1. Förvaringsskåp för målarfärg ska skyddas av ett av följande system:

1.1. En koldioxidanläggning som konstruerats för att ge en minimivolym av fri gas som är lika med 40 procent av bruttovolymen av det skyddade utrymmet.

1.2. En pulveranläggning som är konstruerad för minst 0,5 kg pulver/m3 .

1.3. En anläggning för vattenspridning eller en sprinkleranläggning, konstruerad för 5 liter vatten/m2 och minut; den förstnämnda får anslutas till fartygets huvudbrandledning. Eller

1.4. En anläggning som ger samma skydd, vilket fastställs av Transportstyrelsen. Anläggningen ska under alla förhållanden kunna manövreras från en plats utanför det skyddade utrymmet.

13. Brandkontrollplaner (R 20)

1. I alla fartyg ska det finnas permanent uppsatta generalarrangemangsritningar till ledning för fartygsbefälet som tydligt visar

1) kontrollstationerna för varje däck,
2) de olika brandsektioner som är inneslutna av indelningar av klass A och klass B,
3) uppgifter om anläggningarna för upptäckande av brand och brandlarm,
4) sprinkleranläggningen,
5) brandsläckningsredskapen,
6) tillträdesvägar till olika avdelningar, däck m.m., samt
7) ventilationsanläggningen innefattande uppgifter om
   a) manöverplatser för fläktarna, och
   b) placeringen av spjäll och identifieringsbeteckningar för de ventilationsfläktar som betjänar varje sektion.

Alternativt kan nämnda uppgifter lämnas i en manual av vilken ett exemplar ska tillhandahållas var och en av fartygets befäl och ett exemplar alltid vara tillgängligt ombord på en åtkomlig plats. Ritningar och manualer ska hållas aktuella, och alla ändringar ska föras in i dessa så snart som det är praktiskt möjligt. Beskrivningen i sådana ritningar och manualer ska vara på flaggstatens officiella språk. Om språket är varken engelska eller franska, ska en översättning till ett av dessa språk inkluderas. I det fall fartyget går i inrikes trafik i en annan medlemsstat, ska en översättning till den värdstatens officiella språk, om detta språk varken är engelska eller franska, inkluderas.

För nya fartyg av klass B, C och D som är byggda från och med den 1 januari 2003 ska den information som ska finnas i de föreskrivna brandkontrollplanerna och manualerna, samt de

grafiska symboler som ska användas i brandkontrollplanerna, vara i enlighet med resolution A.756 (18)[5] och A.952 (23)[6].

14. Operativ beredskap och underhåll

1.

1.2.

Underhåll, provning och inspektioner ska utföras på grundval av riktlinjerna i MSC/Circ.850[7] och på ett sätt som vederbörligen garanterar brandbekämpningssystemens och brandsläckningsredskapens tillförlitlighet. En underhållsplan ska förvaras ombord på fartyget och finnas tillgänglig för inspektion, närhelst Transportstyrelsen så kräver.

Underhållsplanen ska omfatta åtminstone följande brandskyddssystem, brandbekämpningssystem och brandsläckningsredskap där sådana finns installerade:

1. Huvudbrandledningar, brandpumpar och brandposter, inbegripet brandslangar och munstycken.

2. Fasta anläggningar för upptäckande av brand och brandlarm.

3. Fasta brandsläckningsanläggningar och andra brandsläckningsredskap.

4. Automatiska anläggningar för sprinkler, upptäckande av brand och brandlarm.

5. Ventilationsanläggningar, inbegripet brandspjäll, fläktar och deras manöverdon.

6. Nödavstängning av bränsletillförsel.

7. Branddörrar och deras manöverdon.

8. Allmänna nödlarmsystem.

9. Flyktmasker.

10. Bärbara brandsläckare, inbegripet reservladdningar; och

11. Brandmansutrustningar.

Underhållsprogrammet får vara datorbaserat.

15. Instruktioner, utbildning ombord och övningar

NYA FARTYG AV KLASS B, C OCH D SAMT EXISTERANDE FARTYG AV KLASS B:

1.

1. Besättningsmedlemmarna ska erhålla instruktioner om brandsäkerheten ombord på fartyget.

2. Besättningsmedlemmarna ska erhålla instruktioner om de uppgifter de tilldelats.

[5] A.756(18) Guidelines on the information to be provided with fire control plans and booklets required by SOLAS regulations II-2/20 and 41-2.

[6] A.952(23) Graphical symbols for shipboard fire control plans.

[7] MSC/Circ.850 Guidelines for the maintenance and inspection of fire-protection systems and appliances.

3. Ansvariga för brandsläckning ska utses. Dessa personer ska kunna fullgöra sina uppgifter under hela den tid då fartyget är i drift.

Del B – Brandsäkerhetsåtgärder

4. Brandintegritet hos skott och däck i nya fartyg som medför fler än 36 passagerare (R 26)

Anmärkningar till tabellerna 4.1 och 4.2

a) Där angränsande utrymmen tillhör samma sifferkategori och beteckningen [a] förekommer krävs inget skott eller däck mellan sådana utrymmen, om Transportstyrelsen anser det onödigt. Exempelvis behöver inte ett skott krävas mellan ett kök och till detta anslutna pentryn i kategori 12, under förutsättning att pentryts skott och däck har samma brandintegritet som kökets avgränsningar. Ett skott erfordras dock mellan ett kök och ett maskineriutrymme, även om båda utrymmena tillhör kategori 12.

b) För fartygssidan, till vattenlinjen vid minsta djupgående till sjöss, samt överbyggnadens och däckshusens sidor under och intill livflottar och utrymningsrutschbanor får normen minskas till A-30.

c) Där en allmän toalett är installerad helt inom ett trapphus får skottet i toalettrummet vara av klass ”B”.

d) Där utrymmen av kategori 6, 7, 8 och 9 är belägna helt och hållet inom samlingsstationens yttre omkrets får skotten till dessa utrymmen tillåtas vara av klass ”B-0”. Kontrollpaneler för ljud-, video- och ljusinstallationer får anses utgöra en del av samlingsstationen.

Tabell 4.2
Däck som varken bildar steg i vertikala huvudzoner eller avgränsar horisontella zoner

Utrymmen	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**
Kontrollstationer (1)	A-30	A-30	A-15	A-0	A-0	A-0	A-15	A-30	A-0	A-0	A-0	A-60	A-0	A-60
Trappor (2)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-30	A-0	A-30
Korridorer (3)	A-15	A-0	A-0[a]	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-30	A-0	A-30
Evakueringsstationer och yttre evakueringsvägar (4)	A-0	A-0	A-0	A-0	–	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Öppna däcksutrymmen (5)	A-0	A-0	A-0	A-0	–	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Bostadsutrymmen med liten brandrisk (6)	A-60	A-15	A-0	A-60	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Bostadsutrymmen med måttlig brandrisk (7)	A-60	A-15	A-15	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-0	A-0	A-0
Bostadsutrymmen med större brandrisk (8)	A-60	A-15	A-15	A-60	A-0	A-15	A-15	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Sanitära och liknande utrymmen (9)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	
Tankar, tomrum och utrymmen för hjälpmaskineri med liten eller ingen brandrisk (10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0[a]	A-0	A-0	A-0	A-0
Utrymmen för hjälpmaskineri, lastutrymmen, lastoljetankar och andra oljetankar samt andra liknande utrymmen med måttlig brandrisk (11)	A-60	A-60	A-60	A-60	A-0	A-0	A-15	A-30	A-0	A-0	A-0[a]	A-0	A-0	A-30
Maskineriutrymmen och centralkök (12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-30	A-30[a]	A-0	A-60
Förrådsrum, verkstäder, pentryn m.m. (13)	A-60	A-30	A-15	A-60	A-0	A-15	A-30	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Andra utrymmen där flambara vätskor förvaras (14)	A-60	A-60	A-60	A-60	A-0	A-30	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0

Anmärkningar till båda tabellerna 5.1 och 5.2:

a) Förtydligande av vad som gäller, se reglerna 3 och 7.

b) Där utrymmen tillhör samma sifferkategori och beteckningen [b] förekommer, krävs ett skott eller däck av den klass som anges endast när de angränsande utrymmena är avsedda för olika ändamål, t.ex. i kategori 9. Ett kök intill ett kök kräver inget skott, men ett kök intill ett färgrum kräver ett ”A-0”-skott.

c) Skott som skiljer styrhytten och navigationshytten från varandra får vara av ”B-0”-klass.

d) Se punkt 2.3 och 2.4 i denna regel.

e) Vid tillämpning av regel 2.1.2 ska ”B-0” och ”C” när de förekommer i tabell 5.1 läsas som ”A-0”.

f) Brandisolering behöver inte anordnas om maskineriutrymmet av kategori 7 har liten eller ingen brandrisk.

***)** Där en asterisk förekommer i tabellerna ska avgränsningen vara av stål eller annat likvärdigt material men behöver inte vara av norm ”A”. Vid tillämpning av regel 2.1.2 ska en asterisk, där den förekommer i tabell 5.2, med undantag av kategorierna 8 och 10, läsas som ”A-0”.

I fartyg som är byggda från och med den 1 januari 2003, där genomföringar anordnas i ett däck, utom i ett utrymme av kategori 10, för dragning av elektriska kablar, rör och ventilationstrummor ska en sådan genomföring göras tät för att hindra att rök och lågor tränger igenom. Indelningar mellan kontrollstationer (nödgeneratorer) och öppna däck får ha öppningar till luftintag som inte går att stänga, utom om de är försedda med en fast brandsläckningsanläggning med gas som släckmedel.

Vid tillämpning av regel 2.1.2 ska en asterisk, när den förekommer i tabell 5.2, med undantag av kategorierna 8 och 10, läsas som ”A-0”.

Tabell 5.1
Brandintegritet hos skott som avskiljer angränsande utrymmen

Utrymmen	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Kontrollstationer (1)	A-0[c]	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*	A-60
Korridorer (2)		C[c]	B-0[a]	A-0[a] B-0[c]	B-0[c]	A-60	A-0	A-0	A-15 A-0[d]	*	A-15
Bostadsutrymmen (3)			C[c]	A-0[a] B-0[c]	B-0[c]	A-60	A-0	A-0	A-15 A-0[d]	*	A-30 A-0[d]
Trappor (4)				A-0[a] B-0[c]	A-0[a] B-0[c]	A-60	A-0	A-0	A-15 A-0[d]	* *	A-15
Arbetsutrymmen (5) (låg risk)					C[c]	A-60	A-0	A-0	A-0	*	A-0
Maskinrum av kategori A (6)						*	A-0	A-0	A-60	*	A-60
Andra maskineri-utrymmen (7)							A-0[b]	A-0	A-0	*	A-0
Lastutrymmen (8)								*	A-0	*	A-0

Arbetsutrymmen (9) (hög risk)									A-0[b]	*	A-30
Öppna däck (10)											A-0
Utrymmen av särskild (11) kategori											A-0

6. Utrymningsvägar (R 28)

1.

4. I existerande fartyg av klass B får en korridor eller en del av en korridor från vilken det finns endast en utrymningsväg inte vara längre än:

1. Fem meter för fartyg byggda den 1 oktober 1994 eller senare.

2. Tretton meter för fartyg byggda före den 1 oktober 1994 som medför fler än 36 passagerare.

3. Sju meter för fartyg byggda före den 1 oktober 1994 som medför högst 36 passagerare.

I nya fartyg av klass A, B, C och D med en längd av minst 24 meter får det inte finnas någon korridor, tambur eller del av korridor som endast har en utrymningsväg.

Återvändskorridorer som används i arbetsområden som är nödvändiga för fartygets drift, t.ex. brännoljestationer och tvärgående försörjningskorridorer, får tillåtas under förutsättning att de är åtskilda från besättningens bostadsutrymmen och är oåtkomliga från passagerarnas bostadsutrymmen. En del av en korridor som har ett djup som inte överstiger dess bredd ska anses vara en recess eller lokal utvidgning, vilket är tillåtet.

9. Ventilationsanläggningar (R 32)

1.

1. Ventilationsanläggningen ska också uppfylla föreskrifterna i punkt 2.2–2.6, 2.8 och 2.9 i denna regel, utöver vad som föreskrivs i punkt 1 regel II/32 i SOLAS 1974 i dess ändrade lydelse av den 17 mars 1998,.

14. Skydd av utrymmen av särskild kategori (R 37)

1.

3.

4. Ett tillräckligt antal dräneringsventiler.

Transportstyrelsen kan tillåta användning av annan fast brandsläckningsanläggning som vid prov i full skala, under förhållanden vid vilka man simulerar en brand i flytande bensin inom ett utrymme av särskild kategori, har visat sig vara minst lika effektiv vid bekämpning av bränder som kan tänkas uppstå i ett sådant utrymme. En sådan fast tryckanläggning för vattenspridning eller annan likvärdig

brandsläckningsanläggning ska uppfylla föreskrifterna i resolution A.123(V)[8] och beakta MSC/Circ.1272[9].

16. Förbättrande åtgärder i existerande fartyg av klass B som medför fler än 36 passagerare (R 41-1)

1.

3.8. Ett allmänt nödlarmsystem ska finnas ombord på fartyget. Larmet ska kunna höras i alla bostadsutrymmen och i de arbetsutrymmen där besättningen normalt uppehåller sig, samt på öppna däck. Nödlarmsystemets ljudnivå ska uppfylla normerna i koden för alarm och indikatorer, antagen av IMO genom resolution A.830 (19)[10].

[8] A.123 (V) Recommendation on fixed fire extinguishing systems for special category spaces.

[9] MSC/Circ.1272 Guidelines for the approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces equivalent to that referred to in resolution A.123(V).

[10] A.830(19) Code on Alarms and Indicators, 1995.

KAPITEL III * LIVRÄDDNINGSREDSKAP

1. Definitioner (R3)

NYA OCH EXISTERANDE FARTYG AV KLASS B, C OCH D:

Vid tillämpning av detta kapitel ska, om inte annat uttryckligen anges, definitionerna i regel III/3 i SOLAS 1974 med ändringar gälla, samt även följande definitioner.

AIS	Automatic Identification System
AIS-SART	liv- och sjöräddningsutrustning för lokalisering som opererar på frekvenser avsedda för AIS (AIS search and rescue transmitter)
LSA-koden	Den internationella koden för livräddningsutrustning (*International Life-Saving Appliances Code*) antagen av den internationella sjösäkerhetsorganisationen (IMO) genom resolution MSC.48(66)[11].
SART	liv- och sjöräddningsutrustning för lokalisering som opererar i 9 GHz-bandet (Search and rescue transponder)

2. Kommunikationer, livräddningsfarkoster och beredskapsbåtar samt personliga livräddningsredskap (R 6, 7, 18, 21 och 22)

NYA OCH EXISTERANDE FARTYG AV KLASS B, C OCH D:

1. Varje fartyg ska medföra åtminstone den radioutrustning för livräddning, samt liv- och sjöräddningsutrustning för lokalisering, personliga livräddningsredskap, livräddningsfarkoster, beredskapsbåtar, nödsignalljus och linkastare som anges i följande tabell och tillhörande anmärkningar enligt fartygets klass.

2. All utrustning som angivits ovan, inklusive sjösättningsredskap i förekommande fall, ska uppfylla reglerna i kapitel III i bilagan till 1974 års SOLAS-konvention och LSA-koden, i dess ändrade lydelse, om inte annat uttryckligen anges i de punkter

[11] Resolution MSC.48(66), International Life-Saving Appliances Code (LSA Code).

som följer. Om inte annat uttryckligen föreskrivs ska existerande utrustning minst uppfylla de krav som gällde då utrustningen installerades.

3. Dessutom ska det på varje livbåt på varje fartyg finnas minst tre räddningsdräkter, och utöver detta termiska skydd för personer som ska rymmas i livbåtar och som inte har räddningsdräkter. Dessa räddningsdräkter och termiska skydd behöver inte finnas

1. för personer som ryms i överbyggda livbåtar, eller

2. om fartyget endast används i varma klimat där Transportstyrelsen anser att termiska skydd inte är nödvändigt, med hänsyn till rekommendationer i MSC/Circ.1046[12].

4. Bestämmelserna i punkt 3.1 gäller även delvis eller helt överbyggda livbåtar trots att de inte uppfyller kraven i avsnitt 4.5 eller 4.6 i LSA-koden, förutsatt att dessa livbåtar finns på fartyg byggda före den 1 juli 1986.

5. En räddningsdräkt som uppfyller kraven i avsnitt 2.3 i LSA-koden eller en överlevnadsdräkt som uppfyller kraven i avsnitt 2.4 i LSA-koden och som har en lämplig storlek, ska finnas för varje person som är utsedd att bemanna beredskapsbåtar eller ingår i gruppen ansvarig för det marina evakueringssystemet. Om fartyget endast används i varma klimat där Transportstyrelsen anser att termiska skydd inte är nödvändigt, behöver denna skyddsklädsel inte finnas, med hänsyn till rekommendationer i MSC/Circ.1046[13].

6. Fartyg som inte medför någon livbåt eller beredskapsbåt ska vara utrustade med minst en räddningsdräkt för räddningsändamål. Om fartyget emellertid endast används i varma klimat där Transportstyrelsen anser att termiska skydd inte är nödvändigt, behöver denna skyddsklädsel inte finnas, med hänsyn till rekommendationer i MSC/Circ.1046[14].

[12] MSC/Circ.1046, Guidelines for the assessment of thermal protection.

[13] Se not 11.

[14] Se not 11.

TABELL

Fartygsklass	**B**		**C**		**D**	
Antal personer (N) Antal passagerare (P)	> 250	≤ 250	> 250	≤ 250	> 250	≤ 250
Livräddningsfarkosternas kapacitet [1, 2, 3, 4]: – existerande fartyg: – nya fartyg:	 1,10 N 1,25 N	 1,10 N 1,25 N	 1,10 N 1,25 N	 1,10 N 1,25 N	 1,10 N 1,25 N	 1,10 N 1,25 N
Beredskapsbåtar [4, 5]	1	1	1	1	1	1
Livbojar [6]	8	8	8	4	8	4
Räddningsvästar [8, 9, 12, 13]	1,05 N	1,05 N	1,05 N	1,05 N	1,05 N	1,05 N
Räddningsvästar för barn [9, 13]	0,10 P	0,10 P	0,10 P	0,10 P	0,10 P	0,10 P
Räddningsvästar för spädbarn [10, 13]	0,025 P	0,025 P	0,025 P	0,025 P	0,025 P	0,025 P
Nödsignalljus [7]	12	12	12	12	6	6
Linkastare	1	1	1	1	-	-
SART/AIS-SART	1	1	1	1	1	1
Tvåvägs VHF-radio-telefonapparater	3	3	3	3	3	2

1) Livräddningsfarkoster kan vara livbåtar eller livflottar eller en kombination av dessa som uppfyller kraven i regel III/2.2. Om det är motiverat med hänsyn till resornas skyddade karaktär och/eller de gynnsamma klimatförhållanden som råder i verksamhetsområdet med hänsyn till rekommendationer i MSC/Circ.1046[15], får Transportstyrelsen godta följande, om värdstaten inte motsätter sig detta:

a) Öppna, vändbara och uppblåsbara livflottar som inte uppfyller kraven i avsnitt 4.2 eller 4.3 i LSA-koden, under förutsättning att sådana livflottar helt uppfyller kraven i bilaga 10 till 1994 års kod för höghastighetsfartyg (TSFS 2009:101), och för fartyg byggda den 1 januari 2012 eller senare, bilaga 11 till 2000 års kod för höghastighetsfartyg (TSFS 2009:102).

b) Livflottar som inte uppfyller kraven i stycke 4.2.2.2.1 och 4.2.2.2.2 i LSA-koden om isolering mot kyla i livflottens golv. Livräddningsfarkoster för existerande fartyg av klass B, C och D ska uppfylla kraven i de relevanta reglerna för existerande fartyg i SOLAS 74 i dess ändrade lydelse av den 17 mars 1998. Ro-ro-passagerarfartyg ska uppfylla kraven i regel III/5-1 i förekommande fall. De livflottar och sjösättningsredskap som krävs enligt tabellen kan ersättas med ett eller flera marina evakueringssystem med motsvarande kapacitet och som uppfyller kraven i avsnitt 6.2 i LSA-koden, inklusive sjösättningsredskap i förekommande fall.

2) Livräddningsfarkosterna ska i möjligaste mån finnas jämnt fördelade på varje sida av fartyget.

3) Livräddningsfarkosternas totala/samlade kapacitet, inklusive ytterligare livflottar, ska uppfylla kraven i tabellen ovan, dvs. 1,10 N = 110 procent och 1,25 N = 125 procent av det sammanlagda antal personer (N) som fartyget är godkänt att medföra. Ett tillräckligt

[15] Se fotnot 11.

antal livräddningsfarkoster ska medföras för att säkerställa att de återstående livräddningsfarkosterna utgör en tillräcklig kapacitet för det antal personer som fartyget är godkänt för, i den händelse en livräddningsfarkost förloras eller blir obrukbar,. Om förvaringskraven för livflottar i regel III/7.5 inte uppfylls kan ytterligare livflottar krävas.

4) Antalet livbåtar och/eller beredskapsbåtar ska vara så stort att varje livbåt eller beredskapsbåt behöver leda högst nio livflottar när fartyget överges av alla personer som det är godkänt för att medföra.

5) Sjösättningsredskap för beredskapsbåtar ska uppfylla kraven i regel III/10. Om en beredskapsbåt uppfyller kraven i avsnitt 4.5 eller 4.6 i LSA-koden får den inräknas i den livräddningsfarkostkapacitet som anges i tabellen ovan. En livbåt kan godkännas som beredskapsbåt förutsatt att även båten och dess sjösättnings- och ombordtagningsanordningar uppfyller kraven för en beredskapsbåt. Minst en av beredskapsbåtarna på ro-ro-passagerarfartyg, om en beredskapsbåt krävs, ska vara en snabbgående beredskapsbåt som uppfyller kraven i regel III/5-1.3. När Transportstyrelsen finner att det är fysiskt omöjligt att installera en beredskapsbåt eller en snabbgående beredskapsbåt ombord på ett fartyg kan detta fartyg undantas från kravet att medföra beredskapsbåt, under förutsättning att fartyget uppfyller alla nedan angivna krav:

a) Fartyget har anordningar som gör det möjligt att rädda en hjälplös person ur vattnet.

b) Räddningen av den hjälplösa personen kan observeras från bryggan.

c) Fartyget har tillräcklig manövreringsförmåga för att gå intill och rädda personer under sämsta tänkbara förhållanden.

6) Minst en livboj på vardera sidan om fartyget ska vara försedd med en flytbar livlina, som är minst dubbelt så lång som avståndet från livbojens förvaringsplats till vattenlinjen när fartyget ligger på sitt minsta djupgående till sjöss, dock ej kortare än 30 meter. Två livbojar ska vara försedda med självaktiverande röksignaler och självtändande ljus och ska snabbt kunna frigöras från bryggan. Resten av livbojarna ska vara försedda med självtändande ljus i enlighet med punkt 2.1.2 i LSA-koden.

7) Nödsignalljus som uppfyller kraven i avsnitt 3.1 i LSA-koden ska förvaras på bryggan eller vid platsen för manövrering.

8) En uppblåsbar räddningsväst ska finnas för varje person som måste utföra arbete på utsatta platser ombord. Sådana uppblåsbara räddningsvästar kan ingå i det totala antalet räddningsvästar som krävs enligt dessa föreskrifter.

9) Ett antal räddningsvästar för barn som motsvarar minst 10 procent av antalet passagerare ska finnas ombord, eller ett större antal om detta krävs för att det ska finnas en räddningsväst för varje barn.

10) Ett antal räddningsvästar för spädbarn som motsvarar minst 2,5 procent av antalet passagerare ska finnas ombord, eller ett större antal om detta krävs för att det ska finnas en räddningsväst för varje spädbarn.

11) Alla fartyg ska medföra ett tillräckligt antal räddningsvästar för vakthavande personal och för användning vid avlägset belägna stationer för livräddningsfarkoster. Räddningsvästar för vakthavande personal ska förvaras på bryggan, i maskinkontrollrummet och på andra bemannade vaktstationer.

Senast vid den första periodiska besiktningen efter den 1 januari 2012 ska alla passagerarfartyg uppfylla kravet i fotnot 12.

12) Om räddningsvästarna för vuxna inte är konstruerade för personer med en vikt upp till 140 kg och bröstomfång på upp till 1 750 mm, ska det finnas tillräckligt med extra utrustning ombord som möter deras behov..

13) I samtliga passagerarfartyg ska varje räddningsväst vara utrustad med ett ljus som uppfyller kraven i punkt 2.2.3 i LSA-koden. Alla ro-ro-passagerarfartyg ska uppfylla kraven i regel III/5-1.5.2.

3. Nödlarm, bruksanvisningar, utbildningsbok, samlingslistor och nödanvisningar (R 6, 8, 9, 19 och 20)

2. *Högtalarsystem (R 6.5)*

2.1. Förutom kraven i regel II-2/B/15.4 och punkt 1 ska alla passagerarfartyg som medför fler än 36 passagerare vara utrustade med ett högtalarsystem.

2.4.2. Högtalarsystemet och dess ljudåtervinningsstandard ska godkännas av Transportstyrelsen i enlighet med rekommendationer i MSC/Circ.808[16]

3. *Samlingslista och nödanvisningar (R 8)*

Varje person ombord ska förses med tydliga instruktioner som ska följas i händelse av en nödsituation i enlighet med SOLAS regel III/8.

Samlingslistor och nödanvisningar som uppfyller kraven i SOLAS regel III/37 ska finnas uppsatta på väl synliga platser i hela fartyget, innefattande bryggan, maskinrummet och besättningens bostadsutrymmen.

Bilder och anvisningar på lämpliga språk ska finnas uppsatta i passagerarhytterna och anslagna på ett iögonfallande sätt vid samlingsstationerna och i andra passagerarutrymmen för att informera passagerarna om

i) deras samlingsstationer,

ii) de väsentliga åtgärder de måste vidta i en nödsituation,

iii) hur de ska ta på sig sina räddningsvästar.

3 a. *Radiokommunikationspersonal*

NYA OCH EXISTERANDE FARTYG AV KLASS B, C OCH D:

1. I enlighet med bestämmelserna i SOLAS regel IV/16 ska varje fartyg medföra personal som är behörig att hantera nödsituationer och radiokommunikation i säkerhetssyfte enligt Transportstyrelsens krav. Personalen ska inneha de certifikat som anges i radioreglementet i förekommande fall, och en person ska utses att ha huvudansvaret för radio-

[16] MSC/Circ.808, Recommendation on performance standards for public address systems on passenger ships, including cabling

kommunikationer i nödsituationer, vilket ska återspeglas i instruktionerna för nödsituationer.

NYA OCH EXISTERANDE FARTYG AV KLASS B OCH C:

2. På fartyg av klass B och C ska minst en person som är behörig i enlighet med punkt 1 utses att endast utföra radiokommunikationsuppgifter vid nödsituationer, vilket ska återspeglas i instruktionerna för nödsituationer.

5. Samlingsstationer och embarkeringssanordningar för livräddningsfarkoster (R 11, 23 och 25)

NYA OCH EXISTERANDE FARTYG AV KLASS B, C OCH D:

8. Minst en embarkeringslejdare som uppfyller kraven i punkt 6.1.6 i LSA-koden ska finnas på vardera sidan av fartyget; Transportstyrelsen kan undanta ett fartyg från detta krav, under förutsättning att fribordet mellan den avsedda embarkeringsplatsen och vattenlinjen inte överstiger 1,5 meter med hänsyn till trim och slagsida för alla lastfall med fartyget i oskadat skick och i föreskrivna skadefall.

5-1. Krav för ro-ro-passagerarfartyg (R 26)

1. *Livflottar*

RO-RO-FARTYG AV KLASS B, C OCH D, BYGGDA FÖRE DEN 1 JANUARI 2003:

1. Livflottar på ro-ro-passagerarfartyg ska betjänas av fartygsevakueringssystem (MES) som uppfyller kraven i SOLAS regel III/48.5, i dess lydelse av den 17 mars 1998, eller sjösättningsredskap som uppfyller kraven i SOLAS regel III/48.6, i dess lydelse av den 17 mars 1998, jämnt fördelade på fartygets båda sidor.

Kommunikation ska kunna ske mellan embarkeringsstationen och plattformen.

När livflottarna byts ut, eller när nämnda fartyg genomgår sådana reparationer, ombyggnader eller väsentliga ändringar som även omfattar utbyte av eller tillägg till fartygens befintliga livräddningsredskap eller livräddningsanordningar, ska ro-ro-passagerarfartygets livflottar förses med

– marina evakueringssystem som uppfyller kraven i avsnitt 6.2 i LSA-koden, eller

– sjösättningsredskap som uppfyller kraven i punkt 6.1.5 i LSA-koden, jämnt fördelade på fartygets båda sidor.

RO-RO-FARTYG AV KLASS B, C OCH D, BYGGDA FRÅN OCH MED DEN 1 JANUARI 2003:

2. Livflottar på ro-ro-passagerarfartyg ska betjänas av marina evakueringssystem (MES) som uppfyller kraven i avsnitt 6.2 i

LSA-koden eller sjösättningsredskap som uppfyller kraven i punkt 6.1.5 i LSA-koden, jämnt fördelade på fartygets båda sidor.

Kommunikation ska kunna ske mellan embarkeringsstationen och plattformen.

ALLA RO-RO-FARTYG AV KLASS B, C OCH D:

3. Varje livflotte på ro-ro-passagerarfartyg ska vara försedd med förvaringsanordningar för fri uppflytning som uppfyller kraven i SOLAS regel III/13.4.

4. Varje livflotte på ro-ro-passagerarfartyg ska vara utrustad med en äntringsramp som uppfyller kraven i antingen punkt 4.2.4.1 eller 4.3.4.1 i LSA-koden.

5. Varje livflotte på ro-ro-passagerarfartyg ska antingen vara automatiskt självrätande eller tältförsedd och vändbar samt vara stabil i hög sjö och fungera säkert, oavsett vilken sida som är vänd uppåt. Öppna vändbara livflottar får godkännas om Transportstyrelsen anser detta lämpligt med hänsyn till resans skyddade karaktär och de gynnsamma klimatförhållanden som råder i verksamhetsområdet och under verksamhetsperioden och under förutsättning att sådana livflottar helt uppfyller kraven i bilaga 10 till 1994 års kod för höghastighetsfartyg.

Alternativt ska fartyget medföra automatiskt självrätande livflottar eller tältförsedda vändbara livflottar, förutom sin normala utrustning av livflottar, vars sammanlagda kapacitet ska kunna rymma minst 50 procent av de personer som inte ryms i livbåtarna.

Denna extra kapacitet av livflottar ska fastställas på grundval av skillnaden mellan det totala antalet personer ombord och det antal personer som ryms i livbåtarna. Varje sådan livflotte ska godkännas av Transportstyrelsen med hänsyn till rekommendationer i MSC/Circ.809[17].

2. *SART och AIS-SART*

ALLA RO-RO-FARTYG AV KLASS B:

1. Senast vid den första periodiska besiktningen efter den 1 januari 2012 ska livflottar som medförs på ro-ro-passagerarfartyg av klass B förses med en SART eller AIS-SART per fyra livflottar. SART eller AIS-SART ska monteras inne i livflotten så att dess antenn är mer än en meter ovanför vattennivån när livflotten används, förutom för tältförsedda vändbara livflottar, där SART eller AIS-SART ska placeras så att den enkelt kan nås och installeras av överlevande. Varje SART eller AIS-SART ska förberedas för att installeras manuellt när livflotten används.

[17] MSC/Circ.809, Recommendation for Canopied reversible liferafts, automatically self-righting liferafts and fast rescue boats.

Containrar med livflottar som försetts med SART eller AIS-SART ska vara tydligt märkta.

3. *Snabbgående beredskapsbåtar*

ALLA RO-RO-FARTYG AV KLASS B, C OCH D

1. Beredskapsbåten, om en sådan båt krävs på ett ro-ro-passagerarfartyg, ska vara en snabbgående beredskapsbåt som uppfyller kraven i LSA-koden 5.1.4 samt rekommendationer i MSC/Circ.809[18].

2. Snabba beredskapsbåtar ska betjänas av en sjösättnings-anordning, som uppfyller kraven i LSA-koden 6.1.7, med hänsyn till att den snabba beredskapsbåten kan komma att sjösättas och tas ombord under svåra väderförhållanden.

3. För varje snabb beredskapsbåt ska minst två besättningar utbildas och tränas regelbundet, dels enligt kraven i resolution A.771(18)[19] i dess ändrade lydelse, och dels enligt kraven för en certifierad person, inklusive alla aspekter på räddning, hand-havande, manövrering och drift av dessa båtar under olika förhållanden och träning i att räta upp den efter kantring.

4. Om den snabbgående beredskapsbåt som krävs enligt punkt 3.1 inte kan installeras i ett existerande ro-ro-passagerar-fartyg på grund av dess arrangemang eller storlek, får den snabbgående beredskapsbåten installeras i stället för en existerande livbåt som är godkänd som beredskapsbåt eller båt för användning i en nödsituation, under förutsättning att alla följande villkor är uppfyllda:

1. Den snabbgående beredskapsbåt som installeras betjänas av ett sjösättningsredskap som uppfyller bestämmelserna i punkt 3.2.

2. Den kapacitet i livräddningsfarkoster som förlorats genom ovannämnda utbyte kompenseras genom installering av liv-flottar som kan medföra minst det antal personer som den ersatta livbåten kunde medföra.

3. Sådana livflottar betjänas av existerande sjösättningsredskap eller marina evakueringssystem.

4. *Räddningshjälpmedel*

ALLA RO-RO-FARTYG AV KLASS B, C OCH D

1. Varje ro-ro-passagerarfartyg ska vara utrustat med effektiva anordningar för att snabbt kunna rädda överlevande ur vattnet

[18] MSC/Circ.809, Recommendation for Canopied reversible liferafts, automatically self-righting liferafts and fast rescue boats.

[19] Resolution A.771(18), Recommendation on training requirements for crews of fast rescue boats samt till STCW-koden, sektion A-VI/2 och tabell A-VI/2-2.

och föra överlevande från räddningsenheter eller livräddningsfarkoster till fartyget.

2. Utrustningen för att överföra överlevande till fartyget kan ingå som en del av ett marint evakueringssystem eller bestå av ett system som är utformat för räddningsändamål. Sådan utrustning ska godkännas av flaggstaten med hänsyn till rekommendationer i MSC/Circ.810[20].

3. Om glidbanan i ett marint evakueringssystem är avsedd att användas för att överföra överlevande till fartygets däck, ska banan vara försedd med grepplinor eller stegar som hjälpmedel för att klättra uppför glidbanan.

5. *Räddningsvästar*

ALLA RO-RO-FARTYG AV KLASS B, C OCH D

1. Utan hinder av kraven i SOLAS regler III/7.2 och III/22.2 ska ett tillräckligt antal räddningsvästar vara placerade i närheten av samlingsstationerna, så att passagerarna inte ska behöva återvända till sina hytter för att hämta sina räddningsvästar.

2. I ro-ro-passagerarfartyg ska varje räddningsväst vara utrustad med ett ljus som uppfyller kraven i punkt 2.2.3. i LSA-koden.

5-2. Landnings- och vinschningsytor för helikoptrar (R 28)

NYA OCH EXISTERANDE FARTYG AV KLASS B, C OCH D:

1. På ro-ro-passagerarfartyg ska det finnas en helikopterhämtningsplats som uppfyller kraven i IAMSAR-manualen[21].

2. På nya ro-ro-passagerarfartyg av klass B, C och D med en längd av minst 130 meter ska det finnas en helikopterlandningsplats i enlighet med IAMSAR-manualen[22] och MSC/Circ.895[23].

5-3. Beslutsstödsystem för befälhavare (R 29)

NYA OCH EXISTERANDE FARTYG AV KLASS B, C OCH D:

1. I alla fartyg ska ett beslutsstödsystem för ledning i nödsituationer finnas på bryggan.

[20] MSC/Circ.810 Recommendation on means of rescue on ro-ro passenger ships.

[21] The International Aeronautical and maritime search and rescue (IAMSAR) manual.

[22] Se not 20.

[23] MSC/Circ.895 Recommendation on helicopter landing areas on ro-ro passenger ships.

2. Systemet ska minst bestå av en eller flera tryckta beredskapsplaner. Alla förutsebara nödsituationer ska finnas specificerade i planen eller planerna, inklusive men inte begränsat till följande huvudgrupper av nödsituationer:

1. Brand.
2. Fartygsskada.
3. Föroreningar.
4. Olagliga handlingar som hotar fartygets och passagerarnas och besättningens säkerhet.
5. Olycksfall avseende personal.
6. Olyckshändelser avseende last.
7. Hjälpinsatser för andra fartyg i nödsituationer.

3. De förfaranden i nödsituationer som fastställs i planen eller planerna ska utgöra beslutsstöd för befälhavare för att hantera alla kombinationer av nödsituationer.
4. Planen eller planerna ska vara enhetligt utformade och lätta att använda. Om tillämpligt ska den faktiska lastkonditionen, så som den beräknas för fartygets stabilitet för resan, användas för skadekontrolländamål.
5. Utöver den eller de tryckta beredskapsplanerna kan Transportstyrelsen också godta användning av ett datorbaserat beslutsstödsystem på bryggan, som tillhandahåller all den information som nödsituationsplanen eller planerna ska innehålla, såsom tillvägagångssätt, checklistor m.m., och som kan skapa en lista över rekommenderade åtgärder som ska vidtas vid förutsebara nödsituationer.

7. Livräddningsfarkosternas placering (R 13 och R 24)

NYA OCH EXISTERANDE FARTYG AV KLASS B, C OCH D:

1. Varje livräddningsfarkost ska vara placerad

e) fullt utrustad enligt kraven i tillämpliga SOLAS-regler, varvid dock sådana livflottar som definieras i anmärkningarna 1 a eller 1 b till tabellen i regel III/2 får undantas från vissa av SOLAS-kraven på utrustning enligt denna anmärkning.

8. Placering av beredskapsbåtar (R 14)

NYA OCH EXISTERANDE FARTYG AV KLASS B, C OCH D:

Varje beredskapsbåt ska

1. ständigt vara klar att sjösättas inom 5 minuter, och om den är uppblåsbar ska den alltid vara uppblåst,

2. vara surrad på en plats som lämpar sig för sjösättning och ombordtagning,
3. vara placerad så att varken beredskapsbåten eller dess surrningsanordning försvårar handhavandet av livräddningsfarkoster vid andra sjösättningsstationer,
4. om den samtidigt är en livbåt placeras enligt kraven i regel 7.

13. Utbildning och övning i att överge fartyget (R 19 och R 30)

NYA OCH EXISTERANDE FARTYG AV KLASS B, C OCH D:

3. Varje övning i att utrymma fartyget ska omfatta de åtgärder som krävs enligt SOLAS regel III/19.3.3.1, med beaktande av riktlinjerna i MSC.1/Circ.1206/Rev.1[24].

4. Livbåtar och beredskapsbåtar ska firas vid på varandra följande övningar i enlighet med SOLAS regel III/19 punkterna 3.3.2., 3.3.3. och 3.3.6.

Om övningar i att sjösätta livbåtar och beredskapsbåtar utförs medan fartyget framförs ska övningarna utföras endast i skyddade vatten och under övervakning av ett befäl med erfarenhet av sådana övningar, på grund av de risker övningarna medför. Övervakningen ska ske med beaktande av riktlinjerna i resolution A.624(15)[25] och A.771(18)[26].

Transportstyrelsen får tillåta fartyg att inte sjösätta livbåtarna på en sida, om deras förtöjningsanordningar i hamn och fartygets trafikmönster inte medger sjösättning av livbåtar på den sidan. Alla sådana livbåtar ska emellertid firas minst en gång var tredje månad och sjösättas minst en gång om året.

[24] MSC.1/Circ.1206/Rev.1 Measures to prevent accidents with lifeboats.

[25] A.624(15) Guidelines on training for the purpose of launching lifeboats and rescue boats from ships making headway through the water.

[26] A.771(18) Training requirements for crews on fast rescue boats.

KAPITEL IV * RADIOKOMMUNIKATION

1. Radiokommunikationsutrustning

FARTYG AV KLASS D:

1. Fartyg av klass D ska minst förses med:

1.1. En VHF-radioanläggning för sändning och mottagning av:

1.1.1. DSC på frekvensen 156,525 MHz (kanal 70). Det ska vara möjligt att inleda sändningen av varningar för nödsituationer på kanal 70 från den plats varifrån fartyget normalt framförs.

1.1.2. Radiotelefoni på frekvenserna 156,300 MHz (kanal 6), 156,650 MHz (kanal 13) och 156,800 MHz (kanal 16).

1.2. VHF-radioanläggningen ska även kunna sända och ta emot allmän radiokommunikation via radiotelefoni.

1.3. Se SOLAS 1974, regel IV/7.1.1 och regel IV/ 8.2.

INTERNATIONAL MARITIME ORGANIZATION

IMO

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A 19/Res.830
7 December 1995
Original: ENGLISH

ASSEMBLY
19th session
Agenda item 10

RESOLUTION A.830(19)
adopted on 23 November 1995

CODE ON ALARMS AND INDICATORS, 1995

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

RECALLING ALSO that it adopted resolution A.686(17) on the Code on Alarms and Indicators, incorporating therein provisions on alarms and indicators contained in the 1974 SOLAS Convention, as amended, and the IBC, BCH, IGC and Gas Carrier Codes, as amended,

RECALLING FURTHER that the Maritime Safety Committee, at its sixty-third session, adopted resolution MSC.39(63) on adoption of the amendments to the Code on Alarms and Indicators, in order to extend resolution A.686(17) to cover the 1989 MODU Code and the Code of Safety for Diving Systems,

NOTING that the Maritime Safety Committee, at its sixty-fifth session, approved amendments to resolution A.686(17) to extend it to cover the 1993 Torremolinos Protocol, Code of Safety for Nuclear Merchant Ships, IMDG Code, Guidelines for Inert Gas Systems, Standards for Vapour Emission Control Systems, MARPOL 73/78, HSC Code and amendments to the 1974 SOLAS Convention concerning radiocommunications for the GMDSS, with a view to ensuring uniformity in the application of these IMO instruments,

RECOGNIZING the need for a revised text of the Code on Alarms and Indicators which incorporates all the amendments approved since its original adoption, for ease of implementing its provisions,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its sixty-fifth session,

1. ADOPTS the Code on Alarms and Indicators, 1995 set out in the Annex to the present resolution;

2. RECOMMENDS Governments to:

(a) take appropriate steps to apply the Code;

(b) use the Code as an international safety standard for designing alarms and indicators for ships, ships' equipment and machinery; and

(c) inform the Organization of measures taken for the application of the Code;

3. URGES the Maritime Safety Committee and the Marine Environment Protection Committee to take account of the provisions of the Code when developing new standards on alarms and indicators;

4. AUTHORIZES the Maritime Safety Committee and the Marine Environment Protection Committee to amend or extend the Code as may be necessary;

5. REVOKES resolutions A.686(17) and MSC.39(63).

ANNEX

CODE ON ALARMS AND INDICATORS, 1995*

The text of the original Code on Alarms and Indicators adopted by A.686(17) subject to the following amendments.

PREAMBLE

In the original Code, replace the two first sentences of paragraph 1 by the following:

"1 The Code is a recommendatory document primarily directed to ships covered by the International Convention for the Safety of Life at Sea, 1974 (1974 SOLAS Convention), as amended, the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), as amended, and associated codes (IBC, BCH, IGC, Gas Carrier, HSC, 1989 MODU, Nuclear Merchant Ships, Diving and IMDG Codes), 1993 Torremolinos Protocol and Guidelines for Inert Gas Systems (IGS) and Standards for Vapour Emission Control Systems (VEC). Although alarms and indicators required by the dynamically supported craft and similar specialized ships are not specifically included, the Code can be used for guidance where appropriate, and in the future it could be extended to include these instruments."

1 PURPOSE AND APPLICATION

In the original Code, replace paragraph 1.1 by the following:

"1.1 This Code is a recommendatory document for alarms and indicators. It is intended to provide general design guidance and to promote uniformity of type, location and priority for those alarms and indicators which are required by the 1974 SOLAS Convention, as amended, MARPOL 73/78 as amended, and associated instruments (IBC, BCH, IGC, Gas Carrier, HSC, 1989 MODU, Nuclear Merchant Ships, Diving and IMDG Codes, 1993 Torremolinos Protocol and Guidelines for IGC and standards for VEC)."

In paragraph 1.3, replace the date "1992" by "1996".

2 DEFINITIONS

In the original Code, add the following new subparagraphs:

"2.2.4 For special ships (e.g. high-speed craft), additional alarms may be classified as emergency alarms in addition to the ones defined above.

2.3.12 For special ships (e.g. high-speed craft), additional alarms may be classified as primary

*A consolidated text of this Code incorporating all the amendments will be published as an IMO publication.

alarms in addition to the ones defined above."

In the original Code, add the following new paragraphs:

"2.15 *1993 Torremolinos Protocol.* The Protocol of 1993 relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977.

2.16 *IGS.* The Guidelines for Inert Gas Systems (MSC/Circ.282, as amended by MSC/Circ.353 and MSC/Circ.387).

2.17 *HSC Code.* The International Code of Safety for High-Speed Craft (resolution MSC.36(63)).

2.18 *VEC.* The Standards for Vapour Emission Control Systems (MSC/Circ.585).

2.19 *IMDG Code.* The International Maritime Dangerous Goods Code.

2.20 *1995 Diving Code.* The Code of Safety for Diving Systems, 1995 (resolution A.831(19)).

2.21 *1989 MODU Code.* The Code for the Construction and Equipment of Mobile Offshore Drilling Units (resolution A.649(16)).

2.22 *Nuclear Merchant Ship Code* of Safety for Nuclear Merchant Ships (resolution A.491(XII))."

3 GENERAL

In the original Code, replace the second sentence of paragraph 3.13 by:

"Equipment and cables for emergency alarms and indicators (e.g. watertight doors' position indicators) should be arranged to minimize risk of total loss of service due to localized fire, collision, flooding or similar damage."

4 AUDIBLE ALARMS AND CALLS

Text of the original Code.

5 VISUAL ALARMS, CALLS AND INDICATORS

In the original Code, add a new paragraph 5.6 as follows:

"5.6 On MODUs, where supplemental visual alarms are installed for general emergency alarms, the colour of these supplemental alarms may be amber, provided they flash with a pulse frequency of at least 4 Hz."

6 CHARACTERISTICS

In table 6.1.1 - Emergency alarms:

In line "Fire alarm: In machinery space", replace audible Code "2" in column "Code" by "2, 3.c,

3.d".

7 REQUIREMENTS FOR PARTICULAR ALARMS

Text of the original Code.

8 GROUPING OF ALARMS AND INDICATORS

Text of the original Code.

9 ALARM AND INDICATOR LOCATIONS (Page 21 of the AI Code)

Amend the original Code as follows:

- in paragraph 9.1, replace "9.1.8" by "9.1.9";
- in the box containing notes below paragraph 9.2, replace "9.1.8" by "9.1.9";
- table 9.1.1 - Location; navigating bridge (page 22); replace regulation "51" (7th line from the top) by regulation "30.3" and accordingly, change the function to "steering gear overload/no volts";
- in table 9.1.1 (continued) (page 24), delete the entry "SOLAS IV" and all entries in the two lines below it;
- in table 9.1.4 (continued) (page 30), delete the entry "SOLAS IV" and all entries in the line below it;
- in table 9.1.6 - Location: miscellaneous (page 32), delete the entry "SOLAS IV" and all entries in the four lines below it; and
- add to location tables 9.1.1 to 9.1.8 of the original Code the amendments as given in the attached tables.

AMENDMENTS TO TABLES 9.1.1 TO 9.1.9

Table 9.1.1 - Location: Navigating bridge

Priority	IMO Instrument **SFV Protocol 1993** **Chapter IV**	Function	Type	Notes
P	4(5) 8(1)(e)(iii)	Machinery failure advance alarm	A,V	Column 1, table 8.3 Column 2, table 8.2
P	6(2)	Oil-fired steam boiler low water level, air supply failure or flame failure	A,V	! Column 2, table 8.3 II-1/32.2 (table 9.1.2)*
P	8(1)(d)	Propulsion control station in control	I	Column 1, table 8.2 II-1/31.2.5* II-1/49.3*
P	8(1)(e)(i) 8(1)(e)(ii)	Propeller speed/ direction/ pitch	MI	Column 1, table 8.2 II-1/31.2.8*
P	8(1)(g)	Propulsion machinery remote control failure	A,V	Column 1, table 8.2 II-1/31.2.7*
P	8(1)(h)	Low propulsion starting air pressure	A,V	! Column 1, table 8.2 II-1/31.2.9*
P	13(3)	Rudder angle indicator	A,V	Column 1, table 8.1 II-1/29.11*
P	13(4)	Steering gear power unit power failure	A,V	Column 1, table 8.1 II-1/29.5.2*
P	13(5)	Steering gear running	I	Column 1, table 8.1 II-1/30.1*
P	13(5)	Steering gear overload/no volts	A,V	Column 1, table 8.1 II-1/30.3*
P	15(5)	Refrigerating machinery spaces alarm	A,V	Column 2, table 8.1
P	19(1)	HP fuel oil pipe leakage	A,V	! Column 2, table 8.3
P	19(3)	Fuel heating high temperature alarm	A,V	! Column 2, table 8.3
P	19(5)	Fire detection alarm	A,V	Column 2, table 8.3
P	20(1)	Bilge high water level alarm	A,V	Column 2, table 8.3 II-1/21.1.6.2*

* Cross reference to SOLAS regulation

Table 9.1.1 (continued) - Location: Navigating bridge

Priority	IMO Instrument	Function	Type	Notes
	Chapter IV (cont.)			
P	22(2)(a)	Essential and important machinery parameters	A,V	Column 2, table 8.3 II-1/51.1.1 (table 9.1.2)*
P	22(2)(d)	Fault requiring action by or attention of the officer on watch	A,V	Column 1, table 8.3 (machinery alarm inc. 22(2)(c), 23(2), 23(3)(c) & 23(3)(d)) II-1/51.1.3*
P	22(3)(b)	Alarm system normal power supply failure	A,V	Column 2, table 8.3 II-1/51.2.2*
P	24	Automatic propulsion shutdown override	I	Column 1, table 8.3 II-1/52*
P	24	Automatic shutdown of propulsion machinery	A,V	Column 1, table 8.3 II-1/52*
	Chapter V			
P	14(2)(b)	Fire detection or automatic sprinkler operation	A,V	Column 2, table 8.1 II-2/12.1.2.2*
P	15(2)(b)	Fire detection alarm	A,V	Column 2, table 8.1 II-2/40.3* II-2/13.1.6*
	IGS			
S	3.14.11	Low water level alarm	A,V	
	HSC Code			
P	7.7.1	Automatic smoke detection system in areas of major and moderate fire hazard and other enclosed spaces in accommodation not regularly occupied	I	! Column 2, table 8.2
P	7.7.1	Automatic smoke detection and fire detection (with detectors sensing other than smoke) in main propulsion machinery room(s) additionally supervised by TV cameras monitored from the operating compartment	I	Column 2, table 8.2

* Cross reference to SOLAS regulation

Table 9.1.1 (continued) - Location: Navigating bridge

Priority	IMO Instrument	Function	Type	Notes
	HSC Code (cont.)			
P	+7.7.2.1.2	Fixed fire detection and fire alarms systems' power loss or fault condition.	A,V	Column 2, table 8.2 II-2/13-1.1.3*
P	+7.7.2.1.4	Fire detection signal	A	Column 2, table 8.2
P	7.7.2.1.6	Fire detection manually operated call point section unit indicator	A,V	Column 2, table 8.3 II-2/13.1.6* II-2/13-1.1.6*
P	7.7.3.1	Fire detection for periodically unattended machinery spaces	A,V	Column 2, table 8.3 II-2/14.2*
S	7.8.1.2	Fire door position	I	Column 2, table 8.2 II-2.37.1.2.2*
S	7.8.5.3	Loss or reduction of required ventilation	I	Column 2, table 8.2 II-1.37.1.6.3*
S	7.9.3.3.3	Fire door closing	I	! Column 2, table 8.2 II-2/37.1.2.2*
P	7.12	Zone ventilation fans control	I	! manned control station
P	7.13.1	Manually operated sprinkler system alarms	M,I	! Column 2, table 8.2
P	7.15	Smoke detection system for cargo spaces	I	! Column 2, table 8.2
P	9.1.14	Liquid cooling system failure	A,V	!
P	9.2.1	Auto fire detection system	A,V	Column 2, table 8.3 II-2/11.8*; 14.2*
P	9.2.1	Bilge alarm	A,V	Column 2, table 8.3 II-2/48.1*; 48.2*
P	9.2.1	Remote machinery alarm system	A,V	Column 2, table 8.3
P	9.4.2	Fuel line failure	A,V	Column 2, table 8.2
P	9.4.5	Lubricating oil pressure or level falling below a safe level	A,V	Column 2, table 8.2

* Cross reference to SOLAS regulation

+ These alarms may be omitted if they are provided at the central fire control station

Table 9.1.1 (continued) - Location: Navigating bridge

Priority	IMO Instrument	Function	Type	Notes
	HSC Code (cont.)			
P	9.5.6	Lubricating fluid supply failure or lubricating fluid pressure loss	A,V	Column 2, table 8.2
S	10.3.12	Unattended space bilge alarm	V	! Column 2, table 8.2 II-1/48.1*
P	11.2.1	Failure of any remote or automatic control system	A,V	Column 2, table 8.3
P	11.4.1	Malfunction or unsafe condition	A,V	! Column 2, table 8.2
EM	11.4.1.1	Indication of conditions requiring immediate action	A,V	Column 2, table 8.2; distinctive alarms in full view of crew members
P	11.4.1.2	Indication of conditions requiring action to prevent degradation to an unsafe condition	V	Column 2, table 8.2; visual display to be distinct from that of alarms referred in 11.4.1.1
S	12.3.9	Emergency battery discharge	I	Column 2, table 8.2 II-1/42.5.3*;43.5.3*
P	12.5.1	Steering system electric overload	A,V	! Column 2, table 8.2 II-1/30.3*
P	12.5.2	Steering system electric phase failure	A,V	Column 2, table 8.2 II-1/30.3*
S	12.6.3	Electrical distribution system low insulation level	A or I	! Column 2, table 8.2 II-1/45.4.2*
P	13.7	Rudder angle indicator and rate-of-turn indicator	I	Column 2, table 8.2 5.4.3 II-1/29.11* V/12(n)*
P	13.11.2	Propulsion indicator	I	Column 2, table 8.2
S	13.11.3	Emergency steering position compass reading indicator	I	Column 2, table 8.2

* Cross reference to SOLAS regulation

Table 9.1.1 (continued) - Location: Navigating bridge

Priority	IMO Instrument	Function	Type	Notes
	1989 MODU Code			
S	7.4.1	Propeller pitch indicator	I	Column 2, table 8.1
S	7.4.2.5 8.5.5	Propulsion station in control indication	I	Columns 1&3, table 8.2 II-1/31.2.5* II-1/49.3*
P	7.4.2.7 8.5.7	Propulsion machinery remote control failure	A,V	Column 1, table 8.2 II-1/31.2.7; II-1/49.5*
P	7.4.2.8	Propeller speed/ direction/pitch	MI	Column 1, table 8.2 II-1/31.2.8*
P	7.4.2.9 8.5.9	Low starting air pressure	A,V	Columns 1&3, table 8.2 II-1/31.2.9; II-1/49.7*
P	7.5.17	Rudder angle indicator	MI	Column 1, table 8.1 II-1/29.11*
P	7.6.1	Steering gear running	I	Columns 1&13 table 8.1 II-1/30.1*
P	7.6.3	Steering gear phase failure/overload alarm	A,V	Column 1, table 8.3 II-1/30.3*
P	8.5.8	Propeller speed/direction/pitch	MI	Column 1, table 8.3 II-1/49.6*
P	8.7.1	Fault requiring attention	A,V	Column 1, table 8.3, including 8.3.5.1, 8.4.1, 8.8.6 and 8.9 II-1/51.1.3*
P	8.7.3	Alarm system normal supply failure	A,V	Column 2, table 8.3 II-1/51.2.2*
P	9.7.1	Fire detection system alarm	A,V	Column 2, table 8.1 II-2/13*
P	9.8	Gas detection and alarm system	A,V	! Column 2, table 8.1

* Cross reference to SOLAS regulation

Table 9.1.2 - Location: machinery space/machinery control room

Priority	IMO Instrument	Function	Type	Notes
	SFV Protocol 1993 Chapter IV			
P	6(2)	Oil-fired steam boiler low water level, air supply failure or flame failure	A,V	! II-1/32.2*
P	8(1)(e)(iii)	Machinery failure advance alarm	A,V	!
S	8(1)(d)	Propulsion control station in control	I	Column 3, table 8.2 II-1/31.2.5* II-1/49.3*
P	8(1)(g)	Propulsion machinery remote control failure	A,V	! Column 3, table 8.2 II-1/31.2.7*
P	8(1)(h)	Low propulsion starting air pressure	A,V	! Column 3, table 8.2 II-1/31.2.9*
S	15(4)(b)	Refrigerant leak alarm	A,V	
S	17(6)	Emergency battery discharge	I	! Column 3, table 8.1 II-1/42.5.3*
S	18(4)(b)	Electrical distribution system low insulation level	A or I	! Column 3, table 8.1 II-1/45.4.2*
P	19(7)	Internal combustion engine monitors	MI	Column 3, table 8.3 II-1/47.2*
P	22(2)(a)	Essential and important machinery parameters	A,V	Column 3, table 8.3 II-1/51.1.1*
P	22(3)(b)	Alarm system normal power supply failure	A,V	Column 3, table 8.3 II-1/51.2.2*
P	23(2)	Automatic changeover of propulsion auxiliaries	A,V	Column 3, table 8.3 II-1/53.4.2*
P	24	Automatic shutdown of propulsion machinery	A,V	Column 3, table 8.3 II-1/52*
P	24	Automatic propulsion shutdown override	I	Column 3, table 8.3 II-1/52*

* Cross reference to SOLAS regulation

Table 9.1.2 (continued) - Location: machinery space/machinery control room

Priority	IMO Instrument	Function	Type	Notes
	IGS			
S	3.14.11	Low water level alarm	A,V	Column 3, table 8.1 II-2/62.19.1.7*
	MARPOL 73/78 Annex I			
P	16(5)	Alarm for excessive oil content in oily mixture discharge into the sea	(A,V)	!
	HSC Code			
P	7.7.2.1.4	Fire detection signal	A,V	Column 3, table 8.2
P	7.7.3.1	Fire detection for periodically unattended machinery spaces	A,V	Column 3, table 8.3 II-2/14.2*
P	9.2.1	Auto fire detection system	A,V	Column 2, table 8.3 II-2/11.8*;14.2*
P	9.2.1	Bilge alarm	A,V	Column 2, table 8.3 II-2/48.1*;48.2*
P	9.2.1	Remote machinery alarm system	A,V	Column 2, table 8.3
P	9.4.2	Fuel line failure	A,V	Column 3, table 8.2
P	9.4.5	Lubricating oil pressure or level falling below a safe level	A,V	Column 3, table 8.2
P	9.5.6	Lubrication fluid supply failure or lubricating fluid pressure loss	A,V	Column 3, table 8.2
S	10.2.7.3	High temperature alarm (oil fuel or settings tank)	V	!
S	10.3.12	Unattended space bilge alarm	V	! Column 3, table 8.2 II-1/48.1*

* Cross reference to SOLAS regulation

Table 9.1.2 (continued) - Location: machinery space/machinery control room

Priority	IMO Instrument	Function	Type	Notes
	HSC Code (cont.)			
P	11.2.1	Failure of any remote or automatic control system	A,V	Column 2, table 8.3
P	11.4.1	Malfunction or unsafe condition	A,V	! Column 3, table 8.2
P	11.4.1.3	Indication of conditions in 11.4.1.1 requiring immediate action	A,V	
P	11.4.1.3	Indication of conditions in 11.4.1.2 requiring action to prevent degradation of an unsafe condition	A,V	Column 3, table 8.2; visual display to be distinct from that of alarms referred in 11.4.1.1
P	11.5	Shutdown system activation	A,V	! Column 3, table 8.2
P	12.5.1	Steering system electric overload	A,V	! Column 3, table 8.2 II-1/30.3*
P	12.5.2	Steering system electric phase failure	A,V	Column 3, table 8.2 II-1/30.3*
S	12.6.3	Electrical distribution system low insulation level	A or I	! Column 3, table 8.2 II-1/45.4.2*
	1989 MODU Code			
P	4.2.7	Machinery failure pre-alarm	A,V	! Column 3, table 8.1
P	4.5.2	Manual overriding of the automatic control indicator	I	Column 3, table 8.1
S	5.3.12	Emergency battery discharge	I	Column 3, table 8.1 II-1/42.5.3*
S	5.5.7	Electrical distribution system low insulation level	A or I	! Column 3, table 8.1 II-1/45.4.2*
P	7.3.1	Water tube boiler high water level alarm	A,V	Column 3, table 8.1
S	7.4.2.4 8.5.4	Propulsion machinery orders from bridge	I	Column 3, table 8.2 II-1/31.2.4*; II-1/49.2*
S	7.4.2.5 8.5.5	Propulsion station in control indication	I	Columns 1&3, table 8.2 II-1/31.2.5*; II-1/49.3*
P	7.4.2.9	Low starting air pressure	A,V	Columns 1&3, table 8.2 II-1/31.2.9*

* Cross reference to SOLAS regulation

Table 9.1.2 (continued) - Location: machinery space/machinery control room

Priority	IMO Instrument	Function	Type	Notes
P	7.6.1	Steering gear running	I	Columns 1&!3, table 8.1 II-1/30.1*
P	8.3.1	HP fuel oil pipe leakage	A,V	! Column 3, table 8.3 II-2/15.5.3*
P	8.3.3	Fuel heating temperature alarm	A,V	! Column 3, table 8.3 II-2/15.5.3*
P	8.3.6	Fire detection alarm for boiler/propulsion machinery	A,V	! Column 3, table 8.3 II-1/47.1*
P	8.3.7	Internal combustion engine monitors	MI	Column 3, table 8.3 II-1/47.2*
P	8.5.7	Propulsion machinery remote control failure	A,V	Column 3, table 8.3 II-1/49.5*
P	8.7.1	Fault requiring attention	A,V	At a normally manned control station in addition to main machinery control station including 8.3.5.1, 8.4.1, 8.8.6 and 8.9 II-1/51.1*
P	8.8.3	Automatic changeover of propulsion auxiliaries	A,V	Column 3, table 8.3 II-1/53.4.2*

* Cross reference to SOLAS regulation

Table 9.1.3 - Location: central fire control station where provided

Priority	IMO Instrument	Function	Type	Notes
	SFV Protocol 1993 Chapter V			
S	14(3)(c)	Automatic sprinkler system pressure	MI	II-2/12.2.3*
	HSC Code			
P	+7.7.2.1.2	Fixed fire detection and fire alarm systems' power loss or fault conditions	A,V	Column 2, table 8.2 II-2/13-1.1.3*
P	+7.7.2.1.4	Fire detection signal	A,V	Column 2, table 8.2
	1989 MODU Code			
P	9.7.1	Fire detection system	A,V I	II-2/13*
P	9.8	Gas detection and alarm systems	A,V	!

* Cross reference to SOLAS regulation

\+ These alarms may be omitted if they are provided at the central fire control station

Table 9.1.4 - Location: at the equipment or at the location being monitored

Priority	IMO Instrument	Function	Type	Notes
	SFV Protocol 1993 **Chapter II**			
S	13(1)	Shell valve closure	A,V	II-1/17.9.2.1*
S	13(2)	Shell valve closure	A,V	II-1/17.9.3*
	Chapter IV			
S	11(7)	Collision bulkhead valve closure	I	II-1/21.2.12*
S	13(3)	Rudder angle indicator	MI	
S	15(4)(a)	Refrigerant leak indicator	I	
P	15(5)	Refrigerating machinery spaces alarm	A,V	At escape exits
	Chapter V			
S	14(3)(c)	Automatic sprinkler system pressure	MI	At each section stop valve II-2/12.2.3*
S	14(5)(a)	Automatic sprinkler tank level	MI	II-2/12.4.1*
P	15(2)(b)	Fire detection alarm	A	To ensure fire alarm sounding on the deck where the fire is detected
	IGS			
S	3.15.3.2.1	Effluent drain valve position indicator	I	!
S	6.2	Tank pressure sensors	MI	!
	VEC systems			
S	2.3.1	Isolation valve position indicator	I	
P	2.4.1.3	Liquid level indicator	MI	At the location where cargo transfer is controlled

* Cross reference to SOLAS regulation

Table 9.1.4 (continued) - Location: at the equipment or at the location being monitored

Priority	IMO Instrument	Function	Type	Notes
	VEC systems (cont.)			
P	2.4.1.4	Liquid level indicator	MI	Portable gauging device on the tank
P	3.2.1.3	Cargo vapour shutoff valve position indicator	I	Near terminal vapour connection
P	3.3.3	Terminal vapour pressure sensing devise	MI	! (3)
P	3.3.3.2	Terminal vapour pressure alarm	A,V	! (3)
P	3.3.3.3	Signal for sequential shutdown of onshore pumps and remotely operated cargo vapour shutoff valve	(A,V)	! (3)
	IMDG Code (vol I) (Amendment 27)			
S	21.4.4	Cargo control temperature less +25°C	A,V	!, Alarms independent of power supply of the refrigeration system
	HSC Code			
EM	7.7.6.1.6	Release of fire-extinguishing medium	A	Spaces in which personnel normally work or to which they have access. II-2/5.1.6*
EM	7.9.3.3.2	Fire door closing	A	Sounding alarm before the door begins to move and until completely closed
S	7.13.1	Manually operated sprinkler system alarms	M,I	! Column 2, table 8.2
S	10.9.5	Bilge cocks and valve position indication	I	To indicate open or closed position

* Cross reference to SOLAS regulation

Table 9.1.4 (continued) - Location: at the equipment or at the location being monitored

Priority	IMO Instrument	Function	Type	Notes
	Diving Code			
P	2.5.3	Diving bell internal pressure	MI	! At the location of the attendant monitoring diving operations
P	2.5.5	Diving bell, etc. overpressure alarm	A,V	! At the location of the attendant monitoring diving operations
P	2.9.3	Diving equipment fire detection alarm	A,V	! At the location of the attendant monitoring diving operations
	1989 MODU Code			
S	3.6.4.2	Watertight doors and hatch cover positions alarm	A,V	
S	4.3.5	Water level of essential boiler	MI	II-1/32.6*
S	4.4.3	Steam pressure	MI	II-1/33.3*
S	4.8.6	Bilge valve indicator	I	II-1/21.2.12*
S	4.9.8	Ballast valve position indicator	I	
S	4.11.11	Cable tension windlass power amount of cable paid out	I	

* Cross reference to SOLAS regulation

Table 9.1.5 - Location: engineer's accommodation

Priority	IMO Instrument	Function	Type	Notes
	SFV Protocol 1993			
	Chapter IV			
P	14	Engineers' alarm	A	Column 4, table 8.3 II-1/38*
P	22(2)(b) 22(2)(c)	Fault requiring attention of engineer on duty	A,V	Column 4, table 8.3 II-1/51.1.2*; II-1/51.1.5*
	HSC Code			
P	7.7.3.1	Fire detection for periodically unattended machinery spaces	A,V	Column 4, table 8.3 II-2/14.2*
	1989 MODU Code			
P	7.8	Engineers' alarm	A	Column 4, table 8.3 II-1/38*
P	8.7.1	Fault requiring attention	A	Activate engineers' alarm required by 7.8 including 8.3.5.1, 8.4.1, 8.8.6 and 8.9 II-1/51.1.5*

* Cross reference to SOLAS regulation

Table 9.1.6 - Location: miscellaneous

Priority	IMO Instrument	Function	Type	Notes
	SFV Protocol 1993			
	Chapter II			
P	2(6)	Watertight door position	I	At remote operating position II-1/15.6.4*
P	4(1)	Freezer room weathertight door position	A,V	! At the attended location
	Chapter IV			
P	15(5)	Refrigerating machinery spaces alarm	A,V	At an attended location (control) station
P	19(5)	Fire detection alarm	A,V	At appropriate spaces when the vessel is in harbour
P	20(1)	Bilge high-water level alarm	A,V	At places where continuous watch is maintained when navigating bridge not manned II-1/21.1.6.2*
	Chapter V			
P	14(2)(b)	Fire detection or automatic sprinkler operation	A,V	Alarm at location easily accessible to crew at all times II-2/12.1.2.2*
P	15(2)(b)	Fire detection alarm	A,V	Alarm at location easily accessible to crew at all times II-2/40.3* II-2/13.1.6*
	Chapter VIII			
EM	2(1)	General emergency alarm	A	Throughout all the accommo-dation and normal crew working spaces III/6.4.2* III/50*

* Cross reference to SOLAS regulation

Table 9.1.6 (continued) - Location: miscellaneous

Priority	IMO Instrument	Function	Type	Notes
	Nuclear Merchant Ship Code			
P	3.9.3	Spaces containing NSSS safety equipment Fire detection alarm	A,V	! Alarm at main control position and emergency control position
P	6.4.3	Controlled areas indication of radiation levels and airborne contamination	I	At main control position
P	6.10.2	Containment structure purge system radioactivity alarm	A,V	At main control position
P	6.10.4	Controlled and supervised areas exhaust for radioactivity alarm	A,V	At main control position
	HSC Code			
EM	4.2.1	General emergency alarm	A	Clearly audible throughout all the accommodation and normal spaces and open decks 8.2.2.2 III/6.4.2*; III/50*
P	7.7.2.1.4	Fire detection signal	A	Clearly audible throughout the crew accommodation and service spaces
P	7.7.2.1.6	Fire detection manual operated call point section unit indicator	A,V	Alarm at location easily accessible to crew at all times II-2/13.1.6*
	1989 MODU Code			
S	3.6.2	Watertight boundary valve position indicator	I	At the remote control station
P	4.3.2	Oil-fired boiler low-water level, air supply failure or flame failure	A,V	Alarm at an attended location II-1/32.2*
S	4.8.1	Presence of water indicator	I	
S	4.11.12	Cable tension speed and direction of wind	I	At a manned station

* Cross reference to SOLAS regulation

Table 9.1.6 (continued) - Location: miscellaneous

Priority	IMO Instrument	Function	Type	Notes
S	6.3.1.1.3	Loss of ventilation	A,V	At a manned station
S	6.3.1.2.3	Loss of ventilation	A,V	At a manned station
S	6.3.1.3.3	Loss of ventilation overpressure	A,V	At a manned station
P	8.7.1	Fault requiring attention	A,V	Including 8.3.5.1, 8.4.1, 8.8.6 and 8.9 II-1/51.1*
P	9.7.1	Fire detection system alarm	A,V	At alarm location easily accessible to crew at all times II-2/13.1.6*
EM	9.7.1	Fire detection alarm not receiving attention	A	Alarmed to crew, may be part of general emergency alarm II-2/13.1.4*
P	9.8	Gas detection and alarm system	A,V	! Alarm at a location easily accessible to crew at all times
EM	10.16.1	General emergency alarm	A	Clearly perceptible in all parts of the unit III/6.4.2*; III/50*
	Diving Code			
P	2.5.2	Compression chamber internal pressure	MI	At central control position
P	2.5.3	Diving bell external pressure	MI	Within the bell
P	2.9.3	Diving equipment fire detection alarm	A,V	! At an attended location other than the above
P	2.11.2	Compression chamber/diving bell parameters	MI	At central control position
P	2.11.3	Diving bell oxygen and CO_2 levels	MI	Within the bell

* Cross reference to SOLAS regulation

Table 9.1.7 - Location: cargo control station

Priority	IMO Instrument	Function	Type	Notes
	IGS			
S	3.15.3.2.1	Effluent drain valve position indicator	I	!
S	6.2	Tank pressure sensors	MI	!If required
	VEC systems			
P	2.5.2.3	Tank overflow alarm	A,V	! (2)
P	2.5.2.4	Signal for sequential shutdown of onshore pumps or valves or both and of the ships' valves	(A,V)	! (2)
P	2.5.2.5	Overflow alarm and shutdown signal	(A,V)	At an attended location ! (2)
P	2.5.2.6	Loss of power to the alarm system	(A,V)	! (2)
P	2.5.2.6	Tank level sensor electrical circuitry failure	(A,V)	! (2)
P	2.6.4	Main vapour collection line pressure	MI	! (2) VEC is equipped, common to two or more tanks
P	2.6.4.1	High vapour pressure alarm	(A,V)	! (2) VEC is equipped, common to two or more tanks
P	2.6.4.2	Low vapour pressure alarm	(A,V)	! (2) VEC is equipped, common to two or more tanks

* Cross reference to SOLAS regulation

Table 9.1.8 - Location: not indicated by IMO instruments

Priority	IMO Instrument	Function	Type	Notes
	1989 MODU Code			
S	4.9.15	Draught indicator	MI	! At an attended location ** II-1/8.7.3*

* Cross reference to SOLAS regulation

Table 9.1.9 - Location: central ballast control station of column-stabilized MODUs

Priority	3 IMO Instrument	Function	Type	Notes
	1989 MODU Code			
S	3.6.4.1	Watertight doors and hatch cover position indicator	I,V	
S	3.6.4.2	Watertight doors and hatch cover position alarm	A,V	
S	4.8.8.1	Flooding detector	I	
P	4.8.8.3	Propulsion and pump room bilge high water level alarm	A,V	
S	4.9.10.2	Ballast pump status indicating system	I	For details see also 4.9.12
S	4.9.10.4	Ballast valve position indicating system	I	For details see also 4.9.17
S	4.9.10.5	Tank level indicating system	I	For details see also 4.9.14
S	4.9.10.6	Draught indicating system	I	For details see also 4.9.15
S	4.9.10.7	Heel and trim indicators	I	
S	4.9.10.8	Main and emergency power available indication	I	
S	4.9.10.9	Ballast system hydraulic/pneumatic pressure indicating system	I	
S	4.9.14.1	Ballast tanks liquid level	MI	
S	4.9.14.2	Other tanks liquid level	MI	
S	4.9.17	Ballast valve position	I	!

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INTERNATIONAL MARITIME ORGANIZATION

IMO

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ASSEMBLY
21st session
Agenda item 9

A 21/Res.894
4 February 2000
Original: ENGLISH

RESOLUTION A.894(21)
adopted on 25 November 1999

INTERNATIONAL AERONAUTICAL AND MARITIME SEARCH AND RESCUE (IAMSAR) MANUAL

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

RECALLING ALSO that, by resolutions A.229(VII) and A.439(XI), it respectively adopted the Merchant Ship Search and Rescue (MERSAR) Manual and the IMO Search and Rescue (IMOSAR) Manual,

NOTING that the Maritime Safety Committee, at its sixty-ninth session, approved the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual, jointly prepared by the International Civil Aviation Organization (ICAO) and IMO, which incorporates, *mutatis mutandis,* the MERSAR Manual and the IMOSAR Manual,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its seventy-first session,

1. ENDORSES the action taken by the Maritime Safety Committee in approving the IAMSAR Manual;

2. ADOPTS the Procedures for amending and updating the IAMSAR Manual, set out in the Annex to the present resolution;

3. INVITES ICAO to ensure that any amendments to the IAMSAR Manual are agreed with the Organization prior to their adoption;

4. REQUESTS the Maritime Safety Committee to ensure that any proposed amendments to the IAMSAR Manual are agreed with ICAO prior to their adoption;

5. URGES Governments to use the guidelines provided in the IAMSAR Manual when establishing, developing and operating their search and rescue organizations;

6. URGES FURTHER Governments to bring the IAMSAR Manual to the attention of all personnel who may be involved in the provision of search and rescue services;

7. RECOMMENDS Governments to ensure that all ships entitled to fly the flag of their countries carry on board a copy of Volume 3 of the IAMSAR Manual;

8. REVOKES resolutions A.229(VII), A.387(X) and A.439(XI).

ANNEX

PROCEDURES FOR AMENDING AND UPDATING THE INTERNATIONAL AERONAUTICAL AND MARITIME SEARCH AND RESCUE (IAMSAR) MANUAL

1 The Maritime Safety Committee should receive and evaluate, through its subsidiary bodies, proposals for amendments and/or additions to the IAMSAR Manual.

2 Such proposals should be examined collectively, rather than individually when, in the Maritime Safety Committee's judgement, they are sufficient or of such importance as to warrant examination.

3 Amendments adopted by the Maritime Safety Committee should become applicable twelve months after adoption. For amendments of a very urgent nature, this period may be shortened at the discretion of the Committee.

4 The active participation of the appropriate specialized agencies and other bodies concerned should be sought according to the nature of the proposed amendments.

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INTERNATIONAL MARITIME ORGANIZATION

IMO

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ASSEMBLY
23rd session
Agenda item 17

A 23/Res.952
25 February 2004
Original: ENGLISH

Resolution A.952(23)

Adopted on 5 December 2003
(Agenda item 17)

GRAPHICAL SYMBOLS FOR SHIPBOARD FIRE CONTROL PLANS

THE ASSEMBLY,

RECALLING Article 15(i) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

BEARING IN MIND that regulation II-2/15.2.4 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, requires that fire control plans be permanently exhibited for the guidance of the ship's officers and that a duplicate set of fire control plans or a booklet containing such plans be permanently stored in a prominently marked weathertight enclosure outside the deckhouse for the assistance of shore-side fire-fighting personnel,

RECOGNIZING that the use of international symbols for shipboard fire control plans would greatly increase their usefulness, both for the crew of the ship and for shore-based fire brigades,

RECALLING ALSO resolution A.654(16) on Graphical symbols for fire control plans,

NOTING that ISO had, in close co-operation with IMO, developed standard ISO 17631:2002 – Ships and marine technology – Shipboard plans for fire protection, life-saving appliances and means of escape, providing fire protection symbols which generally conform to the corresponding symbols set out in resolution A.654(16),

NOTING IN PARTICULAR that, through MSC/Circ.1050, Member Governments had been invited to bring standard ISO 17631:2002 to the attention of shipbuilders, shipowners, shipoperators, shipmasters, shore-based fire-fighting personnel and other parties concerned with the preparation or use of shipboard fire control plans, so that they might use it, on a voluntary basis, for the preparation or use of the shipboard fire control plans required by SOLAS regulation II-2/15.2.4, pending the outcome of the work related to the revision of resolution A.654(16),

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its seventy-seventh session,

1. ADOPTS the Graphical symbols for shipboard fire control plans, set out in the Annex to the present resolution;

2. URGES Governments to bring the aforementioned graphical symbols to the attention of shipbuilders, shipowners, shipoperators, shipmasters, shore-based fire-fighting personnel and other parties concerned with the preparation or use of shipboard fire control plans with a view to encouraging their use for the preparation of the shipboard fire control plans required by SOLAS regulation II-2/15.2.4, for ships constructed on or after 1 January 2004;

3. INVITES Governments to bring standard ISO 17631:2002 to the attention of shipbuilders, shipowners, shipoperators and shipmasters so that they may use the additional guidance contained therein for the preparation of shipboard fire control plans;

4. AGREES that ships constructed before 1 January 2004 may continue to carry fire control plans that use the graphical symbols contained in resolution A.654(16);

5. REQUESTS the Maritime Safety Committee to keep this resolution under review and to amend it as necessary.

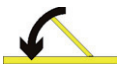
ANNEX

GRAPHICAL SYMBOLS FOR SHIPBOARD FIRE CONTROL PLANS*

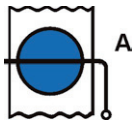
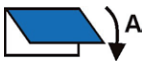
Graphical symbols for structural fire protection

No.	Graphical symbol	Reference	Comments on use
1.1		A-class division	
1.2		B-class division	
1.3		Main vertical zone	
1.4		A-class hinged fire door	The symbol should be at the door position and should show the actual direction of the door. Add **WT** to the right side of the symbol in the case of a watertight door. Add **SWT** to the right side of the symbol in the case of a semi-watertight door.
1.5		B-class hinged fire door	The symbol should be at the door position and should show the actual direction of the door. Add **WT** to the right side of the symbol in the case of a watertight door. Add **SWT** to the right side of the symbol in the case of a semi-watertight door.

* A legend of symbols and explanations should be a constituent part of any fire control plan and contain a list of the graphical symbols used in the plan, together with the appropriate explanations, and may include additional special information such as the type of extinguishing media used in fixed fire-extinguishing systems.

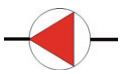
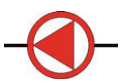
No.	Graphical symbol	Reference	Comments on use
1.6		A-class hinged self-closing fire door	The symbol should be at the door position and should show the actual direction of the door. Add **WT** to the right side of the symbol in the case of a watertight door. Add **SWT** to the right side of the symbol in the case of a semi-watertight door.
1.7		B-class hinged self-closing fire door	The symbol should be at the door position and should show the actual direction of the door. Add **WT** to the right side of the symbol in the case of a watertight door. Add **SWT** to the right side of the symbol in the case of a semi-watertight door.
1.8		A-class sliding fire door	The symbol should be at the door position and should show the actual direction of the door. Add **WT** to the right side of the symbol in the case of a watertight door. Add **SWT** to the right side of the symbol in the case of a semi-watertight door.
1.9		B-class sliding fire door	The symbol should be at the door position and should show the actual direction of the door. Add **WT** to the right side of the symbol in the case of a watertight door. Add **SWT** to the right side of the symbol in the case of a semi-watertight door.

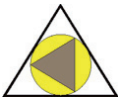
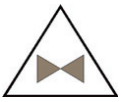
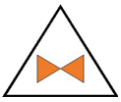
No.	Graphical symbol	Reference	Comments on use
1.10		A-class self-closing sliding fire door	The symbol should be at the door position and should show the actual direction of the door. Add **WT** to the right side of the symbol in the case of a watertight door. Add **SWT** to the right side of the symbol in the case of a semi-watertight door.
1.11		B-class self-closing sliding fire door	The symbol should be at the door position and should show the actual direction of the door. Add **WT** to the right side of the symbol in the case of a watertight door. Add **SWT** to the right side of the symbol in the case of a semi-watertight door.
1.12		Ventilation remote control or shut-off	Colour of the circle and a letter at the right side of the symbol should indicate as follows: **A** = blue for accommodation and service spaces; **M** = green for machinery spaces; **C** = yellow for cargo spaces.
1.13		Remote control for skylight	
1.14		Remote control for watertight doors or fire doors	Add **WT** to the right side of the symbol to indicate remote control for watertight doors or **FD** to indicate remote control for fire doors.

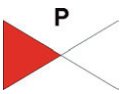
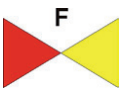
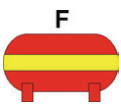
No.	Graphical symbol	Reference	Comments on use
1.15		Fire damper	Colour of the circle and a letter at the right side of the symbol should indicate as follows: **A** = blue for accommodation and service spaces; **M** = green for machinery spaces; **C** = yellow for cargo spaces. Identification number of the damper may be shown at the bottom of the symbol.
1.16		Closing device for ventilation inlet or outlet	Colour of the circle and a letter at the right side of the symbol should indicate as follows: **A** = blue for accommodation and service spaces; **M** = green for machinery spaces; **C** = yellow for cargo spaces. Identification number of the closing device may be shown at the bottom of the symbol.
1.17		Remote control for fire damper(s)	Colour of the circle and a letter at the right side of the symbol should indicate as follows: **A** = blue for accommodation and service spaces; **M** = green for machinery spaces; **C** = yellow for cargo spaces. Identification number of the damper may be shown.

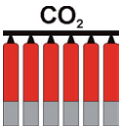
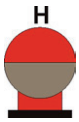
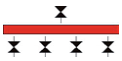
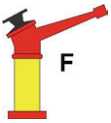
No.	Graphical symbol	Reference	Comments on use
1.18		Remote control for closing device(s) for ventilation inlet and outlet	Colour of the circle and a letter at the right side of the symbol should indicate as follows: **A** = blue for accommodation and service spaces; **M** = green for machinery spaces; **C** = yellow for cargo spaces. Identification number of the closing device(s) may be shown.

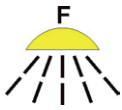
Graphical symbols for fire-protection appliances

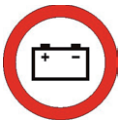
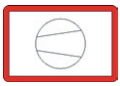
No.	Graphical symbol	Reference	Comments on use
2.1		Fire protection appliances or structural fire protection plan	
2.2		Remote control for fire pump(s)	
2.3		Fire pump(s)	The type, quantity of water delivered per time unit, and pressure head should be indicated either at the right side of the symbol or in the legend.
2.4		Remote control for emergency fire pump or fire pump supplied by the emergency source of power	
2.5		Emergency fire pump	The type, quantity of water delivered per time unit, and pressure head should be indicated either at the right side of the symbol or in the legend.

No.	Graphical symbol	Reference	Comments on use
2.6		Fuel pump(s) remote shut-off	
2.7		Lube oil pump(s) remote shut-off	
2.8		Remote control for bilge pump(s)	
2.9		Remote control for emergency bilge pump	
2.10		Remote control for fuel oil valves	
2.11		Remote control for lube oil valves	
2.12		Remote control for fire pump valve(s)	
2.13		Remote release station	Indicate at the bottom of the symbol the protected space. Extinguishing media should be colour coded in the lower part of the symbol and be indicated by a letter at the right side of the symbol as follows: grey – **CO_2** for carbon dioxide or **N** for nitrogen, brown – **H** for gas other than CO_2 or N (type of gas to be indicated), white – **P** for powder, green – **W** for water.

No.	Graphical symbol	Reference	Comments on use
2.14		International shore connection	
2.15		Fire hydrant	
2.16		Fire main section valve	Indicate the reference number of the valve at the right side of the symbol.
2.17		Sprinkler section valve	Indicate the reference number of the valve at the right side of the symbol. This symbol may also be applied to equivalent water-extinguishing systems. Valves for automatic dry-pipe sprinkler systems should be indicated in the legend.
2.18		Powder section valve	Indicate the reference number of the valve at the right side of the symbol.
2.19		Foam section valve	Indicate the reference number of the valve at the right side of the symbol.
2.20		Fixed fire-extinguishing installation	Extinguishing media should be colour-coded in the centre part of the symbol and indicated by a letter on top of the symbol as follows: grey – **CO_2** for carbon dioxide or **N** for nitrogen, yellow – **F** for foam, brown – **H** for gas other than CO_2 or N (type of gas to be indicated), white – **P** for powder, green – **W** for water.

No.	Graphical symbol	Reference	Comments on use
2.21		Fixed fire-extinguishing battery	Extinguishing media should be colour-coded in the lower part of the symbol and indicated by a letter on top of the symbol as follows: grey – **CO_2** for carbon dioxide or **N** for nitrogen, yellow – **F** for foam, brown – **H** for gas other than CO_2 or N (type of gas to be indicated), white – **P** for powder, green – **W** for water.
2.22		Fixed fire-extinguishing bottle, placed in protected area	Extinguishing media should be colour-coded in the centre part of the symbol and indicated by a letter on top of the symbol as follows: grey – **CO_2** for carbon dioxide or **N** for nitrogen, yellow – **F** for foam, brown – **H** for gas other than CO_2 or N (type of gas to be indicated), white – **P** for powder, green – **W** for water.
2.23		High expansion foam supply trunk (outlet)	Indicate at the bottom of the symbol the protected space, if necessary.
2.24		Water spray system valves	Indicate at the bottom of the symbol the protected space, if necessary.
2.25		Inert gas installation	
2.26		Monitor	Extinguishing media should be colour-coded in the centre part of the symbol and indicated by a letter on the right side of the symbol as follows: yellow – **F** for foam, white – **P** for powder, green – **W** for water.
2.27		Fire hose and nozzle	Indicate the hose length at the right side of the symbol; where only one type of hose is used, the information can be shown in the legend. Extinguishing media should be colour-coded in the lower part of the symbol and indicated by a letter on the right side of the symbol as follows: yellow – **F** for foam, white – **P** for powder, green – **W** for water.

No.	Graphical symbol	Reference	Comments on use
2.28		Fire extinguisher	Indicate type of extinguishing media (**CO_2** for carbon dioxide, **F** for foam, **H** for gas other than CO_2 (type of gas to be indicated), **P** for powder, **W** for water) and capacity (kg for gas and powder, litres for water and foam) at the right side of the symbol. Media should be colour-coded in the lower part of the symbol as follows: grey for carbon dioxide, yellow for foam, brown for gas other than CO_2, white for powder, green for water.
2.29		Wheeled fire extinguisher	Indicate type of extinguishing media (**CO_2** for carbon dioxide, **F** for foam, **H** for gas other than CO_2 (type of gas to be indicated), **P** for powder, **W** for water) and capacity (kg for gas and powder, litres for water and foam) at the right side of the symbol. Media should be colour-coded in the centre part of the symbol as follows: grey for carbon dioxide, yellow for foam, brown for gas other than CO_2, white for powder, green for water.
2.30		Portable foam applicator unit or relevant spare tank(s)	
2.31		Fire locker	Indicate the number of the fire locker at the right side of the symbol. The principal contents of each fire locker should be indicated in the legend.
2.32		Space or group of spaces protected by fire-extinguishing system	Indicate type of extinguishing media (**CO_2** for carbon dioxide, **F** for foam, **H** for gas other than CO_2 (type of gas to be indicated), **P** for powder, **W** for water, **S** for sprinkler or high pressure water extinguishing system) and capacity (kg for gas and powder, litres for water and foam) at the top of the symbol. Add suffix "L" for fixed local application fire fighting system. Media should be colour-coded in the symbol as follows: grey for carbon dioxide, yellow for foam, brown for gas other than CO_2, white for powder, green for water, orange for sprinkler or high pressure water extinguishing system.

No.	Graphical symbol	Reference	Comments on use
2.33		Water fog applicator	
2.34		Emergency source of electrical power (generator)	
2.35		Emergency source of electrical power (battery)	
2.36		Emergency switchboard	
2.37		Air compressor for breathing devices	
2.38		Control panel for fire detection and alarm system	
2.39		Push button/switch for general alarm	
2.40		Manually operated call point	The use of this symbol is optional at the discretion of the competent authority.

No.	Graphical symbol	Reference	Comments on use
2.41		Space or group of spaces monitored by smoke detector(s)	The space(s) should be identified.
2.42		Space or group of spaces monitored by heat detector(s)	The space(s) should be identified.
2.43		Space or group of spaces monitored by flame detector(s)	The space(s) should be identified.
2.44		Space monitored by gas detector(s)	

Graphical symbols for means of escape and escape-related devices

3.1		Primary escape route	
3.2		Secondary escape route	
3.3		Emergency escape breathing device (EEBD)	Indicate the quantity of the EEBDs stowed at the right side of the symbol.

ANNEX 7

RESOLUTION MSC.82(70)
(adopted on 11 December 1998)

AMENDMENTS TO RESOLUTION A.760(18) ON SYMBOLS RELATED TO LIFE-SAVING APPLIANCES AND ARRANGEMENTS

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution A.760(18) on Symbols related to life-saving appliances and arrangements, where the Assembly requests the Committee to keep the resolution under review and amend it as necessary,

RECOGNIZING that as new types of life-saving appliances, in particular marine evacuation systems, are developed it is desirable to identify them by means of an agreed symbol, to be displayed on the ship at the appropriate location in order to facilitate recognition of the appliance by passengers and crew,

HAVING CONSIDERED the recommendation made by the Sub-Committee on Ship Design and Equipment at its forty-first session,

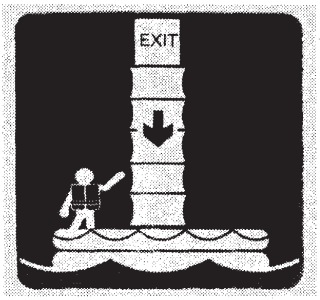
1. ADOPTS the Amendments to resolution A.760(18) on Symbols related to life-saving appliances and arrangements, as set out in the Annex to the present resolution;

2. URGES Governments to ensure that, when applying resolution A.760(18) in compliance with SOLAS regulation III/9, the symbol for an evacuation chute reproduced in the Annex is also taken into account, as appropriate.

ANNEX

AMENDMENTS TO RESOLUTION A.760(18) ON SYMBOLS RELATED TO LIFE-SAVING APPLIANCES AND ARRANGEMENTS

The following row is inserted in the Table "Recommended symbols indicating the location of emergency equipment and muster and embarkation stations" in Annex 2 to resolution A.760(18), after existing row number (reference) 6:

6 *bis*	EVACUATION CHUTE	

INTERNATIONAL MARITIME ORGANIZATION

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IMO

MSC/Circ.808
30 June 1997

Ref. T1/3.02

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MSC
+
DE

RECOMMENDATION ON PERFORMANCE STANDARDS FOR PUBLIC ADDRESS SYSTEMS ON PASSENGER SHIPS, INCLUDING CABLING

1 The Maritime Safety Committee, at its sixty-eighth session (28 May to 6 June 1997), noted that the 1995 SOLAS Conference, in adopting amendments to the 1974 SOLAS Convention concerning the safety of ro-ro passenger ships, adopted Conference resolution 7 - Development of requirements, guidelines and performance standards, whereby the Committee was requested to develop relevant requirements, guidelines and performance standards to assist in the implementation of the amendments adopted by the Conference.

2 The Committee, having considered recommendations made by the Sub-Committee on Ship Design and Equipment (DE), at its fortieth session, approved the Recommendation on performance standards for public address systems on passenger ships, including cabling, set out in the annex.

3 Member Governments are invited to bring the annexed Recommendation to the attention of those concerned and use the provisions contained therein, as appropriate, in conjunction with the relevant requirements of the 1974 SOLAS Convention, as amended.

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MSC/Circ.808

ANNEX

RECOMMENDATION ON PERFORMANCE STANDARDS FOR PUBLIC ADDRESS SYSTEMS ON PASSENGER SHIPS, INCLUDING CABLING

1 Application

These performance standards should apply to public address systems required by SOLAS regulation III/6.5.

2 Requirements for public address systems

2.1 The public address system should be one complete system consisting of a loudspeaker installation which enables simultaneous broadcast of messages from the navigation bridge, and at least one other location on board for use when the navigation bridge has been rendered unavailable due to the emergency, to all spaces where crew members or passengers, or both are normally present and to assembly stations (i.e. muster stations). The controls of the system on the navigation bridge should be capable of interrupting any broadcast on the system from any other location on board. It should not require any action by the addressee. It should also be possible to address crew accommodation and work spaces separately from passenger spaces.

2.2 In addition to any function provided for routine use aboard the ship, the system should have an emergency function control at each control station which:

.1 is clearly indicated as the emergency function;

.2 is protected against unauthorized use;

.3 automatically overrides any other input system or programme; and

.4 automatically overrides all volume controls and on/off controls so that the required volume for the emergency mode is achieved in all spaces.

2.3 The system should be installed with regard to acoustically marginal conditions, so that emergency announcements are clearly audible above ambient noise in all spaces where crew members or passengers or both are normally present and to assembly stations (i.e. muster stations). With the ship underway in normal conditions, the minimum sound pressure levels for broadcasting emergency announcements should be:

.1 in interior spaces 75 dB(A) and at least 20 dB(A) above the speech interference level; and

.2 in exterior spaces 80 dB(A) and at least 15 dB(A) above the speech interference level.

2.4 The system should be arranged to prevent feedback or other interference.

2.5 The system should be arranged to minimize the effect of a single failure, e.g. by the use of multiple amplifiers with segregated cable routes. The public address systems should have at least two loops of flame retardant cable which should be sufficiently separated throughout their length and have two separate and independent amplifiers.

2.6 Each loudspeaker should be individually protected against short circuits.

2.7 The public address system should be arranged to operate on the main source of electrical power, the emergency source of electrical power and transitional sources of electrical power as required by SOLAS chapter II-1.

2.8 The space containing a control unit of the public address system is a control station as defined in SOLAS chapter II-2.

3 Cabling for public address and alarm systems

3.1 Cables and wiring serving internal communications or signals should, as far as practicable, be routed clear of galleys, laundries, machinery spaces of category A and their casings and other high fire risk areas unless serving those spaces. Where practicable, all such cables should be run in such a manner so as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space. All areas of each fire zone should be served by at least two dedicated loops sufficiently separated throughout their length and supplied by independent amplifiers.

3.2 Equipment associated with the public address systems should meet the requirements for a vibration and electromagnetic interference in the current edition of publication 533 or publication 945 of IEC, as appropriate. Electrically powered systems should provide a minimum degree of ingress protection appropriate to the location, in accordance with IEC 92-101 standard.

3.3 Relevant sections of the Code on Alarms and Indicators should also be applied.

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MSC/Circ.810
30 June 1997

Ref. T1/3.02

RECOMMENDATION ON MEANS OF RESCUE ON RO-RO PASSENGER SHIPS

1 The Maritime Safety Committee, at its sixty-eighth session (28 May to 6 June 1997), noted that the 1995 SOLAS Conference, in adopting amendments to the 1974 SOLAS Convention concerning the safety of ro-ro passenger ships, also adopted a new SOLAS regulation III/24-1* on Life-saving appliances for ro-ro passenger ships, which, *inter alia*, included provisions for means of rescue, as specified in paragraph 4 of the said regulation.

2 The Committee, having considered a draft Recommendation on means of rescue on ro-ro passenger ships, prepared by the Sub-Committee on Ship Design and Equipment at its fortieth session, approved it, as set out in the annex.

3 Member Governments are invited to bring the annexed Recommendation to the attention of those concerned and use the provisions contained therein, as appropriate, in conjunction with the relevant requirements of SOLAS regulation III/24-1.4.

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* This regulation has been included as regulation 26.4 in new SOLAS chapter III adopted by resolution MSC.47(66), which is expected to enter into force on 1 July 1998.

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MSC/Circ.810

ANNEX

RECOMMENDATION ON MEANS OF RESCUE ON RO-RO PASSENGER SHIPS

1 Application

This recommendation should apply to means of rescue on ro-ro passenger ships required by SOLAS regulation III/24-1.4.*

2 Requirements for means of rescue

2.1 The means of rescue should provide for the safe transfer of persons, including helpless persons, from the water level to the deck of the ship.

2.2 The means of rescue should provide an area of at least 9 m^2 at water level to receive rescued persons.

2.3 The rescue area into which the means of rescue is launched should be adequately illuminated from the deck of the ship.

2.4 The means of rescue should be one of the following:

.1 A marine evacuation system complying with the requirements of paragraph 6.2** providing a suitable floating platform, with a ladder or other means to ascend to the deck for able-bodied persons, and a mechanically powered means to safely hoist persons lying down. If an inclined passage of a marine evacuation system is intended to provide the means of transfer from the platform to the deck of the ship for able-bodied persons, the inclined passage should be provided with suitable handholds or portable ladders with steps having an efficient non-slip surface.

.2 A device complying with the requirements for davit-launched liferafts in paragraphs 4.1.3.1, 4.1.4.1, 4.1.5.1.1, and in the case of an inflatable device, 4.2.2, 4.2.2.1, 4.2.2.3, 4.2.2.4, 4.2.7, 4.2.8.1, 4.2.8.2 (if fitted) and 4.2.9.1; or in the case of a rigid device, 4.3.1, 4.3.2, 4.3.6.2, 4.3.6.3, 4.3.6.4, 4.3.6.6, 4.3.6.9, 4.3.6.10 and 4.3.7, to provide a suitable floating platform. The device should be used with a launching appliance, meeting the requirements of 6.1 or equivalent, with a powered winch motor capable of raising the loaded device from the water to the deck of the ship with the total number of persons for which it is approved as a means of rescue at a rate of not less than 0.3 m/s. A safety device should be fitted to prevent over stressing the launching appliance. Additionally, the device should comply with the following:

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* This regulation has been included as regulation 26.4 in new SOLAS chapter III adopted by resolution MSC.47(66), which is expected to enter into force on 1 July 1998.

** Unless indicated otherwise, paragraphs referred to in this recommendation are those of the International Life-Saving Appliance (LSA) Code (resolution MSC.48(66)).

.2.1 the device should be of a highly visible colour, and should be protected against damage when moving against the ship's side;

.2.2 the occupants should be protected against injury caused by the launching appliance;

.2.3 two boarding ramps complying with 4.2.4.1 or 4.3.4.1 should be fitted;

.2.4 the maximum number of persons permitted on the device should be conspicuously marked;

.2.5 the floor should be self-draining;

.2.6 suitable means should be provided for bowsing in the device to the ship's side;

.2.7 one knife of a type described in 4.1.5.1.2 should be stowed in a pocket close to each bowsing line attachment patch;

.2.8 a special arrangement should be fitted to close the gap between the loaded device and the deck when the rescued persons board the ship;

.2.9 the device should be conspicuously marked to prevent confusion with liferafts;

.2.10 if inflatable, the inflation system should be quickly initiated by a manual control; and

.2.11 means should be provided for preventing occupants from falling from the device on impact with the ship's side.

.3 A means of rescue approved by the Administration in accordance with SOLAS regulation III/4.3.

3 Testing

3.1 It should be demonstrated that the means of rescue has the capability to receive and accommodate rescued persons out of the water at water level.

3.2 It should be demonstrated that the means of rescue has the capability to rapidly transfer persons from the water level to the deck of the ship.

3.3 It should be demonstrated that a means of rescue meeting the requirements of 2.4.2 above, is designed to the same structural requirements as a davit-launched liferaft of equivalent capacity and tested under section 5 of part 1 of the annex to resolution A.689(17).

3.4 The bowsing line system should be subjected to the test specified in 5.6 of part 1 of the annex to resolution A.689(17).

3.5 It should be demonstrated that the floor of the means of rescue is self-draining to minimize a build-up of water.

3.6 It should be demonstrated that the means of rescue is able to lift from the water to the deck of the ship a mass equal to the mass of the number of persons for which it is approved at 0.3 m/s.

3.7 A means of rescue meeting the requirements of 2.4.2 above, should be subjected to the tests specified in part 2 of the Annex to resolution A.689(17) for davit-launched liferafts and launching appliances.

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Ref. T4/4.03

MSC/Circ.850
8 June 1998

GUIDELINES FOR THE MAINTENANCE AND INSPECTION OF FIRE-PROTECTION SYSTEMS AND APPLIANCES

1 The Maritime Safety Committee, at its sixty-ninth session (11 to 20 May 1998), recognizing the importance of proper maintenance and inspection of fire-protection systems and appliances, approved Guidelines for the maintenance and inspection of fire-protection systems and appliances, as set out in the annex.

2 Member Governments are invited to bring the annexed Guidelines to the attention of shipowners, shipmasters, ships' officers and crew and all other parties concerned.

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MSC/Circ.850

ANNEX

GUIDELINES FOR THE MAINTENANCE AND INSPECTION OF FIRE-PROTECTION SYSTEMS AND APPLIANCES

1 Application

These Guidelines apply to all ships, however it does not contain an exhaustive list of maintenance items and should be used as a recommendation only.

2 Operational readiness

All fire protection systems and appliances should at all times be in good order and available for immediate use while the ship is in service. If a fire protection system is under repair, then suitable arrangements should be made to ensure safety is not diminished.

3 Maintenance and testing

Instructions for on-board maintenance, not necessarily by the ship's crew, and testing of active and passive fire protection systems and appliances should be easily understood, illustrated wherever possible, and, as appropriate, should include the following for each system or appliance:

.1 maintenance and repair instructions;

.2 schedule of periodic maintenance;

.3 list of replaceable parts; and

.4 log for records of inspections and maintenance, listing identified non-conformities and their targeted completion dates.

4 Weekly testing and inspections

Weekly inspections should be carried out to ensure that:

.1 all public address systems and general alarm systems are functioning properly; and

.2 breathing apparatus cylinders do not present leakages.

5 Monthly testing and inspections

Monthly inspections should be carried out to ensure that:

.1 all fireman's outfits, fire extinguishers, fire hydrants, hose and nozzles are in place, properly arranged, and are in proper condition;

.2 all fixed fire-fighting system stop valves are in the proper open or closed position, dry pipe sprinkler systems have appropriate pressures as indicated by gauges;

.3 sprinkler system pressure tanks have correct levels of water as indicated by glass gauges;

.4 all sprinkler system pumps automatically operate on reduction of pressure in the systems;

.5 all fire pumps are operated; and

.6 all fixed fire-extinguishing installation using extinguishing gas are free from leakage.

6 Quarterly testing and inspections

Quarterly inspections should be carried out to ensure that:

.1 all automatic alarms for the sprinkler systems are tested using the test valves for each section;

.2 the international shore connection is in proper condition;

.3 lockers providing storage for fire-fighting equipment contain proper inventory and equipment is in proper condition;

.4 all fire doors and fire dampers are tested for local operation; and

.5 all CO_2 bottle connections for cable operating system clips should be checked for tightness on fixed fire-extinguishing installations.

7 Annual testing and inspections

Annual inspections should be carried out to ensure that:

.1 all fire extinguishers are checked for proper location, charging pressure, and condition;

.2 fire detection systems are tested for proper operation, as appropriate;

.3 all fire doors and dampers are tested for remote operation;

.4 all foam-water and water-spray fixed fire-fighting systems are tested for operation;

.5 all accessible components of fixed fire-fighting systems are visually inspected for proper condition;

.6 all fire pumps, including sprinkler system pumps, are flow tested for proper pressures and flows;

.7 all hydrants are tested for operation;

.8 all antifreeze systems are tested for proper solutions;

.9 sprinkler system connections from the ship's fire main are tested for operation;

.10 all fire hoses are hydrostatically tested;

.11 breathing apparatus air recharging systems checked for air quality;

.12 control valves of fixed fire-fighting systems should be inspected; and

.13 air should be blown through the piping of extinguishing gas systems.

8 Five-year service

At least once every five years, the following inspections and tests should be carried out:

.1 hydrostatic testing for all SCBA's cylinders; and

.2 control valves of fixed fire-fighting systems should be internally inspected.

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Ref. T1/3.02

MSC/Circ.895
4 February 1999
Original: ENGLISH

RECOMMENDATION ON HELICOPTER LANDING AREAS ON RO-RO PASSENGER SHIPS

1 The Maritime Safety Committee, at its sixty-eighth session (28 May to 6 June 1997), noted that the 1995 SOLAS Conference, having adopted amendments to the 1974 SOLAS Convention concerning safety of ro-ro passenger ships, adopted Conference resolution 7 - Development of requirements, guidelines and performance standards, whereby the Committee was requested to develop relevant requirements, guidelines and performance standards to assist the implementation of the amendments adopted by the Conference.

2 The Committee, having considered recommendations made by the Sub-Committee on Ship Design and Equipment, at its fortieth session, and recommendations made by the Working Group on Formal Safety Assessment at MSC 70, approved the Recommendation on helicopter landing areas on ro-ro passenger ships, set out in the annex.

3 Member Governments are invited to bring the annexed recommendation to the attention of those concerned and use the provisions contained therein, as appropriate, in conjunction with the relevant requirements of the 1974 SOLAS Convention, as amended.

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ANNEX

RECOMMENDATION ON HELICOPTER LANDING AREAS ON RO-RO PASSENGER SHIPS

1.1 Application

This recommendation should apply to helicopter landing areas fitted on ro-ro passenger ships of 130 m in length and upwards, constructed on or after 1 July 1999, as required by SOLAS regulation III/28.2.

1.2 Definitions

1.2.1 "Helicopter landing area" means an area on a ship designed for emergency landing of helicopters.

1.2.2 "Diameter (d)" means the overall length of the helicopter with the rotors turning. The maximum value of "d" will depend on the type and size of the helicopter. This should be agreed by the Administration taking into account the particulars of the ship and its area of operation.

1.3 Positioning of landing area

1.3.1 Helicopter landing areas should be located on an upper deck. The landing areas should consist of an outer manoeuvring zone and a clear zone. It is important that, whenever possible, the clear zone should be close to the ship's side.

1.3.2 The first requirement is to identify a location where there is clear access to the operating area and the exit to the ship's side.

1.3.3 Once that location has been identified, the second requirement is to establish the best position within the area for the manoeuvring zone that will give the largest clear zone.

2.2 Details of landing area

2.2.1 Landing area at ship's side

Landing areas should be as large as possible and set out to provide safe access for helicopters from the ship's side. Due account must be taken of possible helicopter slippage and wind and ship movement. Where the boundary of the clear zone is close to or in line with the ship's side, and where the height of fixed obstructions so permits (see 2.2.7 below), helicopter safety will be improved by extending the clear and manoeuvring zones to the ship's side symmetrically, thereby widening the approach to the landing area (see figure 1). This extended landing area at the ship's side is therefore the preferred operating area.

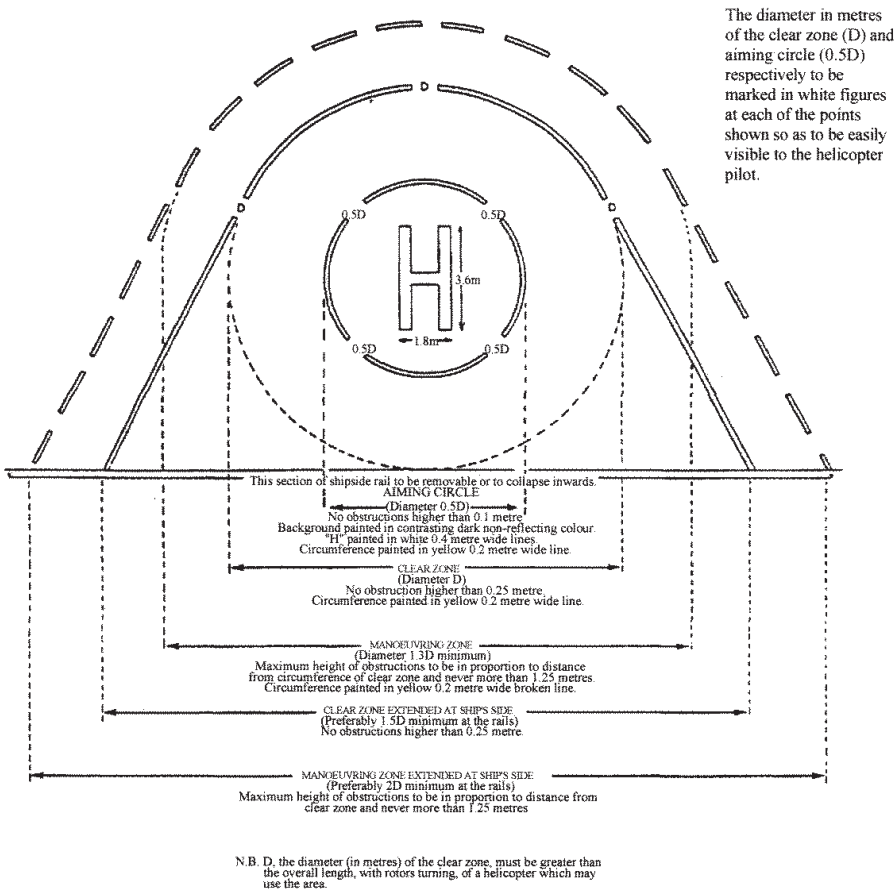
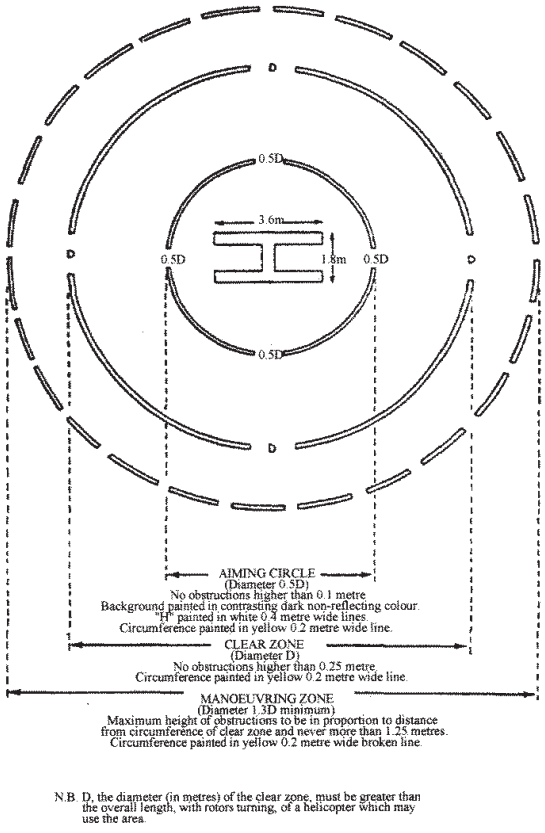


Figure 1: Landing area at the ship's side

2.2.2 **Landing area without unobstructed access from ship's side**

Where it is not possible to provide an operating area with clear access from the ship's side, the landing area should be set out as shown in figure 2 and, if practicable, placed on the ship's centreline.



The diameter in metres of the clear zone (D) and aiming circle (0.5D) respectively to be marked in white figures at each of the points shown so as to be easily visible to the helicopter pilot.

Figure 2: Landing area without unobstructed access from ship's side

2.2.3 **Dimensions of landing area**

In establishing a landing area, it is essential to ensure a safe correlation between:

.1 the dimensions of the aiming circle, clear zone and manoeuvring zone and the maximum permitted height of obstructions in these zones; and

.2 the sizes of helicopters expected to use the facility.

In particular, the clear zone of the landing area should be as large as practicable. Its diameter D should be not less than the overall length of a helicopter (with its rotors turning) (d) which may use it. Other dimensions of the landing area should be in proportion to the diameter of the clear zone, as illustrated in figures 1 and 2.

2.2.4 **Aiming circle (Touch down zone)**

2.2.4.1 The aiming circle is an area concentric to the centre of the clear zone and has a diameter half that of the clear zone itself. A circle of some 10 m diameter is required for the aiming circle of a landing area suitable for the larger helicopters in normal marine use. The circle should accommodate with safety the landing gear of helicopters for which it is intended and should therefore, if possible, be completely obstruction-free. If there are unavoidable obstructions, they should have rounded edges capable of being traversed without damaging the landing gear of a helicopter, and should be no higher than 0.1 m.

2.2.4.2 The aiming circle should be completely covered with a matt anti-slip surface painted in a dark non-reflecting colour which contrasts with the other deck surfaces. Its circumference should be marked with a yellow line 0.2 m wide, with the diameter in metres of the aiming circle clearly indicated in white figures at four points in the circumference line as shown in figures 1 and 2.

2.2.4.3 The letter 'H' should be painted at the centre of the aiming circle in 0.4 m wide white lines forming a letter of dimensions 3.6 x 1.8 m.

2.2.5 **Clear zone**

2.2.5.1 The diameter of the clear zone will depend upon the available landing area. The clear zone should however be as large as practicable recognizing that its diameter D must be greater than the overall length, with rotors turning, of a helicopter able to use the landing area (d). Where the landing area is at the ship's side safe helicopter access will be enhanced by widening, where possible, the boundaries of the obstacle-free clear zone at the ship's side to a dimension of at least 1.5D (see figure 1). The circumference of the clear zone should be marked by a yellow line of 0.2 m width, with the diameter D in metres indicated in white figures at points in the circumference line as shown in figures 1 and 2.

2.2.5.2 There should be no fixed obstructions in the clear zone higher than 0.25 m.

2.2.6 **Manoeuvring zone**

2.2.6.1 The manoeuvring zone of the landing area extends the area in which a helicopter may manoeuvre with safety by enlarging, to a diameter of at least 1.3D, the area over which the rotors of the helicopter may overhang without danger from high obstructions. When the landing area is at the ship's side, safe helicopter access will be enhanced by widening, where possible, the boundaries of the obstruction-free manoeuvring zone at the ship's side to a dimension of at least 2D (see figure 1).

2.2.6.2 If it is impossible to remove all obstructions from the manoeuvring zone, a graduated increase in the permitted height of obstructions, from 0.25 m at the circumference of the clear zone to a maximum of 1.25 m at the circumference of the manoeuvring zone, is acceptable. However, such height above 0.25 m should not exceed a ratio of one to two in relation to the horizontal distance of the obstruction from the edge of the clear zone (see figure 3). So, for example, an obstruction of 1 m in height (0.75 m more than the maximum obstruction height in the clear zone) should be at least 1.5 m outside the circumference of the clear zone. All obstructions in the manoeuvring zone should be clearly marked in contrasting colours.

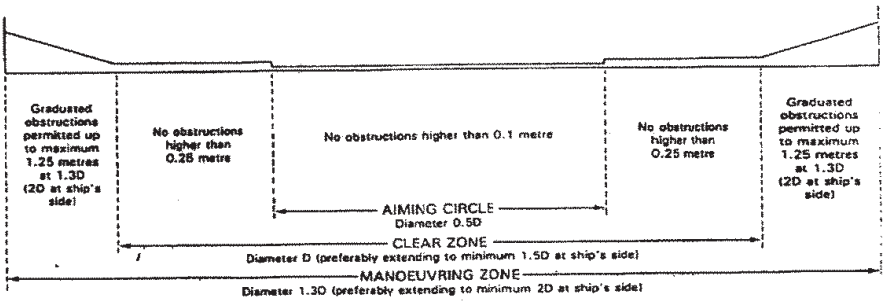


Figure 3: Landing area - permitted height of obstructions (elevation)

2.2.6.3 To assist the helicopter pilot in his positioning, the circumference of the manoeuvring zone should be indicated by a broken yellow line of 0.2 m width (see figures 1 and 2).

2.2.7 Use of landing areas for other purposes

It is considered that helicopter landing areas may be used for other purposes in normal circumstances. In the event of need, it should be possible to clear this area readily.

3 Night operations: Lighting

The following general remarks apply in all cases:

.1 lighting should be arranged so as to illuminate the operating area and should not be directed towards the helicopter; and

.2 a wind pennant or flag should be illuminated.

4 Fire-fighting appliances and rescue equipment

Where helicopters land or conduct winching operations on an occasional or emergency basis on ships with helicopter landing areas, equipment fitted in accordance with SOLAS chapter II-2 may be used. This equipment should be made readily available in close proximity to the landing or winching areas during helicopter operations, and should include the following:

.1 at least two dry powder extinguishers having a total capacity of not less than 45 Kg;

.2 carbon dioxide extinguishers of a total capacity of not less than 18 Kg or equivalent;

.3 a suitable foam application system consisting of monitors or foam making branch pipes capable of delivering foam to all parts of the helicopter landing area;

.4 at least two nozzles of an approved dual-purpose type (jet/spray) and hoses of sufficient length to reach any part of the helicopter landing area;

.5 two sets of fireman's outfits; and

.6 in addition, at least the following equipment:

.1 adjustable wrench;
.2 blanket (fire resistant);
.3 cutters, bolt 60 cm;
.4 hook, grab or salving;
.5 hacksaw, heavy duty complete with 6 spare blades;
.6 ladder;
.7 life line 5 mm diameter x 15 m in length;
.8 pliers, side cutting;
.9 set of assorted screwdrivers; and
.10 harness knife complete with sheath.

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Ref. T4/4.01

MSC/Circ.913
4 June 1999

GUIDELINES FOR THE APPROVAL OF FIXED WATER-BASED LOCAL APPLICATION FIRE-FIGHTING SYSTEMS FOR USE IN CATEGORY A MACHINERY SPACES

1 The Maritime Safety Committee, at its seventy-first session (19 to 28 May 1999), approved Guidelines for the approval of fixed water-based local application fire-fighting systems for use in category A machinery spaces, as set out in the annex.

2 Member Governments are requested to apply the annexed Guidelines when approving fixed water-based local application fire-fighting systems for use in category A machinery spaces.

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MSC/Circ.913

ANNEX

GUIDELINES FOR THE APPROVAL OF FIXED WATER-BASED LOCAL APPLICATION FIRE-FIGHTING SYSTEMS

1 General

Fixed water-based local application fire-fighting systems should provide localized fire suppression in areas, as specified in SOLAS regulation II-2/7.7 for category A machinery spaces, without the necessity of engine shut-down, personnel evacuation, shutting down of forced ventilation fans or the sealing of the space.

2 Definitions

2.1 **Fire suppression**: A reduction in heat output from the fire and control of the fire to restrict its spread from its seat and reduce the flame area.

2.2 **Water-based extinguishing medium**: Fresh water or sea water with or without additives mixed to enhance fire-extinguishing capability.

3 Principal requirements for the system

3.1 The system should be capable of manual release.

3.2 The activation of the fire-fighting system should not result in loss of electrical power or reduction of the manoeuvrability of the ship.

3.3 The system should be capable of fire suppression based on testing conducted in accordance with the appendix to these guidelines.

3.4 The system should be capable of fire suppression with forced ventilation fans running and supplying air to the protected area, or a method of automatically shutting air supply fans upon release of the system should be provided to ensure that the fire-fighting medium is not dispersed.

3.5 The system should be available for immediate use and capable of continuously supplying water-based medium for at least 20 minutes in order to suppress or extinguish the fire and to prepare for the discharge of the main fixed fire-extinguishing system within that period of time.

3.6 The system and its components should be suitably designed to withstand ambient temperature changes, vibration, humidity, shock, impact, clogging and corrosion normally encountered in machinery spaces. Components within the protected spaces should be designed to withstand the elevated temperatures which could occur during a fire. Components should be tested in accordance with the relevant sections of appendix A of MSC/Circ.668, as amended by MSC/Circ.728.

3.7 The system and its components should be designed and installed based on international standards acceptable to the Organization*, and manufactured and tested in accordance with the appropriate elements of the Appendix to these guidelines.

3.8 The location, type and characteristics of the nozzles should be within the limits tested, as referred to in paragraph 3.3. Nozzle positioning should take into account obstructions to the spray of the fire-fighting system.

3.9 The electrical components of the pressure source for the system should have a minimum rating of IP 54. Systems requiring an external power source need only be supplied by the main power source.

3.10 The piping system should be sized in accordance with a hydraulic calculation technique** to ensure availability of flows and pressures required for correct performance of the system.

3.11 The water supply for local application systems may be fed from the supply to a water-based main fire-fighting system providing that adequate water quantity and pressure are available to operate both systems for the required period of time. Local application systems may form a section(s) of a water-based main fire-extinguishing system provided that all requirements of SOLAS regulation II-2/10 and these guidelines, and MSC/Circ.668, as amended by MSC/Circ.728, are met, and the systems are capable of being isolated from the main system.

3.12 The capacity and design of the system should be based on the protected area demanding the greatest volume of water.

3.13 The operation controls should be located at easily accessible positions inside and outside the protected space. The controls inside the space should not be liable to be cut off by a fire in the protected areas.

3.14 Pressure source components of the system should be located outside of the protected areas.

3.15 A means for testing the operation of the system for assuring the required pressure and flow should be provided.

3.16 Where automatically operated fire-fighting systems are installed, a warning notice should be displayed outside each entry point stating the type of medium used and the possibility of automatic release.

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*Pending the development of international standards acceptable to the Organization national standards as prescribed by the Administration should be applied.

**Where the Hazen-Williams Method is used, the following values of the friction factor "C" for different pipe types which may be considered should apply:

Pipe type	C
Black or galvanised mild steel	100
Copper and copper alloys	150
Stainless steel 150	

3.17 Operating instructions for the system should be displayed at each operating position.

3.18 Spare parts and operating and maintenance instructions for the system should be provided as recommended by the manufacturer.

3.19 Nozzles and piping should not prevent access to engine or machinery for routine maintenance. In ships fitted with overhead hoists or other moving equipment, nozzles and piping should not be located to prevent operation of such equipment.

APPENDIX

TEST METHOD FOR FIXED WATER-BASED LOCAL APPLICATION FIRE-FIGHTING SYSTEMS

1 SCOPE

This test method is for evaluating the effectiveness of fixed water-based local application fire-fighting systems. The test method verifies the design criteria for vertical and horizontal grids of nozzles. The test method is intended to evaluate maximum nozzle spacing, minimum and maximum distance from the nozzle to the hazard, minimum nozzle flow rate in addition to minimum and maximum operating pressure.

2 SAMPLING

2.1 The nozzles and other system components should be supplied by the manufacturer with design and installation criteria, operating instructions, drawings, and technical data sufficient for the identification of the components.

2.2 The flow rate for each type and size of nozzle should be determined at the minimum and maximum nozzle operating pressure.

3 FIRE TESTS

3.1 Test principles

3.1.1. These tests are intended to evaluate the fire-extinguishing capabilities of individual nozzles and grids of nozzles used as local application fire-fighting systems on light diesel oil fuel spray fires.

3.1.2 The tests also define the following design and installation criteria:

.1 maximum spacing between nozzles;

.2 minimum and maximum distance between the nozzles and the protected hazard;

.3 the need for nozzles to be positioned outside of the protected hazard; and

.4 minimum and maximum operating pressure.

3.2 Test description

3.2.1 Test enclosure

3.2.1.1 The test enclosure, if any, should be sufficiently large and provided with adequate natural or forced ventilation during the fire test to ensure that the oxygen concentration at the fire location during the fire test remains above 20% (by vol) without activation of the local application fire-fighting system.

3.2.1.2 The test enclosure, if any, should be at least 100 m^2 in area. The height of the test enclosure should be at least 5 m.

3.2.2 Fire scenarios

3.2.2.1 The fire scenarios should consist of nominal 1 and 6 MW spray fires. These fires should be produced using light diesel oil as the fuel as described in Table 3.2.2.1.

Table 3.2.2.1
Spray fire parameters

Spray nozzle	Wide spray angle (120° to 125°) full cone type	Wide spray angle (80°) full cone type
Nominal oil pressure	8 Bar	8.5 Bar
Oil flow	0.16 ± 0.01 kg/s	0.03 ± 0.005 kg/s
Oil temperature	20 ± 5°C	20 ± 5°C
Nominal heat release rate	6 MW	1 MW

3.2.2.2 The fuel spray nozzles should be installed horizontally and directed toward the centre of the nozzle grid.

3.2.2.3 The fuel spray nozzle should be located 1 m above the floor and at least 4 m away from the walls of the enclosure, if any.

3.2.3 Installation requirements for tests

3.2.3.1 The local application system should consist of uniformly spaced nozzles directed vertically downward.

3.2.3.2 The system should consist of either a 2 x 2 or 3 x 3 nozzle grid, as required.

3.2.3.3 The nozzles should be installed at least 1 m below the ceiling of the enclosure, if any.

3.2.3.4 The maximum spacing of the nozzles should be in accordance with the manufacturers system design and installation manual.

3.3 Test programme

3.3.1 The fire-extinguishing capabilities of the system should be evaluated for the minimum and maximum separation distances (the distance between the nozzle grid and the fuel spray nozzle). These distances should be as defined in the manufacturers system design and installation manual.

3.3.2 Each separation distance should be evaluated against the two fire scenarios (1 and 6 MW spray fires). Tests should be conducted with the fuel spray nozzles horizontally positioned in the following locations:

.1 under one nozzle in the centre of the grid;

.2 between two nozzles in the centre of the grid;

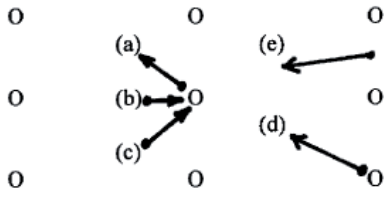
.3 between four nozzles;

.4 under one nozzle at the edge of the grid (corner); and

.5 between two nozzles at the edge of the grid.

These fire locations are shown in figure 3.3.2.

Figure 3.3.2
Fuel spray nozzle locations



O	Water nozzle locations
ö	Fuel spray nozzle location and direction
( )	Test designation

3.4 Test results and interpretation

3.4.1 The local application fire-fighting system is required to extinguish the test fires within 5 minutes from the start of water discharge. If the fire re-ignites after this five minute water discharge period the test is considered to be a failure.

3.4.2 The results of the tests should be interpreted as follows:

.1 Systems (utilizing a 3 x 3 nozzle grid) that extinguish fires referred to in 3.3.2.1 to 3.3.2.3 are considered to have successfully completed the protocol with the condition that the outer nozzles should be installed outside of the protected area a distance of at least 1/4 of the maximum nozzle spacing.

.2 Systems (utilizing either a 2 x 2 or 3 x 3 nozzle grid) that extinguish fires referred to in 3.3.2.3 to 3.3.2.5 are considered to have successfully completed the protocol and can be designed with the outer nozzles located at the edge of the protected area. This does not prohibit the location of the nozzles outside of the protected area.

.3 The requirements stated in either 3.4.2.1 or 3.4.2.2 should be met for both the minimum and maximum separation distances as well as the minimum and maximum operating pressures.

.4 For installations which may be adequately protected using individual nozzles or a single row of nozzles, the effective nozzle coverage (width and length) is defined as 1/2 the maximum nozzle spacing.

4 TEST PROCEDURE

4.1 Pre-burn time

Each fuel oil spray should be ignited and allowed to burn for no more than 15 seconds prior to system operation.

4.2 Measurements

4.2.1 Fuel oil spray system

4.2.1.1 The fuel oil flow rate and pressure in the fuel oil spray system should be verified prior to the test.

4.2.1.2 The fuel oil spray system pressure should be measured during the test.

4.2.2 Oxygen concentration at the fire location

Oxygen concentration should be measured at 100 mm below the fuel oil spray nozzle.

4.2.3 Water spray system pressure and flow rate

The system water pressure and flow rate should be measured using suitable equipment.

4.3 Operation of the fire-fighting system

4.3.1 The water spray system should be activated within the pre-burn time specified in section 4.1.

4.3.2 The water spray system should be operated for a minimum of one minute after fire extinguishment.

4.3.3 The fires should be extinguished within the 5 minutes of water application.

4.3.4 The fuel oil spray should be operated for at least 15 seconds after fire extinguishment.

4.4 Observations during the fire test

During the test, following observations should be recorded:

.1 start of the ignition procedure;

.2 start of the test (ignition);

.3 time when the extinguishing system is activated;

.4 time when the fire is extinguished;

.5 time when the extinguishing system is shut off;

.6 time of re-ignition;

.7 time when the fuel supply to the nozzle is stopped; and

.8 time when the test is terminated.

5 TEST REPORT

The test report should, as a minimum, include the following information:

.1 name and address of the test laboratory;

.2 date of issue and identification number of the test report;

.3 name and address of applicant;

.4 name and address of manufacturer or supplier of the product;

.5 test method and purpose;

.6 product identification;

.7 description of the tested product:

.1 assembly drawings;

.2 descriptions;

.3 assembly of included materials and components;

.4 specification of included materials and components;

.5 installation specification; and

.6 detailed drawings of the test set-up;

.8 date of tests;

.9 drawing of each fire test configuration;

.10 measured water spray nozzle flow characteristics;

.11 identification of the test equipment and used instruments;

.12 test results including observations and measurements made during and after the test:

.1 maximum nozzle spacing;

.2 minimum and maximum separation distances; and

.3 minimum and maximum operating pressures;

.13 deviations from the test method;

.14 conclusions; and

.15 date of the report and signature.

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MSC/Circ.1046
28 May 2002

GUIDELINES FOR THE ASSESSMENT OF THERMAL PROTECTION

1 The Maritime Safety Committee, at its seventy-fifth session (15 to 24 May 2002), recognizing the need for systematised guidelines for thermal protection of crews and passengers according to environmental factors and for appropriate performance standards for additional thermal protective equipment, approved Guidelines for the assessment of thermal protection, as set out in the annex.

2 Member Governments are invited to bring the annexed Guidelines to the attention of all parties concerned, as appropriate.

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MSC/Circ.1046

ANNEX

GUIDELINES FOR ASSESSMENT OF THERMAL PROTECTION

1 Introduction

In considering appropriate thermal protective equipment for use on ships operating in various climatic conditions, Administrations and ship operators should take into account all of the relevant risk factors, to include type of ship, type of survival craft, number of persons on board, environmental conditions in the operational area, and availability of SAR services. The purpose of these Guidelines is to provide information to assist in the assessment of the impact of environmental factors, and specifically water temperature on equipment selection. In the context of the medical threat of hypothermia, the IMO publication "A Pocket Guide to Cold Water Survival" should be referred.

2 THERMAL PROTECTIVE PERFORMANCE

In addition to the performance requirements specified in the International Life-Saving Appliance (LSA) Code, there are some data available which illustrate the performance of the equipment at different water temperatures. Thermal protective performance for the various types of equipment at these temperatures is defined as the time to reach a deep body temperature of 35°C or reduce a deep body temperature by 2°C, which is the point at which a significant degree of incapacitation is expected to occur. These data were obtained by a combination of theoretical and experimental methods. While based upon the best information available, they are provided for comparison purposes only. Individual results may vary greatly based on sea conditions, body type, etc.

Table 1: ***Thermal protective performance by type of personal life-saving appliances***

Thermal protective means. (Clothing is generally included)	**IMO minimum test requirements**		**Time (hrs) for core temperature drop of 2°C or to 35°C when exposed to water of temperature**			
	Time (h)	**Water temp. (°C)**	**0° C**	**5° C**	**10° C**	**20° C**
Lifejacket	-*	-	-	0.5 h	0.8 h	1.7 h
Thermal protective (TP) lifejacket	2 h	10	0.5 h	0.75 h	2 h	4 h
Anti-exposure suit	1 h	5	1.5 h	2 h	4 h	10 h
Immersion suit uninsulated	1 h	5	1.5 h	2 h	5 h	>12 h
Immersion suit insulated	6 h	2	6 h	>12 h	>12 h	>12 h

* No IMO requirements

3 Temperature range and geographical sectors

The sea areas subject to these temperatures vary greatly throughout the year and do not always uniformly follow specified latitudes. Table 2 illustrates the approximate variation of water temperature with latitude during the coldest months of the year in the northern and southern hemispheres. More exact information on seawater temperature can be found at www.nodc.noaa.gov/dsdt/oisst/index.html or appropriate local sources.

Table 2: ***Variation of seawater temperature with latitude***

Temperature range (^{o}C)	**Geographical sectors (degree latitude)**	
	(North)	**(South)**
Above 20	0-30	0-30
20 – 10	30-50	30-45
10 – 5	50-60	45-50
Below 5*	60-70	50-60

* All areas of icing conditions as defined in resolution A.749(18) - Code on Intact Stability, should be included in this range.

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MSC/Circ.1165
10 June 2005

REVISED GUIDELINES FOR THE APPROVAL OF EQUIVALENT WATER-BASED FIRE-EXTINGUISHING SYSTEMS FOR MACHINERY SPACES AND CARGO PUMP-ROOMS

1 The Maritime Safety Committee, at its sixty-fourth session (5 to 9 December 1994), recognizing the urgent necessity of providing guidelines for alternative arrangements for halon fire-extinguishing systems, approved Guidelines for the approval of equivalent water-based fire-extinguishing systems as referred to in SOLAS 74 for machinery spaces and cargo pump-rooms (MSC/Circ.668).

2 The Committee, at its sixty-sixth session (28 May to 6 June 1996), having considered a proposal by the fortieth session of the Sub-Committee on Fire Protection to revise the interim test method for equivalent water-based fire-extinguishing systems, contained in MSC/Circ.668, approved a revised test method for equivalent water-based fire-extinguishing systems for category A machinery spaces and cargo pump-rooms contained in MSC/Circ.668 (MSC/Circ.728).

3 The Sub-Committee on Fire Protection, at its forty-ninth session (24 to 28 January 2005), reviewed the Guidelines for the approval of equivalent water-based fire-extinguishing systems as referred to in SOLAS 74 for machinery spaces and cargo pump-rooms (annex to MSC/Circ.668, as amended by MSC/Circ.728) and made amendments to the test method for equivalent water-based fire-extinguishing systems for machinery spaces of category A and cargo pump-rooms, taking into account the latest technological progress made in this area.

4 The Committee, at its eightieth session (11 to 20 May 2005), after having considered the above proposal by the forty-ninth session of the Sub-Committee on Fire Protection, approved Revised Guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms, as set out in the annex.

5 Member Governments are invited to apply the annexed Guidelines when approving equivalent water-based fire-extinguishing systems for machinery spaces and pump-rooms and bring them to the attention of ship designers, ship owners, equipment manufacturers, test laboratories and other parties concerned.

6 Test approvals already conducted in accordance with guidelines contained in MSC/Circ.668, as amended by MSC/Circ.728, should remain valid until 5 years after the date of this circular.

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MSC/Circ.1165

ANNEX

REVISED GUIDELINES FOR THE APPROVAL OF EQUIVALENT WATER-BASED FIRE-EXTINGUISHING SYSTEMS FOR MACHINERY SPACES AND CARGO PUMP-ROOMS

General

1 Water-based fire-extinguishing systems for use in machinery spaces of category A and cargo pump-rooms equivalent to fire-extinguishing systems required by SOLAS regulation II-2/10 and chapter 5 of the FSS Code should prove that they have the same reliability which has been identified as significant for the performance of fixed pressure water-spraying systems approved under the requirements of SOLAS regulation II-2/10 and chapter 5 of the FSS Code. In addition, the system should be shown by test to have the capability of extinguishing a variety of fires that can occur in a ship's engine-room.

Definitions

2 *Antifreeze system* is a wet pipe system containing an antifreeze solution and connected to a water supply. The antifreeze solution is discharged, followed by water, immediately upon operation of nozzles.

3 *Bilge area* is the space between the solid engine-room floor plates and the bottom of the engine-room.

4 *Deluge system* is a system employing open nozzles attached to a piping system connected to a water supply through a valve that is opened by the operation of a detection system installed in the same areas as the nozzles or opened manually. When this valve opens, water flows into the piping system and discharges from all nozzles attached thereto.

5 *Dry Pipe system* is a system employing nozzles attached to a piping system containing air or nitrogen under pressure, the release of which (as from the opening of a nozzle) permits the water pressure to open a valve known as a dry pipe valve. The water then flows into the piping system and out of the opened nozzle.

6 *Fire extinction* is a reduction of the heat release from the fire and a total elimination of all flames and glowing parts by means of direct and sufficient application of extinguishing media.

7 *Preaction system* is a system employing automatic nozzles attached to a piping system containing air that mayor may not be under pressure, with a supplemental detection system installed in the same area as the nozzles. Actuation of the detection system opens a valve that permits water to flow into the piping system and to be discharged from any nozzles that may be open.

8 *Water-based extinguishing medium* is fresh water or seawater with or without additives mixed to enhance fire-extinguishing capability.

9 *Wet pipe system* is a system employing nozzles attached to a piping system containing water and connected to a water supply so that water discharges immediately from the nozzles upon system activation.

Principal requirements for the system

10 The system should be capable of manual release.

11 The system should be capable of fire extinction, and tested to the satisfaction of the Administration in accordance with appendix B to these Guidelines.

12 The system should be available for immediate use and capable of continuously supplying water for at least 30 min in order to prevent re-ignition or fire spread within that period of time. Systems which operate at a reduced discharge rate after the initial extinguishing period should have a second full fire-extinguishing capability available within a 5-minute period of initial activation.

13 The system and its components should be suitably designed to withstand ambient temperature changes, vibration, humidity, shock, impact, clogging and corrosion normally encountered in machinery spaces or cargo pump-rooms in ships. Components within the protected spaces should be designed to withstand the elevated temperatures which could occur during a fire.

14 The system and its components should be designed and installed in accordance with international standards acceptable to the Organization[1] and manufactured and tested to the satisfaction of the Administration in accordance with appropriate elements of appendices A and B to these guidelines.

15 The nozzle location, type of nozzle and nozzle characteristics should be within the limits tested to provide fire extinction as referred to in paragraph 10.

16 The electrical components of the pressure source for the system should have a minimum rating of IP 54. The system should be supplied by both main and emergency sources of power and should be provided with an automatic change-over switch. The emergency power supply should be provided from outside the protected machinery space.

17 The system should be provided with a redundant means of pumping. The capacity of the redundant means should be sufficient to compensate for the loss of any single supply pump. The system should be fitted with a permanent sea inlet and be capable of continuous operation using seawater.

18 The piping system should be sized in accordance with an hydraulic calculation technique.[2]

19 Systems capable of supplying water at the full discharge rate for 30 min may be grouped into separate sections within a protected space. The sectioning of the system within such spaces should be approved by the Administration in each case.

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[1] Pending the development of international standards acceptable to the Organization, national standards as prescribed by the Administration should be applied.

[2] Where the Hazen-Williams Method is used, the following values of the friction factor "C" for different pipe types which may be considered should apply:

Pipe type	**C**
Black or galvanized mild steel	100
Copper and copper alloys	150
Stainless steel	150

20 In all cases the capacity and design of the system should be based on the complete protection of the space demanding the greatest volume of water.

21 The system operation controls should be available at easily accessible positions outside the spaces to be protected and should not be liable to be cut off by a fire in the protected spaces.

22 Pressure source components of the system should be located outside the protected spaces.

23 A means for testing the operation of the system for assuring the required pressure and flow should be provided.

24 Activation of any water distribution valve should give a visual and audible alarm in the protected space and at a continuously manned central control station. An alarm in the central control station should indicate the specific valve activated.

25 Operating instructions for the system should be displayed at each operating position. The operating instructions should be in the official language of the flag State. If the language is neither English nor French, a translation into one of these languages should be included.

26 Spare parts and operating and maintenance instructions for the system should be provided, as recommended by the manufacturer.

27 Additives should not be used for the protection of normally occupied spaces unless they have been approved for fire protection service by an independent authority. The approval should consider possible adverse health effects to exposed personnel, including inhalation toxicity.

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MSC.1/Circ.1206/Rev.1
11 June 2009

MEASURES TO PREVENT ACCIDENTS WITH LIFEBOATS

1 The Maritime Safety Committee, at its eighty-first session (10 to 19 May 2006), recalled that at its seventy-fifth session (15 to 24 May 2002), it had considered the issue of the unacceptably high number of accidents with lifeboats in which crew were being injured, sometimes fatally, while participating in lifeboat drills and/or inspections, and noted that most accidents fell under the following categories:

.1 failure of on-load release mechanism;

.2 inadvertent operation of on-load release mechanism;

.3 inadequate maintenance of lifeboats, davits and launching equipment;

.4 communication failures;

.5 lack of familiarity with lifeboats, davits, equipment and associated controls;

.6 unsafe practices during lifeboat drills and inspections; and

.7 design faults other than on-load release mechanisms.

2 Pending further consideration of the problem, the Committee approved MSC/Circ.1049 on Accidents with lifeboats, to draw the attention of manufacturers, shipowners, crews and classification societies to the personal injury and loss of life that may follow inadequate attention to the design, construction, maintenance and operation of lifeboats, davits and associated equipment and urged all concerned to take necessary action to prevent further accidents with lifeboats. It invited Member Governments to:

.1 bring the circular to the attention of their maritime Administrations, relevant industry organizations, manufacturers, shipowners, crews and classification societies;

.2 take the necessary action to prevent further accidents with lifeboats pending the development of appropriate IMO guidance;

.3 ensure that:

.3.1 on-load release equipment used on ships flying their flag is in full compliance with the requirements of paragraphs 4.4.7.6.2.2 to 4.4.7.6.5 of the LSA Code;

.3.2 all appropriate documentation for the maintenance and adjustment of lifeboats, launching appliances and associated equipment is available on board;

.3.3 personnel undertaking inspections, maintenance and adjustment of lifeboats, launching appliances and associated equipment are fully trained and familiar with these duties;

.3.4 maintenance of lifeboats, launching appliances and associated equipment is carried out in accordance with approved established procedures;

.3.5 lifeboat drills are conducted in accordance with SOLAS regulation III/19.3.3 for the purpose of ensuring that ship's personnel will be able to safely embark and launch the lifeboats in an emergency;

.3.6 the principles of safety and health at work apply to drills as well;

.3.7 personnel undertaking maintenance and repair activities are appropriately qualified;

.3.8 hanging-off pennants should only be used for maintenance purposes and not during training exercises;

.3.9 all tests required for the design and approval of life-saving appliances are conducted rigorously, according to the Guidelines developed by the Organization, in order to identify and rectify any design faults at an early stage;

.3.10 the equipment is easily accessible for inspections and maintenance and is proven durable in harsh operational conditions, in addition to withstanding prototype tests; and

.3.11 the approving authorities or bodies pay close attention to proper workmanship and state-of-the-art possibilities when assessing equipment for approval; and

.4 encourage shipowners, when undertaking maintenance and repair activities, to employ qualified personnel, preferably certified by the manufacturer.

3 Member Governments were further invited, while enforcing the provisions of SOLAS regulation IX/4.3, to ensure that the above issues are addressed through the Safety Management System of the company, as appropriate.

4 The Committee further recalled that, at its seventy-seventh session (28 May to 6 June 2003), recognizing the experience gained since the approval of the Guidelines on inspection and maintenance of lifeboat on-load release gear (MSC/Circ.614) at its sixty-second session (24 to 28 May 1993), and that the implementation of expanded and improved guidelines could contribute towards a reduction of the incidence of accidents with lifeboats, it had approved the Guidelines for periodic servicing and maintenance of lifeboats, launching appliances and on-load release gear (MSC/Circ.1093), superseding MSC/Circ.614. Taking into account subsequent amendments to SOLAS chapter III and the LSA Code, and having considered proposals by the fiftieth session of the Sub-Committee on Fire Protection, the Committee approved amendments to the Guidelines, and further noted that the guidance developed for lifeboats could also apply to the periodic servicing and maintenance of liferafts, rescue boats and fast rescue boats and their launching appliances and on-load release gear.

5 The Committee further recalled that, at its seventy-ninth session (1 to 10 December 2004), it had endorsed the intention of the Sub-Committee on Ship Design and Equipment, in cooperation with the Sub-Committee on Standards of Training and Watchkeeping, to develop further IMO guidance as envisioned in MSC/Circ.1049 and, accordingly, approved the Guidance on safety during abandon ship drills using lifeboats (MSC/Circ.1136), as set out in annex 2. The Committee further recalled that the Guidance developed for lifeboats has relevance, in general, for emergency drills with other life-saving systems and should be taken into account when such drills are conducted. In connection with MSC/Circ.1136, and recognizing the need to provide a basic outline of essential steps to safely carry out simulated launching of free-fall lifeboats in accordance with SOLAS regulation III/19.3.3.4, and having considered proposals by the forty-seventh session of the Sub-Committee on Design and Equipment, the Committee further approved the Guidelines for simulated launching of free-fall lifeboats (MSC/Circ.1137), as set out in the appendix to annex 2.

6 Having considered the need to update several of the circulars discussed above, and having considered proposals by the fiftieth session of the Sub-Committee on Fire Protection to consolidate the numerous circulars on the subject of measures to prevent accidents with lifeboats in order to better serve the mariner, the Committee approved Guidelines for periodic servicing and maintenance of lifeboats, launching appliances and on-load release gear and Guidelines on safety during abandon ship drills using lifeboats, as set out in annexes 1 and 2, respectively, to MSC.1/Circ.1206.

7 The Maritime Safety Committee, at its eighty-sixth session (27 May to 5 June 2009), approved amendments to the aforementioned Guidelines (annexes 1 and 2 to MSC.1/Circ.1206) concerning inspection and maintenance of lifeboats, launching appliances and on-load release gear, following the recommendations made by the Sub-Committee on Ship Design and Equipment, at its fifty-second session. The revised Guidelines are set out in annexes 1 and 2 to this circular.

8 Member Governments are invited to give effect to the annexed Guidelines as soon as possible and to bring them to the attention of shipowners, ship operators, ship-vetting organizations, ship personnel, surveyors, manufacturers and all others concerned with the inspection and maintenance of lifeboats, liferafts, rescue boats and fast rescue boats and their launching appliances and on-load release gear.

9 This circular supersedes MSC/Circ.1049, MSC/Circ.1093, MSC/Circ.1136, MSC/Circ.1137 and MSC.1/Circ.1206.

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MSC.1/Circ.1206/Rev.1

ANNEX 1

GUIDELINES FOR PERIODIC SERVICING AND MAINTENANCE OF LIFEBOATS, LAUNCHING APPLIANCES AND ON-LOAD RELEASE GEAR

General

1 The objective of these Guidelines is to establish a uniform, safe and documented performance of periodic servicing and maintenance of lifeboats, launching appliances and on-load release gear.

2 These Guidelines relate to the application of the ISM Code to periodic servicing and maintenance of lifeboat arrangements and should therefore be reflected in procedures developed for a ship under that Code.

3 The general principle in these Guidelines may also be applied for the periodic servicing and maintenance of liferafts, rescue boats and fast rescue boats and their launching appliances and release gear.

4 Detailed guidance regarding some procedures covered by these Guidelines is provided in the appendix.

SOLAS regulations

5 These Guidelines relate to the requirements contained in:

.1 SOLAS regulation III/20 – Operational readiness, maintenance and inspections; and

.2 SOLAS regulation III/36 – Instructions for onboard maintenance.

Responsibility

6 The company* is responsible for servicing and maintenance on board its ships in accordance with SOLAS regulation III/20 and for the establishment and implementation of health, safety and environment (HSE) procedures covering all activities during servicing and maintenance.

7 The personnel carrying out servicing and maintenance are responsible for the performance of the work as authorized in accordance with the system specified in paragraph 10.

8 The above personnel are also responsible for complying with HSE instructions and procedures.

9 Service providers carrying out the thorough examination, operational testing, repair and overhaul of lifeboats, launching appliances and on-load release gear should be authorized in accordance with MSC.1/Circ.1277.

* For the purpose of these Guidelines, company is as defined in SOLAS regulation IX/1.2.

Certification

10 Where these Guidelines call for certification of servicing personnel, such certification should be issued in accordance with an established system for training and authorization in accordance with MSC.1/Circ.1277.

Qualification levels

11 Weekly and monthly inspections, and routine maintenance as specified in the equipment maintenance manual(s), should be conducted under the direct supervision of a senior ship's officer in accordance with the maintenance manual(s).

12 All other inspections, servicing and repair should be conducted by the manufacturer's representative or other person appropriately trained and certified for the work to be done in accordance with MSC.1/Circ.1277.

Reports and records

13 All reports and checklists should be correctly filled out and signed by the person who carries out the inspection and maintenance work and should also be signed by the company's representative or the ship's master.

14 Records of inspections, servicing, repairs and maintenance should be updated and filed on board the ship.

15 When repairs, thorough examinations and annual servicing are completed, a statement confirming that the lifeboat arrangements remain fit for purpose should be promptly issued by the service provider who performed the work.

* * *

APPENDIX

SPECIFIC PROCEDURES FOR MAINTENANCE AND SERVICING

1 GENERAL

1.1 Any inspection, servicing and repair should be carried out according to the maintenance manuals and associated technical documentation developed by the manufacturer or an alternative body authorized in accordance with MSC.1/Circ.1277.

1.2 A full set of maintenance manuals and associated technical documentation as specified in 1.1 should be available on board for use in all operations involved in the inspection, maintenance, adjustment and re-setting of the lifeboat and associated equipment, such as davits and release gear.

1.3 The maintenance manuals and associated technical documentation as specified in 1.1 should include the following items as a minimum and should be periodically reviewed and updated as necessary.

2 ANNUAL THOROUGH EXAMINATION

2.1 As items listed in checklists for the weekly/monthly inspections also form the first part of the annual thorough examination, when carrying out this examination the inspection of these items should be performed by the ship's crew in the presence of the manufacturer's representative or other person appropriately trained and certified for the work to be done in accordance with MSC.1/Circ.1277.

2.2 Inspection and maintenance records of inspections and routine maintenance carried out by the ship's crew and the applicable certificates for the launching appliances and equipment should be available.

Lifeboats

2.3 The following items should be examined and checked for satisfactory condition and operation:

.1 condition of lifeboat structure including fixed and loose equipment;

.2 engine and propulsion system;

.3 sprinkler system, where fitted;

.4 air supply system, where fitted;

.5 manoeuvring system;

.6 power supply system; and

.7 bailing system.

Release gear

2.4 The following should be examined for satisfactory condition and operation after the annual winch brake test with the empty boat, as required by 3.1:

.1 operation of devices for activation of release gear;

.2 excessive free play (tolerances);

.3 hydrostatic interlock system, where fitted;

.4 cables for control and release; and

.5 hook fastening.

Notes:

1 The setting and maintenance of release gear are critical operations with regard to maintaining the safe operation of the lifeboat and the safety of personnel in the lifeboat. All inspection and maintenance operations on this equipment should therefore be carried out with the utmost care.

2 No maintenance or adjustment of the release gear should be undertaken while the hooks are under load.

3 Hanging-off pennants may be used for this purpose but should not remain connected at other times, such as when the lifeboat is normally stowed and during training exercises.

4 The release gear is to be examined prior to its operational test. The release gear is to be re-examined after its operational test and the dynamic winch brake test. Special consideration should be given to ensure that no damage has occurred during the winch brake test, especially the hook fastening.

2.5 Operational test of on-load release function:

.1 position the lifeboat partially into the water such that the mass of the boat is substantially supported by the falls and the hydrostatic interlock system, where fitted, is not triggered;

.2 operate the on-load release gear;

.3 reset the on-load release gear; and

.4 examine the release gear and hook fastening to ensure that the hook is completely reset and no damage has occurred.

2.6 Operational test of off-load release function:

.1 position the lifeboat fully waterborne;

.2 operate the off-load release gear;

.3 reset the on-load release gear; and

.4 recover the lifeboat to the stowed position and prepare for operational readiness.

Note:

Prior to hoisting, check that the release gear is completely and properly reset. The final turning-in of the lifeboat should be done without any persons on board.

2.7 Operational test of free-fall lifeboat release function:

.1 engage the simulated launching arrangements as specified in the manufacturer's operating instructions;

.2 the operator should be properly seated and secured in the seat location from which the release mechanism is to be operated;

.3 operate the release mechanism to release the lifeboat;

.4 reset the lifeboat in the stowed configuration;

.5 repeat procedures referred to in .2 to .4 above, using the back-up release mechanism, when applicable;

.6 remove the simulated launching arrangements; and

.7 verify that the lifeboat is in the ready to launch stowed configuration.

Davit

2.8 The following items should be examined for satisfactory condition and operation:

.1 davit structure, in particular with regard to corrosion, misalignments, deformations and excessive free play;

.2 wires and sheaves, possible damages such as kinks and corrosion;

.3 lubrication of wires, sheaves and moving parts;

.4 functioning of limit switches;

.5 stored power systems; and

.6 hydraulic systems.

Winch

2.9 The following items should be examined for satisfactory condition and operation:

.1 open and inspect brake mechanism;

.2 replace brake pads, if necessary;

.3 remote control system;

.4 power supply system; and

.5 winch foundation.

3 DYNAMIC WINCH BRAKE TEST

3.1 Annual operational testing should preferably be done by lowering the empty boat. When the boat has reached its maximum lowering speed and before the boat enters the water, the brake should be abruptly applied.

3.2 The five-year operational test should be done by lowering the boat loaded to a proof load equal to 1.1 times the weight of the survival craft or rescue boat and its full complement of persons and equipment, or equivalent load. When the boat has reached its maximum lowering speed and before the boat enters the water, the brake should be abruptly applied.

3.3 Following these tests, the brake pads and stressed structural parts should be re-inspected.

Note:

In loading the boat for this test, precautions should be taken to ensure that the stability of the boat is not adversely affected by free surface effects or the raising of the centre of gravity.

4 OVERHAUL OF ON-LOAD RELEASE GEAR

Overhaul of on-load release gear includes:

.1 dismantling of hook release units;

.2 examination with regard to tolerances and design requirements;

.3 adjustment of release gear system after assembly;

.4 operational test as per above and with a load according to SOLAS regulation III/20.11.2.3; and

.5 examination of vital parts with regard to defects and cracks.

Note:

Non-destructive examination (NDE) techniques, such as dye penetrants (DPE), may be suitable.

MSC.1/Circ.1206/Rev.1

ANNEX 2

GUIDELINES ON SAFETY DURING ABANDON SHIP DRILLS USING LIFEBOATS

1 GENERAL

1.1 Introduction

1.1.1 It is essential that seafarers are familiar with the life-saving systems on board their ships and that they have confidence that the systems provided for their safety will work and will be effective in an emergency. Frequent periodic shipboard drills are necessary to achieve this.

1.1.2 Crew training is an important component of drills. As a supplement to initial shore-side training, onboard training will familiarize crew members with the ship systems and the associated procedures for use, operation and drills. On these occasions, the objective is to develop appropriate crew competencies, enabling effective and safe utilization of the equipment required by the 1974 SOLAS Convention. The time limits set out in SOLAS for ship abandonment should be considered as a secondary objective when conducting drills.

1.2 Drill frequency

Experience has shown that holding frequent drills furthers the goals of making the crew familiar with the life-saving systems on board their ships and increasing their confidence that the systems will work and will be effective in an emergency. Drills give the crew opportunity to gain experience in the use of the safety equipment and in cooperation. The ability to cope with an emergency and handle the situation, if the ship needs to be abandoned, needs to be well rehearsed. However, frequent crew changes sometimes make it difficult to assure that all on board have had the opportunity to participate in drills if only the minimum required drills are conducted. Therefore, consideration needs to be given to scheduling drills as necessary to ensure all on board have an early opportunity to become familiar with the systems on board.

1.3 Drills must be safe

1.3.1 Abandon ship drills should be planned, organized and performed so that the recognized risks are minimized and in accordance with relevant shipboard requirements of occupational safety and health.

1.3.2 Drills provide an opportunity to verify that the life-saving system is working and that all associated equipment is in place and in good working order, ready for use.

1.3.3 Before conducting drills, it should be checked that the lifeboat and its safety equipment have been maintained in accordance with the ship's maintenance manuals and any associated technical documentation, as well as noting all the precautionary measures necessary. Abnormal conditions of wear and tear or corrosion should be reported to the responsible officer immediately.

1.4 Emphasis on learning

Drills should be conducted with an emphasis on learning and be viewed as a learning experience, not just as a task to meet a regulatory requirement to conduct drills. Whether they are emergency drills required by SOLAS or additional special drills conducted to enhance the competence of the

crew members, they should be carried out at safe speed. During drills, care should be taken to ensure that everybody familiarizes themselves with their duties and with the equipment. If necessary, pauses should be made during the drills to explain especially difficult elements. The experience of the crew is an important factor in determining how fast a drill or certain drill elements should be carried out.

1.5 Planning and organizing drills

1.5.1 The 1974 SOLAS Convention requires that drills shall, as far as practicable, be conducted as if there was an actual emergency.* This means that the entire drill should, as far as possible, be carried out. The point is that, at the same time, it should be ensured that the drill can be carried out in such a way that it is safe in every respect. Consequently, elements of the drill that may involve unnecessary risks need special attention or may be excluded from the drill.

1.5.2 In preparing for a drill, those responsible should review the manufacturer's instruction manual to assure that a planned drill is conducted properly. Those responsible for the drill should assure that the crew is familiar with the guidance provided in the life-saving system instruction manual.

1.5.3 Lessons learned in the course of a drill should be documented and made a part of follow-up shipboard training discussions and planning the next drill session.

1.5.4 The lowering of a boat with its full complement of persons is an example of an element of a drill that may, depending on the circumstances, involve an unnecessary risk. Such drills should only be carried out if special precautions are observed.

2 ABANDON SHIP DRILLS

2.1 Introduction

It is important that the crew who operate safety equipment on board are familiar with the functioning and operation of such equipment. The 1974 SOLAS Convention requires that sufficiently detailed manufacturers' training manuals and instructions be carried on board, which should be easily understood by the crew. Such manufacturers' manuals and instructions should be accessible for everyone on board and observed and followed closely during drills.

2.2 Guidance to the shipowner

2.2.1 The shipowner should ensure that new safety equipment on board the company's ships has been approved and installed in accordance with the provisions of the 1974 SOLAS Convention and the International Life-Saving Appliances (LSA) Code.

2.2.2 Procedures for holding safe drills should be included in the Safety Management System (SMS) of the shipping companies. Detailed procedures for elements of drills that involve a special risk should be evident from workplace assessments adjusted to the relevant life-saving appliance.

* Refer to SOLAS regulation III/19.3.1.

2.2.3 Personnel carrying out maintenance and repair work on lifeboats should be qualified accordingly.*

2.3 Lifeboats lowered by means of falls

2.3.1 During drills, those responsible should be alert for potentially dangerous conditions and situations and should bring them to the attention of the responsible person for appropriate action. Feedback and improvement recommendations to the shipowner, the Administration and the system manufacturer are important elements of the marine safety system.

2.3.2 When performing drills with persons on board a lifeboat, it is recommended that the boat first be lowered and recovered without persons on board to ascertain that the arrangement functions correctly. In this case, the boat should then be lowered into the water with only the number of persons on board necessary to operate the boat.

2.3.3 To prevent lashings or gripes from getting entangled, proper release should be checked before swinging out the davit.

2.4 Free-fall lifeboats

2.4.1 The monthly drills with free-fall lifeboats should be carried out according to the manufacturer's instructions, so that the persons who are to enter the boat in an emergency are trained to embark the boat, to take their seats in a correct way and to use the safety belts; and also are instructed on how to act during launching into the sea.

2.4.2 When the lifeboat is free-fall launched as part of a drill, this should be carried out with the minimum personnel required to manoeuvre the boat in the water and to recover it. The recovery operation should be carried out with special attention, bearing in mind the high risk level of this operation. Where permitted by SOLAS, simulated launching should be carried out in accordance with the manufacturer's instructions, taking due note of the Guidelines for simulated launching of free-fall lifeboats at appendix.

* Refer to the Guidelines for periodic servicing and maintenance of lifeboats, launching appliances and on-load release gear (see annex 1).

APPENDIX

GUIDELINES FOR SIMULATED LAUNCHING OF FREE-FALL LIFEBOATS

1 Definition

Simulated launching is a means of training the crew in the free-fall release procedure of free-fall lifeboats and in verifying the satisfactory function of the free-fall release system without allowing the lifeboat to fall into the sea.

2 Purpose and scope

The purpose of these Guidelines is to provide a basic outline of essential steps to safely carry out simulated launching. These Guidelines are general; the lifeboat manufacturer's instruction manual should always be consulted before conducting simulated launching. Simulated launching should only be carried out with lifeboats and launching appliances designed to accommodate it, and for which the manufacturer has provided instructions. Simulated launching should be carried out under the supervision of a responsible person who should be an officer experienced in such procedures.

3 Typical simulated launching sequence

3.1 Check equipment and documentation to ensure that all components of the lifeboat and launching appliance are in good operational condition.

3.2 Ensure that the restraining device(s) provided by the manufacturer for simulated launching are installed and secure and that the free-fall release mechanism is fully and correctly engaged.

3.3 Establish and maintain good communication between the assigned operating crew and the responsible person.

3.4 Disengage lashings, gripes, etc., installed to secure the lifeboat for sea or for maintenance, except those required for simulated free-fall.

3.5 Participating crew board the lifeboat and fasten their seatbelts under the supervision of the responsible person.

3.6 All crew, except the assigned operating crew, disembark the lifeboat. The assigned operating crew fully prepares the lifeboat for free-fall launch and secures themselves in their seats for the release operation.

3.7 The assigned operating crew activates the release mechanism when instructed by the responsible person. Ensure that the release mechanism operates satisfactorily and, if applicable, the lifeboat travels down the ramp to the distance specified in the manufacturer's instructions.

3.8 Resecure the lifeboat to its stowed position, using the means provided by the manufacturer and ensure that the free-fall release mechanism is fully and correctly engaged.

3.9 Repeat procedures from 3.7 above, using the back-up release mechanism when applicable.

3.10 The assigned operating crew disembarks the lifeboat.

3.11 Ensure that the lifeboat is returned to its normal stowed condition. Remove any restraining and/or recovery devices used only for the simulated launch procedure.

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4 June 2008

GUIDELINES FOR THE APPROVAL OF FIXED WATER-BASED FIRE-FIGHTING SYSTEMS FOR RO-RO SPACES AND SPECIAL CATEGORY SPACES EQUIVALENT TO THAT REFERRED TO IN RESOLUTION A.123(V)

1 The Committee, at its eighty-fourth session (7 to 16 May 2008), having considered the proposal by the Sub-Committee on Fire Protection at its fifty-second session, approved the Guidelines for the approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces equivalent to that referred to in resolution A.123(V), as set out in the annex.

2 Member Governments are invited to apply the annexed Guidelines when approving fixed water-based fire-fighting systems for ro-ro spaces and special category spaces on or after 9 May 2008 and bring them to the attention of ship designers, shipowners, equipment manufacturers, test laboratories and other parties concerned.

3 This circular supersedes MSC/Circ.914.

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MSC.1/Circ.1272

ANNEX

GUIDELINES FOR THE APPROVAL OF FIXED WATER-BASED FIRE-FIGHTING SYSTEMS FOR RO-RO SPACES AND SPECIAL CATEGORY SPACES EQUIVALENT TO THAT REFERRED TO IN RESOLUTION A.123(V)

1 GENERAL

These Guidelines have been developed in recognition of reasonable and realistic performance-based requirements for fixed water-based fire-fighting systems for ro-ro spaces and special category spaces.

These Guidelines and the fire tests are intended for closed ro-ro spaces and special category spaces defined by SOLAS regulations II-2/3.12 and II-2/3.46, respectively. Deluge systems can be applied on open ro-ro spaces when the actual wind condition is taken into consideration. Systems using automatic sprinklers are only permitted for closed ro-ro and special category spaces or other spaces where wind conditions are not likely to affect system performance.

2 DEFINITIONS

2.1 *Area of operation* is a design area for wet-pipe, automatic sprinkler system (to be determined for each system by the test procedure described in the appendix to these Guidelines).

2.2 *Deluge system, automatic and manual release* is a system employing open nozzles attached to a piping system connected to a water supply through a valve that can be opened by signals from a fire detection system and by manual operation. When this valve is opened, water flows into the piping system and discharges from all nozzles attached thereto.

2.3 *Deluge system, manual release* is a system employing open nozzles attached to a piping system connected to a water supply through a valve that is opened by manual operation. When this valve is opened, water flows into the piping system and discharges from all nozzles attached thereto.

2.4 *Dry pipe system* is a system employing automatic sprinklers attached to a piping system containing air or nitrogen under pressure, the release of which (as from the opening of a sprinkler) permits the water pressure to open a valve known as a dry pipe valve. The water then flows into the piping system and out of the opened sprinklers.

2.5 *Fire control* limits the size of a fire by distribution of water so as to decrease the heat release rate, while controlling gas temperatures and pre-wetting adjacent combustibles and/or reducing heat radiation to avoid structural damage.

2.6 *Fire suppression* is the sharp reduction of the heat release rate of a fire and the prevention of regrowth.

2.7 *Preaction system* is a system employing automatic sprinklers attached to a piping system containing air that may or may not be under pressure, with a supplemental detection system installed in the same area as the nozzles or sprinklers. Actuation of the detection system opens a valve that permits water to flow into the piping system and to be discharged from any sprinklers that have operated.

2.8 *Water-based extinguishing medium* is fresh water or seawater with or without additives mixed to enhance fire-extinguishing capability.

2.9 *Wet pipe, automatic sprinkler system* is a system employing automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers opened by heat from a fire.

3 PRINCIPAL REQUIREMENTS

3.1 The system may be automatically activated, manually activated or automatically activated with manual release capabilities. Automatic activation should be approved by the Administration, taking into account the implications of such activations.

3.2 The system should be capable of fire suppression and control and be tested to the satisfaction of the Administration in accordance with the appendix to these Guidelines.

3.3 The capacity of the system water supply should be sufficient for the total simultaneous coverage of the hydraulically most demanding area defined by the minimum coverage area of table 3-1 and the vertically applicable area as defined in paragraph 3.5, and the requirements of paragraph 3.4 below.

Table 3-1

Type of system (Definition number)	Minimum coverage area
A. Wet pipe, automatic sprinkler heads (2.9)	280 m^2 or area of operation as defined in the fire tests – whichever is larger
B. Deluge system, automatic[1] and manual release (2.2)	280 m^2 (as per paragraph 3.6) and the overlapping or adjacent section as defined by paragraph 3.4 [2]
C. Deluge system, manual release (2.3)	2 sections each of min 20 m x w [2,3]
D. Other systems (2.4, 2.7)	Equivalent to the above systems and to the satisfaction of the Administration

Notes:

1 The automatic release should comply with the requirements of paragraphs 4.1 to 4.5.

2 The pump should be sized to cover the largest sections for type B systems and the two largest horizontally adjacent sections for type C systems.

3 Width of cargo space (measured as distance between tight steel divisions).

3.4 The section arrangement for a deluge system with automatic and manual release (system B) should be such that a fire in any location of the border zone between two or more sections would be completely surrounded by activated spray heads, either by activating more than one section or by overlapping sections (whereby two or more sections cover the same area in the vicinity of the border between sections). In case of overlapping sections, such overlap should be a minimum of two times the required spray head spacing of the section in question or five metres, whichever is larger. These overlapping sections need not comply with the minimum width and length requirements of paragraph 3.6 below.

3.5 Vertically the applicable area of all decks, including hoistable decks or other intermediate decks, between reasonably gas-tight steel decks (or equivalent materials), should be included for simultaneous coverage (example: with one hoistable deck, both the layer above and below this deck with a dimensioning area complying with table 3-1 should be included in the water supply calculations). Decks with ramps are accepted as reasonably gas-tight decks, assuming that the ramps are always in their closed position at sea and the ramps and the decks which these ramps are part of are reasonably gas-tight.

3.6 The system should be divided into sections, each with its own section valve. The length of a section (along the lanes) should not be less than 20 m and the width of the section should not be less than 14 m. Further, the sections need not be longer or wider than the distance between reasonably gas-tight steel bulkheads (or equivalent materials). The maximum size of a section on any single deck should be 48 m multiplied with width of cargo space (measured as distance between tight steel divisions). Vertically one section can cover up to three decks.

3.7 Each section should be capable of being isolated by one section control valve. The section control valves should be located outside the protected space, be readily accessible, independent of the protected spaces and their locations should be clearly and permanently indicated. It should be possible to manually open and close the section control valves either directly on the valve or via a control system routed outside the structural fire protection of the protected spaces. Means should be provided to prevent the operation of the section control valves by an unauthorized person.

3.8 The piping system should be sized in accordance with a hydraulic calculation technique such as the Hazen-Williams hydraulic calculation technique* and the Darcy-Weisbach hydraulic calculation technique, to ensure availability of flows and pressures required for correct performance of the system. The design of the system should ensure that full system pressure is available at the most remote nozzle in each section within 60 s of activation.

3.9 The system supply equipment should be located outside the protected spaces and all power supply components (including cables) should be installed outside of the protected space. The electrical components of the pressure source for the system should have a minimum rating of IP 54.

3.10 The system should be provided with a redundant means of pumping or otherwise supplying a water-based extinguishing medium to the system. The capacity of the redundant means should be sufficient to compensate for the loss of any single supply pump or alternative source. Failure of any one component in the power and control system should not result in a reduction of the automatic release capability or reduction of required pump capacity by more than 50% in case of automatic sprinklers and 100% in case of open head systems. However, systems requiring an external power source need only be supplied by the main power source. Hydraulic calculations should be conducted to assure that sufficient flow and pressure are delivered to the hydraulically most demanding section both in normal operation and in the event of the failure of any one component.

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* Where the Hazen-Williams Method is used, the following values of the friction factor *C* for different pipe types which may be considered should apply:

Pipe type	*C*
Black or galvanized mild steel	100
Copper and copper alloys	150
Stainless steel	150

3.11 The system should be fitted with a permanent sea inlet and be capable of continuous operation during a fire using seawater.

3.12 The system and its components should be designed to withstand ambient temperatures, vibration, humidity, shock, impact, clogging and corrosion normally encountered.

3.13 The system and its components should be designed and installed based on international standards acceptable to the Organization[*]. The nozzles should be manufactured and tested based on the relevant sections of appendix A to MSC/Circ.1165.

3.14 The nozzle location, type of nozzle and nozzle characteristics should be within the limits tested to provide fire suppression and control as referred to in paragraph 3.2. In addition, nozzles should be located to protect spaces above and below intermediate decks, hoistable decks and ramps. Nozzles below hoistable decks should be capable of protecting all applicable heights.

3.15 System designs should be limited to the use of the maximum and minimum temperature ratings of the thermally sensitive fire detection devices tested to provide fire suppression and control as referred to in paragraph 3.2.

3.16 Activation of the system should give a visual and audible alarm at a continuously manned station. The visual and audible alarms should be activated when for instance an automatic sprinkler operates or when a section valve is opened. The alarm in the continuously manned station should indicate the specific section of the system that is activated. The system alarm requirements described within this paragraph are in addition to, and not a substitute for, the detection and fire alarm system required by SOLAS regulation II-2/20.4.

3.17 A means for testing the automatic operation of the system and, in addition, assuring the required pressure and flow should be provided.

3.18 If the system is pre-primed with water containing a fire suppression enhancing additive and/or an antifreeze agent, periodic inspection and testing, as specified by the manufacturer, should be undertaken to assure that their effectiveness is being maintained. Fire suppression enhancing additives should be approved for fire protection service by an independent authority. The approval should consider possible adverse health effects to exposed personnel, including inhalation toxicity.

3.19 Wet pipe systems on board vessels that can operate in areas where temperatures below 0^{o}C can be expected, shall be protected from freezing either by having temperature control of the ro-ro space, heating coils on pipes, antifreeze agents or other equivalent measures.

3.20 Operating instructions for the system should be displayed at each operating position.

[*] Pending the development of International Standards acceptable to the Organization, national standards as prescribed by the Administration should be applied.

3.21 Installation plans and operating manuals should be supplied to the ship and be readily available on board. A list or plan should be displayed showing spaces covered and the location of the zone in respect of each section. Instructions for testing and maintenance should be available on board.

3.22 Spare parts and operating and maintenance instructions should be provided as recommended by the manufacturer. In the case of automatic sprinkler systems, the total number of spare sprinkler heads for each type of sprinklers should be 6 for the first 300, 12 for the first 1,000.

3.23 Where automatically operated fire-fighting systems are installed, a warning notice should be displayed outside each entry point stating the type of medium used and the possibility of automatic release.

3.24 All installation, operation and maintenance instruction/plans for the system should be in the working language of the ship. If the working language of the ship is not English, French, nor Spanish, a translation into one of these languages should be included.

4 DETAIL REQUIREMENTS – FIRE DETECTION AND FIRE CONFIRMATION (SYSTEM B)

4.1 For systems of type B (see table 3-1) an efficient fire detection and fire confirmation system covering all parts of the ro-ro or special category spaces should be provided.

4.2 The fire detection system should consist of flame detectors and smoke detectors of approved types. The flame detectors should be installed under fixed continuous decks according to the limitation and application defined by the maker and the approval certificate. The smoke detector arrangement shall comply with the International Code for Fire Safety Systems (FSS Code). Smoke detectors with a spacing not exceeding 11 m should be installed under hoistable ramps.

4.3 A colour TV monitoring system should cover all parts of the ro-ro or special category spaces. Cameras need not be installed below hoistable decks if the camera arrangement can identify smoke (confirm fire) based on positions under a fixed continuous deck.

4.4 The relevant section of the deluge system should be automatically released when two detectors covering this area activate. Systems being released when only one detector activates may also be accepted. The automatic release should not prevent manual operation (both opening and closing) of the section valves. The automatic release may be disconnected during on- and off-loading operations, provided that this function is automatically re-connected after a pre-set time being appropriate for the operations in questions.

4.5 All release controls for the deluge system, monitor(s) for the CCTV system and the control panel (or an indication panel) for the fire detection system should be available and grouped together in a continuously manned control station.

APPENDIX

TEST METHOD FOR FIXED WATER-BASED FIRE-FIGHTING SYSTEMS FOR RO-RO SPACES AND SPECIAL CATEGORY SPACES

1 SCOPE

1.1 This test method is intended for evaluating the effectiveness of fixed water-based fire-fighting systems installed in ro-ro spaces and special category spaces with deck heights up to and including 5 m and/or up to and including 2.5 m.

1.2 The test programme has two objectives:

.1 establishing nozzle location, nozzle characteristics, minimum water delivery rate and minimum water pressure for systems which will provide the required level of system response time, suppression and control; and

.2 establishing the minimum area of operation of the system for the purpose of determining hydraulic design requirements for wet pipe, dry pipe and preaction systems.

2 GENERAL REQUIREMENTS

2.1 Sampling

The nozzles and other components to be tested should be supplied by the manufacturer together with design and installation criteria, operational instructions, drawings and technical data sufficient for the identification of the components.

2.2 Tolerances

Unless otherwise stated, the following tolerances should apply:

.1 length: ± 2% of value;

.2 volume: ± 5% of value;

.3 pressure: ± 3% of value; and

.4 temperature: ± 2% of value.

2.3 Observations

The following observations should be made during and after each test:

.1 time of ignition;

.2 activation time of first nozzle;

.3 time when water flows out through first nozzle;

.4 time when water flow is shut off;

.5 time when the test is terminated; and

.6 total number of activated nozzles.

2.4 Test hall and environmental conditions

The test hall where the tests are conducted should have a minimum floor area of 300 m^2 and a ceiling height in excess of 8 m. The test hall may be equipped with a forced ventilation system, or be natural ventilated, in order to ensure that there is no restriction in air supply to the test fires. The test hall should have an ambient temperature of between 10 and 25°C at the start of each test.

2.5 Measurement equipment

Temperatures should be measured using plain K-type thermocouple wires not exceeding 0.5 mm in diameter. The thermocouple head should be protected against direct water impingement, e.g., by tin cans.

System water pressure should be measured by using suitable equipment. Total water flow rate should be determined by a direct measurement or indirectly by using the pressure data and k factor of the nozzles.

The measurements should be made continuously throughout the tests.

2.6 System operational conditions

The tests should simulate the conditions of an actual installed system regarding objectives such as time delays between the activation of the system and minimum system water pressure or water delivery. In addition, the use of a pre-primed fire suppression enhancing additive, if applicable, should be taken into account.

3 DETERMINATION OF FIRE SUPPRESSION AND CONTROL CAPABILITIES

3.1 Principle

These test procedures test the effectiveness of a water-based fire-fighting system against two different scenarios: a cargo fire in a simulated freight truck, and a passenger vehicle fire.

3.2 Fire source

3.2.1 The primary fire source for both scenarios consists of EUR standard wood pallets (ISO 6780:2003), stored inside with the moisture content of 14 ± 2%. Figure 3.2.1 shows details of a EUR pallet.

3.2.2 Plywood panels made of pine or spruce are used as targets. The panels should be approximately 12 mm thick. The ignition time of the panel should not be more than 35 s and the flame spread time at 350 mm position should not be more than 100 s as measured in accordance with resolution A.653(16).

3.2.3 For ignition, commercial heptane is to be applied.

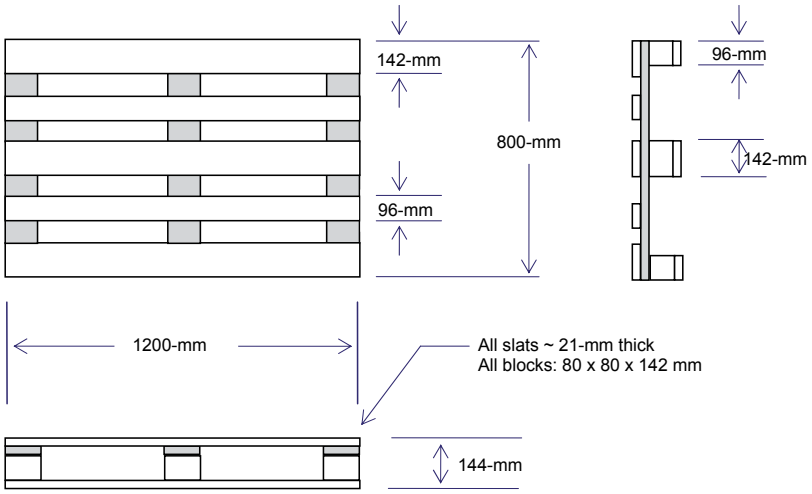

Figure 3.2.1 – Typical dimensions of the standard EUR pallet

3.3 Apparatus

3.3.1 ***Test area***

The tests should be conducted in a test hall as specified in paragraph 2.4 above, under a flat, smooth, non-combustible ceiling of at least 100 m^2. There should be at least a 1 m space between the perimeters of the ceiling and any wall of the test hall.

3.3.2 ***Fire scenario 1: cargo fire in a simulated freight truck*** (see figures 3.3.2.1 to 3.3.2.3)

3.3.2.1 The primary fuel package consists of 112 wood pallets arranged in an array of 2 (wide) x 7 (high) x 8 (long) and raised up on a level of 2.8 m so that the top level of the fuel package is at 3.8 to 3.9 m above the floor.

3.3.2.2 The support frame for the wood pallet array of paragraph 3.3.2.1 should be constructed using open steel racks. The wood pallet piles should be standing freely on horizontal steel beams without any solid bottoms.

3.3.2.3 The fuel pallet array should be half-shielded by a 4.5 m long, 2.6 m wide steel plate (thickness at least 2 mm) at 4 m height. The plate should be properly fixed so that during a test it does not bend to provide an unobstructed passage of water onto the fuel package.

3.3.2.4 Plywood panel targets (acting also as obstructions) of dimensions 3.6 m (wide) x 2.4 m (high) should be arranged symmetrically on both sides of the fuel package at 1 m distance so that the top edge is at the same level as the top level of the wood pallet array.

3.3.2.5 The fire should be ignited by two steel trays centrally located under the fuel package as shown in figures 3.3.2.1 to 3.3.2.3. The square trays are 25 cm high and 0.1 m^2 of free surface area. The trays should be filled with water and 1 *l* of heptane so that the free rim height above the liquid surface is 4 cm. The distance between the bottom of the wood pallet piles and liquid surface is 29 cm.

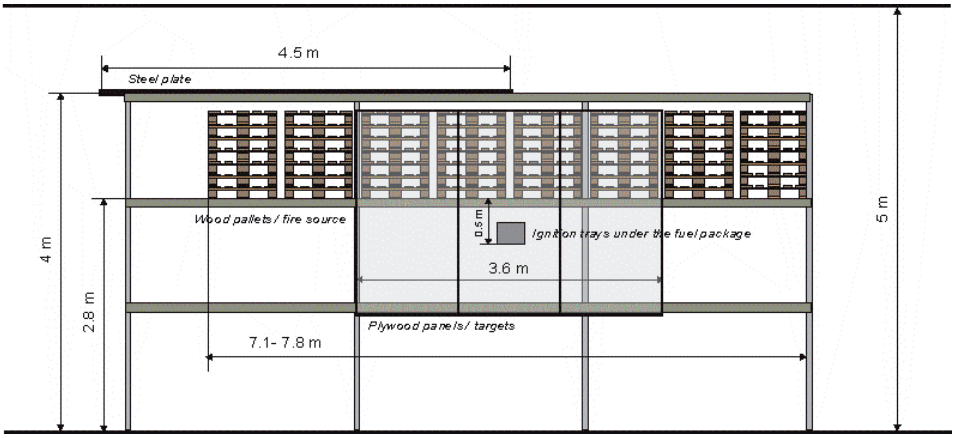

Figure 3.3.2.1 – Side view of the cargo fuel package in a simulated truck

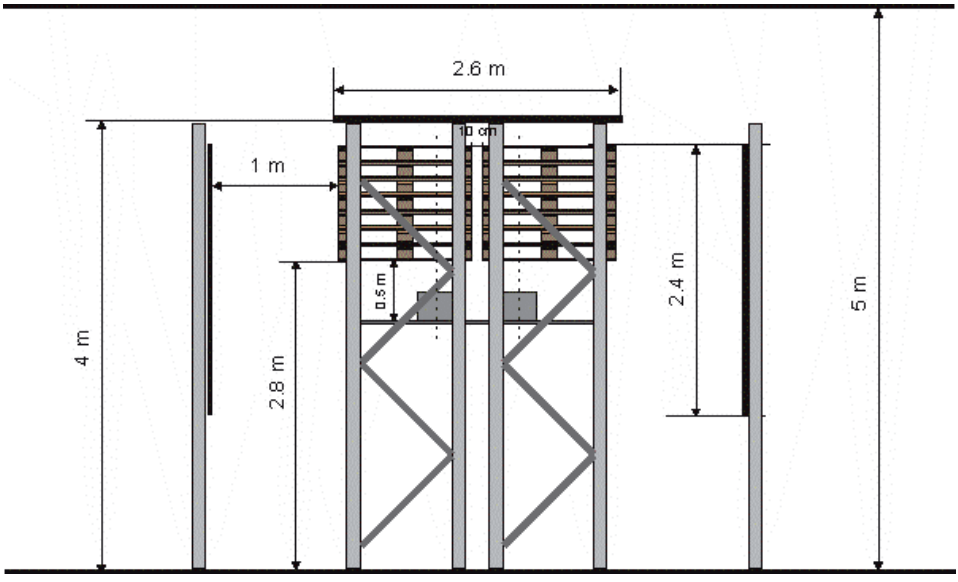

Figure 3.3.2.2 – End view of the cargo fuel package in a simulated truck

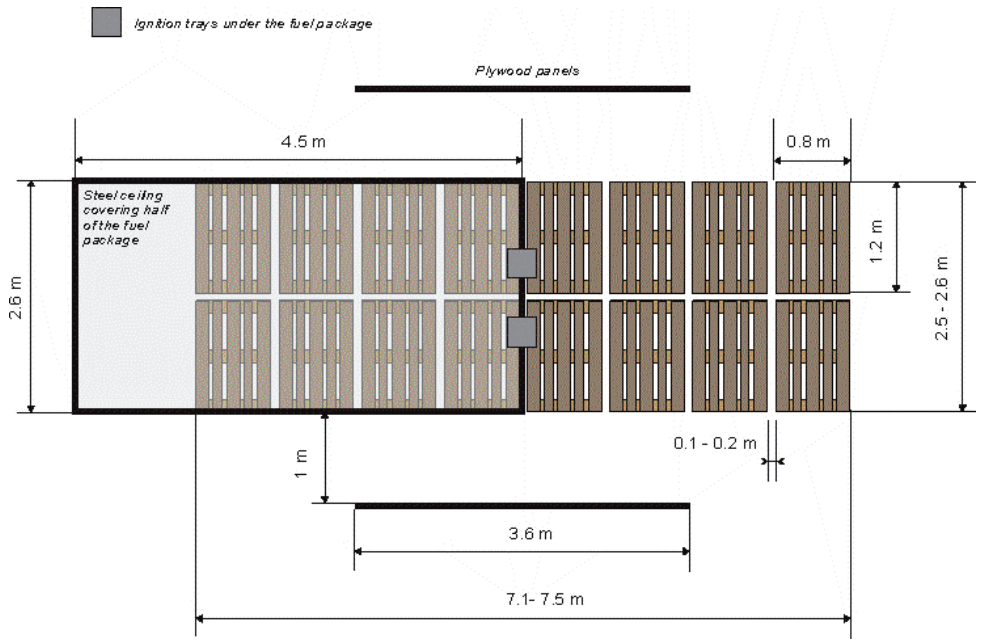

Figure 3.3.2.3 – Top view of the cargo fuel package in a simulated truck

3.3.3 ***Fire scenario 2: passenger vehicle fire*** (see figures 3.3.3.1 and 3.3.3.2)

3.3.3.1 The primary fuel package consists of 12 wood pallets arranged in an array of 1 pallet (wide) x 6 pallets (high) x 2 pallets (long) constructed inside a passenger vehicle mock-up.

3.3.3.2 The passenger vehicle mock-up is constructed of nominally 2 mm steel.

3.3.3.3 Plywood panel targets (acting also as obstructions) of dimensions 1.2 m (wide) x 1.75 m (high) should be arranged symmetrically on both sides of the mock-up at 0.6 m distance so that the top edge is at the same level as the top level of the mock-up car.

3.3.3.4 The fire should be ignited by a steel tray centrally located under the fuel package as shown in figures 3.3.3.1 and 3.3.3.2. The square tray is 10 cm high and 0.1 m^2 of free surface area. The tray should be filled with water and 1 *l* of heptane so that the free rim height above the liquid surface is 4 cm.

3.4 Nozzle positioning

Nozzles should be installed in an array at the ceiling level in accordance with the manufacturer's design and installation criteria. Tests should be repeated with three different relative locations between the nozzle array and the fuel package, i.e., centre of ignition under one nozzle, between two nozzles and between four nozzles, as shown in figure 3.4.1.

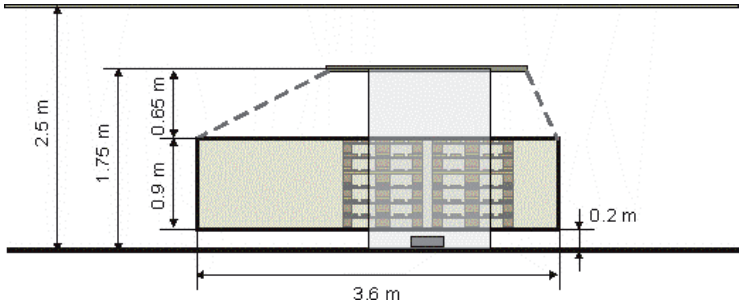

Figure 3.3.3.1 – Side view of the passenger vehicle fuel package
(The dashed lines visualize the shape of a car; the ceiling plate is to be fixed in its location as found most practical)

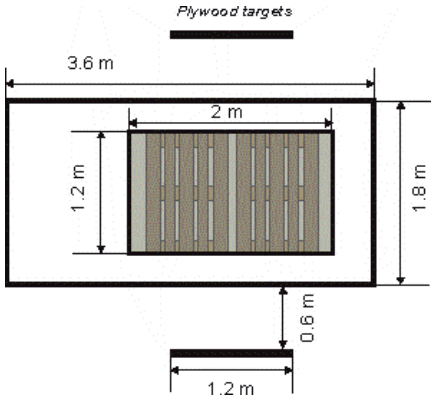

Figure 3.3.3.2 – Top view of the passenger vehicle fuel package

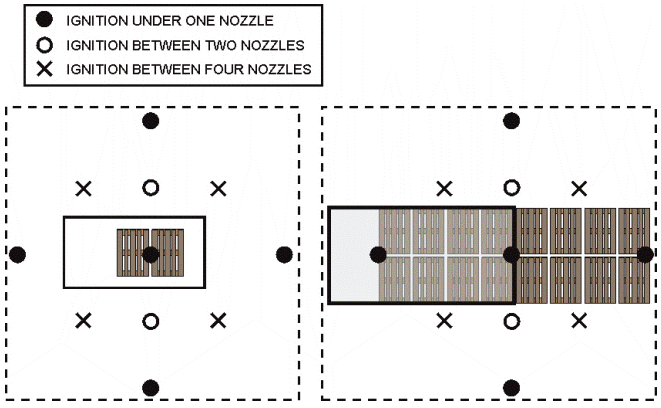

Figure 3.4.1 – Nozzle positioning in the two scenarios

3.5 Instrumentation

Instrumentation for the continuous measuring and recording of test conditions should be employed. At least the following measurements should be made:

.1 gas temperature at 7.5 cm below the ceiling at locations shown in figure 3.5.1;

.2 gas temperature at the targets to indicate ignition of targets as shown in figure 3.5.2; and

.3 system water pressure near the centre of the piping array.

System water flow rate should be defined with suitable means for the system.

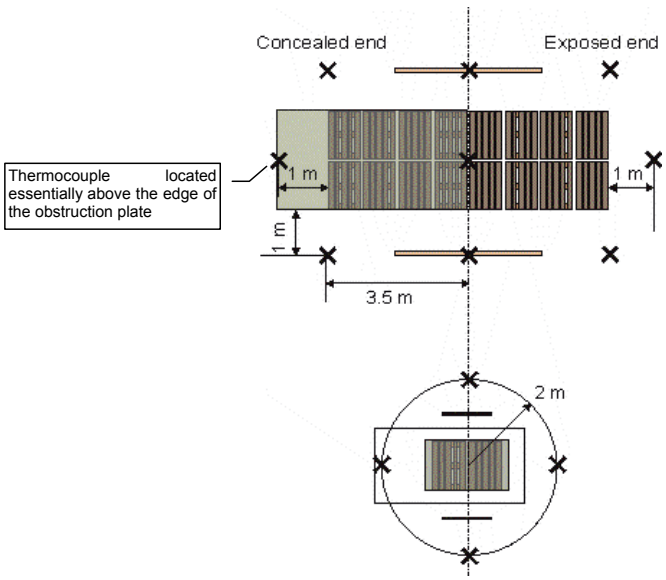

Figure 3.5.1 – Thermocouple locations in the two scenarios*

* For the truck fuel package the three locations at both ends are used for acceptance evaluation, the three locations at and around the centre of ignition are for safety purposes to define during the test whether the ceiling is at danger. For the passenger car fuel package all four locations are used for acceptance evaluation.

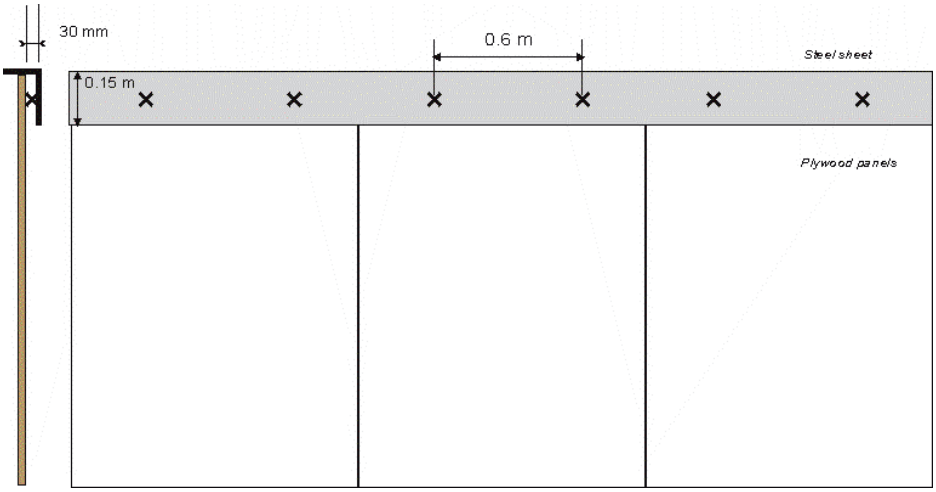

Figure 3.5.2 – Thermocouple locations at the plywood targets for determining ignition of targets*

3.6 Test programme and test procedure

3.6.1 *Test programme*

Tests should be conducted at the minimum system water pressure at the minimum distance between the lowest part of the nozzles and the ceiling, as specified by the manufacturer.

Three tests should be conducted at ceiling heights 5 m and/or 2.5 m, with different nozzle grid locations relative to the fuel package as specified in figure 3.4.1.

3.6.2 *Test procedure*

Prior to starting the test the moisture content of the fuel package should be measured at several locations along the full package with a probe-type moisture meter and the results should be reported.

The actual test procedure for all tests is as follows:

.1 the water pressure used at the start of the test should be set at the minimum value for the system specified by the manufacturer, flowing six open nozzles. If more than six nozzles operate during the test, the water supply pressure should be adjusted accordingly, to keep the required minimum system water pressure;

* A thin (about 1 mm) steel sheet is bent on top of the plywood panels as shown in the figure. Plain charring of panels is seen as a sharp edge between the black charring on the exposed surface and intact surface under the metal sheet. When ignited in flames charring is seen also under the sheet and verified by significant increase in the gas temperature under the metal sheet.

.2 the tray should be filled with 1 *l* litre of heptane on the water base as described in paragraph 3.3.2.5 or 3.3.3.4;

.3 the measurements are started;

.4 the flammable liquid pool fire/s should be lit by means of a torch or a match;

.5 the fire should be allowed to burn freely for a period of 2.5 min;*

.6 the test is continued for 30 min after system activation;

.7 any remaining fire should be manually extinguished; and

.8 the test is terminated.

3.7 Acceptance criteria

The principal acceptance criteria are based on the following factors:

.1 gas temperatures measured at locations not directly affected by impinging flames;

.2 damage to the fuel package; and/or

.3 ignition of targets.

Note 1: Damage to the fuel package is defined by the fraction of charring of the full package. The damage to each individual wood pallet should be evaluated separately and the total fraction calculated based on the detailed results. Totally black, i.e., totally charred pallet is denoted as 100% damage of the pallet (even though the pallet may have maintained its shape) and totally intact pallet is denoted as 0% damage. Partially charred pallets should be visually evaluated. Proper and adequate photographs of the damaged fuel package should be included in the test report.

Note 2: Ignition of targets is defined by the method described in figure 3.5.2, if the visibility during the test is such that it cannot be visually observed.

3.7.1 ***Fire scenario 1: cargo fire in a simulated freight truck (ceiling height 5 m)***

The following four criteria should be met:

.1 after system activation the maximum five minute average at any of the three measurement locations at the exposed end of the fuel package should not exceed 300°C;

* If automatic sprinklers activate already during the 2.5 min pre-burn period, feeding water to the system should be delayed till after the 2.5 min.

.2 after system activation the maximum five minute average at any of the three measurement locations at the concealed end of the fuel package should not exceed 350°C;

.3 total damage to the wood pallet array should not exceed 45% as defined after the test; and

.4 the plywood targets should not ignite during the test.

3.7.2 ***Fire scenario 2: passenger vehicle fire***

The following two criteria should be met:

.1 after system activation the maximum five minute average at any of the four measurement locations should not exceed 350°C; and

.2 the plywood targets should not ignite during the test.

4 DETERMINATION OF AREA OF OPERATION

Both fire scenarios include hidden fires that burn intensely throughout the tests. The suppression tests as defined in paragraph 3.6.1 can be applied in establishing the area of operation of wet pipe, dry pipe and pre-action systems. The evaluation is based on the test with the largest number of nozzles activating.

The ceiling area of 100 m^2 as defined in paragraph 3.3.1 most likely is not sufficient for defining the area of operation. The ceiling should be large enough to allow installation of a sufficient number of nozzles so that it is unambiguous that the nozzles activating truly represent the maximum number of active nozzles.

The area of operation is determined by multiplying the largest number of nozzles activating in the tests by two and defining the corresponding coverage area.

5 TEST REPORT

The test report should, as a minimum, include the following information:

.1 name and address of the test laboratory;

.2 date of issue and identification number of the test report;

.3 name and address of applicant;

.4 name and address of manufacturer or supplier of the nozzles;

.5 test method and purpose;

.6 nozzle identification;

.7 description of the tested nozzles and system performance;

.8 detailed description of the test set-up including drawings and photos of the fuel package and targets before and after the tests;

.9 date of tests;

.10 measured nozzle pressure and flow characteristics;

.11 identification of the test equipment and used instruments;

.12 test results including observations and measurements made during and after the test;

.13 deviations from the test method;

.14 conclusions; and

.15 date of the report and signature.

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