澳門特別行政區

行政長官辦公室

第 36/2015 號行政長官公告

中華人民共和國於一九九九年十二月十三日以照會通知聯合國秘書長，經修訂的《1974年國際海上人命安全公約》自一九九九年十二月二十日起適用於澳門特別行政區；

國際海事組織海上安全委員會於二零一二年五月二十五日透過第MSC.327（90）號決議通過了《國際消防安全系統規則》修正案，該修正案自二零一四年一月一日起適用於澳門特別行政區；

基於此，行政長官根據澳門特別行政區第3/1999號法律第六條第一款的規定，命令公佈包含上指修正案的第MSC.327（90）號決議的中文及英文文本。

二零一五年三月五日發佈。

代理行政長官　陳海帆

REGIÃO ADMINISTRATIVA ESPECIAL DE MACAU

GABINETE DO CHEFE DO EXECUTIVO

Aviso do Chefe do Executivo n.º 36/2015

Considerando que a República Popular da China, por nota datada de 13 de Dezembro de 1999, notificou o Secretário-Geral das Nações Unidas sobre a aplicação da Convenção Internacional para a Salvaguarda da Vida Humana no Mar de 1974, tal como emendada, na Região Administrativa Especial de Macau a partir de 20 de Dezembro de 1999;

Considerando igualmente que, em 25 de Maio de 2012, o Comité de Segurança Marítima da Organização Marítima Internacional, através da resolução MSC.327(90), adoptou emendas ao Código Internacional dos Sistemas de Segurança Contra Incêndios, e que tais emendas são aplicáveis na Região Administrativa Especial de Macau desde 1 de Janeiro de 2014;

O Chefe do Executivo manda publicar, nos termos do n.º 1 do artigo 6.º da Lei n.º 3/1999 da Região Administrativa Especial de Macau, a resolução MSC.327(90), que contém as referidas emendas, nos seus textos em línguas chinesa e inglesa.

Promulgado em 5 de Março de 2015.

A Chefe do Executivo, interina, *Chan Hoi Fan*.

第MSC.327（90）號決議

（2012年5月25日通過）

《國際消防安全系統規則》修正案

海上安全委員會，

憶及《國際海事組織公約》關於本委員會職能的第28（二）條，

注意到本委員會以第MSC.98（73）號決議通過的《國際消防安全系統規則》（以下稱《消防系統規則》），根據《1974年國際海上人命安全公約》（以下簡稱“本公約”）第II-2章已成為強制性文件，

還注意到本公約關於《消防系統規則》修正程序的第VIII（b）條和第II-2/3.22條，

在其第90屆會議上**審議了**按照本公約第VIII（b）（i）條提出和散發的《消防系統規則》修正案，

1. 按照本公約第VIII（b）（iv）條，**通過**《國際消防安全系統規則》修正案，其文本載於本決議附件；

2. 按照本公約第VIII（b）（vi）（2）（bb）條，**決定**該修正案將於2013年7月1日被視為已獲接受，除非在此日期之前，有三分之一以上的本公約締約國政府或擁有商船合計噸位數不少於世界商船總噸數50%的締約國政府通知其反對該修正案；

3. **提請**本公約各締約國政府注意，按照本公約第VIII（b）（vii）（2）條，該修正案在按上述第2段獲接受後，將於2014年1月1日生效；

4. **要求**秘書長按照本公約第VIII（b）（v）條，將本決議及其附件中修正案文本的核證無誤副本分發給所有本公約締約國政府；

5. **進一步要求**秘書長將本決議及其附件的副本分發給非本公約締約國的本組織成員。

附件

《國際消防安全系統規則》修正案

第6章

固定式泡沫滅火系統

5 本章現有文本由下文替代：

“1 適用範圍

本章詳細規定了按照本公約第II-2/10.4.1.1.2條用於保護機器處所、按照第II-2/10.7.1.1條用於保護貨物處所、按照第II-2/10.9.1.2條用於保護貨泵艙和按照第II-2/20.6.1.3條用於保護車輛、特種和滾裝處所的固定式泡沫滅火系統的技術要求。除非主管機關基於對含乙醇燃料和抗乙醇泡沫的附加試驗，對該系統的使用予以特別接受，否則本章不適用於本公約第II-2/1.6.2條中所述載運液體貨物的化學品船的貨泵艙。除另有明文規定外，本章要求應適用於2014年1月1日或以後建造的船舶。

2 定義

2.1 *設計填充率*係指至少為認可試驗期間所使用的最小額定填充率。

2.2 *泡沫*係指當泡沫混合液通過泡沫發生器並和空氣混合時產生的滅火介質。

2.3 *泡沫溶液*係指泡沫濃縮液和水的溶液。

2.4 *泡沫濃縮液*係指以適當濃度與水混合時形成泡沫溶液的液體。

2.5 *泡沫輸送管*係指將高倍泡沫從設於被保護處所外的泡沫發生器注入被保護處所的供應管道。

2.6 *泡沫混合比*係指泡沫濃縮液在與水混合形成的泡沫溶液中所佔的比例。

2.7 *泡沫發生器*係指將高倍泡沫溶液通過發泡形成泡沫排放到被保護處所的排放裝置或組件。使用內部空氣的泡沫發生器通常由一個噴嘴或一套噴嘴和一個外殼組成。外殼典型地由穿孔鋼/不鏽鋼板製成盒子的形狀以圍蔽噴嘴。使用外部空氣的泡沫發生器一般由圍蔽在外殼中的向網噴射的噴嘴組成。還設有電動、液動或氣動的風扇使泡沫溶液發泡。

2.8 *高倍泡沫滅火系統*係指使用內部或外部空氣使泡沫溶液發泡的固定式全淹沒滅火系統。高倍泡沫滅火系統由按照第3.1.3段中規定的滅火試驗所認可的泡沫發生器和專用泡沫濃縮液組成。

2.9 *內部空氣發泡系統*係指泡沫發生器位於被保護處所內並利用該處所內空氣發泡的固定式高倍泡沫系統。

2.10 *額定流率*係指泡沫溶液的流率，以*l*/min表示。

2.11 *額定供給速率*係指單位面積的額定流率，以*l*/min/m^2表示。

2.12 *額定泡沫膨脹比*係指在無火條件下且環境溫度例如約為20℃左右時泡沫體積與形成泡沫的泡沫溶液體積之比。

2.13 *額定泡沫產生量*係指每個單位時間產生的泡沫體積，即額定流率乘以額定泡沫膨脹比，以m^3/min表示。

2.14 *額定填充率*係指額定泡沫產生量與面積之比，即以m^2/min表示。

2.15 *額定填充時間*係指被保護處所的高度與額定填充率之比，即以分鐘表示。

2.16 *外部空氣發泡系統*係指泡沫發生器安裝在被保護處所外直接獲取新鮮空氣的固定式高倍泡沫系統。

3 固定式高倍泡沫滅火系統

3.1 主要性能

3.1.1 該系統須能夠手動釋放，並須設計成在1分鐘之內能夠開始以規定的泡沫供給速率產生泡沫。除非採取適當的操作措施或聯鎖設置以防止本公約第II-2/10.5.6條所要求的任何局部使用系統影響該系統的有效性，否則不得允許該系統自動釋放。

3.1.2 泡沫濃縮液須經主管機關根據本組織制定的導則認可。同一個高倍泡沫系統裏不應混合不同類型的泡沫濃縮液。

3.1.3 該系統的滅火能力、製造和試驗須根據本組織制定的導則使主管機關滿意。

3.1.4 該系統及其部件須設計適當，能夠承受船上通常會遇到的環境溫度變化、振動、潮濕、衝擊、堵塞和腐蝕。被保護處所內的管路、附件和相關部件（墊圈除外）須設計成能承受925℃的溫度。

3.1.5 與泡沫濃縮液接觸的系統管路、泡沫濃縮液存儲櫃、部件和管路附件須能與泡沫濃縮液相兼容，並由諸如不鏽鋼或等效的耐腐蝕材料製成。其他系統管路和泡沫發生器須為全鍍鋅鋼或等效材料。分配管道須有自排乾能力。

3.1.6 須通過泡沫比例混合器進口（水和泡沫濃縮液）和出口處的壓力錶提供測試系統運行和確保所需壓力和流量的手段。在泡沫比例混合器的下游分配管路上須安裝一個試驗閥，及反映該系統計算壓降的測試孔。管路的所有部分須設有供沖洗、排空和通入空氣進行淨化的接頭。所有噴嘴須能拆下檢查以證明噴嘴裏無碎屑。

3.1.7 須為船員安全進行泡沫濃縮液數量檢查和泡沫質量定期控制採樣提供手段。

3.1.8 須在每個操作位置張貼系統操作說明。

3.1.9 須按照生產商的說明提供備件。

3.1.10 如果使用內燃機作為該系統海水泵的原動機，該原動機的燃油櫃內須有足夠的燃油以使泵能滿負荷運轉至少3個小時，且A類機器處所外須有足夠的燃油儲備以使泵能夠額外滿負荷運轉15個小時。如果該燃油櫃同時為其他內燃機服務，整個燃油櫃的容量須足以供給所有相連的發動機。

3.1.11 被保護處所內泡沫發生器和管路的佈置不得妨礙接近所安裝的機器進行日常維護活動。

3.1.12 該系統電源、泡沫濃縮液供應和系統的控制裝置須易於觸及並操作簡便，並須佈置在被保護處所外部不會被被保護處所的

失火所隔斷的位置。所有直接與泡沫發生器連接的電氣元件須至少為IP 54級。

3.1.13 管系的尺寸須按照液壓計算技術確定，以確保提供系統正確運行所需要的流量和壓力。

3.1.14 被保護處所的佈置須使該處所在灌注泡沫時可以通風。應設有程序以確保上部擋火閘、門和其他適當的開口在失火時保持開啟。對於內部空氣發泡系統，500m^3以下的處所無需符合本要求。

3.1.15 須制定船上程序，要求在系統釋放後重新進入被保護處所的人員配戴呼吸裝置，以防範空氣中缺氧和泡沫覆蓋層中夾雜燃燒產物。

3.1.16 安裝圖紙和操作手冊須向船舶提供，在船上隨時可用。須張貼一份清單或圖紙，標出所覆蓋的處所和每個分區內的區域位置。船上須備有試驗和維護說明。

3.1.17 該系統的所有安裝、操作和維護說明/圖紙須使用船舶的工作語言。如果船舶的工作語言既非英文、也非法文或西班牙文，則須包括其中一種語言的譯文。

3.1.18 對泡沫發生器室須進行通風，以防止超壓，並須進行加熱以避免發生凍結的可能性。

3.1.19 所備有的泡沫濃縮液數量須至少足以按照額定膨脹比產生5倍於由鋼質艙壁圍蔽的最大被保護處所容積的泡沫量，或足以對最大被保護處所完全釋放30分鐘的泡沫量，以大者為準。

3.1.20 機器處所、貨泵艙、車輛處所、滾裝處所和特種處所，須在被保護處所內設有聲光報警，對系統釋放發出警告。報警持續時間須為撤離該處所所需的時間，但在任何情況下不得少於20秒。

3.2 內部空氣發泡系統

3.2.1 ***用於保護機器處所和貨泵艙的系統***

3.2.1.1 該系統須由主電源和應急電源供電。應急電源須從被保護處所外提供。

3.2.1.2 須提供足夠的發泡能力以確保滿足該系統的最小設計填充率，並須足以在10分鐘內完全填充最大的被保護處所。

3.2.1.3 泡沫發生器的佈置通常須根據認可試驗的結果進行設計。每個包含內燃機、鍋爐、淨化器和類似設備的處所須至少安裝2台發生器。小工作間和類似處所可僅由一台泡沫發生器覆蓋。

3.2.1.4 泡沫發生器須在包括發動機殼罩在內的被保護處所的最上層天花板下均勻分佈泡沫。泡沫發生器的數量和位置須足以確保該處所內所有部分和所有水平面的所有高風險區域都受到保護。有障礙物位置處可能需要額外的泡沫發生器。除非以更小的間隙進行了試驗驗證，否則泡沫發生器的佈置須使泡沫出口前至少有1米的自由空間。發生器須位於主要結構之後、發動機和鍋爐上方和遠處不易遭受爆炸損壞的位置。

3.2.2 ***用於保護車輛、滾裝、特種和貨物處所的系統***

3.2.2.1 該系統須由船舶主電源供電。無需應急電源。

3.2.2.2 需提供足夠的發泡能力以確保滿足該系統的最小設計填

充率，並須足以在10分鐘內完全填充最大被保護處所。但是，對於甲板適度氣密且甲板高度小於或等於3米的車輛和滾裝處所和特種處所，填充率不得小於設計填充率的三分之二，並須足以在10分鐘填充最大被保護處所。

3.2.2.3 該系統可分成若干分區，但是系統的能力和設計須基於泡沫體積量需求最大的被保護處所。如果相鄰被保護處所之間的限界為“A”級分隔，則無需同時為相鄰處所提供服務。

3.2.2.4 泡沫發生器的佈置通常須根據認可試驗的結果進行設計。發生器的數量可能有所不同，但該系統須提供經認可試驗確定的最小設計填充率。每個處所內須安裝至少2台發生器。泡沫發生器須佈置成在被保護處所內均勻分佈泡沫，且其佈局須考慮到船上裝載貨物時預計可能造成的障礙。至少每個第二層甲板上，包括可移動甲板，須安裝發生器。發生器之間的水平間距須確保將泡沫快速供應至被保護處所的所有部分。此間距須在全尺度試驗的基礎上確定。

3.2.2.5 除非以更小的間隙進行了試驗驗證，否則泡沫發生器的佈置須使泡沫出口前至少有1米的自由空間。

3.3 外部空氣發泡系統

3.3.1 *用於保護機器處所和貨泵艙的系統*

3.3.1.1 該系統須由主電源和應急電源供電。應急電源須從被保護處所外提供。

3.3.1.2 需提供足夠的發泡能力以確保滿足該系統的最小設計填充率，並須足以在10分鐘內完全填充最大被保護處所。

3.3.1.3 泡沫輸送管的佈置通常須根據認可試驗的結果進行設計。泡沫輸送管的數量可能有所不同，但該系統須提供經認可試驗確定的最小設計填充率。每個包含內燃機、鍋爐、淨化器和類似設備的處所須至少安裝2條輸送管。小工作間和類似處所可僅由一條輸送管覆蓋。

3.3.1.4 泡沫輸送管須在包括發動機殼罩在內的被保護處所的最上層天花板下均勻分佈。輸送管的數量和位置須足以確保在該處所內所有部分和所有水平面的所有高風險區域都受到保護。有障礙物位置處可能需設額外的輸送管。除非以更小的間隙進行了試驗驗證，否則輸送管的佈置須使泡沫輸送管前至少有1米的自由空間。輸送管須位於主要結構之後、發動機和鍋爐上方和遠處不易遭受爆炸損壞的位置。

3.3.1.5 泡沫輸送管的佈置須使泡沫發生設備在被保護處所失火時不受影響。如果泡沫發生器的位置靠近被保護處所，則泡沫輸送管的安裝須使發生器和被保護處所之間至少有450毫米的間隔，且分隔應為“A-60”級。泡沫輸送管須為鋼質，其厚度不應小於5毫米。此外，在泡沫發生器和被保護處所之間的限界艙壁或甲板的開口處須安裝厚度不小於3毫米的不鏽鋼擋火閘（單葉或多葉）。該擋火閘須由與其相關的泡沫發生器的遙控裝置自動（電動、氣動或液動）操作，並設置成在泡沫發生器開始運行前保持關閉。

3.3.1.6 泡沫發生器所在位置須有充足的新鮮空氣供應。

3.3.2 ***用於保護車輛、滾裝和特種處所及貨物處所的系統***

3.3.2.1 該系統須由船舶主電源供電。無需設置應急電源。

3.3.2.2 需提供足夠的發泡能力以確保滿足該系統的最小設計填充率，並須足以在10分鐘內完全填充最大被保護處所。但是，對於保護甲板適度氣密且甲板高度小於或等於3米的車輛和滾裝處所和特種處所的系統，填充率不得小於設計填充率的三分之二，並須足以在10分鐘內填充最大的被保護處所。

3.3.2.3 該系統可分成若干分區，但是系統的能力和設計須基於泡沫體積量需求最大的被保護處所。但是該系統的容量和設計應基於被保護處所泡沫需求的最大體積量來確定。如果相鄰被保護處所之間的限界為“A”級分隔，則無需同時為相鄰處所提供服務。

3.3.2.4 泡沫輸送管的佈置通常須根據認可試驗的結果進行設計。泡沫輸送管的數量可能有所不同，但該系統須提供經認可試驗確定的最小設計填充率。每個處所須至少安裝2條輸送管。泡沫發生器須佈置成能在被保護處所內均勻分佈泡沫，且其佈局須考慮到船上裝載貨物時預計帶來的障礙。輸送管須至少通至每個第二層甲板，包括可移動甲板。各輸送管之間的水平間距須確保將泡沫快速供應至被保護處所的所有部分。此間距須在全尺度試驗的基礎上確定。

3.3.2.5 除非以更小的間隙進行了試驗驗證，否則系統的佈置須使泡沫出口前至少有1米的自由空間。

3.3.2.6 泡沫輸送管的佈置須使泡沫發生設備在被保護處所失火時不受影響。如果泡沫發生器的位置靠近被保護處所，泡沫輸送管的安裝須使發生器和被保護處所之間至少有450毫米的間隔，且分隔須為“A-60”級。泡沫輸送管須為鋼質，其厚度不得小於5毫米。此外，在泡沫發生器和被保護處所之間的限界艙壁或甲板的開口處須安裝厚度不小於3毫米的不鏽鋼擋火閘（單葉或多葉）。該擋火閘須由與其相關的泡沫發生器的遙控裝置自動（電動、氣動或液動）操作，並設置成在泡沫發生器開始運行前保持關閉。

3.3.2.7 泡沫發生器所在位置須有充足的新鮮空氣供應。

3.4 安裝試驗要求

3.4.1 安裝後，對管子、閥、附件和組裝的系統須進行試驗，包括對動力和控制系統、水泵、泡沫泵、閥、遙控和就地釋放站和報警裝置進行功能試驗，以使主管機關滿意。須使用安裝於試驗管路的測試孔驗證系統在所要求壓力下的流量。此外，所有分配管路須用淡水沖洗並使用空氣吹通，以確保管路無障礙。

3.4.2 對所有泡沫比例混合器或其他泡沫混合裝置須進行功能試驗，以確認混合比公差在系統認可時界定的額定混合比的+30至-0%的範圍內。對於使用0℃時動粘度等於或小於100 cSt且密度等於或小於1,100 kg/m^3的牛頓型泡沫濃縮液的泡沫比例混合器，該試驗可用水替代泡沫濃縮液進行。其他佈置須用實際的泡沫濃縮液進行試驗。

3.5 使用外部空氣而發生器安裝在被保護處所內的系統

主管機關可以接受使用外部空氣而發生器位於被保護處所內、通過新鮮空氣管道供氣的系統，前提是可表明這些系統具備與3.3段所界定的系統同等的性能和可靠性。在接受這些系統時，主管機關應至少考慮下列設計細節：

.1 供應管中可接受的空氣低壓和高壓及流率；

.2 擋火閘佈置的功能和可靠性；

.3 輸氣管包括泡沫出口的佈置和分佈；和

.4 輸氣管與被保護處所之間的分隔。

4 固定式低倍泡沫滅火系統

4.1 數量和泡沫濃縮液

4.1.1 低倍泡沫滅火系統的泡沫濃縮液須由主管機關根據本組織通過的導則認可。同一個低倍泡沫系統裏不得混合不同類型的泡沫濃縮液。除非其兼容性已獲得認可，否則來自不同生產商的同類型泡沫濃縮液不得混合。

4.1.2 該系統須能夠在不超過5分鐘的時間內通過固定的排放出口釋放出足以在燃油所能散佈的最大單個面積上產生一層有效覆蓋的泡沫量。

4.2 安裝要求

4.2.1 須設有通過固定管系和控制閥或旋塞有效分配泡沫至適當排放出口，及由固定噴射器直接將泡沫有效地噴射到被保護處所

內其他主要失火危險處的裝置。有效分配泡沫的裝置須通過計算或試驗證明可以獲得主管機關的接受。

4.2.2 這種系統的任何控制裝置須易於觸及且操作簡便，並須組合在儘可能少的、不會被被保護處所的失火所隔斷的位置。”

第8章

自動噴水器、探火和失火報警系統

6 在2.1.1段中現有第1句和第2句之間插入以下句子：

“在水可能造成關鍵設備損壞的控制站，可以安裝本公約第II-2/10.6.1.1條所准許的幹管系統或預作用系統。”

RESOLUTION MSC.327(90)
(adopted on 25 May 2012)

AMENDMENTS TO THE INTERNATIONAL CODE FOR FIRE SAFETY SYSTEMS

THE MARITIME SAFETY COMMITTEE,

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

NOTING resolution MSC.98(73) by which it adopted the International Code for Fire Safety Systems (hereinafter referred to as "the FSS Code"), which has become mandatory under chapter II-2 of the International Convention for the Safety of Life at Sea, 1974 (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation II-2/3.22 of the Convention concerning the procedure for amending the FSS Code,

HAVING CONSIDERED, at its ninetieth session, amendments to the FSS Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the International Code for Fire Safety Systems, the text of which is set out in the annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 July 2013, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention the amendments shall enter into force on 1 January 2014, upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the Convention;

5. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annex to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CODE FOR FIRE SAFETY SYSTEMS

CHAPTER 6
FIXED FOAM FIRE-EXTINGUISHING SYSTEMS

5 The existing text of the chapter is replaced by the following:

"**1 Application**

This chapter details the specifications for fixed foam fire-extinguishing systems for the protection of machinery spaces in accordance with regulation II-2/10.4.1.1.2 of the Convention, cargo spaces in accordance with regulation II-2/10.7.1.1, cargo pump-rooms in accordance with regulation II-2/10.9.1.2 and vehicle, special category and ro-ro spaces in accordance with regulation II-2/20.6.1.3. This chapter does not apply to cargo pump-rooms of chemical tankers carrying liquid cargoes referred to in regulation II-2/1.6.2 of the Convention, unless the Administration specifically accepts the use of these systems based on additional tests with alcohol-based fuel and alcohol resistant foam. Unless expressly provided otherwise, the requirements of this chapter shall apply to ships constructed on or after 1 January 2014.

2 Definitions

2.1 *Design filling rate* is at least the minimum nominal filling rate used during the approval tests.

2.2 *Foam* is the extinguishing medium produced when foam solution passes through a foam generator and is mixed with air.

2.3 *Foam solution* is a solution of foam concentrate and water.

2.4 *Foam concentrate* is a liquid which, when mixed with water in the appropriate concentration forms a foam solution.

2.5 *Foam delivery ducts* are supply ducts for introducing high-expansion foam into the protected space from foam generators located outside the protected space.

2.6 *Foam mixing ratio* is the percentage of foam concentrate mixed with water forming the foam solution.

2.7 *Foam generators* are discharge devices or assemblies through which high-expansion foam solution is aerated to form foam that is discharged into the protected space. Foam generators using inside air typically consist of a nozzle or set of nozzles and a casing. The casing is typically made of perforated steel/stainless steel plates shaped into a box that enclose the nozzle(s). Foam generators using outside air typically consist of nozzles enclosed within a casing that spray onto a screen. An electric, hydraulic or pneumatically driven fan is provided to aerate the solution.

2.8 *High-expansion foam fire-extinguishing systems* are fixed total flooding extinguishing systems that use either inside air or outside air for aeration of the foam solution. A high-expansion foam system consists of both the foam generators and the dedicated foam concentrate approved during the fire testing specified in 3.1.3.

2.9 *Inside air foam system* is a fixed high-expansion foam fire-extinguishing system with foam generators located inside the protected space and drawing air from that space.

2.10 *Nominal flow rate* is the foam solution flow rate expressed in *l*/min.

2.11 *Nominal application rate* is the nominal flow rate per area expressed in *l*/min/m^2.

2.12 *Nominal foam expansion ratio* is the ratio of the volume of foam to the volume of foam solution from which it was made, under non-fire conditions, and at an ambient temperature of e.g. around 20ºC.

2.13 *Nominal foam production* is the volume of foam produced per time unit, i.e. nominal flow rate times nominal foam expansion ratio, expressed in m^3/min.

2.14 *Nominal filling rate* is the ratio of nominal foam production to the area, i.e. expressed in m^2/min.

2.15 *Nominal filling time* is the ratio of the height of the protected space to the nominal filling rate, i.e. expressed in minutes.

2.16 *Outside air foam system* is a fixed high-expansion foam system with foam generators installed outside the protected space that are directly supplied with fresh air.

3 Fixed high-expansion foam fire-extinguishing systems

3.1 Principal performance

3.1.1 The system shall be capable of manual release, and shall be designed to produce foam at the required application rate within 1 minute of release. Automatic release of the system shall not be permitted unless appropriate operational measures or interlocks are provided to prevent any local application systems required by regulation II-2/10.5.6 of the Convention from interfering with the effectiveness of the system.

3.1.2 The foam concentrates shall be approved by the Administration based on the guidelines developed by the Organization. Different foam concentrate types shall not be mixed in a high-expansion foam system.

3.1.3 The system shall be capable of fire extinction and manufactured and tested to the satisfaction of the Administration based on the guidelines developed by the Organization.

3.1.4 The system and its components shall be suitably designed to withstand ambient temperature changes, vibration, humidity, shock, clogging and corrosion normally encountered on ships. Piping, fittings and related components inside the protected spaces (except gaskets) shall be designed to withstand 925°C.

3.1.5 System piping, foam concentrate storage tanks, components and pipe fittings in contact with the foam concentrate shall be compatible with the foam concentrate and be constructed of corrosion resistant materials such as stainless steel, or equivalent. Other system piping and foam generators shall be full galvanized steel or equivalent. Distribution pipework shall have self-draining capability.

3.1.6 Means for testing the operation of the system and assuring the required pressure and flow shall be provided by pressure gauges at both inlets (water and foam concentrate supply) and at the outlet of the foam proportioner. A test valve shall be installed on the distribution piping downstream of the foam proportioner, along with orifices which reflect the calculated pressure drop of the system. All sections of piping shall be provided with connections for flushing, draining and purging with air. All nozzles shall be able to be removed for inspection in order to prove clear of debris.

3.1.7 Means shall be provided for the crew to safely check the quantity of foam concentrate and take periodic control samples for foam quality.

3.1.8 Operating instructions for the system shall be displayed at each operating position.

3.1.9 Spare parts shall be provided based on the manufacturer's instruction.

3.1.10 If an internal combustion engine is used as a prime mover for the seawater pump for the system, the fuel oil tank to the prime mover shall contain sufficient fuel to enable the pump to run on full load for at least 3 h and sufficient reserves of fuel shall be available outside the machinery space of category A to enable the pump to be run on full load for an additional 15 h. If the fuel tank serves other internal combustion engines simultaneously, the total fuel tank capacity shall be adequate for all connected engines.

3.1.11 The arrangement of foam generators and piping in the protected space shall not interfere with access to the installed machinery for routine maintenance activities.

3.1.12 The system source of power supply, foam concentrate supply and means of controlling the system shall be readily accessible and simple to operate, and shall be arranged at positions outside the protected space not likely to be cut off by a fire in the protected space. All electrical components directly connected to the foam generators shall have at least an IP 54 rating.

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

3.1.14 The arrangement of the protected spaces shall be such that they may be ventilated as the space is being filled with foam. Procedures shall be provided to ensure that upper level dampers, doors and other suitable openings are kept open in case of a fire. For inside air foam systems, spaces below 500 m^3 need not comply with this requirement.

3.1.15 Onboard procedures shall be established to require personnel re-entering the protected space after a system discharge to wear breathing apparatus to protect them from oxygen deficient air and products of combustion entrained in the foam blanket.

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

3.1.17 All installation, operation and maintenance instructions/plans for the system shall 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 shall be included.

3.1.18 The foam generator room shall be ventilated to protect against overpressure, and shall be heated to avoid the possibility of freezing.

3.1.19 The quantity of foam concentrate available shall be sufficient to produce a volume of foam equal to at least five times the volume of the largest protected space enclosed by steel bulkheads, at the nominal expansion ratio, or enough for 30 min of full operation for the largest protected space, whichever is greater.

3.1.20 Machinery spaces, cargo pump-rooms, vehicle spaces, ro-ro spaces and special category spaces shall be provided with audible and visual alarms within the protected space warning of the release of the system. The alarms shall operate for the length of time needed to evacuate the space, but in no case less than 20 s.

3.2 Inside air foam systems

3.2.1 *Systems for the protection of machinery spaces and cargo pump-rooms*

3.2.1.1 The system shall be supplied by both main and emergency sources of power. The emergency power supply shall be provided from outside the protected space.

3.2.1.2 Sufficient foam-generating capacity shall be provided to ensure the minimum design filling rate for the system is met and in addition shall be adequate to completely fill the largest protected space within 10 min.

3.2.1.3 The arrangement of foam generators shall in general be designed based on the approval test results. A minimum of two generators shall be installed in every space containing combustion engines, boilers, purifiers, and similar equipment. Small workshops and similar spaces may be covered with only one foam generator.

3.2.1.4 Foam generators shall be uniformly distributed under the uppermost ceiling in the protected spaces including the engine casing. The number and location of foam generators shall be adequate to ensure all high risk areas are protected in all parts and at all levels of the spaces. Extra foam generators may be required in obstructed locations. The foam generators shall be arranged with at least 1 m free space in front of the foam outlets, unless tested with less clearance. The generators shall be located behind main structures, and above and away from engines and boilers in positions where damage from an explosion is unlikely.

3.2.2 *Systems for the protection of vehicle, ro-ro, special category and cargo spaces*

3.2.2.1 The system shall be supplied by the ship's main power source. An emergency power supply is not required.

3.2.2.2 Sufficient foam-generating capacity shall be provided to ensure the minimum design filling rate for the system is met and in addition shall be adequate to completely fill the largest protected space within 10 min. However, for systems protecting vehicle and ro-ro spaces and special category spaces, with decks that are reasonably gas-tight and that have a deck height of 3 m or less, the filling rate shall be not less than two thirds of the design filling rate and in addition sufficient to fill the largest protected space within 10 min.

3.2.2.3 The system may be divided into sections, however, the capacity and design of the system shall be based on the protected space demanding the greatest volume of foam. Adjacent protected spaces need not be served simultaneously if the boundaries between the spaces are "A" class divisions.

3.2.2.4 The arrangement of foam generators shall in general be designed based on the approval test results. The number of generators may be different, but the minimum design filling rate determined during approval testing shall be provided by the system. A minimum of two generators shall be installed in every space. The foam generators shall be arranged to uniformly distribute foam in the protected spaces, and the layout shall take into consideration obstructions that can be expected when cargo is loaded on board. As a minimum, generators shall be located on every second deck, including movable decks. The horizontal spacing of the generators shall ensure rapid supply of foam to all parts of the protected space. This shall be established on the basis of full scale tests.

3.2.2.5 The foam generators shall be arranged with at least 1 m free space in front of the foam outlets, unless tested with less clearance.

3.3 Outside air foam systems

3.3.1 *Systems for the protection of machinery spaces and cargo pump-rooms*

3.3.1.1 The system shall be supplied by both main and emergency sources of power. The emergency power supply shall be provided from outside the protected machinery space.

3.3.1.2 Sufficient foam-generating capacity shall be provided to ensure the minimum design filling rate for the system is met and in addition shall be adequate to completely fill the largest protected space within 10 min.

3.3.1.3 The arrangement of foam delivery ducts shall in general be designed based on the approval test results. The number of ducts may be different, but the minimum design filling rate determined during approval testing shall be provided by the system. A minimum of two ducts shall be installed in every space containing combustion engines, boilers, purifiers, and similar equipment. Small workshops and similar spaces may be covered with only one duct.

3.3.1.4 Foam delivery ducts shall be uniformly distributed under the uppermost ceiling in the protected spaces including the engine casing. The number and location of ducts shall be adequate to ensure all high risk areas are protected in all parts and at all levels of the spaces. Extra ducts may be required in obstructed locations. The ducts shall be arranged with at least 1 m free space in front of the foam delivery ducts, unless tested with less clearance. The ducts shall be located behind main structures, and above and away from engines and boilers in positions where damage from an explosion is unlikely.

3.3.1.5 The arrangement of the foam delivery ducts shall be such that a fire in the protected space will not affect the foam-generating equipment. If the foam generators are located adjacent to the protected space, foam delivery ducts shall be installed to allow at least 450 mm of separation between the generators and the protected space, and the separating divisions shall be class "A-60" rated. Foam delivery ducts shall be constructed of steel having a thickness of not less than 5 mm. In addition, stainless steel dampers (single or multi-bladed) with a thickness of not less than 3 mm shall be installed at the openings in the boundary bulkheads or decks between the foam generators and the protected space. The dampers shall be automatically operated (electrically, pneumatically or hydraulically) by means of remote control of the foam generator related to them, and arranged to remain closed until the foam generators begin operating.

3.3.1.6 The foam generators shall be located where an adequate fresh air supply can be arranged.

3.3.2 *Systems for the protection of vehicle and ro-ro spaces and special category and cargo spaces*

3.3.2.1 The system shall be supplied by the ship's main power source. An emergency power supply is not required.

3.3.2.2 Sufficient foam-generating capacity shall be provided to ensure the minimum design filling rate for the system is met and in addition shall be adequate to completely fill the largest protected space within 10 min. However, for systems protecting vehicle and ro-ro spaces and special category spaces, with decks that are reasonably gas-tight and that have a deck height of 3 m or less, the filling rate shall be not less than two thirds of the design filling rate and in addition sufficient to fill the largest protected space within 10 min.

3.3.2.3 The system may be divided into sections, however, the capacity and design of the system shall be based on the protected space demanding the greatest volume of foam. Adjacent protected spaces need not be served simultaneously if the boundaries between the spaces are "A" class divisions.

3.3.2.4 The arrangement of foam delivery ducts shall in general be designed based on the approval test results. The number of ducts may be different, but the minimum design filling rate determined during approval testing shall be provided by the system. A minimum of two ducts shall be installed in every space. The foam generators shall be arranged to uniformly distribute foam in the protected spaces, and the layout shall take into consideration obstructions that can be expected when cargo is loaded on board. As a minimum, ducts shall be led to every second deck, including movable decks. The horizontal spacing of the ducts shall ensure rapid supply of foam to all parts of the protected space. This shall be established on the basis of full scale tests.

3.3.2.5 The system shall be arranged with at least 1 m free space in front of the foam outlets, unless tested with less clearance.

3.3.2.6 The arrangement of the foam delivery ducts shall be such that a fire in the protected space will not affect the foam-generating equipment. If the foam generators are located adjacent to the protected space, foam delivery ducts shall be installed to allow at least 450 mm of separation between the generators and the protected space, and the separating divisions shall be class "A-60" rated. Foam delivery ducts shall be constructed of steel having a thickness of not less than 5 mm. In addition, stainless steel dampers (single or multi-bladed) with a thickness of not less than 3 mm shall be installed at the openings in the boundary bulkheads or decks between the foam generators and the protected space. The dampers shall be automatically operated (electrically, pneumatically or hydraulically) by means of remote control of the foam generator related to them, and arranged to remain closed until the foam generators begin operating.

3.3.2.7 The foam generators shall be located where an adequate fresh air supply can be arranged.

3.4 Installation testing requirements

3.4.1 After installation, the pipes, valves, fittings and assembled systems shall be tested to the satisfaction of the Administration, including functional testing of the power and control systems, water pumps, foam pumps, valves, remote and local release stations and alarms. Flow at the required pressure shall be verified for the system using orifices fitted to the test line. In addition, all distribution piping shall be flushed with freshwater and blown through with air to ensure that the piping is free of obstructions.

3.4.2 Functional tests of all foam proportioners or other foam mixing devices shall be carried out to confirm that the mixing ratio tolerance is within +30 to -0% of the nominal mixing ratio defined by the system approval. For foam proportioners using foam concentrates of Newtonian type with kinematic viscosity equal to or less than 100 cSt at 0ºC and density equal to or less than 1,100 kg/m^3, this test can be performed with water instead of foam concentrate. Other arrangements shall be tested with the actual foam concentrate.

3.5 Systems using outside air with generators installed inside the protected space

Systems using outside air but with generators located inside the protected space and supplied by fresh air ducts may be accepted by the Administration provided that these systems have been shown to have performance and reliability equivalent to systems defined in 3.3. For acceptance, the Administration should consider the following minimum design features:

.1 lower and upper acceptable air pressure and flow rate in supply ducts;

.2 function and reliability of damper arrangements;

.3 arrangements and distribution of air delivery ducts including foam outlets; and

.4 separation of air delivery ducts from the protected space.

4 Fixed low-expansion foam fire-extinguishing systems

4.1 Quantity and foam concentrates

4.1.1 The foam concentrates of low-expansion foam fire-extinguishing systems shall be approved by the Administration based on the guidelines adopted by the Organization. Different foam concentrate types shall not be mixed in a low-expansion foam system. Foam concentrates of the same type from different manufacturers shall not be mixed unless they are approved for compatibility.

4.1.2 The system shall be capable of discharging through fixed discharge outlets, in no more than 5 min, a quantity of foam sufficient to produce an effective foam blanket over the largest single area over which oil fuel is liable to spread.

4.2 Installation requirements

4.2.1 Means shall be provided for effective distribution of the foam through a permanent system of piping and control valves or cocks to suitable discharge outlets, and for the foam to be effectively directed by fixed sprayers onto other main fire hazards in the protected space. The means for effective distribution of the foam shall be proven acceptable to the Administration through calculation or by testing.

4.2.2 The means of control of any such systems shall be readily accessible and simple to operate and shall be grouped together in as few locations as possible at positions not likely to be cut off by a fire in the protected space."

CHAPTER 8
AUTOMATIC SPRINKLER, FIRE DETECTION AND FIRE ALARM SYSTEMS

6 In paragraph 2.1.1, the following sentence is inserted between the existing first and second sentences:

"Control stations, where water may cause damage to essential equipment, may be fitted with a dry pipe system or a pre-action system as permitted by regulation II-2/10.6.1.1 of the Convention."

第 37/2015 號行政長官公告

中華人民共和國是國際海事組織的成員國及一九七四年十一月一日訂於倫敦的《國際海上人命安全公約》（下稱“公約”）的締約國；

國際海事組織海上安全委員會於一九九六年六月四日對公約第III章作出修正時，將有關《國際救生設備規則》（《救生設備規則》）的規定作為公約的強制性要求，並透過第MSC.48(66)號決議通過了《國際救生設備規則》（《救生設備規則》），該規則自一九九九年十二月二十日起適用於澳門特別行政區；

基於此，行政長官根據澳門特別行政區第3/1999號法律第六條第一款的規定，命令公佈包含上指規則的第MSC.48（66）號決議的中文及英文文本。

二零一五年四月十七日發佈。

行政長官　崔世安

Aviso do Chefe do Executivo n.º 37/2015

Considerando que a República Popular da China é um Estado Membro da Organização Marítima Internacional e um Estado Contratante da Convenção Internacional para a Salvaguarda da Vida Humana no Mar, concluída em Londres em 1 de Novembro de 1974, adiante designada por Convenção;

Considerando igualmente que, em 4 de Junho de 1996, o Comité de Segurança Marítima da Organização Marítima Internacional procedeu a emendas ao capítulo III da Convenção para tornar as disposições do Código Internacional dos Meios de Salvação (Código LSA) obrigatórias nos termos da Convenção, e que, através da resolução MSC.48(66), adoptou o Código Internacional dos Meios de Salvação (Código LSA), e que tal Código é aplicável na Região Administrativa Especial de Macau desde 20 de Dezembro de 1999;

O Chefe do Executivo manda publicar, nos termos do n.º 1 do artigo 6.º da Lei n.º 3/1999 da Região Administrativa Especial de Macau, a resolução MSC.48(66), que contém o referido Código, nos seus textos em línguas chinesa e inglesa.

Promulgado em 17 de Abril de 2015.

O Chefe do Executivo, *Chui Sai On*.