

## 有關國際海事組織修訂客輪特殊培訓要求的一些觀點<sup>▲</sup>

### Some Perspective on the IMO's Review of STCW Passenger Ship Specific Safety Training

陳彥宏\* 林彬\*\*

#### 一、前言

維護海上人命安全一直以來都是國際海事組織(IMO)的首重目標，客輪安全的議題，也因此更成為 IMO 所關注的焦點。從歷史的角度來看，客輪的事故，往往也是推動 IMO 提出有關改善措施、改正方法以及法規修訂的關鍵要素。舉例而言，1912 年 4 月 15 日 RMS Titanic 沉沒案促成了 SOLAS (1929)的制定；1987 年 3 月 6 日 MS Herald of Free Enterprise 翻覆案促成了 ISM、SOLAS Chapter II/1、FSA、A.647(Guidelines on Safety Management 19/10/89)等法規文件的修訂；1990 年 4 月 7 日 Scandinavian Star 火燒案更促成了 ISM Code 的正式底定。

2006 年 11 月 IMO 在伊斯坦堡(Istanbul, Turkey)召開的第 82 次海事安全委員會會議中採納了在 2000 年即開始推動的「客輪安全倡議(The IMO Passenger Ship Safety Initiative)」。這個「客輪安全倡議」的指導思想主要包含下列的五大支柱與範疇：<sup>1,2,3</sup>

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\* 陳彥宏 Solomon Chen, AFRIN, MNI, CMILT, Maritime Arbitrator, Lead Auditor 國立高雄海洋科技大學航運技術系副教授兼海事安全研究中心主任、航輪漁技職教育中心主任、海事調查與鑑定中心主任、行政院海岸巡防署海洋事務研究委員會研究委員、台灣海事安全與保安研究會秘書長、廈門大學南海研究院研究員、國立中山大學海洋事務研究所兼任副教授，英國威爾斯大學海洋事務與國際運輸學博士。Email: solomon@safetysea.org

\*\* 林彬，國立台灣海洋大學商船學系講座教授，英國普利茅斯大學海運博士，台灣海事安全與保安研究會理事長，基隆市北寧路 2 號，E-mail: blin@mail.ntou.edu.tw。

1. 預防(Prevention)：從 STCW Code 著手，聚焦在修訂有關航行安全、航路計畫與資源管理(BRM, ERM)方面的指南；並對主管官署、航運公司、訓練機構提出關於大型客船在加強滅火(Enhanced fire fighting)以及損害管制(Damage control)方面的船員訓練指南<sup>4</sup>。修訂 IMO 典範課程中有關群眾與危機管理中有關「安全區域(safe area)」的概念。
2. 提升存活率(Improved survivability)：草擬修訂 SOLAS II/1, II/2，採納有關重要備援系統(essential system redundancy)、應急管理(management of emergencies)、降低災害(casualty mitigation)等方面的指南。其中在有關 SOLAS II/2/21 的傷亡門檻、安全返港以及安全區域(Casualty threshold, safe return to port (SRTP) and safe areas)等方面<sup>5,6</sup>，提出了未來在船舶設計上，必須在船舶失火或浸水造成一空間或一水密艙間完全損害的情況下，仍有自力返港的能力<sup>7</sup>；其次是有一個安全區域能提供必要服務<sup>8</sup>；以及船舶設計上，必須至少保持有 3 小時以上可

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<sup>1</sup> <http://www.imo.org/OurWork/Safety/Regulations/Pages/PassengerShips.aspx>, accessed on 7 September 2014.

<sup>2</sup> <http://www.imo.org/OurWork/Safety/Regulations/Documents/Article-Seaways%20Magazine.pdf>, accessed on 7 September 2014.

<sup>3</sup> Joughin, R. (2009). The era of the large passenger ship – an overview of safety problems and solutions. In: 8th IASST International Conference, 19-20th October 2009, Alexandria, Egypt.

<sup>4</sup> STCW 2010(1978 年航海人員訓練發證及當值標準國際公約 2010 年修正案)

Section A-V/2 Mandatory minimum requirements for the training and qualification of masters, officers, ratings and other personnel on passenger ships

- 群眾管理訓練 Crowd management training
- 在客艙提供對旅客直接服務之人員安全訓練 Safety training for personnel providing direct service to passengers in passenger spaces
- 危機處理及人員行為管理訓練 Crisis management and human behaviour training
- 旅客安全、貨物安全及船體完整性訓練 Passenger safety, cargo safety and hull integrity training

Section B-V/2, Guidance regarding training of seafarers on passenger ships

- 加強滅火 Enhanced Fire Fighting
- 損害管制 Damage Control

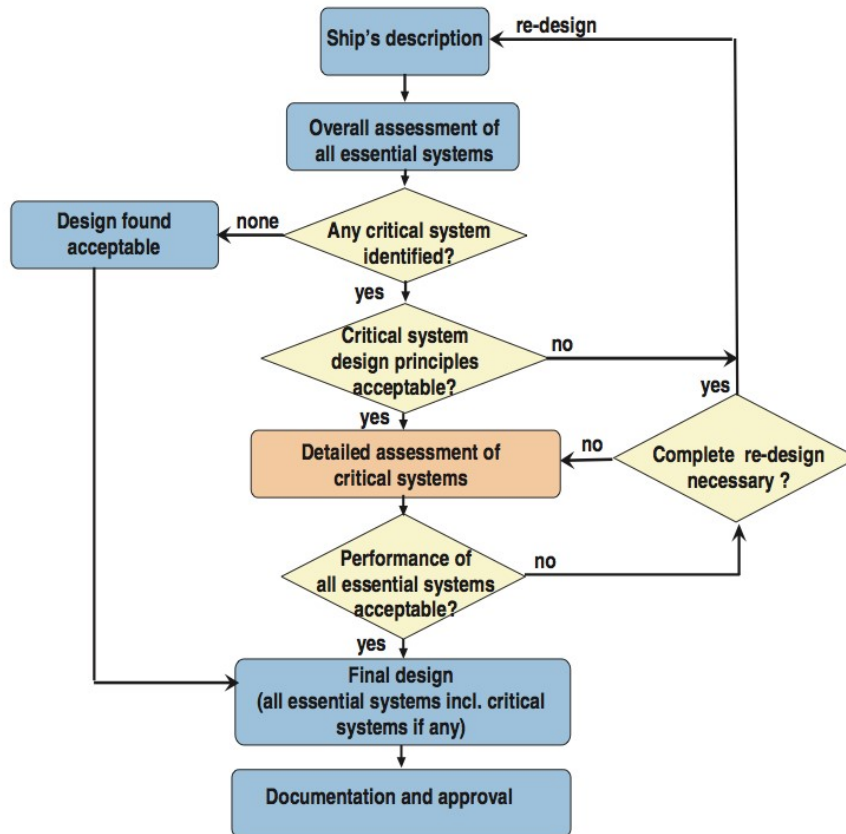
<sup>5</sup> Preliminary Guidelines for Safe Return to Port Capability of Passenger Ships, Rules for Classification and Construction, [http://www.gl-group.com/infoServices/rules/pdfs/gl\\_vi-11-2\\_e.pdf](http://www.gl-group.com/infoServices/rules/pdfs/gl_vi-11-2_e.pdf), accessed on 7 September 2014.

<sup>6</sup> Guidelines on operational information for masters of passenger ships for safe return to port by own power or under tow, MSC.1 Circ.1400, 27 May 2011, IMO: London.

<sup>7</sup> 自力返港能力的基本假設，是以推進系統、舵機與操舵系統、航行系統、加油及駁油系統、船舶內外通訊系統、消防系統、壓艙壓載系統、水密系統、安全區域的支援系統、浸水偵測系統以及其他重要的損管系統設施仍能運作為前提，所作的假設情況。

<sup>8</sup> 包括：衛生設備、水、食物、醫療保健與備用空間、遮風避雨之安身處、避免過熱或失溫的措施、照明、通風。

以進行安全以及有秩序的棄船撤離行動。在應急管理方面，必須透過與駕駛台相連的安全中心，提供客船各相關安全系統的作業、管制、監控等機制<sup>9</sup>。



***Process flowchart for assessment of passenger ship system's capabilities for SRTP as shown in appendix 2 of MSC.1/Circ.1369***

3. 監管體制的靈活性(Regulatory flexibility)：草擬修訂 SOLAS III/1, II/2，考量解決安全議題的靈活性設計、具成本效益考量的獨特應用設計，採納以及認可新的安全技術與措施(new safety technology and arrangements)，並推廣改善損失方面的知識<sup>10,11</sup>。
4. 遠離搜救設施所在的作業(Operations in areas remote from SAR facilities)：草擬

<sup>9</sup> 這些安全系統包括：通風系統、防火門、緊急警報系統、公眾廣播系統、撤離指引系統、水密系統、艙門與開關艙間指示系統、浸水偵測系統、電視監視系統、消防偵測與警報系統、消防與灑水系統等等。

<sup>10</sup> Apostolos Papanikolaou (Ed.), Risk-Based Ship Design - Methods, Tools and Applications, Springer-Verlag Berlin Heidelberg 2009.

<sup>11</sup> SAFEDOR - Design, Operation and Regulation for Safety, [http://ec.europa.eu/research/transport/projects/items/safedor\\_en.htm](http://ec.europa.eu/research/transport/projects/items/safedor_en.htm), accessed on 9 September 2014.

修訂 SOLAS III 有關「從救生艇筏及水中救援遇險人員」的時間規定，並對搜救機構與船員提出參與救援作業方面的指導<sup>12,13</sup>。

5. 衛生安全與醫療服務(Health safety and medical care)：建立醫療安全計畫(medical safety programmes)並改寫冰冷水域中的求生指南(guide on cold water survival)<sup>14,15</sup>。

## 二、STCW 的特殊培訓規定

不管是從「人 - 船 - 環境」還是「SHELL 模式」，「人因(Human Factor)往往是安全的核心，也往往很可能成為事故的主要肇因。為此，IMO 在 STCW 的制定過程中也就特別的在章程第 V 章提出了對客船人員的培訓和資格認證的要求。最特別的是，在 STCW 主體文件上，原來的 STCW 1995 修正中，V/2 章規範駛上駛下客船，V/3 章規範客船，但是在 STCW 2010 修正案中定義客船包含駛上駛下客船，因此也就合併 STCW 95 V/2, V/3 並修訂為 STCW 2010 的 V/2。

在 STCW 2010 修正案中有關客船的規範包括規則主體 Reg-V/2，強制規範的章程 A-V/2，以及非強制的建議 B-V/2，特別值得注意的是 B-V/2 係在 STCW 2010 修正案中首次出現。至於在 IMO Model Course 方面，因應 STCW 1995 修正案的實施，IMO 在 2000 年出版了 IMO Model Course 1.28「在客艙對旅客提供直接服務人員之群眾管理、旅客安全與安全訓練(Crown management, passenger safety and safety training for personnel providing direct services to passengers in passenger spaces)」、IMO Model Course 1.29「危機處理與行為之熟悉訓練，包含了旅客安全、貨物安全與船體訓練(Proficiency in crisis management and human behaviour training including passenger safety, cargo safety and hull integrity training)」<sup>16</sup>。但在 STCW 2010 修正案推出後，目前仍未有推出更新版的 Model Course。

有關 STCW 2010 修正案載客船的特殊培訓規範如下：

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<sup>12</sup> Guide to recovery techniques, MSC.1/Circ.1182, 31 May 2006, IMO: London.

<sup>13</sup> Enhanced contingency planning guidance for passenger ships operating in areas remote from SAR facilities, MSC.1/Circ.1184, 31 May 2006, IMO: London.

<sup>14</sup> Guidance on the establishment of medical and sanitation related programmes for passenger ships, MSC Circ.1129, 15 December 2004, IMO: London.

<sup>15</sup> Guide for cold water survival, MSC.1/Circ.1185, MSC.1/Circ.1185/Rev.1, IMO: London.

<sup>16</sup> IMO Model Course 1.28 含授課：5.75 小時、船上實作：6 小時。IMO Model Course 1.29 含授課：10 小時、船上實作：11.75 小時。

## 2.1 STCW 2010 Regulation V/2

Regulation V/2 客船船長、甲級船員、乙級船員及其他人員訓練及資格之強制性最低要求(Mandatory minimum requirements for the training and qualifications of masters, officers, ratings and other personnel on passenger ships)

- 1 本條規則適用於在從事國際航線客船上服務之船長、甲級船員、乙級船員及其他人員。主管機關應決定此等規定是否適用於在從事國內航線客船上服務之人員。
- 2 在被指派為客船上之船上職責前，航海人員應依其職務、職責及責任業已完成下列第 4 至第 7 項規定之訓練。
- 3 航海人員依下列第 4、6 及 7 項之規定應予訓練者，應在不超過 5 年期間內，接受適當之複習訓練，或要求其提供在過去 5 年內業已達到所要求適任標準之證明。
- 4 在客船上之船長、甲級船員及在佈署表中經指派於緊急情況時協助旅客之人員，應已完成 STCW 章程第 A-V/2 節第 1 項所述之群眾管理訓練。
- 5 在客船之客艙，提供直接服務旅客之人員，應已完成 STCW 章程第 A-V/2 節第 2 項所述之安全訓練。
- 6 在客船上之船長、輪機長、大副、大管輪及經指派部署表負有在緊急情況下旅客安全責任之其他人員，應已完成 STCW 章程第 A-V/2 節第 3 項所述之危機管理與人員行為管理之訓練。
- 7 在駛上/駛下客船上之船長、大副、輪機長、大管輪及經指派對旅客上下船、貨物裝卸與繫固或關閉船體對外通道負有直接之任何人員，應已完成 STCW 章程第 A-V/2 節第 4 項所述認可之旅客安全、貨物安全及船體完整性訓練。
- 8 主管機關應確保將業已完成訓練之證明文件簽發予依本條規則規定業已適格之每位人員。

## 2.2 STCW 2010 Code A-V/2

Section A-V/2 客船船長、甲級船員、乙級船員及其他人員訓練及資格之強制性最低要求(Mandatory minimum requirements for the training and qualification of masters, officers, ratings and other personnel on passenger ships)

### **群眾管理訓練 Crowd management training**

- 1 對規則 V/2 第 4 項所規定在佈署表中被指派於緊急情況時擔任協助旅客之人員所要求群眾管理訓練，應包括但不限於下列各項：

- .1 瞭解救生設備及管制計畫，包括：
  - .1.1 佈署表及應急說明之知識；
  - .1.2 緊急逃生之知識；及
  - .1.3 限制使用昇降機；
- .2 協助旅客並引導至召集站及登艇站之能力，包括：
  - .2.1 發佈清楚與安慰命令之能力；
  - .2.2 旅客在走廊、樓梯間及走道之管制；
  - .2.3 維持逃生路線暢通不受阻礙；
  - .2.4 可利用以撤離殘障人士與需要特別協助人員之方法；及
  - .2.5 起居艙區之搜尋；
- .3 集合程序，包括：
  - .3.1 守秩序之重要性，
  - .3.2 使用既定程序以減少及避免驚慌之能力，
  - .3.3 適當時，使用旅客名冊計算撤離人數之能力，及
  - .3.4 確保旅客適當穿著並正確穿著其救生衣之能力。

**在客艙提供對旅客直接服務之人員安全訓練 Safety training for personnel providing direct service to passengers in passenger spaces**

2 規則 V/2 第 5 項所規定之另增安全訓練至少應確保達成下列能力：

**溝通 Communication**

- .1 考慮及下列各點，在緊急時與旅客溝通之能力：
  - .1.1 所用之一種或多種語言適於特定航線旅客之主要國籍；
  - .1.2 不論旅客及船員是否使用共通之語言，應有可能使用簡單英文語彙做為基本說明，以提供需協助旅客溝通之管道。
  - .1.3 緊急時，使用口頭溝通，實際上不可行時，可能需要以某些其他措施溝通諸如示範、手勢或促使注意操作說明、召集站、救生設備或撤離路線之位置。
  - .1.4 完整之安全說明業以其本國之一種或多種語言提供予旅客。

- .1.5 緊急或演習時，得以語言廣播作緊急宣告，以傳達重要指南予旅客，並便於船員協助旅客。

### **救生設備 Life-saving appliances**

- .2 對旅客示範使用個人救生設備之能力。

### **乘載之程序 Embarkation procedures**

- .3 旅客之登船與下船，尤應特別注意殘障人士及需要協助之旅客。

### **危機處理及人員行為管理訓練 Crisis management and human behaviour training**

- 3 船長、大副、輪機長、大管輪以及在緊急情況下對旅客安全負有責任之任何人員，應：
- .1 依其職務、職責與責任業已完成規則 V/2 第 6 項所要求如表 A-V/2 所述，經認可之危機處理及人員行為管理訓練。
- .2 要求其提供依 A-V/2 表列第 3 欄與第 4 欄適任性評估之方法與標準證明業已達到所要求之適任標準。

### **旅客安全、貨物安全及船體完整性訓練 Passenger safety, cargo safety and hull integrity training**

- 4 船長、大副、輪機長、大管輪及被指派對旅客上下船、貨物裝卸或繫固或關閉駛上/駛下客船船體開口有立即責任之人員依規則 V/2 第 7 項要求旅客安全、貨物安全及船體完整性訓練，至少應確保達成下列適於其職責與責任之能力：

### **裝載及登輪程序 Loading and embarkation procedures**

- .1 正確使用下列船舶所制定程序之能力：
- .1.1 裝卸車輛、有軌車及其他運送貨物單位，包括相關之通信
- .1.2 放下及吊昇跳板
- .1.3 可拆裝車輛甲板之組裝及貯放
- .1.4 旅客上下船，尤其應注意殘障人士及需協助人士

### **危險品裝載 Carriage of dangerous goods**

- .2 有關在駛上/駛下客船上載運危險品，使用任何特別防護、程序與要求之能力

### **貨物繫固 Securing cargoes**

.3 有能力：

- .3.1 正確使用貨物積載及繫固安全實用章程之規定於所載之車輛、有軌車及其他運送貨物單位；及
- .3.2 正確使用所提供之貨物繫固設備及材料，並考慮及其限制。

**穩度、俯仰及應力計算 *Stability, trim and stress calculations***

.4 有能力：

- .4.1 正確使用所提供之穩度及應力資料，
- .4.2 使用所提供之穩度計算機或電腦程序計算各種不同裝載情況下之穩度與俯仰，
- .4.3 計算甲板之負荷因素，及
- .4.4 計算壓艙水及燃油轉駁對穩度、俯仰及應力之不良影響

**船體開口之開啟、關閉及關緊 *Opening, closing and securing hull openings***

.5 有能力：

- .5.1 正確使用船上所制訂開啟、關閉及關緊艙、艙及舷側各門戶及跳板之程序，並正確操作有關系統，及
- .5.2 對封閉措施執行檢查

**車輛甲板大氣 *Ro-Ro deck atmosphere***

.6 有能力

- .6.1 如備有設備時，使用此設備監測駛上/駛下貨艙空間之大氣；及
- .6.2 正確使用船上所制訂在正常航行中及在緊急時裝卸車輛



Table A-V/2 危機處理及人員行為管理之最低適任標準規範 Specification of minimum standard of competence in crisis management and human behaviour			
適任 Competence	知識、瞭解及熟練 Knowledge, understanding and proficiency	適任性之證明方法 Methods for demonstrating competence	適任性之評估標準 Criteria for evaluating competence
船上應急程序之組成 Organize shipboard emergency procedures	具有下列知識： .1 船舶之一般設計與佈置 .2 安全規則 .3 應急計畫與程序  制訂船舶特定應急程序原則之重要性，包括： .1 事先計畫及演練船上應急程序之必要性 .2 在緊急狀況下所有人員應儘可能確切瞭解與堅守事先計畫之應急程序之必要性	從認可之訓練，以一項或多項製備之應急計畫演習及實際示範所獲得之證據予以評估	確使船上之應急程序處於能迅即反應緊急情況之狀態
資源之妥適運用 Optimize the use of resources	考慮及下列對資源妥適運用之能力： .1 在緊急時可資運用之資源可能受限制之可能性 .2 對立即可獲得之人力與設備予以充分利用之必要性，及如有需要即時為之  慮及由以往涉及客船事故所學得之教訓組成逼真演習以保持迅速狀況及在演習後作出任務提示之能力	從認可之訓練、實際示範及船上訓練與演習應急程序所獲得之證據予以評估	妥適運用可資利用資源之應急計畫  任務與責任之分配反映其瞭解每一個人之適任性  明確之闡釋團隊與個人之職分與責任
對緊急事項之控制反應 Control response to emergencies	依據所制定應急程序對緊急情況作初步評估並提出有效回應之能力  領導技巧 在緊急情況中領導與指導其他人員之能力，包括下列之需要： .1 在緊急情況時發出警告 .2 作出決定，以在緊急時立即採取必要之行動 .3 對旅客及其他人員予以誘導、鼓勵並使恢復信心  壓力之處理 鑑定個人及船上應急團隊其他成員過度壓力徵兆發展之能力 瞭解由緊急情況所生之壓力能影響每個人之行為及其在指導與繼之而至程序上採取行動之能力	從認可之訓練、實際示範及船上訓練與演習應急程序所獲得之證據予以評估	程序與行動係依據船上危機處理之既定原則與計畫為之  考慮及意外之事故及妥適運用可資利用之資源，其目標與策略適於緊急之實況  船員之行動有助於命令與控制之維持

Table A-V/2 危機處理及人員行為管理之最低適任標準規範 Specification of minimum standard of competence in crisis management and human behaviour			
<p>在緊急狀況時控制旅客與其他人員 Control passengers and other personnel during emergency situations</p>	<p>行為管理及反應 在緊急狀況時控制旅客與其他人員之能力，包括：</p> <ol style="list-style-type: none"> <li>.1 知道旅客與其他人員在緊急狀況時一般反應之形式，包括下列可能性：                             <ol style="list-style-type: none"> <li>.1.1 通常在人們接受發生緊急情況之事實前有些時間</li> <li>.1.2 某些人可能驚慌且不遵守合理性之正常規範，其理解之能力可能受損，且該等人員可能無法一如在非緊急情況時易於接受指導</li> </ol> </li> <li>.2 知道旅客與其他人員可能之下列其他事項：                             <ol style="list-style-type: none"> <li>.2.1 當某些情況不對時首先之反應是開始尋找親戚、朋友及(或)其隨身行李</li> <li>.2.2 當其想及他們能逃出危險時，在艙室或船上其他地方尋找安全</li> <li>.2.3 當船舶傾側時有向上移動之趨向</li> </ol> </li> <li>.3 重視因家庭分散所造成驚慌之可能問題</li> </ol>	<p>從認可之訓練、實際示範及船上訓練與演習應急程序所獲得之證據予以評估</p>	<p>船員致力於維持秩序與控制之行動</p>
<p>有效溝通之建立與保持 Establish and maintain effective communications</p>	<p>建立與保持有效溝通之能力，包括：</p> <ol style="list-style-type: none"> <li>.1 清晰簡潔指示與報告之重要性</li> <li>.2 鼓勵與旅客及其他人員交換資訊並由他們反饋之必要</li> </ol> <p>在緊急情況時提供有關資訊予旅客及其他人員之能力，以保持他們對整個狀況之消息，並於考慮及下列情況後，通知他們所需之任何行動：</p> <ol style="list-style-type: none"> <li>.1 其一種或多種語言適於在特定航線上所乘載旅客與其他人員之主要國籍</li> <li>.2 當口頭溝通為不可能時，可能需要於緊急時以某些其他方式溝通，例如以示範表演或以手語信號或促使注意操作說明、召集站、救生設施或逃生路線之位置</li> <li>.3 在緊急或演習時得以語言廣播作緊急宣告以對旅客傳遞重要指導並便於船員協助旅客</li> </ol>	<p>從認可之訓練、演習及實際示範所獲得之證據予以評估</p>	<p>由所有可資運用之資源所獲得之資訊，儘可能迅即予以評估與證實並檢討整個緊急狀況</p> <p>所提供予每個人、緊急反應團隊及旅客之資訊係屬正確、中肯且適時</p> <p>保持緊急情況時通知旅客之資訊及其所需之行動</p>

## 2.3 STCW 2010 Code B-V/2

Section B-V/2 有關客船航海人員訓練準則(Guidance regarding training of seafarers on passenger ships)

### 加強滅火 ENHANCED FIRE FIGHTING

- 1 對於客船之甲級船員與乙級船員應提供額外之訓練強調滅火之困難,包括進入侷限之空間及防止火之蔓延至鄰接之空間。

### 損害管制 DAMAGE CONTROL

- 2 在依第 A-II/1, A-II/2 及 A-III/2 節之規定制定適任標準,以獲得必要程度之損害管制與水密完整性之理論知識、瞭解與熟練時,公司與訓練機構應考慮及下列有關損害管制與水密完整性之知識、瞭解與熟練:

#### 適任

將泛水之風險減至最小,並保持備便狀態以回應涉及船舶完整性損害之緊急情況。

#### 知識、瞭解與熟練

#### 船上損害管制計畫與組織

#### 損害管制系統、設備(鎖扣裝置)與應急逃生路線

#### 保持穩度與水密完整性之關鍵因素

#### 控制泛水與保持水密周界之重要性

#### 船上發生爆炸、擱淺、碰撞或火災之際應採取之行動

#### 與船上現有之設備包括船舶艙底水系統與泵相關之損害管制技術

## 三、IMO 有關客輪安全的發展走向

### 3.1 MSC 大會<sup>17</sup>

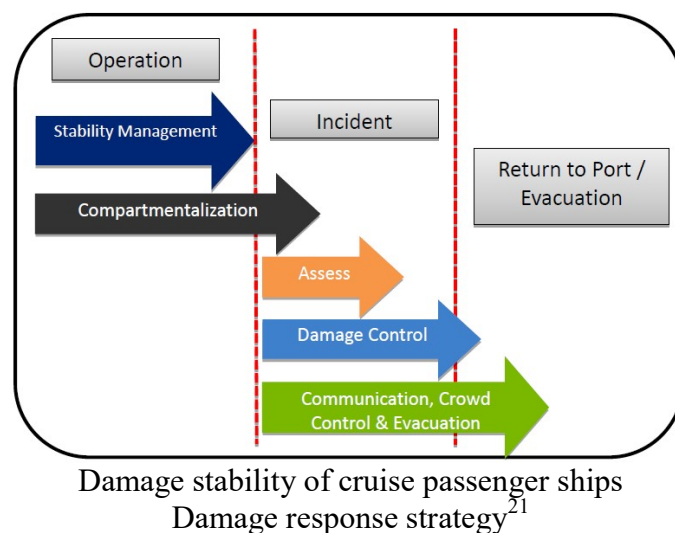
從 1912 到 2012 整整一百年<sup>18</sup>,平實而論,IMO 的努力是有成效的。事實上 IMO 原本也是有規劃安排一系列的百年總檢討與成果發表之類的活動。但不料 2012 年 1 月

<sup>17</sup> MSC 90 – MSC 95 有關客船安全的大會議程詳見附錄 A.

<sup>18</sup> Safety and Shipping 1912-2012 - From Titanic to Costa Concordia - An insurer's perspective from Allianz Global Corporate & Specialty, [http://www.agcs.allianz.com/assets/PDFs/Reports/AGCS\\_safety\\_and\\_shipping\\_report.pdf](http://www.agcs.allianz.com/assets/PDFs/Reports/AGCS_safety_and_shipping_report.pdf), accessed on 16 April 2013.

13 日，卻發生了 Costa Concordia 客輪的觸礁翻覆沉沒案件<sup>19,20</sup>，打亂了所有計畫。當然，Costa Concordia 事故原因很多，需要調查研究的工作事項也很多，但最直接被檢視的部分，即在於國際客輪在開航後 24 小時內應完成救生艇操演的規定。畢竟 Costa Concordia 係於當日傍晚啟航，21 時 45 分就出事。若非船員訓練有素、旅客服從性高以及外在良好的天候海象與地理環境相互配合，否則這艘載有 3,229 名旅客與 1,023 名船員的客輪，死亡人數肯定超過 32 人，甚或有可能超過鐵達尼的死亡人數。影響所及，2012 年 5 月 MSC 第 90 次大會，立即提案要求航程超過 24 小時的國際航線客輪，於開航前即應完成新加入成員的應急訓練與操演，以及增加在登艇甲板的救生衣數量，並於 2013 年 6 月的 MSC 第 92 次大會通過修訂 SOLAS III/19, HSC Code, MODU Code, DSC Code 也同步修正適用。

2014 年五月 14~23 日的 MSC 第 93 次大會的議程六「客輪安全」對於肇因於 Costa Concordia 的水密艙間的安全與穩性的議題；人員撤離分析；客船遇險存活率的研究；重組綜合安全評估(Formal Safety Assessment, FSA)專家小組；修訂客船安全長程計畫；對客船公司提出提升客船安全的建議措施等等都做出了一些成果。其中最特別的還是國際郵輪協會(Cruise Lines International Association)在本次大會中針對郵輪穩性損害(Damage stability of cruise passenger ships)所提出的十項報告。但是比較令人遺憾的是，這次大會討論的議題卻被 4 月 16 日發生在韓國的世越號(MV Sewol)渡輪的傾覆沉沒事件弄得有點模糊失焦。



<sup>19</sup> [http://en.wikipedia.org/wiki/Costa\\_Concordia\\_disaster](http://en.wikipedia.org/wiki/Costa_Concordia_disaster), accessed on 7 September 2014.

<sup>20</sup> Safety and Shipping 1912-2012: From Titanic to Costa Concordia, [http://www.agcs.allianz.com/assets/PDFs/Reports/AGCS\\_safety\\_and\\_shipping\\_report.pdf](http://www.agcs.allianz.com/assets/PDFs/Reports/AGCS_safety_and_shipping_report.pdf), accessed on 7 September 2014.

<sup>21</sup> Damage stability of cruise passenger ships: Damage response strategy, PASSENGER SHIP SAFETY, Submitted by the Cruise Lines International Association (CLIA), MSC 93/6/10, 11 March 2014, IMO: London.

在 MSC 第 93 次大會的議程六「客輪安全」工作小組的報告文件上，也廣泛的提出了非常多的論點<sup>22</sup>。諸如：

1. 針對義大利所提 Costa Concordia 的海難調查報告與建議案中有關雙層船殼保護水密艙間(watertight compartments, WTCs)以及 UHF 無線電交換機安裝位置的問題；
2. 海難調查報告送交專家小組研究審議，並於 MSC 第 94 次大會提出事故原因、引發議題、記取教訓、人因分析等報告，並據以更新客輪安全長程行動計畫。
3. 綜合安全評估(FSA)專家小組提議的技術性議題包括：
  - (1). 損害穩性 Damage stability
  - (2). 浸水後提升存活性的措施 Measures to enhance survivability after flooding
  - (3). 機艙雙層艙的概念 Double hull in way of main engine-rooms
  - (4). 關閉雙重底艙 Continuous closed double bottom
  - (5). 關閉水密門 No open watertight doors
  - (6). 船上損害穩性系統 Onboard damage stability system
  - (7). 使用防火門防範浸水 Use of fire doors to prevent flooding
  - (8). 浸水模擬 Flooding simulations
  - (9). 分艙穩性簡化計算 Simplified calculation of the attained subdivision index A
  - (10). 監控與評估水密門操作風險 Monitoring and assessing risk from operation of watertight doors
  - (11). 損害因應策略 Damage response strategy (damage control drills)
  - (12). 加強損害管制訓練 Enhanced damage stability training
  - (13). 加強損害管制計畫 Enhanced damage control plans
  - (14). 搜救合作計畫 SAR COOPERATION PLANS

2014 年 12 月 28 日義大利駛上駛下客輪 MS Norman Atlantic 在亞得里亞海(Adriatic Sea)的 Otranto 海峽航行中失火，造成 9 人死亡 19 人失蹤的船難事故，隔日 12 月 29 日 MV Ierapetra L 客船在駛離 Brindisi 港後不久亦失火，雖然沒造成人員傷亡，但這二起案例已引起 IMO 海事安全委員會的極度重視，並在 2015 年 6 月召開的 MSC 第 95 次會

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<sup>22</sup> Passenger ship safety - Report of the Working Group, MSC 93/WP.6, 20 May 2014, IMO: London.

議中再度提出跨個分委會的客船安全倡議(Passenger ship safety initiatives)以及客船安全長期行動計畫(Long-term action plan on passenger ship safety)<sup>23</sup>。

跨各分委會的客船安全倡議工作規劃如下：

- HTW Sub-Committee is reviewing STCW passenger ship-specific safety training;(審議客船特別安全訓練)
- SDC Sub-Committee is developing the guidelines on safe return to port for passenger ships and interpretation of SOLAS regulation II-1/13.6 on means of escape from ro-ro cargo spaces;(制定客船返港準則及 RO/RO 貨艙逃生方法)
- SDC Sub-Committee is reviewing the conditions under which passenger ship watertight doors may be opened during navigation and preparing amendments to SOLAS regulation II-1/22 and MSC.1/Circ.1380;(審議航行中水密艙門可能被打開的情況)
- SDC Sub-Committee is developing amendments to SOLAS and the FSS Code to make evacuation analysis mandatory for new passenger ships and reviewing the Recommendation on evacuation analysis for new and existing passenger ships;(修訂規則使新客船及現成船分別有強制疏散分析、建議疏散分析)
- SDC and HTW Sub-Committees are considering the amendments to SOLAS chapter II-1 and associated guidelines on damage control drills for passenger ships;(修訂客船損害管制演習的相關安全準則)
- SSE and HTW Sub-Committees are revisiting the requirements for escape route signs and equipment location markings in SOLAS and related instruments;(審查逃生路徑標誌及設備位置標誌要求)
- SSE Sub-Committee is developing the amendments to SOLAS regulation II-2/20 and associated guidance on air quality management for ventilation of closed vehicle spaces, closed ro-ro and special category spaces;(準備修訂對密閉車艙空間及 RO/RO 特別艙間的通風空氣品質管理)

<sup>23</sup> Passenger ship safety - Safety of ro-ro passenger ships, MSC 95/6, 19 January 2015, IMO: London.

- SSE Sub-Committee is also revisiting the requirements for automatic sprinkler systems; and(重新審查自動噴灑水系統)
- III Sub-Committee is coordinating the analysis of casualty and PSC data to identify trends and develop knowledge and risk-based recommendations.(整合事故分析及 PSC 資料庫已發展以知識及風險為基礎的建議)

客船安全長期工作行動計畫規劃如下<sup>24</sup>：

Table 1: The items included in the following table are suggested as potential issues to be taken forward, subject to provision of full justification in accordance with the Committees' Guidelines. These are suggested in all cases to examine the need to consider:(表一係指被認為具有充份理由被認定為是潛在的問題而且需被提出討論的)

No.	Description of the output 敘述	Parent body 所屬機構	Coordinating body 協調機構	Associated bodies 相關機構	Source of proposal 案由	Comments 註釋
<b>SOLAS chapter II-1 and related matters</b>						
1	Review and update arrangements for discontinuity between compartments containing ship's essential systems (such as propulsion sets or main generators sets) in order to preserve their functional integrity for new ships(審查及更新船舶必要系統(如推進與主發電機)佈置間的不連續以維護新船功能的完整性)	MSC	SDC		MSC 92/6/3 (Italy) MSC 92/WP.8/Rev.1	There is a link with the findings in the Costa Concordia accident investigation report. (依據 Costa Concordia 事故調查發現報告)
2	Review of the criteria for the distribution and capacity of bilge pumps, along the length passenger ships, for new ships. (艙底泵的容量與分佈)	MSC	SSE		MSC 92/6/3 (Italy) MSC 92/WP.8/Rev.1	There is a link with the findings in the Costa Concordia accident investigation report. Related to SOLAS regulation II-1/35-1.3.4.2 and SOLAS regulation II-1/35-1.3.7.1
3	Review of emergency power redundancy for existing ships (現成船冗餘之緊急供電)	MSC	SSE		MSC 92/6/3 (Italy) MSC 92/WP.8/Rev.1	There is a link with the findings in the Costa Concordia accident investigation report.
4	Development of onboard damage stability system (開發船上穩性損害系統)	MSC	SDC		MSC 93/6/7, paragraphs 19 and 20 (CLIA) MSC 93/WP.6/Rev.1	This concerns the integration of remote soundings, flooding detection system and draught reading systems which would improve the usability of the stability system. (與遠程探測、浸水檢測系統及吃水檢測系統的整合有關，用以增進穩定系統的可用性)
5	Development of guidance on the use of fire doors to prevent flooding (開發防火門使用準則以防止進水)	MSC	SDC		MSC 93/6/7, paragraphs 21 and 22 (CLIA) MSC 93/WP.6/Rev.1	This is to prevent progressive flooding, by any means possible, to other zones (防止在其他區域以任何方式繼續進水)

<sup>24</sup> Passenger ship safety - Revised long-term action plan on passenger ship safety, MSC 95/6/1, 15 January 2015, IMO: London.

No.	Description of the output 敘述	Parent body 所屬機構	Coordinating body 協調機構	Associated bodies 相關機構	Source of proposal 案由	Comments 註釋
6	Amendment to SOLAS regulation II-1/21 and associated technical guidelines on watertight doors maintenance (水密門維修)	MSC	SDC		MSC 94/6/3 (Italy) MSC 94/21, paragraphs 6.12 to 6.14	At MSC 94 views were expressed that the maintenance of watertight doors was already covered by the ISM Code and that there was no need to consider this further. (在 MSC 94 中水密門的維修已經包含在 ISM 規則裡，所以沒有必要進一步考慮此項)
<b>SOLAS chapter II-2 and related matters</b>						
7	Revision of chapter 13 of the FSS Code (arrangement of means of escape) to indicate the maximum capacity of public spaces (修訂 FSS 規則第 13 章(逃生途徑之配置)指出最大公共空間的容量)	MSC	SDC		MSC 90/27/6 and Corr.1 (MSC 90/INF.15) (Spain) MSC 90/27/7 and Corr.1 (MSC 90/INF.16) (Spain)	
<b>SOLAS chapter III and related matters</b>						
8	Develop guidelines for Administrations regarding substitution of lifeboats by liferafts (SOLAS regulation III/21.1.1) (救生筏替代救生艇的準則)	MSC	SSE		MSC 90/27/10 (Italy)	
9	Review of SOLAS regulation III/27 to add the nationality of all persons on board (加註所有船上人員國籍)	MSC	NCSR		MSC 91/7/1 (CLIA) MSC 91/22, paragraphs 7.24 and 7.25	The main issue is to include the nationality. Currently included as an interim measure in MSC.1/Circ.1446/Rev.2.
10	Guidance for flag Administrations in considering alternative arrangements under regulation III/11.7 (船旗國依據 III/11.7 的替代安排)	MSC	SSE		MSC 92/6/3 (Italy) MSC 92/WP.8/Rev.1	There is a link with the findings in the Costa Concordia accident investigation report. This item relates to the minimum number of embarkation ladders. (與最少登艇梯數量有關)
<b>SOLAS chapter V and related matters</b>						
11	Review of the effectiveness of plans for cooperation of passenger ships with appropriate search and rescue services required by regulation V/7.3 (circular MSC/Circ.1079) (客船與搜救服務合作事宜)	MSC	NCSR	III	MSC 90/27/4 (United States) MSC 93/6/15 (Finland) MSC 93/WP.6/Rev.1 MSC 93/22 MSC 91/21, paragraphs 6.9 to 6.11	There is a link with the Costa Concordia report.
12	Development of guidelines for comprehensive risk assessment, passage planning and position monitoring; effective bridge resource management; and to remove distractions. (全面風險評估、通道規劃及位置監控、有效的駕駛台資源管理及消除干擾)	MSC	NCSR	HTW	III 1/18, section 5 MSC 94/21, paragraph 6.3 ]	Having considered the outcome of III 1, in particular, on consideration of the casualty report on the Costa Concordia, MSC 94 agreed to add this potential issue, in square brackets, in table 1 for consideration on the text for this item by MSC 95
13	Consideration of the inclusion of inclinometer measurements within all VDRs (VDRs 設備增加傾側儀)	MSC	NCSR		III 1/18, section 5 MSC 94/21, paragraph 6.3	Currently the recommendation is that the VDR should be connected to an electronic inclinometer if installed (resolution MSC.333(90))(電子傾側儀) Having considered the outcome of III 1, in particular, on consideration of the casualty report on the Costa Concordia, MSC 94 agreed to add this potential issue, in square brackets, in table 1 for consideration on the text for this item by MSC 95



No.	Description of the output 敘述	Parent body 所屬機構	Coordinating body 協調機構	Associated bodies 相關機構	Source of proposal 案由	Comments 註釋
<b>STCW Convention</b>						
14	Development of more detailed assessment criteria for recognizing manning agencies (認可的人力仲介管理公司更詳細的評估準則)	MSC	HTW		III 1/18, section 5 MSC 94/21, paragraph 6.3]	Having considered the outcome of III 1, in particular, on consideration of the casualty report on the Costa Concordia, MSC 94 agreed to add this potential issue, in square brackets, in table 1 for consideration on the text for this item by MSC 95
15	Development of guidelines on the appropriate assignment of trained crew to emergency duties (適當指派已受訓之船員應急職責)	MSC	HTW		III 1/18, section 5 MSC 94/21, paragraph 6.3]	Having considered the outcome of III 1, in particular, on consideration of the casualty report on the Costa Concordia, MSC 94 agreed to add this potential issue, in square brackets, in table 1 for consideration on the text for this item by MSC 95

Table 2: The items included in the following table are items which are already related to an existing or new planned output.

No.	Description of the output 敘述	Parent body 所屬機構	Coordinating body 協調機構	Associated bodies 相關機構	Source of proposal 案由	Comments 註釋
<b>SOLAS chapter II-1 and related matters</b>						
1	Review of conditions under which passenger ship watertight doors may be opened during navigation and prepare amendments to SOLAS regulation II-1/22 and MSC.1/Circ.1380 (審查客船之水密門在航行中可能被打開的狀況及準備修訂規則)	MSC	SDC		MSC 90/27/4 (United States) MSC 92/23/2 (Norway et al.) MSC 93/6/7, paragraphs 12 to 18 (CLIA) MSC 93/WP.6/Rev.1 MSC 93/6/9 (CLIA) MSC 93/WP.6/Rev.1	Already on the agenda of SDC 2. (已經列在 SDC2 議程中) For new ships only. The goal should be to obviate the need to pass through watertight doors during the daily work and activities on board. (僅適用新船。目標應為避免船上日常工作及活動時穿過水密門) For new and existing ships. Monitoring and assessing risk from operation of watertight doors. (對新造及現有之船舶。對水密門之監控及風險評估)
2	Revision of SOLAS chapter II-1 subdivision and damage stability regulations (修訂艙區及損害穩性規則) Limit the down flooding points on the bulkhead deck for new passenger ships (限制新客船艙壁甲板之溢流點) Double hull in way of main engine-rooms (機艙區域之雙層船殼)	MSC	SDC		MSC 92/6/3 (Italy) MSC 92/WP.8/Rev.1 MSC 93/6/7, paragraphs 6 to 8 (CLIA) MSC 93/WP.6/Rev.1	Related to the ongoing work in SDC, under the existing agenda item on amendments to SOLAS chapter II-1 subdivision and damage stability regulations. (SDC 正在進行相關作業，現有的議程項目中修訂 SOLAS II-1 章艙區及穩性損害規則)
3	Amendments to SOLAS chapter II-1, part B-4, Stability Management, to include requirements on damage control drills for passenger ships (修訂 SOLAS II-1 章 B-4 編，穩度管理包含客船之損害管制演習要求)	MSC	SDC	HTW	MSC 93/6/10 (CLIA) MSC 93/WP.6/Rev.1 MSC 93/22	MSC 93 agreed to include this new unplanned output in the 2014-2015 biennial agenda of the SDC Sub-Committee and provisional agenda for SDC 2, with a target completion year of 2016. (同意納入 SDC 次委員會 2014-2015 兩年期議程及 SDC2 臨時議程中，目標為在 2016 年完成)
4	Revision of section 3 on damage	MSC	SDC	HTW	MSC 93/6/12 (CLIA)	MSC 93 agreed to include this new

	control plans of the Guidelines for damage control plans and information to the master (MSC.1/Circ.1245) to include enhancements to the damage control plan for passenger ships (修訂損害管制計畫之損害管制計畫之準則包含加強客船損害管制訊息)				MSC 93/WP.6/Rev.1 MSC 93/22	unplanned output in the post-biennial agenda of the SDC Sub-Committee. (納入 SCD 次委員會的兩年期議程)
5	On-board stability computer or shore-based support for existing passenger ships (現成客船船上穩度計算電腦或岸上支援)	MSC	SDC		MSC 92/6/3, paragraph 7.2 (Italy) MSC 94/6/1 (Bahamas et al.) MSC 94/21, paragraph 6.4 to 6.8	MSC 94 agreed to include this output as a new unplanned output in the post-biennial agenda of SDC Sub-Committee. (納入 SCD 次委員會的兩年期議程)
<b>SOLAS chapter II-2 and related matters</b>						
6	Evacuation analysis Regulation 13, subparagraphs 3.2, 7.1, 7.2 and 7.4 (疏散分析規則)	MSC	SDC		MSC 90/27/9, +Corr.1 (MSC 90/INF.18) (Spain) MSC 92/6/2 (Germany and Spain) MSC 92/6/4 (ITF and NI) MSC 92/WP.8/Rev.1 MSC 93/20/4 (France et al.) MSC 93/22	MSC 93 agreed to expand the existing output "Review of the recommendations on evacuation analysis for new and existing passenger ships" (planned output 5.1.1.3) to include development of amendments to SOLAS and other mandatory instruments to make the application of evacuation analysis to passenger ships mandatory. (同意擴大現有"審核現有及新造船疏散分析之建議"以包含發展 SOLAS 修正案及其他強制文書應用至強制客船疏散分析)
<b>STCW Convention</b>						
7	Review of the adequacy of passenger ship specific safety training in the STCW Convention (審核 STCW 中客船特殊安全訓練之充分性)	MSC	HTW		MSC 90/27/4 (United States); MSC 91/19/7 (United States) MSC 93/6/11 (CLIA) MSC 93/WP.6/Rev.1	The Group noted that this item was included on the agenda of STW 45 at MSC 91, and was of the view that it should be maintained on the agenda of HTW 1. Enhanced damage stability training programme for deck officers and engineers. (加強艙面甲級船員及輪機員之穩性損害訓練)
<b>General matters</b>						
8	Review the adequacy of shipboard safety signs and markings (審查船上安全標示及標誌之充分性)	MSC	SSE	HTW	MSC 90/27/4 (United States); MSC 91/WP.8/Rev.1 MSC 94/18/6 (United States and ISO) MSC 94/21, paragraph 18.7	The issue of emergency drills, which was previously part of the description of this potential issue, has been forwarded separately as a proposal for damage control drills on passenger ships (see table 2, No.3 above). (應急演習為先前此項潛在議題說明的一部分，且已經成為客船損害管制演習之提案) MSC 94 agreed to include in the biennial status report of the SSE Sub-Committee and the provisional agenda of SSE 2 an unplanned output on "Revision of requirements for escape route signs and equipment location markings in SOLAS and related instruments", with a target completion date of 2016. (MSC 94 同意將此納入 SSE 次委員會兩年期的報告，及 SSE 2 臨時議程將計畫外的"修訂 SOLAS 及相關文書中逃生路線標誌及設備位置之要求"，目標為 2016 年完成)

### 3.2 HTW 大會

有關人員的培訓議題，在 IMO 一向係由 MSC、MEPC 委員會下的 STW 分委會 (Standards of Training and Watchkeeping (STW) Sub-Committee)負責擬定，2014 年 IMO 重整分委會以後，STW 分委會更名為 HTW 分委會(The Human Element, Training and Watchkeeping (HTW) Sub-Committee)。

回顧有關客船人員的培訓議題，從 2009 年的 STW 40 到 2013 年的 STW 44 五次會議中僅有 2009 年的 STW 40 有一次提及加強滅火的提案，其餘均未「單獨」提及<sup>25</sup>。及至 MS Costa Concordia 以後的連續數起重大客船海事案例以及相應的 MSC 大會的熱烈討論，在 2014 及 2015 的 HTW 大會上即出現了檢討客船特殊培訓的一些討論議題如下：

#### Human Elements, Training and Watchkeeping (HTW) 1st session (17-21 February 2014) Agenda item/sub item 13: Review of STCW passenger ship specific safety training

doc no	title	submitted by	date received
13	Proposed review of STCW passenger ship specific safety training (提出 STCW 客船特殊安全訓練之審查)	United States	18/12/13
13/ Corr.1	Proposed review of STCW passenger ship specific safety training (提出 STCW 客船特殊安全訓練之審查)	United States	31/1/14
13/1	Review and revision of training requirements for passenger ships (審查及修訂客船之訓練要求)	ITF	24/1/14

#### Human Elements, Training and Watchkeeping (HTW) 2nd session (2-6 February 2015) Agenda item/sub item 10: Review of STCW passenger ship specific safety training (5.2.2.2)

doc no	title	submitted by	date received
10	Outcome of MSC 93 (大會決議)	Secretariat	16/9/14
10/1	Report of the Correspondence Group (因應小組報告)	United States	1/12/14
10/2	Comments on the report of the correspondence group (因應小組報告之意見)	ICS CLIA Interferry	12/1/15
10/3	Enhanced damage stability training programme (加強穩性損害之訓練計畫)	CLIA	14/1/15

這些討論議題仍處於會員國或相關機構的提議階段，仍未達最後決議。但是可以觀察的是對於客船人員的培訓，還是必須從 MSC 會議中的客船安全倡議以及客船安全長期行動計畫中有涉 HTW 的實質內容，才能抓到 IMO 的真正脈動。例如：

- Table 1, Item 12: Development of guidelines for comprehensive risk assessment, passage planning and position monitoring; effective bridge resource management; and to remove distractions. (制定綜合危險評估、通道規畫及位置監控、有效的駕駛台資源管理及消除干擾)
- Table 1, Item 14: Development of more detailed assessment criteria for recognizing

<sup>25</sup> Comprehensive review of the STCW Convention and the STCW Code - Chapter V of the STCW Convention and Code - Fire-fighting training for personnel on passenger ships, STW 40/7/65, 12 December 2008, IMO: London.

manning agencies (制定更詳細的認可蘭仲介管理機構評估標準)

- Table 1, Item 15: Development of guidelines on the appropriate assignment of trained crew to emergency duties (制定受訓船員合適之應急職責)
- Table 2, Item 3: Amendments to SOLAS chapter II-1, part B-4, Stability Management, to include requirements on damage control drills for passenger ships (修正 SOLAS 穩定管理系統，包含客船損害管制演習)
- Table 2, Item 4: Revision of section 3 on damage control plans of the Guidelines for damage control plans and information to the master (MSC.1/Circ.1245) to include enhancements to the damage control plan for passenger ships (修訂損害管制計畫之損害管制計畫之準則包含加強客船損害管制訊息)
- Table 2, Item 7: Review of the adequacy of passenger ship specific safety training in the STCW Convention (檢視 STCW 公約中客船特殊安全訓練的適當性)
- Table 2, Item 8: Review the adequacy of shipboard safety signs and markings (檢查船上之安全信號及標誌是否足夠)

### 3.3 相關法規

IMO MSC 有關客船安全工作小組的許多議題仍處研議階段，若要正式列入客船安全長程計畫甚或變成正式法規，可能還有一段時日要走，但總值得持續觀察。目前，除了船舶安全的共同性公約與規定外，就現行與客輪安全直接相關的法規而言，可以依時間序簡列如下<sup>26</sup>：

1. 2007.10.12 - MSC Resolution.45(83) Recommendation on a standard method for evaluating cross-flooding arrangements (recommendation to A.266(VIII) passenger and cargo ships MSC.216(82) revised by MSC.362(92))(apply to ships constructed on or after 14 June 2013 and that calculations to evaluate cross-flooding arrangements performed before 14 June 2013 remain valid) (橫貫浸水裝置評估方法)
2. 2007.10.30 - MSC.1 Circ.1238 Guidelines for evacuation analysis for new and existing passenger ships (supersedes MSC/Circ.1033 guidelines MSC/Circ.1166) (新造及現成客船疏散分析準則)
3. 2007.10.31 - MSC.1 Circ.1234 Drainage of fire-fighting water from enclosed vehicle and ro-ro spaces and special category spaces for passenger and cargo ships (消防用水從客船及貨船密閉車輛艙間及 RO/RO 特別艙間卸除之準則)

<sup>26</sup> 法國驗船協會(BV)在 2014 年 1 月出版的 Safety of ro-ro passenger & cruise ships (NI-388-Revision 10) 一書中有更詳盡的列表。  
[http://www.veristar.com/portal/rest/jcr/repository/collaboration/sites%20content/live/veristarinfo/web%20contents/bv-content/generalinfo/giRulesRegulations/bvRules/guidancenotes/documents/5592.36.388-NI\\_2014-01.pdf](http://www.veristar.com/portal/rest/jcr/repository/collaboration/sites%20content/live/veristarinfo/web%20contents/bv-content/generalinfo/giRulesRegulations/bvRules/guidancenotes/documents/5592.36.388-NI_2014-01.pdf), accessed on 8 September 2014.

4. 2007.11.29 – Resolution A.999(25) Guidelines on voyage planning for passenger ships operating in remote areas (guidelines A.893(21) MSC/Circ.1056 recommendation MSC.1/Circ.1446) (偏遠水域作業客船航程規劃準則)
5. 2008.06.03 - MSC.1 Circ.1274 Guidelines for the evaluation of fire risk of external areas on passenger ships (客船火災風險疏散至外部區域評估準則)
6. 2008.12.09 - MSC.1 Circ.1291 Guidelines for flooding detection systems on passenger ships (客船浸水監測系統準則)
7. 2009.06.11 - MSC.1 Circ.1320 Guidelines for the drainage of fire-fighting water from enclosed vehicle and ro-ro spaces and special category spaces of passenger and cargo ships (guidance to MSC.256(84)) (消防用水從客船及貨船密閉車輛艙間及RO/RO 特別艙間卸除之準則)
8. 2010.06.02- MSC.1 Circ.1347 Determination of the required safe working load of liferaft launching appliances on passenger ships (occupant weight MSC.81(70) MSC.293(87) MSC.295(87)) (客船救生筏安全工作負荷)
9. 2010.06.02 - MSC.1 Circ.1348 Guidelines for the assessment of technical provisions for the performance of an in-water survey in lieu of bottom inspection in dry-dock to permit one dry-dock examination in any five-year period pr passenger ships other than ro-ro passenger ships (水下檢驗代替乾塢底層檢測之準則)
10. 2010.06.22 - MSC.1 Circ.1369 Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (enter into force 1 July 2010)(guidance to MSC.216(82) revokes MSC.1/Circ.1214 interpretation MSC.1/Circ.1437) (對於火災或水災事故發生後客船系統的能力進行評估之臨時解釋說明)
11. 2010.12.10 - MSC.1 Circ.1380 Guidance for watertight doors on passenger ships which may be opened during navigation (guidance from 1 January 2011) (客船之水密門在航行中可能被開啟之準則)
12. 2011.05.27 - MSC.1 Circ.1400 Guidelines on operational information for masters of passenger ships for safe return to port by own power or under tow (提供客船船長以自身能力或經拖船幫助安全回港之操作信息)
13. 2012.05.25 - MSC Resolution.336(90) Adoption of measures aimed at enhancing the safety of passenger ships (voyage plans A.893(21) A.999(25) enhance safety MSC.1/Circ.1446) (加強客船安全之措施)
14. 2012.06.13 - MSC.1 Circ.1417 Guidelines for passenger ship tenders (use annexed guidelines form 21 May 2012) (客船接駁船準則)
15. 2012.06.13 - MSC.1 Circ.1418 Guidelines for the design and installation of a visible element to the general emergency alarm on passenger ships (use annexed guidelines form 21 May 2012) (客船一般緊急警報可見基本項目之設計及安裝準則)
16. 2012.12.04 - MSC.1 Circ.1369 Add.1 Interim explanatory notes for the assessment

of passenger ship systems' capabilities after a fire or flooding casualty (火災或水災事故發生後客船系統的能力進行評估之臨時解釋說明)

17. 2013.05.17 – MEPC Resolution 233(65) 2013 guidelines for calculation of reference lines for use with the energy efficiency design index (EEDI) for cruise passenger ships having non-conventional propulsion (非傳統推進之遊輪基準線與能效設計指數 (EEDI) 之計算準則)
18. 2013.08.08 – MSC.1 Circ.1446/Rev.2 Recommended interim measures for passenger ship companies to enhance the safety of passenger ships (replaces MSC.1/Circ.1446/Rev.1)(給客船公司增進客船安全之臨時建議措施)

#### 四、結論建議

作為一個適格的客船船員，符合 STCW 公約規範所有對應等級的教育訓練只是個基本必須，更重要的是有沒有完成有關「載客船舶」所衍生的知識與技能要求。例如：客船基本與旅客安全、貨物安全及船體完整性的安全訓練、危機處理訓練、群眾管理訓練、人員撤離訓練、加強滅火訓練等等，又如高速客船還需額外增加的高速客船訓練等等。

要求的根源來自維護乘客的安全、保障船舶的安全、保護海洋環境三大領域，要求的另一個面向來自「殷鑑」，也就是「亡羊補牢」的新發現、或以前應注意而未注意到的事物、或以前以為不會發生卻發生的事物。例如：1987.03.06 Herald of Free Enterprise 的翻覆案、1987.12.20 Doña Paz 的碰撞失火案、1990.04.07 Scandinavian Star 的失火案、1994.09.28 Estonia 的沉沒案、2005.11.05 Seabourn Spirits 的海盜攻擊案、2010.02.26 年 Celebrity Mercury 的諾羅病毒與疾病管制案、2010.11.08 Carnival Splendor 與 2013.02.10 MV Carnival Triumph 的機艙失火案、2012.01.13 年 Costa Concordia 的擱淺案、2014.04.16 Sewol 沉沒案、2015.06.01 東方之星翻覆案等等。凡此種種，都是用很多很多無辜犧牲的生命換來新的公約的制定以補強安全的漏洞(Safety Gap)。

以 SOLAS 為主體的各章法規的增修、同樣是在 SOLAS 下的 ISM、ISPS 程序補強等等，無一不在築起一道道維護「人、船、環境」的安全網。所有的程序、所有的系統、所有的軟硬件的最終使用者或者說是最終實踐者就是「人」，因此透過 STCW 來規範「載客船舶」船員的知識、技能似乎也就是最後一道防線。

IMO HTW 目前正透過 MSC 大會對於客船安全的分析與研議，逐一修訂客輪安全特別訓練課程，新的課程架構還沒定案，但是值得思考的是在國際政治與商務操作的折衝運作下，STCW 最終所制訂出來的將是國際間可接受的「最低」標準。

而最令人憂心的情事莫不過是如果政府當局以最低標準為滿足標準，而「安全文化」與「安全意識」水平不足，或是某小部分認為倒楣事情不會發生在他們身上的航運業者或船員，認為政府部門所規範的不過是「外行人管內行人」、「擾民」、「杞人憂天」、「有那麼嚴重嗎」、「不懂的在教懂的」等等的回應時，這樣的安全價值，這樣的海洋文化與核心價值就一覽無遺了。這樣的安全氛圍下所培育的船員就不足以成為海洋大國、航運強國的條件，這樣的安全氛圍下所培育的船員就不足以操作國際郵輪船隊、大型客船(渡船)船隊。

海洋台灣的人民，普遍有著吃苦耐勞卻也樂天知命的堅韌個性，但也有無限可能的可塑性與適應性，因此，當政府部門設定任何的門檻標準，百姓們也都能配合標準準備如何的去恰恰好可以跨過門檻就好。因此，關於客輪安全培訓的議題，或許可以拉高視野先來想想我國的國際郵輪、大型客船的政策是什麼？我國的大型渡船與小型渡船的政策是什麼？我國的小型客船與載客小船的標準又是什麼？

如此一來，再來依據 STCW 所規範的「最低」標準研擬出一套適合台灣各等級載客船舶的安全規範以及船員訓練的準繩。畢竟，回歸 STCW 公約的精神，公約是給主管當局作為制定適合本國情況的參考「最低」標準罷了！

IMO 再三強調船員必須適格適任，最低標準只能培訓出適格的船員，只適合在風平浪靜、一切正常下，安穩的完成航行任務。但當情況異常、危急情況下，就必須適格適任的船員才能化解危機，防止海難發生或降低海難所造成之損失。客船安全在於保障那些毫無海上危機意識的普通遊客，IMO 已從最近幾次客船意外事故中，重新檢討客船特殊培訓的一些議題，我國主管當局也應深思我國客船船員之員額及訓練標準，如何防止類似韓國世越號之海難事故在台灣海域上演。

#### 附錄 A MSC 大會議程

##### Maritime Safety Committee (MSC) 90th session (16 - 25 May 2012)

##### Agenda item/sub item 27: Passenger ship safety

doc no	title	submitted by	date received
	Passenger ship safety		
27	Passenger ship safety provision	Secretary-General	5/3/12
27/1	Cruise Industry Operational Safety Review	CLIA	9/3/12
27/2	Cruise industry operational safety review	CLIA	28/3/12
27/3 replaced by Inf.14	German priorities for an enhanced passenger ship safety level	Germany	28/3/12
27/3/ Corr.1	German priorities for an enhanced passenger ship safety level	Germany	15/5/12
27/4	Passenger ship safety issues for consideration	United States	20/4/12
27/5	Investigation into the Costa Concordia incident	Italy	1/5/12
27/6 replaced by Inf.15	Proposal to amend chapter 13 of the International Code for Fire Safety Systems (FSS Code)	Spain	1/5/12

27/6/ Corr.1	Proposal to amend chapter 13 of the International Code for Fire Safety Systems (FSS Code)	Spain	21/5/12
27/7 replaced by Inf.16	Proposal for interpretations of the initial distribution of persons on board for the purposes of escape analysis and calculation of the width of escape routes	Spain	1/5/12
27/7/ Corr.1	Proposal for interpretations of the initial distribution of persons on board for the purposes of escape analysis and calculation of the width of escape routes	Spain	21/5/12
27/8 replaced by Inf.17	Safe return to port: consistency between requirements for the operation of essential systems after flooding and damage stability requirements	Spain	1/5/12
27/8/ Corr.1	Safe return to port: consistency between requirements for the operation of essential systems after flooding and damage stability requirements	Spain	21/5/12
27/9 replaced by Inf.18	Extension of the application of regulation II-2/13.7 of the SOLAS Convention to passenger ships other than ro-ro passenger ships	Spain	1/5/12
27/9/ Corr.1	Extension of the application of regulation II-2/13.7 of the SOLAS Convention to passenger ships other than ro-ro passenger ships	Spain	21/5/12
27/10 replaced by Inf.19	Proposals for the implementation of short-term additional safety measures on board passenger ships	Italy	1/5/12
27/10/ Corr.1	Proposals for the implementation of short-term additional safety measures on board passenger ships	Italy	15/5/12
27/11	Cruise Industry Operational Safety Review	CLIA	1/5/12
27/12	Cruise Industry Operational Safety Review	CLIA	1/5/12
27/13	Considerations by navigating in the Polar waters	Denmark BIMCO	1/5/12
27/14	Issues for consideration	ICS	1/5/12
Inf.11	Indicative guidelines for qualified inspectors when carrying out unscheduled surveys during a regular crossing (Annex IV of European Directive 1999/35/EC)	Italy	20/4/12
Inf.19	Proposals for the implementation of short-term additional safety measures on board passenger ships	Italy	16/7/12

### Maritime Safety Committee (MSC) 91th session (26-30 November 2012)

#### Agenda item/sub item 7: Passenger ship safety

doc no	title	submitted by	date received
7	Outcome of MSC 90	Secretariat	4/10/12
7/1	Cruise industry operational safety review	CLIA	9/10/12
7/2	Future passenger ship safety	United Kingdom	4/10/12
7/3	Safe return to port stability criteria	United Kingdom	4/10/12
7/4	Watertight doors	United Kingdom	4/10/12
7/5	The Costa Concordia casualty investigation: progress report	Italy	4/10/12
7/6	Outcome of MSC 90	ICS	18/10/12
7/7	Investigation into the Costa Concordia accident	Italy	27/11/12

### Maritime Safety Committee (MSC) 92th session (12-21 June 2013)

#### Agenda item/sub item 27: Passenger ship safety

doc no	title	submitted by	date received
6	Outcome of MSC 91	Secretariat	27/2/13
6/1	Cruise Industry Operational Safety Review	CLIA	20/3/13
6/2	Evacuation analysis	Germany Spain	20/3/13
6/3	Preliminary recommendations arising from the Costa Concordia marine casualty investigation	Italy	3/4/13
6/4	Evacuation analysis	ITF NI	15/4/13
6/5	Review of Operational Safety Measures to Enhance the Safety of Passenger Ships	ICS	22/4/13
6/6	Survivability of passenger ships	EC & signatories	22/4/13
6/7	Comments on MSC 92/6/6 regarding the survivability of passenger ships after damage	United States	7/5/13
6/8	Comments on preliminary recommendations arising from the Costa Concordia Casualty Investigation (MSC 92/6/3)	IUMI	20/5/13



6/9	Comments relating to the Costa Concordia incident: the importance of shoreside management to maintaining shipboard safety	CLIA	30/5/13
6/10	Comments relating to the Costa Concordia incident: specific comments on Italy's recommendations	CLIA	31/5/13
Inf.6	Report on the Costa Concordia marine casualty investigation	Italy	20/5/13
report	Costa Concordia report		23/5/13

### Maritime Safety Committee (MSC) 93th session (14-23 May 2014)

#### Agenda item/sub item 6: Passenger ship safety

doc no	title	submitted by	date received
6	Outcome of MSC 92 and SDC 1	Secretariat	1/4/14
6/1	Preliminary recommendations arising from the Costa Concordia marine casualty investigation	Italy	26/2/14
6/2	Report of the intersessional meeting of the Experts Group on Formal Safety Assessment (FSA)	Chairman FSA EG	20/1/14
6/3	Comments on documents SDC 1/6 and SDC 1/INF.7	EC	12/3/14
6/4	Status and purpose of the long-term action plan on passenger ship safety	Secretariat	26/2/14
6/5	Recommendations arising from the Costa Concordia casualty	RINA	21/3/14
6/6	Damage stability of cruise passenger ships	CLIA	24/3/14
6/7	Damage stability of cruise passenger ships: Measures to enhance survivability after flooding	CLIA	24/3/14
6/8	Damage stability of cruise passenger ships: Simplified calculation of the attained subdivision index A	CLIA	24/3/14
6/9	Damage stability of cruise passenger ships: Monitoring and assessing risk from operation of watertight doors	CLIA	26/3/14
6/10	Damage stability of cruise passenger ships: Damage response strategy	CLIA	24/3/14
6/11	Damage stability of cruise passenger ships: Enhanced damage stability training	CLIA	24/3/14
6/12	Damage stability of cruise passenger ships: Enhanced damage control plans	CLIA	24/3/14
6/13	Comments on document MSC 93/6/3	Japan	9/4/14
6/14	Comments on MSC 93/6/5	CLIA	14/4/14
6/15	Availability of updated SAR cooperation plans	Finland	10/4/14
6/16	Revision of SOLAS Chapter II-1 – Subdivision and Damage Stability Regulations on passenger ship survivability after damage	CESA Interferry	14/4/14
Inf.1	Damage stability of cruise passenger ships: Analysis of simplified calculation of the attained subdivision index A	CLIA	24/3/14
WP.6	Passenger ship safety - Report of the Working Group		4/6/14

### Maritime Safety Committee (MSC) 94th session (17-21 November 2014)

#### Agenda item/sub item 6: Passenger ship safety

doc no	title	submitted by	date received
6	Passenger ship safety		
6	Outcome of III 1 on consideration of the casualty report on the Costa Concordia	Secretariat	16/9/14
6/1	Further consideration of the proposal to extend, to existing passenger ships, the SOLAS requirement relating to computerized stability support for the master in case of flooding	Bahamas Liberia IACS CLIA	15/9/14
6/2	Availability of updated SAR cooperation plans	United States	25/9/14
6/3	Maintenance of watertight doors	Italy	25/9/14

### Maritime Safety Committee (MSC) 95th session (3-12 June 2015)

#### Agenda item/sub item 6: Passenger ship safety

doc no	title	submitted by	date received
6	Safety of ro-ro passenger ships	Secretary- General	16/2/15
6/1	Revised long-term action plan on passenger ship safety	Secretariat	27/1/15
6/2	Proposals to improve passenger ship survivability after damage	EC & Signatories	17/4/15
6/3	ISO new work item to provide ISO standard to aid in the unified interpretation of the	ISO	14/4/15

	provision of Man Overboard Detection Devices for Passenger Ships		
Inf.4	Revision of SOLAS Chapter II-1 subdivision and damage stability regulations - Proposals to improve passenger ship survivability after damage	EC	17/4/15
Inf.5	Revision of SOLAS chapter II-1 subdivision and damage stability regulations - Proposals to improve passenger ship survivability after damage	EC	14/4/15