

## STCW1995 版轉換為 2010 版船上訓練紀錄簿應補差項目表：一、二等管輪

專長 FUNCTION：操作級-輪機工程

### MARINE ENGINEERING AT THE OPERATIONAL LEVEL

項次 Ref No	訓練 Training			評估標準 Criteria for Evaluation	適任性證明 Competence Demonstrated	
1	適任 Competence： 保持安全之機艙當值 Maintain a safe engineering watch					同部門較自身高階之 甲級船員簽名/日期 Assessor (Signature/Date)
1.2	執行當值 Conduct the watch			機器、設備及系統之監視頻率 和範圍，經常符合廠商之建議 ，可接受的長規及程序，而且 充分對付一般操作錯誤及瑕 疵狀況時。可疑的決斷及/或行 動將導致面對的挑戰及回應 The frequency and extent of monitoring: machinery, equipment and systems conform to manufacturers' recommendations and accepted principles and procedures and are sufficient to deal with common operational errors and fault condition.:Questionable decisions and/or actions result in appropriate challenge and response		
18	了解有效的當值涉及善於處理當值職責，除 監督外尚包含對推進機組及其他機器繼續維 持安全運作 Understand that effective watchkeeping involves managing watch duties, including supervision, as well as maintaining the safe operation of propulsion plant and other machinery					

1.3	突然斷電及緊急情況的因應 Respond to black-out and emergency situations			依照擬定的程序立即採取行動，並改善當時的情況。有效的領導行為及示範 <i>Immediate actions are executed in accordance, with laid down procedures, and due regard paid to the actual situation. Effective leadership behaviors are demonstrated</i>		
.10	說明首次啟動安排須知 Demonstrate knowledge of first start arrangements					
1.5	完成機艙日誌及其他紀錄簿之登錄 Complete the engine room log book and other records			所有引擎系統相關的重要讀數、動態及活動應都被適當的登錄 <i>All significant readings, movements and activities related to the engineering systems are properly recorded</i>		
.6	說明警鈴紀錄簿之用途及須知 Demonstrate a knowledge of and understand the purpose of the Alarm Record Book					
1.6	瞭解機艙資源管理之原則 Knowledge of engine room resource management principles			資源之配置依需要之優先而分配以執行所需完成之工作 <i>Resources are allocated and assigned as needed in correct priority to perform necessary tasks</i>		
.1	機艙資源管理配置及應用設定可行之方案 Set realistic plans for allocation and use of engine room resources					
.2	計畫工作能及時完成 Plan tasks to achieve timely outcome					
.3	瞭解為達成目標或目的計畫必須有明確充分的細節 Understand that to achieve a goal or an objective the plan must be specific with sufficient detail					

	[4] 收集及說明管理資料以確定工作進度 Demonstrate collection and interpretation of management data to assess task progress					
	[5] 帶領團隊成員在進度中重行檢查所設定之計畫以確保工作能如期達成 Lead progress review with team members to ensure task is attainable within the plan set					
	[6] 工作完成後之檢討能給予讚許的回饋因在其他場合中可能會很困難達成 Lead task review on completion giving credit where due and noting areas where things may be done differently on another occasion					
2	<b>適任 Competence :</b> <b>能以書面及口頭方式使用英語</b> <b>Use English in written and oral form</b>			<b>評估標準</b> <b>Criteria for Evaluation</b>		<b>適任性證明</b> <b>Competence Demonstrated</b> 同部門較自身高階之 甲級船員簽名/日期 Assessor ( Signature/Date )
2.2	能適時與用英語和他人溝通 Communicate with others in English language, as appropriate			<i>溝通應清晰及明確</i> <i>Communications are clear and understood</i>		
	[4] 確定夥伴已正確了解所下達之命令 Ensure that others have understood orders correctly					
	[5] 對不同國籍夥伴能用英文溝通指令的能力 Demonstrate an ability to communicate instructions effectively in the English language to a multi-lingual crew					
3	<b>適任 Competence :</b> <b>能使用船上對內部聯絡系統</b> <b>Use internal communication systems</b>			<b>評估標準</b> <b>Criteria for Evaluation</b>		<b>適任性證明</b> <b>Competence Demonstrated</b> 同部門較自身高階之 甲級船員簽名/日期 Assessor ( Signature/Date )

3.1	能使用船上所有對內部聯絡系統 Operation of all internal communication systems on board	能連續且有效的發送及接收信息，通信紀錄應依當時情況完整及確實記錄 <i>Transmission and reception of messages are consistently successful. Communication records are complete, accurate and comply with statutory requirements</i>			
	科目/職責 Task/Duty	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	
.1	操作船上內部電話系統 Demonstrate operation of the ship's internal phone system				
.2	使用船上內部訊息系統傳送及接受訊息或指示 Use internal message system to send and receive information or instructions				
.3	瞭解溝通係雙向交換，練習下列實作： Understand communication is a two-way exchange and demonstrate this in practice : 舵機房與機艙 Steering gear to engine room				
.4	舵機房與駕駛台 Steering gear to bridge				
.5	演示使用手持無線電話通訊時能正確的識別 站台程序 Demonstrate correct station ID procedure when using hand held transceivers (portable radios)				
4	<b>適任 Competence :</b> <b>能操作主機、副機及各種控制系統</b> <b>Operate main and auxiliary machinery and associated control systems</b>	<b>評估標準</b> <b>Criteria for Evaluation</b>		<b>適任性證明</b> <b>Competence Demonstrated</b> 同部門較自身高階之 甲級船員簽名/日期 Assessor ( Signature/Date )	

4.1	離港前機器的備便 Prepare machinery for departure	依照擬定的指示執行各項檢查及操作，並且使輔機及控制系統能發揮適當功能。紀錄各項相關的檢查及操作 <i>All checks and actions are carried out in accordance with laid down instructions and all auxiliary and control systems are functioning properly. All relevant checks and actions are recorded</i>			
	科目/職責 Task/Duty	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	
7	說明如何選擇高水位及低水位海水閘 Demonstrate a knowledge of the use of high level and low level sea suctions				
5	<p align="center"><b>適任 Competence :</b></p> <p align="center">能操作燃油、潤滑油、壓艙水、 其他泵浦系統及各種操縱系統</p> <p align="center"><b>Operate fuel, lubrication, ballast and other pumping systems and associated control systems</b></p>		<p align="center"><b>評估標準</b></p> <p align="center"><b>Criteria for Evaluation</b></p>	<p align="center"><b>適任性證明</b> <b>Competence Demonstrated</b></p> <p align="center">同部門較自身高階之 甲級船員簽名/日期 Assessor ( Signature/Date )</p>	
5.1	規劃輔助及管路系統的操作及選用裝備 Plan the operations of auxiliary and piping systems and service plants	各項操作規畫妥當並於執行操作前完成各項裝備及控制系統的檢查 <i>Operations are planned and all equipment and control systems checked before operations are executed</i>			
	科目/職責 Task/Duty	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	

.1	繪一油水分離器(OWS)系統線路圖 Sketch a line diagram of the oily water separator (OWS) system					
.2	繪一壓艙水系統線路圖 Sketch a line diagram of the ballast water system					
.3	繪一機艙汗水系統線路圖 Sketch a line diagram of the engine room bilge water system					
.4	繪一汗水保留系統線路圖 Sketch a line diagram of the hold bilge water system					
.5	協助油水分離器(OWS)之操作 Assist with the operation of the OWS					
.6	有正確填寫油紀錄簿的知識 Demonstrate a knowledge of making correct entries in the Oil Record Book					
.10	對汗水泵浦的知識 Demonstrate a knowledge of the bilge pump					
5.2	燃油、滑油、壓艙水、艙底水、汗水、海洋環境維護等設備和裝卸貨泵之操作 Operate the systems for fuel oil, lube oil, ballast, bilge, MARPOL equipment and cargo pumping			依照海上環境污染防治的規定及程序完成各項操作 <i>The operations are carried out in accordance with rules and procedures to ensure safety of operations and avoid pollution of the marine environment</i>		
.4	瞭解產生含硫(磺)物質管制區之知識 Demonstrate a knowledge of Sulphur Emissions Control Areas					
.5	如有機會，在指導下轉換重黏度燃油到輕黏度燃油，反之亦然。 Assist an officer with change over from heavy fuel oil to low viscosity fuel oil and vice versa, where applicable					

.16	<p>抽掉船上污水保留艙實應確保遵守防止污染的規定與要求          Pump out hold bilges ensuring that all pollution prevention regulations and requirements are observed</p>					
.17	<p>示範船舶進水時緊急淨空機艙艙底水的措施          Demonstrate the emergency arrangements for emptying engine room bilges in the event of flooding</p>					



交通部航港局

Maritime and Port Bureau, MOTC

**專長 FUNCTION：操作級-電機、電子及控制工程**  
**ELECTRICAL, ELECTRONIC AND CONTROL ENGINEERING AT THE**  
**OPERATIONAL LEVEL**

項次 Ref No	訓練 Training		評估標準 Criteria for Evaluation	適任性證明 Competence Demonstrated	
6	適任 Competence： 能操作電機、電子及控制工程 Operate electrical, electronic and control systems				同部門較自身高階之 甲級船員簽名/日期 Assessor ( Signature/Date )
6.1	電器設備基本的配置及操作原則： 電器設備及其配置系統應確定其位置及 有關的操作手冊、圖表及說明書 Basic configuration and operating principles of electrical equipment： Locate and use relevant manuals, drawings, diagrams and instructions for electrical equipment and distribution systems		相應的說明書及手冊能快速 辨認及適當使用此為安全有 效的作業。能用電路圖/說明 書瞭解及說明電路系統 The instructions and manuals relevant for safe and efficient operations are quickly identified and properly used. Electrical systems can be understood and explained： with drawings/instructions		
	科目/職責 Task/Duty	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	
1	說明系統圖、電路圖、配線圖之不同 Explain the difference between a system diagram, a circuit diagram and a wiring diagram				
4	說明在配電網路中主控板及保護裝置之位置 Demonstrate a knowledge of the location of major control and protection devices within the distribution network				



.5	<p>說明電負荷的類別如主要的或次要的，主要的負荷是提供那些服務</p> <p>Demonstrate a knowledge of which electrical loads are classed as essential or non-essential, and how essential services are supplied</p>					
.6	<p>指出岸電接頭之位置及說明接/拆岸電之程序</p> <p>Locate shore power connection and state the procedures for connection/disconnection</p>					
6.2	<p>準備及啟動交流發電機或發電機</p> <p>Prepare and start alternators or generators</p>			<p>操作應先規劃然後依照作業手冊，確定的準則及程序，以確保安全作業之達成</p> <p><i>The operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations</i></p>		
.1	<p>在啟動前協助檢查及測試電器設備及控制系統</p> <p>Assist with pre start-up checks and tests on electrical equipment and control systems</p>					
.9	<p>檢查高壓燃油管外層護套及相聯的溢漏指示器之功能</p> <p>Check efficiency of sheathing on high-pressure fuel pipes and associated leak-off indicators</p>					
6.3	<p>交流發電機或發電機之並聯及切換</p> <p>Parallel and change-over alternators or generators</p>			<p>操作應先規劃然後依照作業手冊，確定的準則及程序，以確保安全作業之達成</p> <p><i>The operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations</i></p>		
.4	<p>描述在配電系統中如果主電源故障時保護設備的安全機制</p> <p>Describe the safety features in the power distribution system which protect alternators in case of a major fault</p>					

6.4	<p>合適時，啟動電動馬達包含高壓設備</p> <p>Start electric motors including high voltage installations, where appropriate</p>		<p>操作應先規劃然後依照作業手冊，確定的準則及程序，以確保安全作業之達成</p> <p><i>The operations are planned and carried out in accordance with operating manuals, established rules and procedures to ensure safety of operations</i></p>		
.1	<p>說明啟動電動馬達的條件</p> <p>Demonstrate an understanding of the starting methods for electric motors</p>				
.2	<p>說明如何啟動及操作高容量泵浦</p> <p>Start up and operate a high capacity pump</p>				
.3	<p>說明與高電壓結合裝置中之保護開關知識</p> <p>Demonstrate a knowledge of protective switch gear associated with high voltage installations</p>				
.4	<p>說明在船上電器施工工作前許可須知</p> <p>Demonstrate an understanding of the ship's permit to work system concerning electrical equipment</p>				
6.5	<p>電子設備的基本配置及操作原則： 基本電路元素之特性</p> <p>Basic configuration and operating principles of electronic equipment : Characteristics of basic electronic circuit elements</p>	<p>能快速確認及正確使用有關安全及有效操作的說明書及手冊。並藉由附圖/介紹來瞭解及闡明電子系統</p> <p><i>The instructions and manuals relevant for safe and efficient operations are quickly identified and properly used. Electronic systems can be understood and explained with drawings/instructions</i></p>			
.1	<p>繪草圖說明提供電子控制設備之組件</p> <p>Sketch and describe a component providing electronic equipment control</p>				

.2	協助對設備之例行檢查與測試 Assist with routine checks and tests on electronic equipment					
.3	說明電子線路圖上符號之意義 Demonstrate a knowledge of electronic circuit symbols					
.4	說明電子線路上基本元件之特性 Demonstrate a knowledge of the characteristics of basic electronic circuit elements					
6.6	自動及控制系統流程圖 Flow chart for automatic and control systems	能快速確認及正確使用有關安全及有效操作的說明書及手冊。並藉由附圖/介紹來瞭解及闡明電子系統 <i>The instructions and manuals relevant for safe and efficient operations are quickly identified and properly used. Electronic systems can be understood and explained with drawings/instructions</i>				
.1	闡述程序信號的符號和一般術語應用在控制系統圖的知識 Demonstrate a knowledge of process signal symbols and terminology commonly used with control system diagrams					
.2	應用順序控制電路來描繪一份船電分配系統 Sketch a part of the ship's electrical distribution system that uses sequential control circuits					

.3	應用順序控制電路來表列其它裝備項目 List other items of equipment that use sequential control circuits					
.4	闡述電子裝備操作的自動和控制系統流程圖的知識 Demonstrate a knowledge of flowcharts for automatic and control systems for electronic equipment operation					
.5	協助進行電子裝備控制系統的例行檢查和測試 Assist with routine checks and tests on electronic equipment control systems					
6.7	機械控制系統之功能、特性及特色 Functions, characteristics and features of control systems for machinery	很快辨認出安全、有效操作相關的說明書及手冊並加以適當地應用。藉由附圖/說明書來瞭解及闡明電子系統 <i>The instructions and manuals relevant for safe and efficient operations are quickly identified and properly used. Electronic systems can be understood and explained with drawings/instructions</i>				
.1	繪草圖及說明電子控制系統 Sketch and describe a system of electronic control					
.2	說明下列設備控制系統之功能及特性 Demonstrate a knowledge of the functions, characteristics and features of the control system for : 主機 Main propulsion engine					
.3	鍋爐 Steam boiler					
.4	舵機 Steering gear					

6.8	<p>電氣及電子控制系統的基本構造和操作原理： 自動控制的方法和特性</p> <p>Basic configuration and operating principles of electrical and electronic control systems： Automatic control methodologies and characteristics</p>		<p>很快辨認出安全、有效操作相關的說明書及手冊並加以適當地應用。藉由附圖/說明書來瞭解及闡明電子系統</p> <p>The instructions and manuals relevant for safe and efficient operations are quickly identified and properly used. Electronic systems can be understood and explained with drawings/instructions</p>		
.1	<p>解釋在控制系統的術語“高增益”</p> <p>Explain the term 'high gain' in a control system</p>				
.2	<p>說明控制系統不穩定性是如何發生的</p> <p>Explain how instability in a control system can occur</p>				
.3	<p>描繪出你闡述的控制元件工作的自動化控制系統的佈置示意圖</p> <p>Sketch a diagrammatic arrangement of an automatic control system you have worked on showing the control elements</p>				
.4	<p>舉例藉由調整比例-積分-微分（PID）控制器可以達到其成效改善/穩定性</p> <p>Give examples of Proportional-Integrate-Derivative (PID) controllers that may be adjusted to achieve improved results/stability</p>				
.5	<p>表列一般用在船上調整的方法</p> <p>List tuning methods commonly used on board</p>				
.6	<p>表列在 PID 迴路調節使用的應用程式</p> <p>List software applications used in PID loop tuning</p>				
.7	<p>解釋控制系統供暖、通風和空調系統的基本區別</p> <p>Explain the fundamental difference in control system for heating, ventilation and air conditioning systems</p>				

8	舉一個系統“下垂”已被控制的例子 Give an example of a system where 'droop' has to be controlled				
9	描述一個基於 PLC 控制器的功能，識別預先設定的可調參數 Describe the function of a PLC-based controller, identifying pre-set and adjustable parameters				
6.9	比例微積分計算 (PID) 控制的特性 Proportional-Integral-Derivative (PID) control characteristics	很快辨認出安全、有效操作相關的說明書及手冊並加以適當地應用。藉由附圖/說明書來瞭解及闡明電子系統 <i>The instructions and manuals relevant for safe and efficient operations are quickly identified and properly used. Electronic systems can be understood and explained with drawings/instructions</i>		1	解釋三種控制的基本原則 Explain the basic principle of three term control
2	闡述 PID 控制特性的知識和相關的系統設備進行程序控制 Demonstrate a knowledge of PID control characteristics and associated system devices for process control				
7	<b>適任 Competence :</b> <b>能保養及維修電機與電子設備</b> <b>Maintenance and repair of electrical and electronic equipment</b>	<b>評估標準</b> <b>Criteria for Evaluation</b>	<b>適任性證明</b> <b>Competence Demonstrated</b> 同部門較自身高階之 甲級船員簽名/日期 Assessor ( Signature/Date )		

7.1	找出並解讀電氣和簡單的電子圖 Locate and interpret electrical and simple electronic diagrams		快速找出手冊和圖紙並選擇那些對任務的執行最適合的 <i>Manuals and diagrams are quickly located and those selected are the most suitable for the task to be performed</i>			
	科目/職責 Task/Duty		科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	
1	表列相關的手冊/圖紙用於船上的裝備： List shipboard equipment for which relevant manuals/ diagrams used : 1. _____ 2. _____ 3. _____ 4. _____					
7.2	結構的知識和電氣測試和測量設備的操作 Knowledge of construction and operation of electrical testing and measuring equipment		快速找出手冊和圖紙並選擇那些對任務的執行最適合的 <i>Manuals and diagrams are quickly located and those selected are the most suitable for the task to be performed</i>			
在下面框中表列使用了下列的船上裝置或設備：電池阻抗測試計、夾式電流表、萬用表、絕緣試驗台、高/低電壓檢測器和絕緣測試 In the box below list the shipboard plant or equipment on which you have used the following : battery impedance testers, current clamp meters, multi-meters, dielectric test sets, high/low voltage detectors and insulation testers						
	工作項目 Item Worked On	量測工具及測試 裝備 Measuring Instruments and Test Equipment Used	科目已完成 Task Completed 施訓者簽名/日期 Instructor ( Signature/Date )	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor ( Signature/Date )	

.1							
.2							
.3							
.4							
7.3	<p>確保所有人員在電氣系統工作的安全， 包括電氣設備的安全隔離， 在這些設備工作之前要求人員得到許可</p> <p>Ensure safety of all personnel working on electrical systems, including the safe isolation of electrical equipment, required before personnel are permitted to work on such equipment</p>				<p>依據裝備的手冊及最佳方式 進行拆解、檢查、維修及組 裝。並依據手冊及最佳方式 進行組裝及性能測試</p> <p><i>Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice. Reassembling and performance testing is in accordance with manuals and good practice</i></p>		
1	<p>應用安全措施，隔離和鎖定電氣設備 Isolate and lock out electrical equipment, applying safety measures</p>						
2	<p>應用安全使用在危險區域測試和維護電氣設 備的知識 Apply knowledge of safe use of electrical equipment for testing and maintenance in hazardous areas</p>						
3	<p>闡述安全工作的方法和程序的認識，包括穿 著適當的服裝：使用動力操作的工具 Demonstrate an understanding of safe working practices and procedures including use of appropriate clothing for : Use of power operated tools</p>						
4	<p>進入電氣設備的密閉的空間（進入艙櫃） Entry into enclosed spaces (tank entry) with electrical equipment</p>						



[5]	在電力配電盤工作 Work on electrical switchboards					
[6]	起動工具的使用 Use of lifting gear					
[7]	在冷凍機械的艙間工作 Work within refrigeration machinery spaces					
[8]	在電動機械工作 Work on electrical machinery					
[9]	解釋發電機電纜和電路連接至自動電壓調節器(AVR)的單元測試絕緣時要採取的預防措施 Explain the precautions to be taken when testing the insulation of generator cables and wiring connected to an automatic voltage regulator (AVR) unit					
[10]	解釋為什麼有時採用變壓器與便攜式工具和手提工作燈間逐步隔離方式 Explain why step down isolating transformers are sometimes used with portable tools and hand lamps					
[7.4]	電力系統設備、配電盤、電動機、發電機和直流電氣系統和設備的維修和維修 Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment				依據裝備的手冊及最佳方式進行拆解、檢查、維修及組裝。並依據手冊及最佳方式進行組裝及性能測試 <i>Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice : Reassembling and performance testing is in accordance with manuals and good practice</i>	
[1]	準確地解釋在系統圖、電路圖和接線圖中的訊息 Interpret accurately the information in a system diagram, a circuit diagram and a wiring diagram					

.2	在電子控制系統協助進行例行檢查和測試 Assist with routine checks and tests on electronic control systems					
.3	闡述主配電盤、控制室控制台的佈置的知識 Demonstrate a knowledge of main switchboard and control room console layouts					
.4	繪製一個電路圖來表示機艙報警系統的緊急電池充電的安排 Sketch a circuit diagram showing the arrangements for emergency battery charging for the ER alarm system					
.5	闡述船舶應急電源要求的知識 Demonstrate a knowledge of the vessel's emergency power requirements					
.6	協助主配電盤日常維修的聯繫人和聯繫 Assist with main switchboard routine maintenance of contacts and connections					
.7	闡述脫開主配電盤程序的知識 Demonstrate a knowledge of the procedure to split the main switchboard					
.8	闡述相關維修配電盤儀表和安全工作準則的知識 Demonstrate a knowledge of switchboard instrumentation and safe working practices associated with its maintenance					
.9	協助測量發電機的絕緣電阻 Assist with measuring the insulation resistance of a generator					
.10	解釋為什麼絕緣測試最好趁熱或在工作溫度進行 Explain why insulation testing is best conducted while hot, or at working temperature					

.11	用兆歐表進行對電動機絕緣的測試 Carry out insulation tests on a motor using a Megger					
.12	協助對起動器的維修 Assist in the maintenance of a starter					
.13	繪製一個顯示安排的電池充電電路圖 Sketch a circuit diagram showing the arrangements for battery charging					
.14	進行對應急蓄電池的日常檢測和維修 Carry out routine testing and maintenance on emergency storage batteries					
7.5	檢測和維修電氣故障和失靈及採取防止損壞措施 Detect and repair electrical faults and malfunctions and take measures to prevent damage	<p>依據裝備的手冊及最佳方式進行拆解、檢查、維修及組裝。並依據手冊及最佳方式進行組裝及性能測試</p> <p><i>Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice. Reassembling and performance testing is in accordance with manuals and good practice</i></p>				
.1	繪製電路圖顯示在主配電盤的接地指示燈 Sketch the circuit diagram for the earth indicator lamps on the main switchboard					
.2	對絕緣電阻和連續性的測試進行兆歐表測試 Carry out Megger testing for insulation resistance and continuity testing					
.3	協助對電氣設備控制系統進行故障查找 Assist with fault finding on electrical equipment control systems					

.4	協助追查接地故障 Assist with tracing earth faults					
7.6	維修故障和正確的故障修理 Repair faults and correct malfunctions	<p>依據裝備的手冊及最佳方式進行拆解、檢查、維修及組裝。並依據手冊及最佳方式進行組裝及性能測試</p> <p><i>Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice. Reassembling and performance testing is in accordance with manuals and good practice</i></p>			.1	<p>協助電子控制系統的維修、維修和故障的查找。列表工作過的項目：</p> <p>Assist with maintenance, repair and fault finding on electronic control systems. List items worked on :</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p>

交通部航港局  
Maritime and Port Bureau, MOTC

<p>2</p>	<p>協助交流電力系統的維修、維修和故障的查找。列表工作過的項目： Assist with maintenance, repair and fault finding on AC electrical systems. List items worked on :</p> <p>1. _____ 2. _____ 3. _____ 4. _____</p>					
<p>3</p>	<p>協助直流電力系統的維修、維修和故障的查找。列表工作過的項目： Assist with maintenance, repair and fault finding on DC electrical systems. List items worked on :</p> <p>1. _____ 2. _____ 3. _____ 4. _____</p>					
<p>7.7</p>	<p>發現電力失靈，找出故障所在和處置防止損傷 Detection of electric malfunction, location of faults and measures to prevent damage</p>	<p>依據裝備的手冊及最佳方式進行拆解、檢查、維修及組裝。並依據手冊及最佳方式進行組裝及性能測試 <i>Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice. Reassembling and performance testing is in accordance with manuals and good practice</i></p>				
<p>1</p>	<p>闡述接地故障的知識及如何避免之 Demonstrate a knowledge of earth faults and how to avoid them</p>					

.2	協助追查和維修接地故障 Assist in tracing and correcting earth faults					
.3	當從事維修或維修工作時，隔離和鎖定電氣設備 Isolate and lock out associated equipment when engaged in repair or maintenance work					
.4	執行日常檢測和維護上的報警系統，確保電路隔離，鎖定和保護的通知，及核發相應的工作許可 Carry out routine testing and maintenance on alarm systems, ensuring that the circuits are isolated, locked out and protected by notices and that appropriate permit to work is issued					
.5	協助進行正確的常規接地放電的高電壓設備的維護工作 Assist with correct earthing-down routine for maintenance work on high voltage equipment					
.6	協助進行船舶照明電路的故障檢查和組件測試 Assist with fault finding on ship's lighting circuits and component testing					
.7	協助維修或更換各種類型的住艙照明燈，在船上貨艙及甲板使用的投射照明燈 Assist with repairing or replacing various types of accommodation lights, cargo hold and deck flood lights used on board					
7.8	<p>監測系統、自動控制裝置及保護裝置的作用、性能測試及結構配置等知識</p> <p>Knowledge of the function and performance tests and configuration of monitoring systems, automatic control devices and protective devices</p>	<p>依據裝備的手冊及最佳方式進行拆解、檢查、維修及組裝。並依據手冊及最佳方式進行組裝及性能測試</p> <p>Dismantling, inspecting, repairing and reassembling equipment are in accordance with manuals and good practice. Reassembling and performance testing is in accordance with manuals and good practice</p>				

.1	解釋為什麼任何監測、控制系統都有獨立的感應器 Explain why on any system there should be separate sensors for monitoring and control					
.2	檢查及更換有缺陷的感應器對機器操作是必要的 Check and replace defective sensors essential for engine operation					
.3	當發生故障時，應至少要有一台主機監測系統狀態連接自動停止主機 State at least one main engine monitoring system that automatically stops the engine in case of a fault					
.4	維修或換新 Repair or replace : 保險絲 Fuses					
.5	控制指示燈 Control lamps					
.6	溫度感應器 Temperature sensors					
.7	壓力感應器 Pressures sensors					
.8	完成例行的測試和保養於 Carry out routine testing and maintenance on : 電路開關 Circuit breakers					
.9	脫開機構 Tripping mechanisms					
.10	馬達啟動器 Motor starters					

.11	燈具 Lights					
.12	在系統保養日誌記錄包括檢查警報器設定及預設值 Check alarm settings and pre-sets contained In a system maintenance log					
.13	描述直流、交流馬達的優、缺點 Outline the advantages and disadvantages of DC and AC motors					
.14	描述如何由一個電子驅動控制來停止超載的馬達，但仍保持其運行 Outline how an electronic drive control can stop a motor overloading but keep it operating					
.15	說明在何處的電子驅動中會產生熱及如何散熱 Explain where heat is generated in an electronic drive and how it is dissipated					



## 專長 FUNCTION：操作級-保養及維修

### MAINTENANCE AND REPAIR AT THE OPERATIONAL LEVEL

項次 Ref No	訓練 Training					
8	適任 Competence： 在船上裝配及維修時能正確使用手、機械工具與量測儀器 <b>Appropriate use of hand tools,            machine tools and measuring instruments for            fabrication and repair on board</b>		評估標準 <b>Criteria for Evaluation</b>		<b>適任性證明            Competence            Demonstrated</b> 同部門較自身高階之 甲級船員簽名/日期 Assessor (Signature/Date)	
8.1	材質和工序特性和限制的知識應用在船舶和裝備的建造和維修 Knowledge of characteristics and limitations of materials and processes used in construction and repair of ships and equipment		確認建造同型船相關組件的重要參數是適合的。選擇的 材質亦是合適的 <i>The identification of important            parameters for fabrication of typical            ship-related components is appropriate.            Selection of materials is appropriate</i>			
	科目/職責 Task/Duty		科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	
.1	闡述有關材質的特性、性質及侷限等知識 Demonstrate a knowledge of characteristics, properties and limitations of： 低碳鋼 Mild steel					
.2	高張力鋼 High tensile steel					
.3	不鏽鋼 Stainless steel					
.4	黃銅 Brass					
.5	鋁合金 Aluminum alloy					

.6	銅 Copper					
8.2	工序特性和限制的知識應用在製造和維修 Knowledge of characteristics and limitations of processes used for fabrication and repair			確認建造同型船相關組件的重要參數是適合的。選擇的材質亦是合適的。符合製造設計公差 <i>The identification of important parameters for fabrication of typical ship-related components is appropriate. Selection of materials is appropriate. Fabrication is to designated tolerances</i>		
.1	闡述以下有關的特性、性質及限制等知識： Demonstrate a knowledge of characteristics, properties and limitations of： 低碳鋼的焊接 Welding mild steel					
.2	電焊 Electric arc welding					
.3	氬焊 Argon arc welding					
.4	銅(硬)焊 Brazing					
.5	鉚接 Riveting					
.6	綜合性固定方式 Synthetic fixing methods					
8.3	完成安全的緊急性/臨時性維修的方法 Methods for carrying out safe emergency/temporary repairs			使用裝備和手工具、工具機及測量儀器是正確和安全的 <i>Use of equipment and hand tools, machine tools and measuring instruments is appropriate and safe</i>		

.1	闡述如何臨時性維修有洩漏的管子 Demonstrate temporary repair to leaking pipe										
.2	表列其它的臨時性維修 List other temporary repairs made 1. _____ 2. _____ 3. _____ 4. _____										
8.4	使用手工具、工具機及測量儀器要採取安全措施， 確保安全的工作環境 Safety measures to be taken to ensure a safe working environment and for using hand tools, machine tools and measuring instruments	使用裝備和手工具、工具機 及測量儀器是正確和安全的 Use of equipment and hand tools, machine tools and measuring instruments is appropriate and safe			.1	闡述有關安全規範和程序的理解： Demonstrate an understanding of safe working practices and procedures for： 使用動力操作的工具 Use of power operated tools					
.2	工具機 Machine tools										
.3	焊接裝備 Welding equipment										
.4	做好適當的個人防護裝備 Done appropriate personal protective equipment										

8.5	手工具和工具機的使用 Use of hand tools and machine tools	使用裝備和手工具/工具機 及測量儀器是正確和安全的 <i>Use of equipment and hand tools/          machine tools and measuring          instruments is appropriate and safe</i>		
-----	---	---	--	--

在下面框中表列的船上設備或裝置您已使用過，例如，下列的手工具：  
 鑿、鋸、扳手、銼刀，手動鑽頭和工具機，鑽床、銑床、鋸、砂磨機和砂輪  
 In the box below list the shipboard plant or equipment on which you have used, for example, the following hand tools :  
 chisels, saws, spanners, files, hand-drills and machine tools, drill press, milling machine, saw, grinding machine and abrasive wheel

	裝配或維修項目 Item Fabricated or Repaired	所用手或機動工 具 Hand Tools/Machine Tools Used	科目已完成 Task Completed 施訓者簽名/日期 Instructor (Signature/Date)		對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor (Signature/Date)	
.1							
.2							
.3							
.4							
.5							
.6							
.7							
.8							
.9							
.10							

8.6	測量儀器的使用 Use of measuring instruments	用於維修和保養機械和設備選定的測量儀器相關的作業；正確的測量，並檢查是否符合規定的公差 <i>The selected measuring instruments used for repair and maintenance of machinery and equipment are relevant for the tasks; correct measurements are taken and checked for compliance with stated tolerances</i>		
-----	---	--	--	--

在下面框中表列的船上設備或裝置您已使用的測量設備。測量儀器或可包括，例如，半內徑卡尺、數字卡尺、內徑千分尺、深度計和游標卡尺

In the box below list the shipboard plant or equipment on which you have used measuring equipment. Measuring instruments may include, for example, odd leg calipers, digital calipers, internal micrometer, depth gauge and venire gauge

	裝配或維修項目 Item Fabricated or Repaired	所用量測工具 Measuring Instruments Used	科目已完成 Task Completed 施訓者簽名/日期 Instructor (Signature/Date)		對改進部分之建議 Advice on Areas for Improvement		科目已完成 Task Completed 施訓者簽名/日期 Instructor (Signature/Date)	
.1								
.2								
.3								
.4								
.5								
.6								
.7								
.8								
.9								

8.7	密封劑和填料的使用 Use of sealants and packings	選擇正確的材質 <i>The selection of materials is appropriate</i>		
.1	闡述正確使用各類密封劑和填料及注意當使用： Demonstrate the correct use of various types of sealants and packings and note when used： 密封壓蓋密封 Gland seals			
.2	法蘭(盤) Flanges			
.3	襯墊材質，包括壓縮非石棉、軟木、橡膠和纖維 Gasketing materials, including compressed non-asbestos, cork, rubber and fiber			
.4	閥桿填料 Valve stem packing			
.5	泵密封 Pump seal			
.6	液壓密封 Hydraulic seal			
.7	O型環密封 O-Ring seal			
.8	法蘭(盤)氣密接合密封劑 Flange joint sealants			
.9	排氣及管路 Exhausts and piping			
.10	軸封/填料 Shaft seals/packing			

<b>8.8</b>	在船上製造或維修工作特殊工具的使用 Use of special tools for fabrication and repair work on board	選擇正確的工具，並依據說明書、手冊和安全操作守則來使用 <i>Correct tools are chosen and used in accordance with instructions, manuals and safe working practice</i>		
------------	--	--	--	--

在下面框中表列的船上設備或裝置上已施行維修，或協助他人維修，指出專用工具的使用。這包括拆卸、檢查、維修和組裝工作。作為至少維修所需要的：液壓工具、軸承拆卸和扭矩扳手。機械包括舵機、機艙泵和風扇，甲板絞纜機和錨機，廚房及餐飲設備和空調。  
 In the box below list the machinery or equipment on which you have carried out repairs, or assisted in repairs with others, showing the special tools used. This includes dismantling, inspection, repair and reassembly work. As a minimum carry out repairs requiring use of : hydraulic tools, bearing pullers and torque wrench. Machinery may include steering gear, engine room pumps and fans, deck winches and windlass, galley and catering equipment and air conditioning.

	裝配或維修項目 Item Fabricated or Repaired	所用特別工具 Special Tools Used	科目已完成 Task Completed 施訓者簽名/日期 Instructor (Signature/Date)	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor (Signature/Date)
.1					
.2					
.3					
.4					
.5					
.6					
.7					
.8					
.9					
.10					

8.9	製造和維修使用的工具機及焊接設備 Use of machine tools and welding equipment for fabrication and repairs	所選擇的材料符合該部分要製造和工作進行中所指定的公差，並要依據安全操作準則 <i>The selected material is suitable for the part to be fabricated and the work is carried out within the designated tolerances and in accordance with safe working practice</i>		
-----	--	---	--	--

在下面框中表列的船上設備或裝置上已施行維修，或協助他人維修，指出專用工具的使用。這包括拆卸、檢查、維修和組裝工作。作為至少維修所需要的：液壓工具、軸承拆卸和扭矩扳手。機械包括舵機、機艙泵和風扇，甲板絞纜機和錨機，廚房及餐飲設備和空調。  
 In the box below list the parts which you have fabricated (made), or assisted in making, using machine tools. For example : centre lathes, drill press, gas welding/brazing equipment, gas cutting equipment including plasma arc, electric arc welding and other special equipment.

	裝配或維修項目 Item Fabricated or Repaired	所用機動工具或設備 Machine Tools or Equipment Used	科目已完成 Task Completed 施訓者簽名/日期 Instructor (Signature/Date)		對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor (Signature/Date)	
.1							
.2							
.3							
.4							
.5							
.6							
.7							
.8							
.9							



9	<p style="text-align: center;"><b>適任 Competence :</b>  <b>保養及維修船上機械與設備</b>  <b>Maintenance and repair of shipboard machinery and equipment</b></p>	<p style="text-align: center;"><b>評估標準</b>  <b>Criteria for Evaluation</b></p>	<p style="text-align: center;"><b>適任性證明</b>  <b>Competence Demonstrated</b>  同部門較自身高階之  甲級船員簽名/日期  Assessor (Signature/Date)</p>
9.7	<p>緊急裝備的保養和維修  Undertake maintenance and repair to emergency equipment</p>	<p>分離、拆解和重新組裝是按照認可的方法和程序。選擇正確的工具及使用且不會損壞機器或設備  <i>Isolation, dismantling and reassembly are in accordance with accepted practices and procedures. Correct tools are chosen and used without causing damage to machinery or equipment</i></p>	
8	<p>氧氣呼吸器組和充氣呼吸器瓶  Breathing apparatus sets and recharging breathing apparatus bottles</p>		

**專長 FUNCTION：操作級-船舶操作管控與照護船上人員**  
**CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR PERSONS ON BOARD AT THE OPERATIONAL LEVEL**

項次 Ref No	訓練 Training			適任性證明 Competence Demonstrated	
10	適任 Competence： 運用領導統御與團隊合作技巧 <b>Application of leadership and team working skills</b>		評估標準 <b>Criteria for Evaluation</b>	同部門較自身高階之 甲級船員簽名/日期 Assessor ( Signature/Date )	
10.1	團隊角色扮演 Plays team role		在工作周遭展現的意識及共同的目標。對深入溝通和明確語言的理解。以海員身份的方式挑戰可商確的決定。自由分享關於當下的行動和任務信息 <i>Displays awareness of others working nearby and in common goals. Communicates clearly and unambiguously in language understood. Challenges questionable decisions in a seamanlike manner. Freely shares information concerning the manoeuvre or task in hand</i>		
	科目/職責 Task/Duty	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	
.1	了解到作為一個團隊成員每個人都有不同的經驗及在任何任務中發揮作用 Understand that as a team member everyone has different experience and has a role to play in any task				
.2	積極參與涉及不同職級的工作計劃會議 Participate actively in task planning meetings involving different ranks				

.3	<p>輪機和在甲板工作時是藉由雙向的交流和說明來瞭解溝通的</p> <p>Understand communication is a two-way exchange and demonstrate this in practice both in the engine room and when working on deck</p>					
.4	<p>保持對改變形勢的認識</p> <p>Maintain awareness of changing situations</p>					
.5	<p>接受決議，如有疑問應提出質疑</p> <p>Accept authority but not be afraid to question if in doubt</p>					
.6	<p>檢查自己的理解情況並分享其他團隊成員</p> <p>Check own understanding of situation is shared by other team members</p>					
.7	<p>積極參加不同層級任務檢評和評估會議</p> <p>Participate actively in task review and evaluation meetings involving different ranks</p>					
10.2	<p>展現領導能力</p> <p>Exhibits leadership ability</p>	<p>提出創見，並在時間內執行必要的任務</p> <p>Takes initiative and carries others along with what needs to be done in timely way</p>				
.1	<p>在緊急任務及演習時，思考前衛，並妥適規劃任務</p> <p>Think ahead and plan tasks that will follow the immediate task or manoeuvre</p>					
.2	<p>當緊急任務間有所衝突，無法同時執行時，需正確地設定優先次序</p> <p>Set priorities correctly when seeing conflict between immediate needs and tasks that may be held back</p>					
.3	<p>妥善配置資源，以有效達成預期的成果</p> <p>Allocate resources effectively to achieve desired outcomes</p>					
.4	<p>根據需求或被教導的方式，檢查結果，並採取正確的行動</p> <p>Check results and take corrective actions as needed/ instructed</p>					

.5	接受資深船員意見，有所疑問時，應展現自信與成熟 Demonstrate confidence and maturity to refer to senior officer if in doubt					
11	<b>適任 Competence :</b> <b>確保符合防止污染要求</b> <b>Ensure compliance with pollution prevention requirements</b>	<b>評估標準</b> <b>Criteria for Evaluation</b>	<b>適任性證明</b> <b>Competence Demonstrated</b> 同部門較自身高階之 甲級船員簽名/日期 Assessor ( Signature/Date )			
11.1	執行保護措施以保護海洋環境 Implement proactive measures to protect the marine environment	操作經適當之計劃並符合國際規則精神與指示。保證維持正面環境之信譽 <i>The operations are properly planned and comply with international regulation in spirit as well as in word. Ensures that a positive environmental reputation is maintained</i>				
	科目/職責 Task/Duty	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )	對改進部分之建議 Advice on Areas for Improvement	科目已完成 Task Completed 施訓者簽名/日期 Instructor( Signature/Date )		
.1	瞭解環境之保護包括海與空兩方面，其保護之細節依防止船舶污染國際公約之規則 Understand that environmental protection includes both sea and air which are protected by mandatory MARPOL regulations					
.2	至少說出兩處特別敏感海域之名稱 Name at least two Particularly Sensitive Sea Areas (PSSAs) 1. _____ 2. _____					
.3	舉例示範準備接受個人行動之責任以保護海洋環境 Demonstrate by example preparedness to take personal responsibility for actions to protect the marine environment					

.4	<p>瞭解海上之污染物必需符合防止船舶污染國際公約之規定於岸上安全處置</p> <p>Understand that marine pollutants must be landed ashore for safe disposal in compliance with MARPOL</p>					
.5	<p>瞭解有關在海上處置油水混合物之嚴格規則適用於所有船舶</p> <p>Understand there are strict rules covering the storage and disposal of oily water mixtures applicable to all ships</p>					
.6	<p>瞭解有關在海上處置有毒液體物質之嚴格規則適用於所有船舶</p> <p>Understand there are strict rules covering disposal of noxious liquid substances applicable to all ships</p>					
.7	<p>瞭解有關處置以包裝型式載運有害物質之嚴格規則適用於所有船舶</p> <p>Understand there are strict rules covering disposal of harmful substances carried in packaged form applicable to all ships</p>					
.8	<p>瞭解有關處置防止污水污染之嚴格規則適用於所有船舶</p> <p>Understand there are strict rules covering pollution prevention by sewage applicable to ships</p>					
.9	<p>瞭解防止船上垃圾污染之嚴格規則適用於所有船舶</p> <p>Understand there are strict rules for prevention of pollution by garbage from ships, applicable to all ships</p>					
.10	<p>瞭解防止船上所致空氣污染之嚴格規則正逐步適用於所有船舶</p> <p>Understand there are strict rules covering air pollution from ships at sea which will progressively apply to all ships</p>					
.11	<p>瞭解SO<sub>x</sub>, NO<sub>x</sub> 之影響，及為何需盡力減低空氣之污染</p> <p>Understand the impact of SO<sub>x</sub>, NO<sub>x</sub>, VOC and PM and why efforts are needed to reduce atmospheric pollution</p>					

11.3	發現船舶周圍有任何汙染時即刻展開原因調查 Initiate immediate investigation to detect the source on discovering any pollution around the ship	運用所有可用對策偵測汙染源並適時向船長或主管陳報 <i>All available resources are utilized to detect the source and the master or authorities are informed as appropriate</i>				
.1	參與船上油或其他有毒或毒性物質溢出之應急反應演練 Participate in an emergency response exercise for controlling spillage of oil or other noxious or toxic substances on board					
.2	了解立即報告及檢查潛在汙染事件的重要性 Be aware of the importance of immediately reporting and investigating potential pollution incidents					
11.6	執行污水、壓載水與加油作業 Carry out bilge, ballast and bunkering operations	所有作業之施行係依據防止船舶汙染國際公約並特別注意船上油汙染應急計畫 <i>All operations are carried out in accordance with MARPOL and due regard paid to the Shipboard Oil Pollution Emergency Plan (SOPEP)</i>				
.1	確定船舶壓載水管理計畫所在之位置並證明瞭解其內容 Locate the ship's ballast water management plan and demonstrate an understanding of its content					
.4	說明監控卸油裝備操作須知(油艙) Demonstrate an understanding of Oil Discharge Monitor Equipment operation (oil tankers)					