

CCS 通函

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关于下发香港商船资讯（102/2012）的通知

-----见习高级船员的培训计划和培训记录簿

香港海事处2012年11月16日下发商船资讯102/2012,向船东、海员和海员工会通告关于见习高级船员船上培训计划和培训记录簿已获得批准。拟取得香港海员适任证书的见习高级船员应根据批准的培训计划内容（详见附件）完成适任培训，并保持培训记录簿。本社海事管理体系审核员和劳工检查员在对香港旗船舶审核/检查时，对于见习高级船员（适用时）可根据本通函核查符合性。

我社审核员/检查员在进行相关审核/检查时，也应提醒船东及船员严格按照通函要求执行。

附件：

- (a) 香港商船资讯（102/2012）译文，共17页
- (b) 香港商船资讯（102/2012）原文，共17页

中文翻译如有歧义，以海事通函原文为主。本通函在实施过程中如有任何疑问，请与总部：**认证管理处**联系。



香港商船資訊

HONG KONG MERCHANT SHIPPING INFORMATION NOTE

经批准的见习高级船员船上培训计划和培训记录簿

致: 船东、海员和海员工会

摘要

本资讯目的是向船东、海员和海员工会通告关于见习高级船员船上培训计划和培训记录簿已获得批准, 并作为海员获得证书的条件。

1. 见习高级船员的发证须满足以下决定的各项要求, 以取得其第一张适任证书 (即三级证书):

(a) 适任证书、驾驶员执照 (2012版); 和

(b) 适任证书、轮机员和电机员执照 (2012版)。

上述决定上传海事处官网 (http://www.mardep.gov.hk/en/pub_services/exam.html)。

2. 决定中有一个条件, 即要求见习高级船员完成经批准的船上培训计划并将其培训情况记录在培训记录簿上。海事处能够接受包括适用于甲板见习高级船员的附件1或适用于轮机见习高级船员的附件2所列要素的船上培训计划, 和根据该批准计划实施的培训记录, 作为其完成认可培训的证据。该培训记录簿可由见习高级船员所在的公司或培训机构编制, 也可由海事组织出版。

3. 参加船上培训的见习高级船员如果未达到培训要素的要求, 则应按要求通过附加航海服务、附加培训课程或由海事处确定的评估结果的方式进行弥补。

4. 关于对本资讯存在的任何疑问, 可直接通过以下方式与船舶/海员发证高级验船师取得联系: 电话号码: (+852) 2852 4368; 传真号码: (+852) 2541 6754; 或邮箱地址: sscrt@mardep.gov.hk。

海事处

航运政策科

2012年11月16日

海事处
海港政府大楼
统一码头道38号
普通邮政信箱4155
香港

电话: (852) 2852 3001
传真: (852) 2544 9241
电传: 64553 MARHQ HX
E-mail: hkmpd@mardep.gov.hk
网址: <http://www.mardep.gov.hk>

甲板见习高级船员船上培训

船上监督培训

按照SCTW公约规则II/1 第2.2款，船上监督培训应至少包括以下几个要素：

1. 熟悉各种船舶

- 1.1 应急演练（如弃船、消防演习等）；
- 1.2 安全工作实践（如进入密闭处所、热工作业等）；
- 1.3 防止环境污染实践（如垃圾处理等）。

2. 计划并执行一个航程以及确定船位

2.1 天文导航

2.1.1 能够通过各种天体确定船舶位置

2.2 地文导航、沿岸航行

2.2.1 能够通过以下几个方面确定船舶位置：

- .1 地标
- .2 航标，包括灯塔、航标、浮标
- .3 航位推算，考虑风、潮汐、海流、估计航速

2.2.2 全面了解并能够使用航海图和航海出版物，如航路指南、潮汐表、航海通告、无线电航行警报、船舶航路信息）

2.3 电子定位与导航系统

能够通过电子助航设备确定船舶位置

2.4 回声探测器

能够操作该设备并正确使用信息

2.5 磁罗经、电罗经

2.5.1 了解磁罗经和电罗经原理；

2.5.2 能够通过天文和地文的方法确定磁罗经和电罗经的误差，并允许存在这样的误差。

2.6 操舵系统

2.6.1 了解操舵系统、操作程序以及人工控制与自动化控制相互转换；

2.6.2 控制调节达到最佳性能

2.7 气象

2.7.1 能够对船载气象仪器中的信息进行使用和解释；

2.7.2 了解各种天气系统特征、报告程序、记录系统；

2.7.3 能够使用可获得的气象信息

3. 保持安全航海值班

3.1 值班

3.1.1 全面了解经修正的《1972年国际海上避碰规则》的内容、适用范围和目的；

3.1.2 全面了解保持航行值班所遵循的原则；

3.1.3 根据船舶航线的一般规定使用航线；

3.1.4 通过导航设备信息保持安全航行值班；

3.1.5 了解低能见度情况导航技术；

3.1.6 按照船舶报告一般原则和船舶交通服务（VTS）程序进行报告。

3.2 驾驶台资源管理

3.2.1 了解驾驶台资源管理原则，其中包括：

.1 资源配置、分配和优化；

.2 有效沟通；

- .3 自信和领导力;
- .4 获得并保持态势感知;
- .5 考虑团队经验。

4. 通过雷达和自动雷达标绘仪 (ARPA) 保持安全航行

4.1 雷达导航

4.1.1 了解雷达和自动雷达标绘仪 (ARPA) 的基本原理;

4.1.2 能够操作雷达并对其中的信息进行解释和分析, 其中包括以下几个方面的信息:

性能, 其中包括:

- .1 影响性能和准确性的因素;
- .2 显示设置和保持;
- .3 虚假信息、假回波、海面反射信号等雷达信号台和搜救雷达应答器 (SAR T) 的探测。

使用, 其中包括:

- .1 距离和方位、其他船舶的航向和速度、穿越船舶、迎面船舶和超越船舶最接近点的时间和距离;
- .2 确定重要回波、检测其他船舶航向和速度变化、对本船航向或 (和) 速度变化的影响;
- .3 使用经修正的《1972年国际海上避碰规则》;
- .4 标绘技术, 相对运动和真运动概念;
- .5 平行标定指数。

4.1.3 自动雷达标绘仪 (ARPA) 主要类型及其显示特征、性能标准和过分依赖于自动雷达标绘仪 (ARPA) 所存在的危害

4.1.4 能够操作自动雷达标绘仪 (ARPA) 并对其中的信息进行解释和分析, 其中包括:

- .1 系统性能和准确性、跟踪能力和约束条件、处理延迟;
 - .2 操作警报和系统测试的使用情况;
 - .3 目标采集及其局限性;
 - .4 真向量和相对向量、目标信息和危险区域的图像显示;
 - .5 信息、重要回波、禁止区域和试验性操纵的使用和分析。
5. 使用电子海图显示与信息系统 (ECDIS) 保持安全航行
- 5.1 采用电子海图显示与信息系统 (ECDIS) 航行
- 5.1.1 了解电子海图显示与信息系统 (ECDIS) 操作能力和局限性, 其中包括:
- .1 全面理解电子海图 (ENC) 数据、数据准确性、表示规则、显示选择和其它海图数据格式;
 - .2 过分依赖于电子海图显示与信息系统 (ECDIS) 所存在的危害;
 - .3 熟悉现行性能标准规定的电子海图显示与信息系统 (ECDIS) 功能。
- 5.1.2 熟练操作电子海图显示与信息系统 (ECDIS) 并对其中的信息进行解释和分析, 其中包括:
- .1 与其它各种装置的导航系统相结合的功能使用情况, 包括正常工作、调整到期望设置;
 - .2 信息安全监督和调整, 包括本船位置、海域显示、模式和定位、海图数据显示、航路监视、用户创建信息层、(连接自动识别系统AIS和/或雷达跟踪) 联系方式和(连接界面后的) 雷达覆盖区;
 - .3 通过其他方法确认船舶位置;
 - .4 有效使用设置, 确保符合操作规程, 包括防搁浅报警参数、接近触碰和特殊区域、填写海图数据和海图更新状态、备份布置;
 - .5 调整设置和数值, 确保适合于当前情况;
 - .6 使用电子海图显示与信息系统 (ECDIS) 时的情景意识, 包括安全水域和靠近危险物、流向和流速、海图数据和比例选择、航路适合性、触碰探测和管理、传感器的完整性。

6. 应急情况的反应

6.1 应急程序

6.1.1 乘客在紧急情况下的安全防护措施；

6.1.2 发生碰撞或搁浅时所采取的初始行动；初始破损评估和控制；

6.1.3 领会海上人员搜救、协助遇险船舶、在港内应急情况的响应所需要遵循的程序。

7. 海上求救信号的响应

7.1 搜救服务：了解《国际航空和航海搜救手册》（IAMSAR手册）的相关内容

8. 使用《IMO标准海上通信用语》，语言形式为书面英语和口头英语

8.1 英语：充分理解英语，以便高级船员能够使用海图或其它航海出版物；理解有关船舶安全和操作的气象信息和通知；与其他船舶、海岸电台和船舶交通服务（VTS）中心通信；以及和其它多语言船员沟通履行高级船员职责，包括能够使用和理解《IMO标准海上通信用语》（IMO SMCP）。

9. 通过视觉信号发送和接受信息

9.1 视觉信号

.1 能够使用《国际信号规则》；

.2 能够按照经修正的《1972年国际海上避碰规则》附则IV和《国际信号规则》附件1要求通过莫尔斯信号灯发送和接收遇险信号SOS以及《国际信号规则》所要求的单字符信号。

10. 船舶操纵

10.1 船舶操纵和操作

了解：

.1 载重量、吃水深度、纵倾、速度和转弯时龙骨间隙和制动距离的影响；

.2 风、海流流对船舶操作的影响；

.3 人员落水的搜救操作和程序；

.4 船身下沉效应、浅水效应和类似效应;

.5 锚泊、系泊正确程序。

11. 监督货物装载、积载、系固、航行过程中的管理以及卸载

11.1 货物装卸、积载和系固

.1 了解货物（包括超重货物）对船舶适航性和稳性的影响;

.2 了解货物（包括危险货物、危害货物、有害货物）安全装卸、积载和系固以及这些货物对人命安全和船舶安全的影响；

.3 能够建立并保持装卸过程中的有效通信。

12. 检查并报告货舱、舱口盖和压载舱出现的缺陷和损害

12.1 了解并能够解释如何寻找由于以下原因造成的常见损害和缺陷的能力：

.1 装卸作业；

.2 . 腐蚀；

.3 . 恶劣的天气状况。

12.2 能够说明每次需要检查的船舶哪一部分，确保在给定的期限内检查所有部分；

12.3 确定关系船舶安全的船舶结构要素；

12.4 说明货舱和压载舱的腐蚀原因及其鉴别和预防办法；

12.5 熟悉检查执行程序；

12.6 能够解释确保可靠地探测缺陷和损坏；

12.7 理解“加强检验程序”的目的。

13. 确保符合防污要求

13.1 海上环境污染防治和防污程序

.1 熟悉海上环境污染防治所采用的各种安全措施；

.2 防污程序和各种相关设备；

.3 采取积极措施保护海上环境的重要性。

14. 保持船舶的适航性

14.1 船舶稳性

14.1.1 船舶稳性、纵倾和应力表、示意图和应力计算设备的应用知识及使用；

14.1.2 理解出现部分失去完整浮力时所采用的基本措施；

14.1.3 理解水密完整性的基本原理。

14.2 船舶构造

14.2.1 基本了解船舶的主要结构件和各种部件的正确名称

15. 船上火灾预防、控制和灭火

15.1 火灾防治和消防设备

- .1 能够组织消防演习;
- .2 了解火灾级别和化学性质;
- .3 了解消防系统;
- .4 熟悉火灾,包括油类系统引起的火灾发生时需要采取的措施。

16. 操作救生设备

16.1 救生:

能够组织弃船演习并熟悉救生艇筏和救助艇及其降落设备和装置,和艇上设备,包括无线电救生设备、卫星应急无线电示位标、搜救雷达应答器、浸水保温服和保温用具的操作。

17. 船上医疗急救的使用

17.1 医疗救助:

通过无线电医疗急救指导和建议的实际应用,包括船上有可能发生事故或疾病时,能够根据这些医疗急救知识采取有效措施

18. 监督符合法规要求

18.1 有关海上人命安全、保安和海洋环境保护的各种相关IMO公约的基本应用知识。

19. 领导力和团队合作技能的应用

- 19.1 船上人员管理和培训的应用知识;
- 19.2 熟悉相关国际海事公约、建议以及国家法规;
- 19.3 能够采用任务和工作量管理,其中包括:

- .1 计划、协调;
- .2 人员分配;
- .3 时间、资源的限制;
- .4 优化。

19.4 了解并能够采用有效资源管理:

- .1 资源布置、分配和优化;
- .2 船上-岸上有效通信;
- .3 结合团队经验的决定;
- .4 自信和领导力 (包括动机);
- .5 情景意识能力的获得和保持。

19.5 了解并能够采用决策技巧:

- .1 态势和风险评估;
- .2 识别和考虑可选方案;
- .3 . 措施选择过程;
- .4 结果有效性评价。

培训记录簿

20. 培训记录簿同样应包含以下信息:

- 20.1 用于发证的见习船员个人信息情况 (如姓名、出生日期、家庭地址、海员服务簿编号等);
- 20.2 见习船员所服务的公司情况 (如企业名称、地址、特别培训计划服务时间等);
- 20.3 见习船员所服务的船舶情况, 如船舶名称、船舶主尺度、主机参数、救生和消防设备、货物装卸设备、导航设备、全球海上遇险和安全系统 (GMDSS) 设备等。

见习轮机员船上培训

船上监督培训

按照SCTW公约规则II/1 第2.2款，船上监督培训应至少包括以下几个要素：

1. 熟悉各种船舶

- 1.1 应急演练（如弃船、消防演习等）；
- 1.2 安全工作规程（如进入密闭处所、热工规程等）；
- 1.3 环境防污规程（如垃圾处理等）。

2. 轮机操作级

2.1 保持安全轮机值班

2.1.1 全面了解保持轮机值班所遵循的原则：

- .1 值班交接并接受值班的相关职责；
- .2 值班时所承担的日常工作；
- .3 维护机舱日志和读数的意义；
- .4 值班交接的相关职责。

2.1.2 安全和应急程序、各种系统本地控制和遥控/自动化控制相互转换

2.1.3 值班时遵循的安全防护措施和发生火灾或事故（尤其是油类系统）时所采取的立即措施

机舱资源管理

2.1.4 了解机舱资源管理原则，其中包括：

- .1 资源配置、分配和优化；
- .2 有效沟通；
- .3 自信和领导力；

.4 获得并保持情景意识;

.5 考虑团队经验。

2.2 使用书面英语和口头英语

2.2.1 充分理解英语，便于高级船员使用轮机出版物和履行轮机职责。

2.3 使用内部通信系统

2.3.1 船上各种内部通信系统的操作

2.4 操作主机、辅机以及相关的控制系统

2.4.1 机械系统基本构造和操作原理，（如适用）其中包括：

.1 船用柴油机

.2 船用汽轮机

.3 船用燃气轮机

.4 船用锅炉

.5 轴系装置（包括推进器）

.6 其它辅助设备（包括各种泵、空压机、净化器、海水淡化器、换热器、冷藏设备、空调系统和通风系统）

.7 操舵装置

.8 自动化控制系统

.9 液体流量、润滑油、柴油和冷却系统的特征

.10 甲板机械

2.4.2 推进装置，包括控制系统操作的安全和应急程序

2.4.3 下列机械项目和控制系统的准备、操作、问题检测以及预防出现损坏而采取的必
要措施：

.1 主机及相关辅助机械；

.2 蒸汽锅炉及相关辅助设施和蒸汽系统；

.3 辅机及相关系统

.4 其他辅助设备（包括冷藏系统、空调系统、通风系统）

2.5 操作燃油、润滑油、压载和其他泵送系统及相关控制系统

2.5.1 泵和管系，包括控制系统的操作特性

2.5.2 泵系操作：

.1 日常泵送操作；

.2 舱底、压载、货油泵送系统的操作。

2.5.3 油水分离器（或相似设备）要求和操作

3. 操作级水平的维护和修理

3.1 适当使用手动工具、机械工具和测量仪器在船上进行制造和修理

3.1.1 船舶、设备建造和修理所采用的材料特征和限制；

3.1.2 制造和修理所采用的工艺特征和限制；

3.1.3 系统、部件制造和修理所考虑的特性和参数；

3.1.4 安全应急/临时修理执行方法；

3.1.5 为确保安全工作环境和使用手动工具、机械工具和测量仪器而采取的安全措施；

3.1.6 手动工具、机械工具和测量仪器的使用情况；

3.1.7 各种类型的密封剂和填料的使用情况。

3.2 船上机械设备的维护和修理

3.2.1 修理和维护所采取的安全措施，包括人员获准在船上的机械设备上工作前对该机械设备进行安全隔离；

3.2.2 适当的基本机械知识和技能；

3.2.3 维护和修理，如机械设备的拆卸、调整和重装；

3.2.4 使用适合的专业工具和测量仪器；

3.2.5 设备建造中的设计特征和材料选择;

3.2.6 机械图纸和手册的说明;

3.2.7 管系、液压和气动图表说明。

4. 操作级的电气、电子和控制工程

4.1 操作电气系统、电子系统和控制系统

4.1.1 以下电气设备、电子设备和控制设备的基本配置和操作原理（如适用）：

.1 电气设备:

- .a 发电和配电系统;
- .b 发电机的准备、启动、并电和转换;
- .c 电机，包括启动方法;
- .d 高压装置;
- .e 顺序控制电路及相关系统装置。

.2 电子设备:

- .a 基本电子电路元件的特征;
- .b 自动和控制系统的流程图;
- .c 机械项目控制系统的功能、特征和特点，包括主推进装置操作控制、蒸汽锅炉自动化控制。

.3 控制系统:

- .a 各种自动化控制方法和特征;
- .b 用于过程控制的比例积分微分控制器（PID）控制特性及相关系统设备。

4.2 电气设备和电子设备的维护和修理

4.2.1 船上电气系统工作安全要求，包括人员获准在电气设备上工作前对该电气设备进行安全隔离;

4.2.2 电气系统设备、配电板、电机、发电机和直流电气系统及设备的维护和修理;

4.2.3 电气故障检测、故障位置确定和损害预防措施；

4.2.4 电气试验和测量设备构造和操作；

4.2.5 关于下列设备及其配置的功能和性能测试：

.1 监测系统；

.2 自动化控制设备；

.3 保护装置。

4.2.6 电气和简易电子图说明

5. 在操作级水平的船舶操作控制及船上人员照顾

5.1 确保符合防污要求

海上污染防治

5.1.1 熟悉海上污染防治所采用的各种安全措施；

5.1.2 防污程序和各种相关设备；

5.1.3 采取积极措施保护海上环境的重要性。

5.2 保持船舶的适航性

船舶稳性

5.2.1 船舶稳性、纵倾和应力表、示意图和应力计算设备的应用知识及使用；

5.2.2 理解水密完整性的基本原理；

5.2.3 理解出现部分失去完整浮力时所采用的基本措施。

船舶构造

5.2.4 基本了解船舶的主要结构件和各种部件的正确名称

5.3 船上火灾预防、控制和灭火

火灾防治和消防设备

5.3.1 能够组织消防演习；

5.3.2 了解火灾级别和化学性质;

5.3.3 了解消防系统;

5.3.4 火灾（包括油类系统引起的火灾）发生时需要采取的措施。

5.4 监督符合法规要求

5.4.1 有关海上人命安全和海洋环境保护的各种相关IMO公约的基本工作知识。

5.5 领导力和团队合作技能的应用

5.5.1 船上人员管理和培训的应用知识;

5.5.2 熟悉相关国际海事公约和建议，以及国家法规;

5.5.3 能够采用任务和工作量管理，其中包括:

.1 计划、协调;

.2 人员分配;

.3 时间、资源的限制;

.4 优化。

5.5.4 了解并能够采用有效资源管理:

.1 资源布置、分配和优化;

.2 船上-岸上有效通信;

.3 结合团队经验的决定;

.4 自信和领导力（包括动机）;

.5 情景意识的获得和保持。

5.5.5 了解并能够采用决策技巧:

.1 现状和风险评估;

.2 识别和考虑可选方案;

.3 措施选择过程;

.4 结果有效性评价。

5.6 操作救生设备

救生

5.6.1 能够组织弃船演习并熟悉救生艇和搜救船及其降落设备和装置和艇上设备，包括无线电救生设备、卫星应急无线电示位标、搜救雷达应答器、浸水保温服和保温用具的操作。

培训记录簿

6. 每项任务培训记录簿同样应包含以下项目：

6.1 任务名称；

6.2 有关设备/工具/系统等；

6.3 培训日期；

6.4 任务结束后监督轮机长姓名及首字母；

6.5 任务评价和改进方面。

7. 培训记录簿同样应包含以下信息：

7.1 用于发证的见习船员个人信息情况（如姓名、出生日期、家庭地址、海员服务簿编号等）；

7.2 见习船员所服务的公司情况（如企业名称、地址、特别培训计划服务时间等）；

7.3 见习船员所服务的船舶情况，如船舶名称、船舶主尺度、主机参数、救生和消防设备、货物装卸设备、导航设备、全球海上遇险和安全系统（GMDSS）设备等。



香港商船資訊

HONG KONG MERCHANT SHIPPING INFORMATION NOTE

Approved Onboard Training Programme and Approved Training Record Books for Officer Cadets

To : Shipowners, Seafarers and Seafarers' Unions

Summary

The purpose of this Note is to inform shipowners, seafarers and seafarers' unions regarding approved onboard training programme and approved training record books for officer cadets leading to seafarers' certification.

1. Officer cadets for certification are required to meet the requirements as stipulated in the following determinations for obtaining their first Certificate of Competency, i.e. Class 3 certificate.

- (a) Certificates of Competency and Licences for Deck Officers' Determinations (2012 edition); and
- (b) Certificates of Competency and Licences for Marine Engineer Officers and Electro-technical Officers Determinations (2012 edition).

The above determinations have been uploaded to Marine Department's website (http://www.mardep.gov.hk/en/pub_services/exam.html) for information.

2. One of the conditions as stated in the determinations requires officer cadets to complete an approved onboard training programme and is documented in an approved training record book. Onboard training programme including all the elements listed in Annex 1 for deck officer cadets, or in Annex 2 for marine engineer officer cadets, and the record of the training conducted in accordance with such approved programme are acceptable to the Marine Department as the approved ones. Such training record book can be one prepared by officer cadets' companies or training institute as well as one published by maritime organizations.

3. An officer cadet with his onboard training falls short of the required training elements will be required to compensate by additional seagoing service, training courses or assessment as determined by the Department.

4. Enquiries relating to this Note should be made to the Senior Surveyor of Ships/Seafarers' Certification on telephone no.: (+852) 2852 4368; fax no.: (+852) 2541 6754; or e-mail address: sscrt@mardep.gov.hk.

Marine Department
Shipping Division

16 November 2012

Onboard training for deck officer cadets

Supervised onboard training

With respect to the paragraph 2.2 of Regulation II/1 of the STCW Convention, the supervised onboard training should at least cover the following elements:

1. Familiarization for all ships
 - 1.1 Emergency drills such as abandon ship and firefighting drill etc.
 - 1.2 Safe working practices such as entering enclosed space, hot work practice etc.
 - 1.3 Environmental pollution prevention practice such as garbage handling etc.

2. Plan and conduct a passage and determine position
 - 2.1 Celestial navigation
 - 2.1.1 Ability to use celestial bodies to determine the ship's position
 - 2.2 Terrestrial and coastal navigation
 - 2.2.1 Ability to determine the ship's position by use of:
 - .1 landmarks
 - .2 aids to navigation, including lighthouses, beacons and buoys
 - .3 dead reckoning, taking into account winds, tides, currents and estimated speed
 - 2.2.2 Thorough knowledge of and ability to use nautical charts, and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ships' routing information
 - 2.3 Electronic systems of position fixing and navigation
Ability to determine the ship's position by use of electronic navigational aids
 - 2.4 Echo-sounders
Ability to operate the equipment and apply the information correctly

- 2.5 Compass – magnetic and gyro
 - 2.5.1 Knowledge of the principles of magnetic and gyro-compasses
 - 2.5.2 Ability to determine errors of the magnetic and gyro-compasses, using celestial and terrestrial means, and to allow for such errors
- 2.6 Steering control system
 - 2.6.1 Knowledge of steering control systems, operational procedures and change-over from manual to automatic control and vice versa.
 - 2.6.2 Adjustment of controls for Optimum performance
- 2.7 Meteorology
 - 2.7.1 Ability to use and interpret information obtained from shipborne meteorological instruments
 - 2.7.2 Knowledge of the characteristics of the various weather systems, reporting procedures and recording systems
 - 2.7.3 Ability to apply the meteorological information available
- 3. Maintain a safe navigational watch
 - 3.1 Watchkeeping
 - 3.1.1 Thorough knowledge of the content, application and intent of the International Regulations for Preventing Collisions at Sea, 1972, as amended
 - 3.1.2 Thorough knowledge of the Principles to be observed in keeping a navigational watch
 - 3.1.3 The use of routing in accordance with the General Provisions on Ships' Routing
 - 3.1.4 The use of information from navigational equipment for maintaining a safe navigational watch
 - 3.1.5 Knowledge of blind pilotage techniques
 - 3.1.6 The use of reporting in accordance with the General Principles for Ship Reporting Systems and with VTS procedures
 - 3.2 Bridge resource management
 - 3.2.1 Knowledge of bridge resource management principles, including:

- .1 allocation, assignment, and prioritization of resources
- .2 effective communication
- .3 assertiveness and leadership
- .4 obtaining and maintaining situational awareness
- .5 consideration of team experience

4. Use of radar and ARPA to maintain safety of navigation

4.1 Radar navigation

4.1.1 Knowledge of the fundamentals of radar and automatic radar plotting aids(ARPA)

4.1.2 Ability to operate and to interpret and analyse information obtained from radar, including the following:

Performance, including:

- .1 factors affecting performance and accuracy
- .2 setting up and maintaining displays
- .3 detection of misrepresentation of information, false echoes, sea return, etc., racons and SARTs

Use, including:

- .1 range and bearing; course and speed of other ships; time and distance of closest approach of crossing, meeting overtaking ships
- .2 identification of critical echoes; detecting course and speed changes of other ships; effect of changes in own ship's course or speed or both
- .3 application of the International Regulations for Preventing Collisions at Sea, 1972, as amended
- .4 plotting techniques and relative- and true-motion concepts
- .5 parallel indexing

4.1.3 Principal types of ARPA, their display characteristics, performance standards and the dangers of over-reliance on ARPA

4.1.4 Ability to operate and to interpret and analyse information obtained from ARPA, including:

- .1 system performance and accuracy, tracking capabilities and limitations, and processing delays
- .2 use of operational warnings and system tests
- .3 methods of target acquisition and their limitations
- .4 true and relative vectors, graphic representation of target information and danger areas
- .5 deriving and analysing information, critical echoes, exclusion areas and trial manoeuvres

5. Use of ECDIS to maintain the safety of navigation

5.1 Navigation using ECDIS

5.1.1 Knowledge of the capability and limitations of ECDIS operations, including:

- .1 a thorough understanding of Electronic Navigational Chart (ENC) data, data accuracy, presentation rules, display options and other chart data formats
- .2 the dangers of over-reliance
- .3 familiarity with the functions of ECDIS required by performance standards in force

5.1.2 Proficiency in operation, interpretation, and analysis of information obtained from ECDIS, including:

- .1 use of functions that are integrated with other navigation systems in various installations, including proper functioning and adjustment to desired settings
- .2 safe monitoring and adjustment of information, including own position, sea area display, mode and orientation, chart data displayed, route monitoring, user-created information layers, contacts (when interfaced with AIS and/or radar tracking) and radar overlay functions (when interfaced)
- .3 confirmation of vessel position by alternative means
- .4 efficient use of settings to ensure conformance to operational procedures, including alarm parameters for anti-grounding, proximity to contacts and special areas, completeness of chart data and chart update status, and backup arrangements
- .5 adjustment of settings and values to suit the present conditions
- .6 situational awareness while using ECDIS including safe water and proximity of hazards, set and drift, chart data and scale selection, suitability of route, contact detection and management, and integrity of sensors

6. Respond to emergencies

6.1 Emergency procedures

6.1.1 Precautions for the protection and safety of passengers in emergency situations

6.1.2 Initial action to be taken following a collision or a grounding; initial damage assessment and control

6.1.3 Appreciation of the procedures to be followed for rescuing

persons from the sea, assisting a ship in distress, responding to emergencies which arise in port

7. Respond to a distress signal at sea
 - 7.1 Search and rescue: Knowledge of the contents of the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual
8. Use the IMO Standard Marine Communication Phrases and use English in written and oral form
 - 8.1 English language: Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship's safety and operation, to communicate with other ships, coast stations and VTS centres and to perform the officer's duties also with a multilingual crew, including the ability to use and understand the IMO Standard Marine Communication Phrases(IMO SMCP)
9. Transmit and receive information by visual signaling
 - 9.1 Visual signaling
 - .1 Ability to use the International Code of Signals
 - .2 Ability to transmit and receive, by Morse light, distress signal SOS as specified in Annex IV of the International Regulations for Preventing Collisions at Sea, 1972, as amended, and appendix 1 of the International Code of Signals, and visual signaling of single-letter signals as also specified in the International Code of Signals
10. Manoeuvre the ship
 - 10.1 Ship manoeuvring and handling. Knowledge of:
 - .1 the effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances
 - .2 the effects of wind and current on ship handling
 - .3 manoeuvres and procedures for the rescue of person overboard
 - .4 squat, shallow-water and similar effects
 - .5 proper procedures for anchoring and mooring
11. Monitor the loading, stowage, securing, care during the voyage and the unloading of cargoes
 - 11.1 Cargo handling, stowage and securing
 - .1 Knowledge of the effect of cargo, including heavy lifts, on the

- seaworthiness and stability of the ship
 - .2 Knowledge of safe handling, stowage and securing of cargoes, including dangerous, hazardous and harmful cargoes, and their effect on the safety of life and of the ship
 - .3 Ability to establish and maintain effective communications during loading and unloading
12. Inspect and report defects and damage to cargo spaces, hatch covers and ballast tanks
- 12.1 Knowledge and ability to explain where to look for damage and defects most commonly encountered due to:
 - .1 loading and unloading operations
 - .2 corrosion
 - .3 severe weather conditions
 - 12.2 Ability to state which parts of the ship shall be inspected each time in order to cover all parts within a given period of time
 - 12.3 Identify those elements of the ship structure which are critical to the safety of the ship
 - 12.4 State the causes of corrosion in cargo spaces and ballast tanks and how corrosion can be identified and prevented
 - 12.5 Knowledge of procedures on how the inspections shall be carried out
 - 12.6 Ability to explain how to ensure reliable detection of defects and damages
 - 12.7 Understanding of the purpose of the “enhanced survey programme”
13. Ensure compliance with pollution-prevention requirements
- 13.1 Prevention of pollution of the marine environment and anti-pollution procedures
 - .1 Knowledge of the precautions to be taken to prevent pollution of the marine environment
 - .2 Anti-pollution procedures and all associated equipment
 - .3 Importance of proactive measures to protect the marine environment
14. Maintain seaworthiness of the ship
- 14.1 Ship stability
 - 14.1.1 Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment

- 14.1.2 Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy
 - 14.1.3 Understanding of the fundamentals of watertight integrity
- 14.2 Ship construction
 - 14.2.1 General knowledge of the principal structural members of a ship and the proper names for the various parts
- 15. Prevent, control and fight fires on board
 - 15.1 Fire prevention and fire-fighting appliances
 - .1 Ability to organize fire drills
 - .2 Knowledge of classes and chemistry of fire
 - .3 Knowledge of fire-fighting systems
 - .4 Knowledge of action to be taken in the event of fire, including fires involving oil systems
- 16. Operate life-saving appliances
 - 16.1 Life-saving:

Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids
- 17. Apply medical first aid on board ship
 - 17.1 Medical aid:

Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship
- 18. Monitor compliance with legislative requirements
 - 18.1 Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment
- 19. Application of leadership and teamworking skills
 - 19.1 Working knowledge of shipboard personnel management and training
 - 19.2 A knowledge of related international maritime conventions and

recommendations, and national legislation

- 19.3 Ability to apply task and workload management, including:
 - .1 planning and co-ordination
 - .2 personnel assignment
 - .3 time and resource constraints
 - .4 prioritization

- 19.4 Knowledge and ability to apply effective resource management:
 - .1 allocation, assignment, and prioritization of resources
 - .2 effective communication onboard and ashore
 - .3 decisions reflect consideration of team experiences
 - .4 assertiveness and leadership, including motivation
 - .5 obtaining and maintaining situational awareness

- 19.5 Knowledge and ability to apply decision-making techniques:
 - .1 situation and risk assessment
 - .2 identify and consider generated options
 - .3 selecting course of action
 - .4 evaluation of outcome effectiveness

Training record book

- 20. The training record book should also contain the following information:
 - 20.1 Personal information of the candidate for certification, such as name, date of birth, residential address, seaman discharge book no. etc.
 - 20.2 Company(ies) information which the candidate has been served such as company name, company address, service period for the particular training programme etc.
 - 20.3 Ship(s) information which the candidate has been served such as ship's name, ship's major particulars, engine particulars, lifesaving and firefighting equipment, cargo gears, navigational equipment and GMDSS equipment etc.

Onboard training for marine engineer officer cadets

Supervised onboard training

With respect to the paragraph 2.2 of Regulation III/1 of the STCW Convention, the supervised onboard training should at least cover the following elements:

1. Familiarization for all ships
 - 1.1 Emergency drills such as abandon ship and firefighting drill etc.
 - 1.2 Safe working practices such as entering enclosed space, hot work practice etc.
 - 1.3 Environmental pollution prevention practice such as garbage handling etc.

2. Marine engineering at the operational level
 - 2.1 Maintain a safe engineering watch
 - 2.1.1 Thorough knowledge of Principles to be observed in keeping an engineering watch, including:
 - .1 duties associated with taking over and accepting a watch
 - .2 routine duties undertaken during a watch
 - .3 maintenance of the machinery space logs and the significance of the readings taken
 - .4 duties associated with handing over a watch
 - 2.1.2 Safety and emergency procedures; change-over of remote/automatic to local control of all systems
 - 2.1.3 Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil systems

 - 2.1.4 Knowledge of engine-room resource management principles, including:
 - .1 allocation, assignment, and prioritization of resources
 - .2 effective communication
 - .3 assertiveness and leadership

Engine-room resource management

- .4 obtaining and maintaining situational awareness
 - .5 Consideration of team experience
- 2.2 Use English in written and oral form
- 2.2.1 Adequate knowledge of the English language to enable the officer to use engineering publications and to perform engineering duties
- 2.3 Use internal communication systems
- 2.3.1 Operation of all internal communication systems on board
- 2.4 Operate main and auxiliary machinery and associated control systems
- 2.4.1 Basic construction and operation principles of machinery systems, including (where applicable) :
 - .1 marine diesel engine
 - .2 marine steam turbine
 - .3 marine gas turbine
 - .4 marine boiler
 - .5 shafting installations, including propeller
 - .6 other auxiliaries, including various pumps, air compressor, purifier, fresh water generator, heat exchanger, refrigeration, airconditioning and ventilation systems
 - .7 steering gear
 - .8 automatic control systems
 - .9 fluid flow and characteristics of lubricating oil, fuel oil and cooling systems
 - .10 deck machinery
 - 2.4.2 Safety and emergency procedures for operation of propulsion plant machinery, including control systems
 - 2.4.3 Preparation, operation, fault detection and necessary measures to prevent damage for the following machinery items and control systems:
 - .1 main engine and associated auxiliaries
 - .2 steam boiler and associated auxiliaries and steam systems
 - .3 auxiliary prime movers and associated systems
 - .4 other auxiliaries, including refrigeration, air-conditioning and ventilation systems
- 2.5 Operate fuel, lubrication, ballast and other pumping systems and associated control systems
- 2.5.1 Operational characteristics of pumps and piping systems, including control systems
 - 2.5.2 Operation of pumping systems:

- .1 routine pumping operations
 - .2 operation of bilge, ballast and cargo pumping systems
 - 2.5.3 Oily-water separators (or similar equipment) requirements and operation.
- 3. Maintenance and repair at the operational level
 - 3.1 Appropriate use of hand tools, machine tools and measuring instruments for fabrication and repair on board
 - 3.1.1 Characteristics and limitations of materials used in construction and repair of ships and equipment
 - 3.1.2 Characteristics and limitations of processes used for fabrication and repair
 - 3.1.3 Properties and parameters considered in the fabrication and repair of systems and components
 - 3.1.4 Methods for carrying out safe emergency/temporary repairs
 - 3.1.5 Safety measures to be taken to ensure a safe working environment and for using hand tools, machine tools and measuring instruments
 - 3.1.6 Use of hand tools, machine tools and measuring instruments
 - 3.1.7 Use of various types of sealants and packings
 - 3.2 Maintenance and repair of shipboard machinery and equipment
 - 3.2.1 Safety measures to be taken for repair and maintenance, including the safe isolation of shipboard machinery and equipment required before personnel are permitted to work on such machinery or equipment
 - 3.2.2 Appropriate basic mechanical knowledge and skills
 - 3.2.3 Maintenance and repair, such as dismantling, adjustment and reassembling of machinery and equipment
 - 3.2.4 The use of appropriate specialized tools and measuring instruments
 - 3.2.5 Design characteristics and selection of materials in construction of equipment
 - 3.2.6 Interpretation of machinery drawings and handbooks
 - 3.2.7 The interpretation of piping, hydraulic and pneumatic diagrams

4. Electrical, electronic and control engineering at the operational level
 - 4.1 Operate electrical, electronic and control systems
 - 4.1.1 Basic configuration and operation principles of the following electrical, electronic and control equipment (where applicable) :
 - .1 electrical equipment:
 - .a generator and distribution systems
 - .b preparing, starting, paralleling and changing over generators
 - .c electrical motors including starting methodologies
 - .d high-voltage installations
 - .e sequential control circuits and associated system devices
 - .2 electronic equipment:
 - .a characteristics of basic electronic circuit elements
 - .b flowchart for automatic and control systems
 - .c functions, characteristics and features of control systems for machinery items, including main propulsion plant operation control and steam boiler automatic controls
 - .3 control systems:
 - .a various automatic control methodologies and characteristics
 - .b Proportional–Integral–Derivative (PID) control characteristics and associated system devices for process control
 - 4.2 Maintenance and repair of electrical and electronic equipment
 - 4.2.1 Safety requirements for working on shipboard electrical systems, including the safe isolation of electrical equipment required before personnel are permitted to work on such equipment
 - 4.2.2 Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment
 - 4.2.3 Detection of electric malfunction, location of faults and measures to prevent damage
 - 4.2.4 Construction and operation of electrical testing and measuring equipment
 - 4.2.5 Function and performance tests of the following equipment and their configuration:
 - .1 monitoring systems
 - .2 automatic control devices

.3 protective devices

4.2.6 The interpretation of electrical and simple electronic diagrams

5. Controlling the operation of the ship and care for persons on board at the operational level

5.1 Ensure compliance with pollution prevention requirements

Prevention of pollution of the marine environment

5.1.1 Knowledge of the precautions to be taken to prevent pollution of the marine environment

5.1.2 Anti-pollution procedures and all associated equipment

5.1.3 Importance of proactive measures to protect the marine environment

5.2 Maintain seaworthiness of the ship

Ship stability

5.2.1 Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment

5.2.2 Understanding of the fundamentals of watertight integrity

5.2.3 Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy

Ship construction

5.2.4 General knowledge of the principal structural members of a ship and the proper names for the various parts

5.3 Prevent, control and fight fires on board

Fire prevention and fire-fighting appliances

5.3.1 Ability to organize fire drills

5.3.2 Knowledge of classes and chemistry of fire

5.3.3 Knowledge of fire-fighting systems

5.3.4 Action to be taken in the event of fire, including fires involving oil systems

5.4 Monitor compliance with legislative requirements

- 5.4.1 Basic working knowledge of the relevant IMO conventions concerning safety of life at sea and protection of the marine environment
- 5.5 Application of leadership and team working skills
 - 5.5.1 Working knowledge of shipboard personnel management and training
 - 5.5.2 A knowledge of related international maritime conventions and recommendations, and national legislation
 - 5.5.3 Ability to apply task and workload management, including:
 - .1 planning and co-ordination
 - .2 personnel assignment
 - .3 time and resource constraints
 - .4 prioritization
 - 5.5.4 Knowledge and ability to apply effective resource management:
 - .1 allocation, assignment, and prioritization of resources
 - .2 effective communication on board and ashore
 - .3 decisions reflect consideration of team experiences
 - .4 assertiveness and leadership, including motivation
 - .5 obtaining and maintaining situational awareness
 - 5.5.5 Knowledge and ability to apply decision-making techniques:
 - .1 Situation and risk assessment
 - .2 Identify and consider generated options
 - .3 Selecting course of action
 - .4 Evaluation of outcome effectiveness
- 5.6 Operate life-saving appliances
 - Life-saving*
 - 5.6.1 Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids

Training record book

- 6. The training record of each task should include following items
 - 6.1 Name of the task

- 6.2 Related equipment/tools/systems etc.
 - 6.3 Date of training
 - 6.4 Name of supervising marine engineer officer and his initials after task completion
 - 6.5 Task evaluation and areas for improvement
7. The training record book should also contain the following information:
- 7.1 Personal information of the candidate for certification, such as name, date of birth, residential address, seaman discharge book no. etc.
 - 7.2 Company(ies) information which the candidate has been served such as company name, company address, service period for the particular training programme etc.
 - 7.3 Ship(s) information which the candidate has been served such as ship's name, ship's major particulars, engine particulars, lifesaving and firefighting equipment, cargo gears, navigational equipment and GMDSS equipment etc.