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C C S 技术通告

Technical Information

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发：本社总部有关处室，本社验船师、审核员，船东和管理公司

香港海事处发布迎接 TOKYO & PARIS MOU 9 月 1 日-11 月 30 日集中大检查导则

各有关船公司：

巴黎备忘录和东京备忘录将从 2013 年 9 月 1 日至 11 月 30 日开展关于主推进机械和辅助机械的集中大检查。近日香港海事处发布了船东通告，以帮助香港注册船舶船长准备此次关于主推进机械和辅助机械的集中大检查。集中大检查主要关注 4 个方面，即与主推进机械和辅助机械相关的文件资料、主机和辅机、辅助机械和操作控制，这些方面将作为检查标准，PSCO 发现任何不符合标准的缺陷都可能导致船舶滞留。

详见本通告附件。

请船公司予以关注并采取必要措施。

本通告在本社网站（www.ccs.org.cn）上发布，并由各分社转发所辖区域内的有关船公司。

特此通告！

中国船级社营运入级处

本通知在实施过程中如有任何疑问，请与总部：*营运入级处* 联系。
电话/Tel：（010）58112809 传真/Fax：（010）58112807 E-mail 地址：cd@ccs.org.cn

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6 August 2013

关于主推进机械和辅助机械的集中大检查
2013 年 9 月 1 日至 11 月 30 日实施

巴黎备忘录和东京备忘录将从 2013 年 9 月 1 日至 11 月 30 日开展关于主推进机械和辅助机械的集中大检查。其他备忘录在此期间也会开展相同的大检查。

大检查会重点关注所有船型船舶对 SOLAS 第 II-1 章规定的遵守情况并将结合常规港口国监督检查的目标系统进行。本次集中大检查的目的是对相关适用公约的遵守情况有详细的了解。

集中大检查主要关注 4 个方面，即与主推进机械和辅助机械相关的文件资料、主机和辅机、辅助机械和操作控制，这些方面将作为检查标准，PSCO 发现任何不符合标准的缺陷都可能导致船舶滞留。

为帮助香港注册船舶船长准备此次关于主推进机械和辅助机械的集中大检查，相关准备指南附后以供参考（见附录 I）。请您特别注意在大检查前采取以下行动：

(a) 船舶管理公司务必将此通告和指南发放给所管理的香港注册的船舶并确保所有船员完全清楚本次大检查。
(b) 船舶管理公司及或船员必须进行类似的检查以确保任何时候都满足相关要求，尤其是在大检查开始以前；和
(c) 船舶管理公司必须确保船上的船长和高级船员可以与 PSCO 进行有效的沟通。因为在检查期间，缺乏与 PSCO 的有效沟通容易导致贵公司船舶

滞留。

在集中大检查期间，PSCO 将使用涵盖本次大检查的检查项目的调查表。调查表已经在巴黎备忘录及东京备忘录的网站上发布：

http://www.parismou.org
http://www.tokyo-mou.org

维护香港注册船舶良好的 PSC 记录需要我们大家共同努力。因此，我们必须紧密合作以实现这一目标。

如您有任何疑问，请联系货船安全部高级验船师，联系方式如下：

电话号码：（852）2852 4510
传真号码：（852）2545 0556
E-mail：ss_css@mardep.gov.hk

附录 I

香港注册船舶关于主推进机械和辅助机械的集中大检查的准备指南

介绍

2013 年 9 月 1 日至 11 月 30 日，巴黎备忘录与东京备忘录将共同开展关于主推进机械和辅助机械的集中大检查（CIC）。其它备忘录在此期间将进行同样内容的大检查。

目的

大检查会重点关注所有船型船舶对 SOLAS 第 II-1 章规定的遵守情况。大检查会检查特定的区域，但不会超出正常港口国监督检查的范围。集中大检查会结合常规港口国监督检查的目标系统进行。本次 CIC 的目的是详细了解对相关适用公约的遵守情况，以确保：

(a)船舶符合 SOLAS 公约的规定；

(b)船舶主推进机械及辅助机械设备的安全性，尤其是主机、辅机，辅助机械及相关报警系统的运行状况和维护保养状况；

(c)所有负责操作主推进机械及辅助机械设备的高级船员及普通船员熟悉主机、辅机及辅助机械设备的安全操作程序和应急操作程序；

(d)提高相关责任船员的安全意识。

需要注意的问题

CIC 会关注关于主推进机械及辅助机械设备的以下四个重要方面（11 个问题：问题 1-11）：证书文件（问题 1-2）、主机和辅机（问题 3-6）、辅助机械设备（问题 7-9）及操作控制（问题 10-11）。任何因为不符合要求而被检查官发现的缺陷都可能会导致船舶滞留。船东、船舶管理公司和船长需要特别关注以下问题：

证书文件

问题 1　指导船舶机械设备正常使用的使用说明书、操作手册是否使用船员能理解的语言编写？

◆ 公司及船长需确认遵守以下 SOLAS 公约：

✧ SOLAS 公约 II-1 章第 26.10 条“通则”

操作和维护保养须知以及船舶安全运行所必需的机器和设备的工程图纸，应以在履行职责时须看懂这些资料的高级船员和普通船员所能理解的语言编制。（适用于 1986 年 7 月 1 日及以后建造的船舶）

✧ SOLAS 公约 V 章第 14.3 条“船舶配员”

对所有船舶，为保证船员能够进行与安全有关的有效操作，应建立一种工作语言并将其记录在船舶航海日志上。符合本公约 IX/1 条定义的公司或船长(合适者)应确定适当的工作语言。应要求每个船员能懂得这种语言，并在合适时使用这种语言下达指令和包括应答。如果工作语言不是船旗国的官方语言则所有需张贴的图纸和图表应翻译成工作语言。（适用于所有船舶）

◆ 注意：公司及船长需要确认：

✧ 香港注册船舶需要保存在船上的证书文件妥善保存。请参考香港商船资讯（No.49/2011）：“IMO 通函及香港规定的香港国际航行船舶需要或建议保存在船上的证书、文件和出版物” 的详细要求；并且

✧ 另外，需要特别注意以下证书文件：

☐ 最低安全配员证书；

☐ 船舶入级证书；

☐ 更新的船员清单；

☐ 主推进机械及辅助机械设备维护保养计划；

☐ 自动控制系统和远程遥控系统安保设施的定期检查记录；

☐ 轮机循环检验记录；

☐ 主推进机械及辅助机械设备的试验记录；

☐ 主推进机械及辅助机械设备的训练手册及应急操作程序记录。

问题 2　如果船舶在运行过程中机舱周期性无人值班，能否提供有效文件表明其满足周期性无人值班机器处所相关要求？

◆ SOLAS 公约 II-1 章第 46.3 条“通则”规定：

每艘船舶均应备有主管机关满意的证明文件，用以证明其适合于在机器处所周期性无人值班的情况下运行。（适用于 1984 年 9 月 1 日及以后建造的船舶）

- ◆ 如果一艘香港注册船舶有周期性无人值班的机器处所，以下文件要包含无人值班机器处所的信息：
  - ✧ 本主管机关签发的最低安全配员证书（SOLAS 公约第 V 章 14.2 条）；及
  - ✧ 船级社签发的入级证书或相关文件。
- ◆ 公司及船长需要确认：
  - ✧ 根据本主管机关签发的最低安全配员证书，香港注册船舶在前往下一港之前正确配员；
  - ✧ 如果无人值班机舱系统不能运行，则需要额外配员；并且
  - ✧ 在到达所有港口前，船员清单需更新。

主机和辅机

问题 3　船舶主机、辅机的曲轴箱油雾浓度探测器或其它能使主机、辅机自动停车的装置是否处于正常的工作状态？

- ◆ SOLAS 公约 II-1 章第 47.2 条“防火措施”规定：
  2250kW 及以上或气缸内径大于 300mm 的内燃机，应设有曲轴箱油雾浓度探测器或发动机轴承温度监测器或等效装置。（适用于 1984 年 9 月 1 日及以后建造的船舶）
- ◆ SOLAS 公约 II-1 章第 27.5 条“机器”规定：
  主涡轮推进机械和（如适用）主内燃推进机械及辅机，应设有在发生诸如滑油供给故障等可能迅速导致其完全破坏、严重损坏或爆炸的故障时能自动停车的装置。主管机关可允许采用自动停车的越控装置。（适用于 1984 年 9 月 1 日及以后建造的船舶）
- ◆ 公司及船长需要确认：
  - ✧ 油雾浓度探测器（或发动机轴承温度监测器或等效装置）和其它能使主机、辅机自动停车的装置需要正确维护保养至良好工作状态；并且
  - ✧ 维护保养计划（包括检查和试验）和记录保存在船上。

◆ 轮机部船员需要熟悉：

✧ 油雾浓度探测器（或发动机轴承温度监测器或等效装置）的位置，操作程序和试验方法；并且

✧ 其它能使主机、辅机自动停车的装置，例如滑油低压停机报警装置。

问题 4　机舱内如运动部件、高温表面、具有触电等危险的设备，是否配有使船上人员危险降至最低的保护设施？

◆ SOLAS 公约 II-1 章第 26.1 条“通则”规定：

机器、锅炉和其他受压容器、相关管系和附件的设计和建造应适合于其预定用途，其安装和防护应使其对船上人员的危险性降至最低程度，并应充分考虑到运动部件、高温表面和其他危险。设计应考虑到建造中使用的材料、设备的预定用途以及将要遇到的工作条件和船上环境条件。（适用于 1984 年 9 月 1 日及以后建造的船舶）

◆ SOLAS 公约 II-1 章第 45 条“触电、电气火灾及其他电器灾害的预防措施”详细规定了电气安全要求事项。详情请参考有关公约。

◆ 公司和船长需要确保机舱内如运动部件、高温表面、具有触电等危险的设备配有使船上人员危险降至最低的保护设施。例如：

✧ 机舱运动部件应正确保护和安装，如主机和辅机的飞轮、主压缩机和皮带驱动的水泵的联轴器等；

✧ 高温表面要有绝缘保护，例如燃油管系、排气管、涡轮增压器的进出口排气管和锅炉安装等；以及

✧ 防触电的安全保护和适当措施，例如每个配电板前后铺设绝缘垫、正确维护保养电动机、电缆正确支撑并维护至良好状态、机舱及生活区照明设备灯罩完好等。

问题 5　船舶主推进机械及主要辅助机械设备是否处于正常的工作状态？

◆ SOLAS 公约 II-1 章第 26.3 条“通则”规定：

应设有措施，在任一重要辅机失效时，使推进机械的正常运转能够维持或恢复。应特别注意下列设备的故障：

.1 作为主电源的发电机组；

.2 蒸汽供应源；

.3 锅炉给水系统；

.4 锅炉或发动机的燃油供给系统；

.5 润滑油压力源；

.6 水压源；

.7 凝水泵和保持冷凝器真空的装置；

.8 锅炉的机械送风；

.9 空气压缩机和起动或控制用空气瓶；

.10 主推进机械（包括可调螺距螺旋桨）的液压、气动或电气控制装置。（适用于 1984 年 9 月 1 日及以后建造的船舶）

◆ 公司和船长需要确认正确的维护保养主要的机械设备和电气安装，让其能够为推进系统和辅助服务提供持续的动力。相关检查和维护保养记录需保存在船上。

◆ 应特别注意下列操作条件：

✧ 辅机及发电机是为推进系统和辅助服务提供持续的动力的主要机械设备和电气安装。在任一重要辅机失效时，推进机械的正常运转能够维持或恢复。

✧ 其他为推进机械重要的辅机，包括燃油系统、滑油系统、冷却淡水泵系、启动空气系统和海水冷却系统等。

问题 6 机舱（包括舱底）的清洁状况是否令人满意？

◆ SOLAS 公约 II-1 章第 26.7 条“通则”规定：

应有便于对主推进装置和辅机，包括锅炉和受压容器，进行清洁、检查和维护保养的措施。（适用于 1984 年 9 月 1 日及以后建造的船舶）

◆ 公司和船长需要确保：

✧ 主机和辅机没有漏油；

✧ 燃油泵、滑油泵、净化器、管系和它们的绝缘材料维护保养至清洁无残油状态；

✧ 机舱，尤其是分油机间，维护保养至清洁整齐状态；

✧ 主机、辅机、设备和它们的花铁板清洁无残油；以及

✧ 没有残油和碎布遗留在舱底。

辅机

问题 7　船舶主、辅锅炉及给水系统是否处于安全的工作状态？

◆ SOLAS 公约 II-1 章第 32 条“蒸汽锅炉和锅炉给水系统” 规定：

.1 每台蒸汽锅炉和每台非燃烧的蒸汽发生器，均应至少设有两个排量足够的安全阀。但是，在主管机关对任何锅炉或非燃烧蒸汽发生器考虑到其蒸汽产量或任何其他特性后，如果确信对超压已有充分防护，可允许只设一个安全阀。

.2 每台无人监控的燃油锅炉均应设有在出现低水位、空气供给故障或火焰熄灭时能关闭燃油供应和发出警报的安全装置。

.3 用于涡轮推进机械的水管式锅炉应装有高水位报警装置。

.4 船舶安全所必需的或由于给水故障可能导致危险的每一蒸汽发生系统，应设有不少于两套从给水泵开始并包括给水泵在内的独立给水系统，并应注意到可以接受在汽鼓上有一处贯穿。除非泵的特性能防止超压，否则应设有防止此系统任何部分超压的装置。

.5 锅炉应设有监视和控制给水质量的设施。应有适当布置尽可能地阻止对锅炉产生不利影响的油或其他污物进入锅炉。

.6 船舶安全所必需并设计有规定水位的每台锅炉，应至少设有两个水位指示装置，其中至少有一个应是直接读数的玻璃水位表。

（适用于 1984 年 9 月 1 日及以后建造的船舶）

◆ 公司和船长需要确保船舶主、辅锅炉及给水系统按照 SOLAS 公约的要求正确维护保养。下列事项应特别注意：

✧ 安全阀及其减压装置维护保养至良好工作状态；

✧ 低水位、空气供给故障或火焰熄灭时的燃油关闭装置维护保养至良好工作状态；

✧ 给水系统维护保养至良好工作状态；

- ✧ 两个水位指示装置维护保养至良好工作状态；
- ✧ 所有压力表维护保养至良好工作状态；
- ✧ 绝缘材料适当安装、状态良好（SOLAS 公约 II-1 章 26.1 条）；以及
- ✧ 维护保养计划和记录保存在船上。

问题 8　船舶应急电源及应急照明是否处于正常的工作状况？

◆ SOLAS 公约 II-1 章第 42、43 及 44 条规定了关于应急电源和应急照明的要求。详情请参考有关公约。

- ✧ SOLAS 公约 II-1 章第 42 条“客船应急电源”；
- ✧ SOLAS 公约 II-1 章第 42.1 条“客滚船的附加应急照明”；
- ✧ SOLAS 公约 II-1 章第 43 条“货船应急电源”；
- ✧ SOLAS 公约 II-1 章第 44 条“应急发电机组的起动装置”。

◆ 公司和船长需要确保遵守 SOLAS 公约。下列事项应特别注意：

- ✧ 应急发电机组包括自动起动装置、起动装置及燃油柜液位维护保养至良好状态；
- ✧ 应急发电机的起动方式，例如电力、液压和压缩空气，任何时候均维护保养至良好的工作状态；
- ✧ 人工起动，例如手摇曲柄、惯性起动器、人工充液液压蓄能器或火药填充筒何时候均维护保养至良好的工作状态；
- ✧ 应急电源维护保养至良好的工作状态；
- ✧ 所有应急照明维护保养至良好的工作状态；
- ✧ 船上需有全部应急系统的定期试验，包括自动起动装置的试验（SOLAS 公约 II-1 章第 42 和 43 条）；以及
- ✧ 相关检查、试验和维护保养记录需保存在船上。

问题 9　船舶舱底水泵装置是否处于良好的工作状态？

◆ SOLAS 公约 II-1 章第 35-1 条“舱底水泵装置”规定：

2　客船和货船

2.1　应设有有效的舱底水泵系统，在所有实际情况下均能抽除和排干任何

水密舱室的水，但固定用于装载淡水、压载水、燃油或液货并设有其他有效排水设备的处所除外。冷藏舱应设置有效的排水装置。

2.2 卫生泵、压载泵及通用泵如与舱底排水系统有必要的连接，均可作为独立的动力舱底泵。

2.3 用于煤舱或燃油贮存舱柜内及其下方处所，或用于锅炉舱或机器处所内，包括设置沉淀油柜或燃油泵所在处所内的所有舱底水管，应为钢质或其他合适的材质。

2.4 舱底排水管系及压载管系，应布置成能防止由海上或来自压载舱的水进入货舱及机器处所，或自一舱进入另一舱的可能性。对于舱底排水管系及压载管系有连接的任何深舱，应采取措施以防在深舱装有货物时不慎灌入海水，或在深舱装有压载水时通过舱底排水管抽出压载水。

2.5 所有与舱底水泵装置相连接的分配箱和手动阀，应设在通常情况下可以到达的位置。

2.6 位于客船舱壁甲板上和货船干舷甲板上封闭的货物处所应设有排水装置，对于任何船舶或任何级别船舶的任何特殊舱室，如果主管机关确信这些处所的尺度或内部分舱不会因免除其内部的排水装置而损害船舶的安全，可准许此类处所免设排水装置。

2.6.1 当船舶横倾超过 5° 时，至舱壁甲板或至干舷甲板的干舷分别使甲板边缘浸水，则应设有足够数量适当尺寸的泄水孔直接将水排到舷外。此类泄水孔的设置，对客船应符合第 15 条的要求，对货船应符合现行《国际载重线公约》中关于泄水孔、进水孔和排水孔的要求。

2.6.2 当船舶横倾为 5° 或小于 5° 时，其干舷分别使舱壁甲板边缘或干舷甲板边缘浸水，则舱壁甲板或干舷甲板上的封闭货物处所内排出的水应导向一个或多个容量足够的处所，这类处所应设有高水位报警器和向舷外排放的合适装置。此外，还应确保：

.1 泄水孔的数量、尺寸与布置应能防止自由水的不合理积聚；

.2 本条对客船或货船要求的排水装置（如适用），应考虑任何一种固定压力水雾灭火系统的要求；

.3 受汽油或其他危险物质污染的水，不应排向机器处所或其他可能存在火源的处所；

.4 如封闭的货物处所由二氧化碳灭火系统保护，则甲板泄水孔应设有防止此类窒息性气体遗漏的装置。

3 客船

详情请参考有关公约。

4 货船

至少应设有与主舱底排水系统相连的两台动力泵，其中一台可由推进机械驱动。如果主管机关确信船舶的安全不会受到损害，则个别舱室可免设舱底水泵装置。

◆ 公司和船长需要确保遵守 SOLAS 公约。下列事项应特别注意：

✧ 舱底水泵系统包括舱底泵、管系、阀（特别是海水吸入阀和舷外排出阀）和仪表正确维护保养至良好的工作状态；

✧ 舱底水泵系统没有非法连接；

✧ 从舱壁甲板之上的所有旋塞和阀门都清楚地标明，并提供指示，表明其处于开启或关闭状态（仅适用于 SOLASII-1 章/R21.22.12 的客船）；以及

✧ 舱底应急吸口阀维护保养至良好的工作状态。 （仅适用于 SOLASII-1 章/21.2.7.2/2.7.3/35-1 的客船）。

操作控制

问题 10 是否见证应急操舵演习，演习结果是否令人满意？

◆ SOLAS 公约 II-1 章第 29 条“操舵装置”规定：

1 除另有明文规定外，每艘船舶应设有一台主操舵装置和一台辅助操舵装置并使主管机关满意。该主操舵装置和辅助操舵装置的布置应使其中一台发生的故障不会导致另一台失效。

2.1 所有操舵装置的部件和舵杆应为主管机关满意的坚固和可靠的构造。对于非双套的必要部件的适用性应特别注意。任何这类必要部件，如合适时，应采用耐磨轴承，如球轴承、滚子轴承或者能持久润滑或设

有润滑装置的套筒轴承。

2.2 对于承受内部液压的管系和其他操舵装置的部件，确定其尺寸计算所用的设计压力应至少为本条 3.2 所指运行状况下可能出现的最大工作压力的 1.25 倍，同时应考虑在该系统低压一侧可能存在的压力。根据主管机关的意见，管系和部件的设计应采用疲劳衡准，同时考虑动力负荷所产生的脉动压力。

2.3 凡在液压系统中能被隔断的和由于动力源或外力作用能产生压力的任何部件，应设置安全阀。安全阀的调定应不超过设计压力。安全阀应有足够尺寸并布置成能够避免过度升高的压力超过设计压力。

3 主操舵装置和舵杆应：

.1 具有足够强度，并能在最大营运前进航速下操纵船舶，此应予以证实；

.2 能在船舶处于最深航海吃水并以最大营运航速前进时将舵自一舷 35° 转至另一舷 35° 以及于相同条件下在不超过 28 s 内将舵自任一舷 35° 转至另一舷 30°；

.3 动力操纵，以必要时满足本条 3.2 的要求，以及满足任何情况下主管机关对舵柄处的舵杆直径大于 120 mm（不包括冰区加强）的要求；和

.4 设计成在最大后退航速下不致损坏；但这一设计要求不必用最大后退航速和最大舵角下的试航证明。

4 辅助操舵装置应：

.1 具有足够强度和足以在可航行的航速下操纵船舶，并能在紧急情况下迅速投入工作；

.2 能在船舶处于最深航海吃水并以最大营运前进航速的一半或 7 节（取大者）前进时，在不超过 60 s 内将舵自一舷 15° 转至另一舷 15°；和

.3 动力操纵，以必要时满足本条 4.2 的要求，以及满足任何情况下主管机关对舵柄处的舵杆直径大于 230 mm（不包括冰区加强）的要求。

5　主操舵装置和辅助操舵装置的动力设备应：

.1　布置成电源发生故障后恢复供电时能自动再起动；和

.2　能从驾驶室某一位置投入工作。操舵装置的任何一台动力设备失电时，应在驾驶室里发出听觉和视觉报警。

6.1 如果操舵装置包括有两台或更多相同的动力设备，则不必装设辅助操舵装置，但：

.1　在客船上，当任一台动力设备不能运转时，主操舵装置应能按本条 3.2 的要求操舵；

.2　在货船上，当所有动力设备都运转时，主操舵装置应能按本条 3.2 的要求操舵；

.3　主操舵装置应布置成当其管系或 1 台动力设备发生单项故障后，此故障能被隔离，使操舵能力能够保持或迅速恢复。

6.2　直至 1986 年 9 月 1 日止，主管机关可以接受设置经证实具有可靠性记录但不符合本条 6.1.3 对液压系统要求的操舵装置。

6.3　非液压型式的操舵装置应达到等效的标准，并使主管机关满意。

7　应按下列要求设操舵装置的控制装置：

.1　对于主操舵装置，在驾驶室和舵机舱；

.2　如主操舵装置按照本条 6 布置并由两个独立的控制系统控制，该两个控制系统均能从驾驶室操作，但不必设置两套操舵手轮或操舵手柄。如果控制系统是由液遥控传动装置组成，则除 10,000 总吨及以上的油船、化学品船或气体运输船外，不必设置第二套独立控制系统；

.3　对于位于舵机舱的辅助操舵装置，如系动力操纵，也应能在驾驶室进行操作，并应独立于主操舵装置的控制系统。

8　能从驾驶室操作的任何主操舵装置和辅助操舵装置的控制系统应符合下列要求：

.1　如系电动者，应由在舵机舱内操舵装置电源电路上的一点所设独立电路供电，或由向操舵装置电力线路供电的配电板上邻近该电力线路处的一点直接供电；

.2 应在舵机室内设有将驾驶室操作的控制系统与其所控制的操舵装置断开的装置；

.3 系统能从驾驶室某一位置投入工作；

.4 当控制系统的电源供应发生故障时，应在驾驶室发出听觉和视觉报警；和

.5 应仅对操舵装置控制供电线路设有短路保护。

9 本条和第 30 条要求的电力线路和操舵装置系统以及相关的部件、电缆和管子应在其整个长度范围内尽可能地分离。

10 驾驶室与舵机舱之间应设有通信设施。

11 舵角位置应：

.1 当主操舵装置系动力操纵时，在驾驶室显示。舵角指示器应独立于操舵装置控制系统；

.2 能在舵机舱内辨认出。

◆ SOLAS 公约 II-1 章第 30.1 条“电动和电动液压操舵装置的附加要求”要求：对于电动和电动液压操舵装置，应在驾驶室和适当的主机控制位置装设指示其电动机正在运转的设备。

◆ SOLAS 公约 V 章第 26 条“操舵装置：试验和演习”规定：

1 船舶开航前 12 h 内，应由船员对操舵装置进行校核和试验。试验程序（如适用）应包括下述操作：

.1 主操舵装置；

.2 辅助操舵装置；

.3 操舵装置遥控系统；

.4 驾驶室内的操舵位置；

.5 应急动力供应；

.6 相对于舵实际位置的舵角指示器；

.7 操舵装置遥控系统动力故障报警器；

.8 操舵装置动力设备故障报警器；和

.9 自动隔断装置及其他自动设备。

2 校核和试验应包括：

.1 按所要求的操舵装置能力进行满舵运动；

.2 操舵装置及其联动部件的外观检查；和

.3 驾驶室与舵机室之间通信设备的操作。

3.1 在驾驶室及舵机室内，应永久展示操舵装置遥控系统和操舵装置动力设备转换程序的简单操作说明，并附有方框图。

3.2 所有与操舵装置的操作和/或维护保养有关的船舶驾驶员，应熟悉船上所装的操舵系统的操作以及从一个系统转换到另一系统的程序。

4 除本条 1 和 2 所述的常规校核和试验外，应至少每 3 个月进行一次应急操舵演习，以练习应急操舵程序。演习应包括在舵机室内的直接控制、与驾驶室的通信程序以及（如适用）转换动力供应的操作。

5 对于定期从事短程航行的船舶，主管机关可免除本条 1 和 2 所规定的核查和试验要求，但这些船舶应每周至少进行一次这样的校核和试验。

6 进行本条 1 和 2 规定的校核和试验的日期，以及进行本条 4 所述应急操舵演习的日期和详细内容应作记录。

◆ 公司和船长需要确认：

✧ 遵守 SOLAS 公约 II-1 章第 29 条“操舵装置”和 SOLAS 公约 II-1 章第 30 条“电动和电动液压操舵装置的附加要求”的规定；

✧ 进行了 SOLAS 公约 V 章第 26 条“操舵装置：试验和演习”规定的应急操舵装置的试验和演习，并将所有记录保存在船上；

✧ 责任船员熟悉操舵装置的操作，包括应急情况；

✧ 应急操舵处所有值班表；以及

✧ 操舵处所维护保养至清洁整齐状态。

◆ 以下应急操舵程序需要特别注意：

✧ 舵机间就地操舵；

✧ 驾驶室和舵机间的通信系统；

✧ 舵机动力系统的转换操作，如适用。

✧

问题 11 是否见证主机应急操作演习，演习结果是否令人满意？

◆ SOLAS 公约 II-1 章第 31 条“机器的控制”规定：

1 船舶推进和安全所必需的主机和辅机应设有有效的操作和控制装置。

2 如推进机械由驾驶室遥控而机器处所有人值班，则应适用下列要求：

.1 航速、推进方向以及（如适用）螺旋桨螺距应在所有航行（包括操纵）工况下，均可从驾驶室完全控制；

.2 每一独立的螺旋桨应由一个控制装置进行遥控，该控制装置的设计和制造应使其操作不需对机器的操作细节予以特别注意。如果多螺旋桨设计为同时运行，则可由一个控制装置进行控制；

.3 主推进机械应在驾驶室设有一个独立于驾驶室控制系统的紧急停机装置；

.4 驾驶室发出的推进机械指令应视具体情况在主机控制室或操纵台显示；

.5 推进机械在同一时间内应只能从一处进行遥控；在这种处所允许有互相连接的控制位置。每一处所均应有指示器显示何处在控制推进机械的。驾驶室和机器处所之间的控制转换应只能在主机处所或主机控制室内进行。此系统应包括将控制由一处转换到另一处时防止推力发生较大变化的装置；

.6 即使在遥控系统的任一部分发生故障时，推进机械应仍能就地控制；

.7 遥控系统应设计成在其发生故障时给出报警。除主管机关认为不可行外，应在实行就地控制动前保持预设的螺旋桨转速和推力方向；

.8 驾驶室应装有指示器，用以指示：

.8.1 固定螺距螺旋桨的转速和转动方向；

.8.2 可调螺距螺旋桨的转速和螺距位置；

.9 应在驾驶室和机器处所各设一个报警器，用以指示仍能多次起动主机的起动空气的规定低压。如果推进机械的遥控系统设计成自动起动，对于起动失败的自动连续起动次数应予限制，以保证有足够的起动空气压力进行就地起动。

3 如果主推进机械和相关机械（包括主电源）设有不同程度的自动控制或遥控，并在控制室有值班人员连续监管，则其布置和控制装置的设计、配备和安装应使机器的运转与处于直接监管下同样安全和有效；为此，

应视具体情况适用第 46 条至第 50 条的要求。对于这类处所的防火和防止进水应予特别考虑。

4　一般情况下，自动起动、操作和控制系统应包括人工越控自动控制的装置。这些系统的任何部分发生故障应不致妨碍使用人工越控功能。

5　1998 年 7 月 1 日或以后建造的船舶应符合如下经修正的本条 1 至 4 的要求：

.1　本条 1 由如下文字替代：

“1　对船舶推进、控制和安全所必需的主机和辅机应设有有效的操作和控制装置。船舶推进、控制和安全所必需的所有控制系统应是独立的，或设计成在某一系统失效时不会降低其他系统的功能。”；

.2　删除本条 2 中“而机器处所有人值班”的文字；

.3　本条 2.2 第一句由如下文字替代：

“.2　每一独立的螺旋桨应使用单一控制装置进行控制，所有有关的设备具有自动性能，如必要，具有防止推进机械超负荷运转的装置。”；

.4　本条 2.4 由如下文字替代：

“.4　驾驶室发出的推进机械指令应在主机控制室和操纵台上显示；”；

.5　本条 2.6 后新增如下文字：

“对船舶推进和安全所必需的辅机也能就地或在其附近进行控制；”和

.6　本条 2.8、2.8.1 和 2.8.2 由如下文字替代：

“.8　在驾驶室、主机控制室和操纵台应设置指示器，以显示：

.8.1　固定螺距螺旋桨的转速和转动方向；和

.8.2　可调螺距螺旋桨的转速和螺距位置；”。

6　2004 年 7 月 1 日或以后建造的船舶应符合如下经修正的本条 1 至 5 的要求：

.1　在 2 之后新增.10 如下：

“.10　自动控制系统的设计应确保向负责航行值班的驾驶员及时发出推进系统即将或快要减速或停车的临界报警，以评估紧急情况下的航行条件。尤其是该系统在为负责航行值班的驾驶员提供手动干

预机会的同时，应控制、监视、报告、发出报警并采取减速或停车的安全措施，但短时间内由于手动干预而导致发动机和/或推进设备完全失效（例如过速）的情况除外。”（Res.MSC.194(80)通过）

◆ 关于主机应急操作演习公司和船长需要注意以下事项：

✧ 应急演习的培训计划和记录保存在船上；

✧ 应急演习按照培训计划进行；

✧ 一些常见的应急演练，需包括在培训计划中，如：

☐ 主机故障演练；

☐ 机械设备损坏失效；

☐ 驾驶台操控失效；

☐ 控制转换（驾驶室-集控室-机旁间的转换）；

☐ 机动“自动停车”后的操作程序。

✧ 责任船员熟悉主机应急状况时的职责。

◆ 公司和船长需要确认船员熟悉主机应急状况时的操作，包括：

✧ 驾驶室与集控室包括机旁的通信（SOLAS 公约 II-1 章第 31 条）；

✧ 指令能否正确传达（SOLAS 公约 II-1 章第 31.2.4 条）；

✧ 启动空气低压报警（SOLAS 公约 II-1 章第 31.2.9 条）；

✧ 驾驶室至集控室的操作转换（SOLAS 公约 II-1 章第 31.2.5 条）；

✧ 集控室至机旁操作位置的操作转换（SOLAS 公约 II-1 章第 31.2.6 条）；

✧ 主推进机械紧急停机装置的操作（SOLAS 公约 II-1 章第 31.2.3 条）；

✧ 启动失败后能自动重新启动并发出报警；

✧ 主机的优先控制；以及

✧ 主机的机旁操作（SOLAS 公约 II-1 章第 31.6 条）。

-结束-

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6 August 2013

To: Shipowners, Ship Managers and Ship Masters

Dear Sirs/Madams,

Concentrated Inspection Campaign on Propulsion and Auxiliary Machinery
Conducted from 1 September to 30 November 2013

The Paris MOU and the Tokyo MOU will jointly conduct the Concentrated Inspection Campaign (CIC) on Propulsion and Auxiliary Machinery from 1 September to 30 November 2013. Other MOUs may follow the same routine during the campaign.

The campaign will target aspects of compliance provisions of SOLAS Chapter II-1 on all vessels regardless of type, which will be conducted in conjunction with the regular port Sate control targeting system. The purpose of this CIC is to get a detailed insight of the compliance of the relevant regulations as applicable.

The CIC will focus on 4 main areas, namely, documentation, main engine and auxiliary engines, auxiliary machinery and operational controls, with respect to the Propulsion and Auxiliary Machinery, which are considered critical that any non-compliance detected by a PSCO may result in ship detention.

To facilitate masters of Hong Kong registered ships to prepare for this CIC exercise, relevant guidelines for preparation of the CIC on Propulsion and Auxiliary Machinery are attached for reference (see Annex I). Your particular attention is drawn to take the following actions before the campaign:

(a) ship management companies should distribute this circular letter and guidelines to their Hong Kong registered ships and make sure that all shipboard staff are fully aware of the campaign;

(b) ship management companies and/or shipboard staff should carry out similar inspection to verify the compliance with the applicable requirements at all times, in particular prior to the commencement of the campaign; and

(c) ship management companies should ensure that masters and officers onboard ship could communicate effectively with PSCOs. Since poor communications with PSCOs during inspection may lead to the detention of your ships.

During the CIC, PSCOs will apply a questionnaire listing a number of items to be covered during the campaign. The questionnaire has been published on the websites of the Paris MOU and the Tokyo MOU:

http://www.parismou.org
http://www.tokyo-mou.org

May I reiterate that maintaining a good PSC record for the Hong Kong registered ships is an on-going task for all of us. Therefore, we should work closely and in co-operation to achieve the target.

If you have any question, please contact Senior Surveyor of Cargo Ships Safety Section as follows:

Telephone No.:	(852) 2852 4510
Fax: No.:	(852) 2545 0556
E-mail:	ss_css@mardep.gov.hk

Yours faithfully,

(S.H. Tse)
Senior Surveyor/Cargo Ships Safety
for Director of Marine

Encl.

Annex I

Guidelines for Preparation of the Concentrated Inspection Campaign on Propulsion and Auxiliary Machinery for Hong Kong Registered Ships

Introduction

The Paris MOU and the Tokyo MOU will jointly conduct the Concentrated Inspection Campaign (CIC) on Propulsion and Auxiliary Machinery from 1 September to 30 November 2013. Other MOUs may follow the same routine during the campaign.

Purpose

The campaign will target aspects of compliance provisions of SOLAS Chapter II-1 on all vessels regardless of type. The campaign is designed to examine a specific area and is not intended to detract from normal coverage of port State control inspections. The CIC will be conducted in conjunction with the regular port State control targeting system. The purpose of this CIC is to get a detailed insight of the compliance of the relevant regulations as applicable in order to ensure that:

(a) there is compliance with the requirements of the SOLAS convention as applicable;
(b) there is compliance with the safety of propulsion and auxiliary machinery, especially the working order and maintenance of the main engine, auxiliary engines, auxiliary equipment and their related alarm systems;
(c) all officers and crew members in charge of operation of propulsion and auxiliary machinery are familiarized with safety and emergency procedures with regard to the main engine, auxiliary engines and auxiliary equipment; and
(d) to raise awareness among engine crew on propulsion and auxiliary machinery related issues.

Issued to be attended

The CIC will focus on the following 4 areas (11 Questions: Q1-Q11) with respect to propulsion and auxiliary machinery which are considered as critical areas for Documentation (Q1-Q2), Main Engine and Auxiliary Engines (Q3-Q6), Auxiliary Machinery (Q7-Q9) and Operational Controls (Q10-Q11) that any non-compliance detected by a PSCO may result in ship detention. Shipowners, ship management companies and ship masters should pay special attention to the following issues:

DOCUMENTATION

Q1 Are instructions and manuals for ship machinery essential to safe operation, written in a language understood by the ship`s personnel?

- The company and the ship master should ensure that the following SOLAS regulations are complied with:

  - SOLAS Reg. II-1/26.10 "General"

    Operating and maintenance instructions and engineering drawings for ship machinery and equipment essential to the safe operation of the ship shall be written in a language understandable by those officers and crew members who are required to understand such information in the performance of their duties. (For ships constructed on or after 1 July 1986)

  - SOLAS Reg. V/14.3 "Ship's manning"

    On all ships, to ensure effective crew performance in safety matters, a working language shall be established and recorded in the ship's log-book. The company, as defined in regulation IX/1, or the master, as appropriate, shall determine the appropriate working language. Each seafarer shall be required to understand and, where appropriate, give orders and instructions and to report back in that language. If the working language is not an official language of the State whose flag the ship is entitled to fly, all plans and lists required to be posted shall include a translation into the working language. (All ships)

- Note: The company and the ship master should ensure that:

  - the certificates and documents required to be carried on board Hong Kong registered ships are properly maintained. Please refer to Hong Kong Merchant Shipping Information Notes (No. 49/2011): "IMO circular and Hong Kong requirements on certificates, documents and publications that are required or recommended to be carried on board Hong Kong ships engaged in international voyage" for the detailed requirements; and

  - in addition, special attention should be given to the following certificates and documents:

    - ☐ Minimum Safe Manning Certificate;
    - ☐ Certificate of Class;
    - ☐ up-to-date crew list;
    - ☐ maintenance plans and records for propulsion and auxiliary machinery;
    - ☐ periodical inspection records for alarms and safeguards on automatic and remote control equipment;
    - ☐ Records of Continuous Machinery Survey;
    - ☐ Records of safety device test for propulsion and auxiliary machinery; and
    - ☐ training plans and records for emergency operational drills to

propulsion and auxiliary machinery.

Q2 If the ship operates with periodically unattended machinery spaces, has it been provided with documentary evidence of fitness?

- SOLAS Reg. II-1/46.3 "General" requires that:

  Every ship shall be provided with documentary evidence, to the satisfaction of the Administration, of its fitness to operate with periodically unattended machinery spaces. (For ships constructed on or after 1 September 1984)

- If a Hong Kong registered ship operates with periodically unattended machinery spaces, the following documents contain the information of the unattended machinery spaces:

  - Minimum Safe Manning Certificate issued by this Administration (SOLAS Reg. V/14.2); and

  - Certificate of class or relevant documents issued by the ship's classification society.

- The company and the ship master should ensure that:

  - the Hong Kong registered ship is properly manned in accordance with the Minimum Safe Manning Certificate issued by this Administration before the ship is proceeding to next port;

  - if the unattended machinery space system becomes inoperative, additional manning scale may be required; and

  - the crew list is up-to-date before arrival of any ports.

MAIN ENGINE AND AUXILIARY ENGINES

Q3 Do the Oil Mist Detectors or any other automatic shut-off arrangements for the main engine and auxiliary engines appear to be working satisfactory?

- SOLAS Reg. II-1/47.2 "Fire precautions" requires that:

  Internal combustion engines of 2250 kW and above or having cylinders of more than 300 mm bore shall be provided with crankcase oil mist detectors or engine bearing temperature monitors or equivalent devices.
  (For ships constructed on or after 1 September 1984)

- SOALS Reg. II-1/27.5 "Machinery" requires that:

  Main turbine propulsion machinery and, where applicable, main internal combustion propulsion machinery and auxiliary machinery shall be provided with automatic shut-off arrangements in the case of failures such as lubricating oil supply failure which could lead rapidly to complete breakdown, serious damage or explosion. The Administration may permit provisions for overriding automatic shutoff devices.
  (For ships constructed on or after 1 September 1984)

- The company and the ship master should ensure that:

  - ✧ oil mist detectors (or engine bearing temperature monitors or equivalent devices) and other automatic shut-off arrangements for the main engine and auxiliary engines have to be properly maintained in good working condition; and

  - ✧ maintenance plans (including inspection and testing) and records are kept on board.

- Engine crew should be familiar with:

  - ✧ the locations, operational procedures and testing of the oil mist detectors (or engine bearing temperature monitors or equivalent devices); and

  - ✧ other automatic shut-off arrangements for the main engine and auxiliary engines, e.g. L.O. low pressure tripping devices and alarms.

Q4 Are protective arrangements for machinery in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards?

- SOLAS Reg. II-1/26.1 "General" requires that:

  The machinery, boilers and other pressure vessels, associated piping systems and fittings shall be of a design and construction adequate for the service for which they are intended and shall be so installed and protected as to reduce to a minimum any danger to persons on board, due regard being paid to moving parts, hot surfaces and other hazards. The design shall have regard to materials used in construction, the purpose for which the equipment is intended, the working conditions to which it will be subjected and the environmental conditions on board. (For ships constructed on or after 1 September 1984)

- SOLAS Reg. II-1/45 "Precautions against shock, fire and other hazards of electrical origin" stipulates detailed requirements for electrical safety matters.

Please refer to the regulation for details.

- The company and the ship master should ensure that protective arrangements for machinery are in place to minimize danger to persons with regard to moving parts, hot surfaces, electric shock and other hazards. For examples:

  - ✧ safeguards and fencing are adequately provided for moving parts of machinery, such as flywheels of main engine and auxiliary engines, shaft coupling of main compressors and belt driven pumps, etc.;

  - ✧ protective insulations are provided for hot surfaces, such as fuel oil pipes, exhaust gas manifolds, turbocharger gas inlet and outlet to main and auxiliary engines and boiler mountings, etc.; and

  - ✧ safety protections and adequate measures are provided for avoiding electric shock, such as provision of non-conducting matting in the front and behind each electric switchboard, electric motors are properly maintained, electrical wirings are properly supported and maintained in good condition, and lights in engine room and accommodations are fitted with guards, etc.

Q5 Does propulsion machinery and essential auxiliaries appear to be in operational condition?

- SOLAS Reg. II-1/26.3 "General" requires that:

  Means shall be provided whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration should be given to the malfunctioning of:

  .1 a generating set which serves as a main source of electrical power;
  .2 the sources of steam supply;
  .3 the boiler feedwater systems;
  .4 the fuel oil supply systems for boilers or engines;
  .5 the sources of lubricating oil pressure;
  .6 the sources of water pressure;
  .7 a condensate pump and the arrangements to maintain vacuum in condensers;
  .8 the mechanical air supply for boilers;
  .9 an air compressor and receiver for starting or control purposes; and
  .10 the hydraulic, pneumatic or electrical means for control in main propulsion machinery including controllable pitch propellers.

  (For ships constructed on or after 1 September 1984)

- The company and the ship master should ensure that essential machinery and electrical installations are properly maintained so that they are capable of

providing continuous power for propulsion and auxiliary services. The relevant inspection and maintenance recorded shall be kept on board.

- Special attention should be given to the operational condition of the following:

  - Auxiliary engines with their electrical generators are essential machinery and electrical installations for providing continuous power for propulsion and auxiliary services. If one electrical generator is out of order, means shall be provided whereby normal operation of the propulsion and auxiliary services can be sustained or restores.

  - Other essential auxiliaries for propulsion machinery include fuel oil supply system, lubricating oil system, jacket cooling fresh water system, starting air system and sea water cooling system, etc.

Q6 Is cleanliness of the Engine Room, including bilges satisfactory?

- SOLAS Reg. II-1/26.7 "General" requires that:

  Provision shall be made to facilitate cleaning, inspection and maintenance of main propulsion and auxiliary machinery including boilers and pressure vessels. (For ships constructed on or after 1 September 1984)

- The company and the ship master should ensure that:

  - no oil leaking from main engine or auxiliary engines;

  - fuel oil pumps, lubricating oil pumps, filters, pipelines and their lagging are maintained in clean condition without oil residues;

  - Engine Room, in particular to Purifier Room, is maintained in clean and tidy condition;

  - main engine, auxiliary engines, equipment, and their floor plating are clean without oil residues; and

  - no oily residues and rags are left in bilges.

AUXILIARY MACHINERY

Q7 Do the Main or Auxiliary Boilers and Boiler Feed Systems appear to be in safe working order?

- SOLAS Reg. II-1/32 "Steam boilers and boiler feed systems" requires that:

.1 Every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. However, having regard to the output or any other features of any boiler or unfired steam generator, the Administration may permit only one safety valve to be fitted if it is satisfied that adequate protection against overpressure is thereby provided.

.2 Each oil-fired boiler which is intended to operate without manual supervision shall have safety arrangements which shut off the fuel supply and give an alarm in the case of low water level, air supply failure or flame failure.

.3 Water tube boilers serving turbine propulsion machinery shall be fitted with a high-water-level alarm.

.4 Every steam generating system which provides services essential for the safety of the ship, or which could be rendered dangerous by the failure of its feed water supply, shall be provided with not less than two separate feed water systems from and including the feed pumps, noting that a single penetration of the steam drum is acceptable. Unless overpressure is prevented by the pump characteristics means shall be provided which will prevent overpressure in any part of the systems.

.5 Boilers shall be provided with means to supervise and control the quality of the feed water. Suitable arrangements shall be provided to preclude, as far as practicable, the entry of oil or other contaminants which may adversely affect the boiler.

.6 Every boiler essential for the safety of the ship and designed to contain water at a specified level shall be provided with at least two means for indicating its water level, at least one of which shall be a direct reading gauge glass.

(For ships constructed on or after 1 September 1984)

◆ The company and the ship master should ensure that the main or auxiliary boilers and boiler feed water systems are properly maintained as required by the SOLAS regulations. Special attention should be given to the following:

✧ the safety valves and their easing gears are maintained in good working condition;

✧ the fuel oil shut-off arrangements for low water level, air supply failure or flame failure are maintained in good condition;

- ✧ the feed water supply system is maintained in good condition;
- ✧ the two means for indicating water level are in good working condition;
- ✧ all pressure gauges are in good working condition;
- ✧ the lagging is in place and in good condition. (SOLAS Reg. II-1/26.1); and
- ✧ maintenance plans and records are kept on board.

Q8 Do the emergency sources of power and emergency lighting appear to be working satisfactory?

◆ SOLAS Reg. II-1/42, 43 & 44 stipulate the requirements for emergency sources of power and emergency lights. Please refer to the regulations for details.

- ✧ SOLAS Reg. II-1/42 "Emergency source of electrical power in passenger ships";
- ✧ SOLAS Reg. II-1/42.1 "Supplementary emergency lighting for ro-ro passenger ships";
- ✧ SOLAS Reg. II-1/43 "Emergency source of electrical power in cargo ships"; and
- ✧ SOLAS Reg. II-1/44 "Starting arrangements for emergency generating sets".

◆ The company and the ship master should ensure that the relevant SOLAS regulations are complied with. Special attention should be given to the following:

- ✧ emergency generator set including automatic starting arrangements, starting devices and fuel oil tank level are maintained in good condition;
- ✧ starting means, i.e. electric, hydraulic and compressed air, of emergency generators are maintained in good working condition at all times;
- ✧ manual starting, such as manual cranking, inertia starters, manually charged hydraulic accumulators, or powder charge cartridges are maintained in good working condition at all times;
- ✧ emergency source of power is maintained in good condition;

- ✧ all emergency lights are maintained in good working condition;

- ✧ periodic testing of the complete emergency system shall be established on board and shall include the testing of automatic starting arrangements (SOLAS Reg. II-1/42 & 43); and

- ✧ the relevant inspection, testing and maintenance records are kept on board.

Q9 Do the bilge pumping arrangements appear to be in good working order?

◆ SOLAS Reg. II-1/35-1 "Bilge pumping arrangements" requires that:

2 Passenger ships and cargo ships

2.1 An efficient bilge pumping system shall be provided, capable of pumping from and draining any watertight compartment other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or liquid cargo and for which other efficient means of pumping are provided, under all practical conditions. Efficient means shall be provided for draining water from insulated holds.

2.2 Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.

2.3 All bilge pipes used in or under coal bunkers or fuel storage tanks or in boiler or machinery spaces, including spaces in which oil-settling tanks or oil fuel pumping units are situated, shall be of steel or other suitable material.

2.4 The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another. Provision shall be made to prevent any deep tank having bilge and ballast connections being inadvertently flooded from the sea when containing cargo, or being discharged through a bilge pump when containing water ballast.

2.5 All distribution boxes and manually operated valves in connection with the bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.

2.6 Provision shall be made for the drainage of enclosed cargo spaces situated on the bulkhead deck of a passenger ship and on the freeboard deck of a cargo ship, provided that the Administration may permit the means of

drainage to be dispensed with in any particular compartment of any ship or class of ship if it is satisfied that by reason of size or internal subdivision of those spaces the safety of the ship is not thereby impaired.

2.6.1 Where the freeboard to the bulkhead deck or the freeboard deck, respectively, is such that the deck edge is immersed when the ship heels more than 5°, the drainage shall be by means of a sufficient number of scuppers of suitable size discharging directly overboard, fitted in accordance with the requirements of regulation 15 in the case of a passenger ship and the requirements for scuppers, inlets and discharges of the International Convention on Load Lines in force in the case of a cargo ship.

2.6.2 Where the freeboard is such that the edge of the bulkhead deck or the edge of the freeboard deck, respectively, is immersed when the ship heels 5° or less, the drainage of the enclosed cargo spaces on the bulkhead deck or on the freeboard deck, respectively, shall be led to a suitable space, or spaces, of adequate capacity, having a high water level alarm and provided with suitable arrangements for discharge overboard. In addition it shall be ensured that:

.1 the number, size and disposition of the scuppers are such as to prevent unreasonable accumulation of free water;

.2 the pumping arrangements required by this regulation for passenger ships or cargo ships, as applicable, take account of the requirements for any fixed pressure water-spraying fire extinguishing system;

.3 water contaminated with petrol or other dangerous substances is not drained to machinery spaces or other spaces where sources of ignition may be present; and

.4 where the enclosed cargo space is protected by a carbon dioxide fire extinguishing system the deck scuppers are fitted with means to prevent the escape of the smothering gas.

3 Passenger ships

Please refer to the regulation for details.

4 Cargo ships

At least two power pumps connected to the main bilge system shall be provided, one of which may be driven by the propulsion machinery. If the Administration is satisfied that the safety of the ship is not impaired, bilge pumping arrangements may be dispensed with in particular compartments.

- The company and the ship master should ensure that the SOLAS regulations are complied with. Special attention should be given to the following:

  - the bilge pumping system including bilge pumps, piping, valves (in particular to sea suction valves and overboard discharge valves) and gauges are properly maintained and in good working condition;

  - there is no illegal connection in the bilge pumping system;

  - all cocks and valves operating from above the bulkhead deck are clearly marked and provided with means indicating they are opened or closed (applicable only to passenger ships under SOLAS Reg. II-1/21.22.12); and

  - direct emergency suction valve is properly maintained and in good working condition (applicable only to passenger ships under SOLAS Reg. II-1/21.2.7.2/2.7.3/35-1).

OPERATIONAL CONTROLS

Q10 Where an emergency steering drill was witnessed, was it found to be satisfactory?

- SOLAS Reg. II-1/29 "Steering gear" requires that:

  1 Unless expressly provided otherwise, every ship shall be provided with a main steering gear and an auxiliary steering gear to the satisfaction of the Administration. The main steering gear and the auxiliary steering gear shall be so arranged that the failure of one of them will not render the other one inoperative.

  2.1 All the steering gear components and the rudder stock shall be of sound and reliable construction to the satisfaction of the Administration. Special consideration shall be given to the suitability of any essential component which is not duplicated. Any such essential component shall, where appropriate, utilize anti-friction bearings such as ball bearings, roller bearings or sleeve bearings which shall be permanently lubricated or provided with lubrication fittings.

  2.2 The design pressure for calculations to determine the scantlings of piping and other steering gear components subjected to internal hydraulic pressure shall be at least 1.25 times the maximum working pressure to be expected under the operational conditions specified in paragraph 3.2, taking into account any pressure which may exist in the low pressure side of the system.

At the discretion of the Administration, fatigue criteria shall be applied for the design of piping and components, taking into account pulsating pressures due to dynamic loads.

2.3 Relief valves shall be fitted to any part of the hydraulic system which can be isolated and in which pressure can be generated from the power source or from external forces. The setting of the relief valves shall not exceed the design pressure. The valves shall be of adequate size and so arranged as to avoid an undue rise in pressure above the design pressure.

3 The main steering gear and rudder stock shall be:

.1 of adequate strength and capable of steering the ship at maximum ahead service speed which shall be demonstrated;

.2 capable of putting the rudder over from 35° on one side to 35° on the other side with the ship at its deepest seagoing draught and running ahead at maximum ahead service speed and, under the same conditions, from 35° on either side to 30° on the other side in not more than 28 seconds;

.3 operated by power where necessary to meet the requirements of paragraph 3.2 and in any case when the Administration requires a rudder stock of over 120 mm diameter in way of the tiller, excluding strengthening for navigation in ice; and

.4 so designed that they will not be damaged at maximum astern speed; however, this design requirement need not be proved by trials at maximum astern speed and maximum rudder angle.

4 The auxiliary steering gear shall be:

.1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;

.2 capable of putting the rudder over from 15° on one side to 15° on the other side in not more than 60 seconds with the ship at its deepest seagoing draught and running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater; and

.3 operated by power where necessary to meet the requirements of paragraph 4.2 and in any case when the Administration requires a rudder stock of over 230 mm diameter in way of the tiller, excluding strengthening for navigation in ice.

5 Main and auxiliary steering gear power units shall be:

.1 arranged to restart automatically when power is restored after a power failure; and

.2 capable of being brought into operation from a position on the navigation bridge. In the event of a power failure to any one of the steering gear power units, an audible and visual alarm shall be given on the navigating bridge.

6.1 Where the main steering gear comprises two or more identical power units, an auxiliary steering gear need not be fitted, provided that:

.1 in a passenger ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while any one of the power units is out of operation;

.2 in a cargo ship, the main steering gear is capable of operating the rudder as required by paragraph 3.2 while operating with all power units;

.3 the main steering gear is so arranged that after a single failure in its piping system or in one of the power units the defect can be isolated so that steering capability can be maintained or speedily regained.

6.2 The Administration may, until 1 September 1986, accept the fitting of a steering gear which has a proven record of reliability but does not comply with the requirements of paragraph 6.1.3 for a hydraulic system.

6.3 Steering gears, other than of the hydraulic type, shall achieve standards equivalent to the requirements of this paragraph to the satisfaction of the Administration.

7 Steering gear control shall be provided:

.1 for the main steering gear, both on the navigating bridge and in the steering gear compartment;

.2 where the main steering gear is arranged in accordance with paragraph 6, by two independent control systems, both operable from the navigating bridge. This does not require duplication of the steering wheel or steering lever. Where the control system consists of an hydraulic telemotor, a second independent system need not be fitted, except in a tanker, chemical tanker or gas carrier of 10,000 tons gross tonnage and upwards;

.3 for the auxiliary steering gear, in the steering gear compartment and, if power operated, it shall also be operable from the navigating bridge and shall be independent of the control system for the main steering gear.

8 Any main and auxiliary steering gear control system operable from the navigating bridge shall comply with the following:

.1 if electric, it shall be served by its own separate circuit supplied from a steering gear power circuit from a point within the steering gear compartment, or directly from switchboard busbars supplying that steering gear power circuit at a point on the switchboard adjacent to the supply to the steering gear power circuit;

.2 means shall be provided in the steering gear compartment for disconnecting any control system operable from the navigating bridge from the steering gear it serves;

.3 the system shall be capable of being brought into operation from a position on the navigating bridge;

.4 in the event of a failure of electrical power supply to the control system, an audible and visual alarm shall be given on the navigating bridge; and

.5 short circuit protection only shall be provided for steering gear control supply circuits.

9 The electric power circuits and the steering gear control systems with their associated components, cables and pipes required by this Regulation and by Regulation 30 shall be separated as far as is practicable throughout their length.

10 A means of communication shall be provided between the navigating bridge and the steering gear compartment.

11 The angular position of the rudder shall:

.1 if the main steering gear is power operated, be indicated on the navigating bridge. The rudder angle indication shall be independent of the steering gear control system;

.2 be recognizable in the steering gear compartment.

- SOLAS Reg. II-1/30.1 "Additional requirements for electric and electro-hydraulic steering gear" requires that means for indicating that the motors of electric and electro-hydraulic steering gear are running shall be installed on the navigating bridge and at a suitable main machinery control position.

- SOLAS Reg. V/26 "Steering gear: Testing and drills" requires that:

1 Within 12 hours before departure, the ship's steering gear shall be checked and tested by the ship's crew. The test procedure shall include, where applicable, the operation of the following:

.1 the main steering gear;
.2 the auxiliary steering gear;
.3 the remote steering gear control systems;
.4 the steering positions located on the navigation bridge;
.5 the emergency power supply;
.6 the rudder angle indicators in relation to the actual position of the rudder;
.7 the remote steering gear control system power failure alarms;
.8 the steering gear power unit failure alarms; and
.9 automatic isolating arrangements and other automatic equipment.

2 The checks and tests shall include:

.1 the full movement of the rudder according to the required capabilities of the steering gear;
.2 a visual inspection for the steering gear and its connecting linkage; and
.3 the operation of the means of communication between the navigation bridge and steering gear compartment.

3.1 Simple operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear power units shall be permanently displayed on the navigation bridge and in the steering compartment.

3.2 All ships' officers concerned with the operation and/or maintenance of steering gear shall be familiar with the operation of the steering systems fitted on the ship and with the procedures for changing from one system to another.

4 In addition to the routine checks and tests prescribed in paragraphs 1 and 2, emergency steering drills shall take place at least once every three months in order to practise emergency steering procedures. These drills shall include direct control within the steering gear compartment, the communications procedure with the navigation bridge and, where applicable

the operation of alternative power supplies.

5 The Administration may waive the requirements to carry out the checks and tests prescribed in paragraphs 1 and 2 for ships which regularly engage on voyages of short duration. Such ships shall carry out these checks and tests at least once every week.

6 The date upon which the checks and tests prescribed in paragraphs 1 and 2 are carried out and the date and details of emergency steering drills carried out under paragraph 4, shall be recorded.

- The company and the ship master should ensure that:
  - the requirements of SOLAS Reg. II-1/29 "Steering gear" and SOLAS Reg. II-1/30 "Additional requirements for electric and electro-hydraulic steering gear" are complied with;
  - testing and emergency steering drills required by SOLAS Reg. V/26 "Steering gear: Testing and drills" are carried out and all records are kept on board;
  - the responsible crew members are familiar with the operation of the steering system including in emergency situations;
  - a duty list for emergency steering station is available; and
  - the steering gear compartment is maintained in clean and tidy condition.
- Special attention should be given to the following procedures of emergency steering drill:
  - direct control of the steering gear in the steering gear compartment;
  - communications between steering gear compartment and navigation bridge; and
  - operation of alternative power supplies, where applicable.

Q11 Where an emergency operational drill to main engine was witnessed, was it found to be satisfactory?

- SOLAS Reg. II-1/31 "Machinery controls" requires that:

1 Main and auxiliary machinery essential for the propulsion and safety of the ship shall be provided with effective means for its operation and control.

2 Where remote control of propulsion machinery from the navigating bridge is provided and the machinery spaces are intended to be manned, the following shall apply:

.1 the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge under all sailing conditions, including manoeuvring;

.2 the remote control shall be performed, for each independent propeller, by a control device so designed and constructed that its operation does not require particular attention to the operational details of the machinery. Where multiple propellers are designed to operate simultaneously, they may be controlled by one control device;

.3 the main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system;

.4 propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the manoeuvring platform as appropriate;

.5 remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in the main machinery space or the main machinery control room. This system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another;

.6 it shall be possible to control the propulsion machinery locally, even in the case of failure in any part of the remote control system;

.7 the design of the remote control system shall be such that in case of its failure an alarm will be given. Unless the Administration considers it impracticable the preset speed and direction of thrust of the propellers shall be maintained until local control is in operation;

.8 indicators shall be fitted on the navigating bridge for:

.8.1 propeller speed and direction of rotation in the case of fixed pitch propellers;

.8.2 propeller speed and pitch position in the case of controllable pitch propellers;

.9 an alarm shall be provided on the navigating bridge and in the machinery space to indicate low starting air pressure which shall be set at a level to permit further main engine starting operations. If the remote control system of the propulsion machinery is designed for automatic starting, the number of automatic consecutive attempts which fail to produce a start shall be limited in order to safeguard sufficient starting air pressure for starting locally.

3 Where the main propulsion and associated machinery, including sources of main electrical supply, are provided with various degrees of automatic or remote control and are under continuous manual supervision from a control room the arrangements and controls shall be so designed, equipped and installed that the machinery operation will be as safe and effective as if it were under direct supervision; for this purpose regulations 46 to 50 shall apply as appropriate. Particular consideration shall be given to protect such spaces against fire and flooding.

4 In general, automatic starting, operational and control systems shall include provisions for manually overriding the automatic controls. Failure of any part of such systems shall not prevent the use of the manual override.

5 Notwithstanding the requirements of paragraph 1 to 4, ships constructed on or after 1 July 1998 shall comply with the following requirements:

.1 Main and auxiliary machinery essential for the propulsion, control and safety of the ship shall be provided with effective means for its operation and control. All control systems essential for the propulsion, control and safety of the ship shall be independent or designed such that failure of one system does not degrade the performance of another system.";

.2 Where remote control of propulsion machinery from the navigating bridge is provided, the following shall apply:

.2.1 the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge under all sailing conditions, including manoeuvring;

.2.2 the control shall be performed by a single control device for each independent propeller, with automatic performance of all associated services, including, where necessary, means of

preventing overload of the propulsion machinery;

.2.3 the main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system;

.2.4 propulsion machinery orders from the navigation bridge shall be indicated in the main machinery control room and at the manoeuvring platform;

.2.5 remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which locations is in control of the propulsion machinery. The transfer of control between the navigating bridge and machinery spaces shall be possible only in the main machinery space or the main machinery control room. This system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another;

.2.6 it shall be possible to control the propulsion machinery locally, even in the case of failure in any part of the remote control system. It shall also be possible to control the auxiliary machinery, essential for the propulsion and safety of the ship, at or near the machinery concerned;

.2.7 the design of the remote control system shall be such that in case of its failure an alarm will be given. Unless the Administration considers it impracticable the preset speed and direction of thrust of the propellers shall be maintained until local control is in operation;

.2.8 indicators shall be fitted on the navigation bridge, the main machinery control room and at the manoeuvring platform, for:

.2.8.1 propeller speed and direction of rotation in the case of fixed pitch propellers; and

.2.8.2 propeller speed and pitch position in the case of controllable pitch propellers;

.2.9 an alarm shall be provided on the navigating bridge and in the machinery space to indicate low starting air pressure which shall be set at a level to permit further main engine starting operations.

If the remote control system of the propulsion machinery is designed for automatic starting, the number of automatic consecutive attempts which fail to produce a start shall be limited in order to safeguard sufficient starting air pressure for starting locally.

.3 Where the main propulsion and associated machinery, including sources of main electrical supply, are provided with various degrees of automatic or remote control and are under continuous manual supervision from a control room, the arrangements and controls shall be so designed, equipped and installed that the machinery operation will be as safe and effective as if it were under direct supervision; for this purpose regulations 46 to 50 shall apply as appropriate. Particular consideration shall be given to protect such spaces against fire and flooding.

.4 In general, automatic starting, operational and control systems shall include provisions for manually overriding the automatic controls. Failure of any part of such systems shall not prevent the use of the manual override.

6 Ship constructed on or after 1 July 2004 shall comply with the requirements of paragraphs 1 to 5, as amended, as follows:

.1 a new subparagraph .10 is added to paragraph 2 to read as follows:
".10 automation systems shall be designed in a manner which ensures that threshold warning of impending or imminent slowdown or shutdown of the propulsion system is given to the officer in charge of the navigational watch in time to assess navigational circumstances in an emergency. In particular, the systems shall control, monitor, report, alert and take safety action to slow down or stop propulsion while providing the officer in charge of the navigational watch an opportunity to manually intervene, except for those cases where manual intervention will result in total failure of the engine and/or propulsion equipment within a short time, for example in the case of overspeed." (Adopted by Res. MSC.194(80))

◆ The company and ship master should pay attention to the following matters relating to an emergency operational drill to main engine:

✧ training plans and records for emergency drill are kept on board;

✧ emergency drills are carried out in accordance with the training plans;

✧ training plans should include the most common emergency drills, for

examples:

- ☐ main engine failure;
- ☐ auxiliary engine and generator set failure;
- ☐ bridge control for main engine failure;
- ☐ changeover of controls among wheelhouse, engine control room and engine side; and
- ☐ operation of maneuvering handles after "auto-stop".

✧ crew members are familiar with their duties related to emergency situation with main engine.

◆ The company and the ship master should ensure that crew members are familiar with the operation of the main engine in emergency situation including the following:

✧ communication between Wheelhouse and Engine Control Room including engine side (SOLAS Reg. II-1/37);

✧ monitoring of telegraphs order (SOLAS Reg. II-1/31.2.4);

✧ starting air low pressure alarm (SOLAS Reg. II-1/31.2.9);

✧ changeover control from Wheelhouse to Engine Room (SOLAS Reg. II-1/31.2.5);

✧ changeover control from Engine Control Room to engine side/local control (SOLAS Reg. II-1/31.2.6);

✧ operation of emergency stopping device of main propulsion machinery (SOLAS Reg. II-1/31.2.3);

✧ alarm and restarting after starting failure;

✧ changeover of control station at black out; and

✧ operation and maneuvering from engine side/local control (SOLAS Reg. II-1/31.6).

- The End -