

## سازمان بنادر و دریانوردی

### دستور العمل اجرایی برگزاری دوره آموزشی تطبیقی سمت

افسر مهندس سوم بر روی کشتی های با قدرت رانش کمتر از ۳۰۰۰ کیلووات سفرهای نزدیک به ساحل

*The Code of Practice for Conducting Third Engineer Officer on Ships  
of Propulsion Power KW<3000 Engaged on Near  
Coastal Voyages Upgrading Training Course*

کد مدرک : P6-W103

شماره بازنگری	تاریخ بازنگری	شرح تغییرات (علت و مصلحت)	تهیه کننده	تأیید کننده	تصویب کننده
۰۲	۹۳/۰۶/۰۳	بر اساس بازنگری کلی کنوانسیون STCW 78, As Amended	رئیس اداره استانداردهای دریانوردان نصرت اله علی پور	مدیر کل امور دریانوردان حسین میرزایی	معاون امور دریایی سید علی استیری

صفحه: ۱ از ۱۱





سازمان آموزش و پرورش دریایی

دوره آموزش تطبیقی ست افسر مهندس سوم بر روی کشتی های با قدرت رانش کمتر از ۳۰۰۰ کیلووات سفرهای نزدیک ساحل  
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سازمان آموزش و پرورش دریایی



## مقدمه

سازمان بنادر و دریانوردی در اجرای وظایف و اختیارات قانونی ناشی از ماده ۱۹۲ قانون دریایی جمهوری اسلامی ایران مصوب شهریور ماه ۱۳۴۳ و بند ۱۰ ماده ۳ آئین نامه تشکیل سازمان بنادر و دریانوردی مصوب بهمن ماه ۱۳۴۸ کمیسیون های خاص دو مجلس که صدور هرگونه سند یا گواهینامه و پروانه مربوط به کشتی، فرماندهان، افسران و کارکنان کشتی ها را در صلاحیت این سازمان قرار داده و در راستای رعایت مفاد کنوانسیون بین المللی استانداردهای آموزش، صدور گواهینامه و نگهبانی دریانوردان (STCW- as amended) مصوب مرداد ماه سال ۱۳۷۵ مجلس شورای اسلامی و با عنایت به بند ۴ از مقرر ۱/۱۱ کنوانسیون مذکور، این "دستورالعمل اجرایی برگزاری دوره آموزشی تطبیقی سمت افسر مهندس سوم بر روی کشتیهای با قدرت رانش کمتر از ۳۰۰۰ کیلووات سفرهای نزدیک به ساحل" را تدوین نموده و پس از تصویب هیأت عامل قابل اجرا می باشد.

**یادداشت:** قانون تغییر نام سازمان بنادر و دریانوردی و کشتیرانی به سازمان بنادر و

دریانوردی در تاریخ ۱۳۸۷/۰۲/۱۰ به تصویب مجلس شورای اسلامی رسید.





دستورالعمل اجرایی برگزاری دوره آموزشی تطبیقی سمت افسر مهندس سوم بر روی کشتی های با قدرت رانش کمتر از ۳۰۰۰ کیلووات نزدیک ساحل  
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### ۱- هدف از تدوین

هدف از تدوین این دستورالعمل ارائه حداقل نیازمندیهای برگزاری دوره آموزشی سمت تطبیقی افسر مهندس سوم بر روی کشتی های با قدرت رانش کمتر از ۳۰۰۰ کیلووات سفرهای نزدیک به ساحل می باشد.

### ۲- دامنه کاربرد

این دستورالعمل برای کلیه مراکز آموزشی مورد تایید سازمان و مجری برگزاری دوره آموزشی سمت تطبیقی افسر مهندس سوم بر روی کشتی های با قدرت رانش کمتر از ۳۰۰۰ کیلووات سفرهای نزدیک به ساحل کاربرد دارد.

### ۳- تعاریف

اصطلاحات استفاده شده در راستای اهداف این دستورالعمل دارای معانی ذیل می باشند.

#### ۳-۱ تایید (Approved):

به معنای تایید اداره استانداردهای دریانوردان مطابق با دستورالعمل های سازمان می باشد.

#### ۳-۲ گواهی خدمت دریایی (Seagoing Service Documentary Evidence):

به معنای تأییدیه خدمت دریایی دریانوردان جهت شرکت در دوره های آموزشی، آزمونهای دریانوردی و صدور گواهینامه های دریانوردی می باشد که علاوه بر ثبت در شناسنامه دریانوردی، توسط شرکت کشتیرانی/ مالک کشتی و یا اتحادیه مالکان کشتیها به صورت فرم کامپیوتری (computer sheet)، نامه اداری شماره شده و یا فرم تعریف شده (به ضمیمه این دستورالعمل) قابل ارائه می باشد.

#### ۳-۳ گواهینامه شایستگی دریانوردی (Certificate of Competency):

به معنای گواهینامه صادره طبق مفاد بند ۵,۴ این دستورالعمل برای فرماندهان، افسران و کاربران مخابرات می باشد و دارندهی قانونی آن محق به خدمت در سمت و عمل به وظایف مربوطه در سطح مسئولیت مشخص شده در آن است.





دستورالعمل اجرایی برگزاری دوره آموزشی تطبیقی ست افسر مهندس سوم بر روی کشتی های با قدرت رانش کمتر از ۳۰۰۰ کیلووات سزای نزدیک بر ساحل  
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**۳-۴ گواهینامه مهارت دریانوردی (Certificate of Proficiency):**

به معنای گواهینامه‌ای به غیر از گواهینامه شایستگی صادر شده برای دریانورد است که نشان می‌دهد الزامات آموزشی، شایستگی‌ها یا خدمت دریایی مندرج در کنوانسیون را برآورده می‌نماید.

**۳-۵ دستورالعمل (Code of Practice)**

به معنای مجموعه قوانین، مقررات ملی و الزامات مندرج در این دستورالعمل است که توسط اداره کل امور دریانوردان تدوین و به تصویب هیات عامل سازمان رسیده است.

**۳-۶ شرکت کشتیرانی (Company):**

به معنای مالک کشتی، هر شخصی مانند مدیر یا اجاره کننده در بست کشتی است، که مسئولیت عملیات کشتی از طرف مالک کشتی بر وی فرض شده است، و با قبول چنین مسئولیتی، کلیه وظایف و مسئولیت‌های محول شده بر شرکت کشتیرانی توسط این دستورالعملها را بر عهده گرفته است.

**۳-۷ گواهی طی دوره (Course Completion Certificate or Documentary Evidence):**

به معنای گواهی است که مرکز آموزشی مورد تایید سازمان به فراگیر پس از گذراندن موفقیت آمیز دوره مربوطه ارائه می‌دهد.

**۳-۸ افسر مهندس (Engineer Officer):**

به معنای افسری است که مطابق با الزامات مقرر ۳/۱، ۳/۲ یا ۳/۳ کنوانسیون دارای صلاحیت است.

**۳-۹ آئین نامه ی امنیت کشتی ها (ISPS Code):**

به معنای آئین نامه بین المللی امنیت کشتی ها و تسهیلات بندری است که در تاریخ ۲۰۰۲ میلادی طی قطعنامه شماره ۲ کنفرانس دولتهای متعاهد به کنوانسیون بین المللی ایمنی جان اشخاص در دریا ۱۹۷۴ ( SOLAS) به تصویب رسیده و ممکن است توسط سازمان بین المللی دریانوردی بر اساس اصلاحیه های بعدی تغییر یابد.

**۳-۱۰ فرمانده (Master):**

به معنای شخصی است که عهده دار فرماندهی کشتی می باشد.

**۳-۱۱ گواهینامه سلامت پزشکی (Medical Fitness Certificate):**

به معنای گواهینامه ای است که توسط پزشک معتمد سازمان طبق دستورالعمل مربوطه و جهت متقاضیانی که از نظر پزشکی از سلامت برخوردار باشند، صادر می گردد.





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**۳-۱۲ کشتی تجاری (Merchant Ship):**

به معنای هر نوع شناوری است (به استثنای شناورهای خدماتی، سکوهای متحرک فراساحلی، صیادی و یا نظامی) که در امر جابجایی کالاهای تجاری، مسافر و بار تسهیلات مربوط به کالاهای تجاری بکار گرفته می شود.

**۳-۱۳ ماه (Month):**

جهت محاسبه خدمت دریایی هر ماه متشکل از ۳۰ روز می باشد.

**۳-۱۴ سازمان (Ports & Maritime Organization):**

به معنای سازمان بنادر و دریانوردی جمهوری اسلامی ایران می باشد.

**۳-۱۵ دستگاه نظارت بندر (Port's Monitoring Office)**

به معنای معاونتی که اداره امتحانات و اسناد دریانوردان بنادر زیر مجموعه آن می باشد و به نیابت از اداره استانداردهای دریانوردان، وظیفه صدور مجوز دوره های آموزشی و نظارت بر مراکز آموزشی محل استان جغرافیایی خود را به عهده دارد. اداره یا بخشهای دیگر در مجموعه معاونت مربوطه به عنوان دستگاه نظارت محسوب نمی گردند.

**۳-۱۶ قدرت رانش موتور (Propulsion Power):**

به معنای مجموع حداکثر قدرت موجود در موتورهای کشتی بر حسب کیلووات که در گواهینامه ثبت کشتی و یا دیگر مدارک مربوطه درج شده باشد.

**۳-۱۷ خدمت دریایی (Seagoing Service):**

به معنای مدت زمان دریانوردی بر روی کشتی است که می بایست مرتبط با صدور و یا تجدید گواهینامه های شایستگی و یا مهارت در یانوردان می باشد.

**۳-۱۸ کشتی دریا پیمای (Seagoing Ship):**

به معنای کشتی است به غیر از آنهاستیکه منحصرأ در آبهای سرزمینی، نزدیک یا مجاور آبهای پناه گاهی و یا مناطق مشمول مقررات بندری، تردد می کنند.





دستورالعمل اجرایی برگزاری دوره آموزشی تئوریک ست افسر مهندس سوم بر روی کشتی‌های با قدرت رانش کمتر از ۳۰۰۰ کیلووات سرفه‌ای نزدیک به ساحل  
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**۳-۱۹ وظایف امنیتی (Security Duties)**

به معنای تمامی مسئولیتها و وظایف امنیتی روی کشتی‌ها مطابق با تعریف مندرج در کنوانسیون بین المللی جان اشخاص در دریا ، ۱۹۷۴ (اصلاح شده) و آیین نامه بین المللی امنیت کشتی و تسهیلات بندری (ISPS) می باشد.

**۳-۲۰ کنوانسیون (Convention):**

به معنای کنوانسیون اصلاح شده بین المللی استانداردهای آموزشی، صدور گواهینامه و نگهداری دریانوردان (STCW-78 as amended) می باشد.

**۳-۲۱ آئین نامه ی کنوانسیون (STCW Code):**

به معنای آئین نامه ی استانداردهای آموزش، صدور گواهینامه و نگهداری دریانوردان که طی قطعنامه ی شماره ۲ کنفرانس سال ۱۹۹۵ میلادی تصویب و ممکن است توسط سازمان بین المللی دریانوردی بر اساس اصلاحیه های بعدی تغییر یابد، می باشد.

**۳-۲۲ سطح پشتیبانی (Support Level)**

به معنای سطحی از مسئولیت اطلاق می گردد که وظایف، تکالیف و مسئولیتهای محوله بر روی کشتی را تحت نظر افراد سطح مدیریتی و یا عملیاتی انجام می پذیرد.

**۳-۲۳ افسر مهندس سوم (Third Engineer Officer):**

به معنای افسر مهندسی است که مسئولیت نگهداری در موتورخانه را در زمان معینی بر عهده دارد و بر اساس مفاد مربوطه واجد شرایط باشد.

**۳-۲۴ مرکز آموزشی (Training Center):**

به معنای دانشگاه، شرکت، موسسه یا هر ارگانی که بر اساس مجوز اخذ شده از سازمان در زمینه آموزشهای دریانوردی فعالیت می کند.

**۳-۲۵ سفرهای نامحدود (Unlimited Voyages):**

به معنای سفرهای است که محدود به سفرهای نزدیک به ساحل نباشد.





#### ۴- مسئولیت ها

- ۴-۱ مسئولیت بازنگری این دستورالعمل بر عهده دستگاه نظارت مرکز می باشد.
- ۴-۲ مسئولیت تایید اصلاحیه ها به این دستورالعمل بر عهده اداره کل امور دریانوردان می باشد.
- ۴-۳ مسئولیت تصویب اصلاحیه ها به این دستورالعمل بر عهده معاون امور دریایی به نیابت از هیات عامل سازمان می باشد.
- ۴-۴ مسئولیت اجرای کامل دوره آموزشی بر اساس عناوین اعلام شده بر عهده مرکز آموزشی می باشد.
- ۴-۵ مسئولیت نظارت بر حسن اجرای این دستورالعمل در مراکز آموزشی دریانوردی بر عهده دستگاه نظارت مرکز می باشد

#### ۵- روش اجرا

##### ۵-۱- هدف از برگزاری دوره آموزشی

هدف از برگزاری این دوره آموزشی ، آماده نمودن فراگیران برای کسب توانمندی های مندرج در بند ۱-۶-۵ این دستورالعمل می باشد

##### ۵-۲- طول دوره

۵-۲-۱- طول دوره حداقل ۷۹ ساعت به صورت نظری (تئوری)

۵-۲-۲- حداکثر مدت زمان آموزش روزانه برای هر فراگیر ۸ ساعت می باشد.

##### ۵-۳- تعداد شرکت کنندگان در دوره

۵-۳-۱- حداکثر فراگیران شرکت کننده در هر دوره ۲۰ نفر می باشد.

۵-۳-۲- در صورت افزایش حداقل فضا، تجهیزات و امکانات مرتبط کمک آموزشی بر اساس دستورالعمل صدور مجوز و نظارت بر اجرای دوره ها در مرکز آموزشی دریانوردی و پس از اخذ تاییدیه از دستگاه نظارت ذیربط، تعداد شرکت کنندگان دوره می تواند حداکثر تا ۳۰ نفر افزایش یابد.







دستورالعمل اجرایی برگزاری دوره آموزشی تطبیقی سمت مهندس سوم بر روی کشتی‌های با قدرت رانش کمتر از ۳۰۰۰ کیلووات برای نزدیک ساحل  
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**۴-۵- شرایط ورود به دوره**

- ۱-۴-۵- دارای گواهینامه سلامت پزشکی معتبر بر اساس دستورالعمل مصوب سازمان
- ۲-۴-۵- دارا بودن مدرک معتبر مهندس سوم بر روی کشتیهای با قدرت رانش کمتر از ۳۰۰۰ کیلووات سفرهای نزدیک به ساحل و یا گواهی موفقیت آمیز طی دوره فوق.

**۵-۵- دانش ، درک و مهارت مورد انتظار**

۱-۵-۵- کسب اطلاعات کافی در خصوص راه اندازی ماشین آلات موتور تحت سرپرستی مهندسین ارشد کشتی

۲-۵-۵- کسب اطلاعات کافی در خصوص تعمیر و نگهداری ماشین آلات موتورخانه

تحت سرپرستی مهندسین ارشد کشتی

۳-۵-۵- توانایی بر عهده گیری نگهداری مستقل موتورخانه

۴-۵-۵- مهارت در بکارگیری قوانین ایمنی در حدود اختیارات و وظایف

۵-۵-۵- درک نیاز به کوشش برای حفاظت از محیط زیست

۶-۵-۵- توانایی درک دستورات مافوق و ایجاد ارتباط در محیط کاری

**۶-۵- عناوین دروس و ریز مواد درسی**

حداقل مواد درسی دوره آموزش تطبیقی سمت افسر مهندس سوم بر روی کشتیهای با قدرت رانش کمتر از ۳۰۰۰ کیلو وات سفرهای نزدیک به ساحل ، در بخش انگلیسی این دستورالعمل می باشد .





دستورالعمل اجرایی برگزاری دوره آموزشی تئوری ست افسر مهندس سوم بر روی کشتی‌های با قدرت رانش کمتر از ۳۰۰۰ کیلووات سزای نزدیک به ساحل  
*The Code of Practice for Conducting Third Engineer Officer on  
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کد مدرک : P6-W103/2

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### ۷-۵- امکانات مورد نیاز جهت برگزاری دوره

جهت برگزاری دوره های آموزشی علاوه بر فضای آموزشی قید شده در "دستورالعمل صدور مجوز و نظارت بر مراکز آموزشی دریانوردی" مصوب سازمان، تجهیزات کمک آموزشی مشروحه زیر نیز مورد نیاز می باشد:

۷-۵-۱- سالن / کلاسها می بایست مجهز به سیستم تهویه و نور کافی و وسایل سمعی و بصری و امکانات مورد نیاز برای تدریس باشد.

۷-۵-۲- کتابخانه مجهز به کتب تخصصی مورد نیاز تدریس و اطلاعات جامع دیگر در خصوص دوره.

### ۸-۵- شرایط مدرسین و مربیان دوره

مدرسین دوره آموزشی مندرج در این دستورالعمل می بایست علاوه بر گذراندن دوره مدرسی (TFT) مورد تأیید سازمان دارای حداقل مدارک و تجارب مشروحه زیر باشند:

#### ۱-۸-۵- مدرسین

۱-۸-۱-۱- دارای حداقل مدرک تحصیلی دیپلم مورد تایید وزارت آموزش و پرورش.

۲-۸-۱-۲- گواهینامه شایستگی معتبر افسر مهندس سوم بر روی کشتیهای با قدرت رانش ۷۵۰ کیلووات یا بیشتر - سفرهای نامحدود با حداقل ۱۲ ماه خدمات دریایی در آن سمت ; و یا

۳-۸-۱-۳- جهت ارایه مواد درسی دانش مهندسی عمومی، موتور و آرشیوتکت دریایی این دستورالعمل، گواهینامه شایستگی معتبر مهندس دوم بر روی کشتی های با قدرت رانش کمتر از ۳۰۰۰ کیلووات سفرهای نزدیک به ساحل و یک سال خدمت دریایی در آن سمت.

۴-۸-۱-۴- جهت ارایه مواد درسی الکترونیک این دستورالعمل، فوق لیسانس مرتبط با موضوع درس و یا حداقل دارای گواهینامه شایستگی افسر مهندس الکترونیک بر روی کشتی های با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر سفرهای نامحدود و یک سال خدمت دریایی در آن سمت.

۵-۸-۱-۵- دارندگان مدرک لیسانس در رشته های معماری و سازه کشتی یا افسر اول در کشتی های با ظرفیت ناخالص ۳۰۰۰ یا بیشتر سفر های نامحدود با حداقل ۶ ماه خدمت دریایی در آن سمت نیز می توانند مدرس بخشهای آرشیوتکت کشتی باشند.

#### ۲-۸-۵- مربیان

این دوره نیاز به مربی ندارد.





دستورالعمل اجرایی برگزاری دوره آموزشی تطبیقی سمت افسر مهندس سوم بر روی کشتی‌های با قدرت رانش کمتر از ۳۰۰۰ کیلووات نزدیک به ساحل  
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**۹-۵- ارزیابی و صدور گواهینامه**

۹-۵-۱- در صورت موفقیت فراگیران در ارزیابی های حین و یا پایان دوره ، گواهی موفقیت آمیز دوره توسط مرکز آموزشی مورد تایید و مجری بر گزاری دوره صادر می گردد ; و

۹-۵-۲- متعاقبا اداره امتحانات و اسناد دریانوردن سازمان بر اساس مفاد دستورالعمل صدور، تمدید و تجدید گواهینامه های شایستگی و مهارت دریانوردان و رعایت دیگر شرایط لازم گواهینامه شایستگی و یا مهارت دریانوردی مرتبط صادر می نماید

**۱۰-۵- شرایط تمدید / تجدید گواهینامه**

گواهینامه های شایستگی و مهارت دریانوردی بر اساس مفاد دستورالعمل صدور، تمدید، و تجدید گواهینامه های شایستگی و مهارت دریانوردن تمدید و یا تجدید می گردد.

**۱۱-۵- روش تأیید دوره**

تایید دوره بر اساس مفاد مندرج در دستورالعمل صدور مجوز و نظارت بر اجرای دوره‌ها در مراکز آموزش دریانوردی صورت می پذیرد.

**۶- سوابق**

کلیه سوابقی که نشان دهنده رعایت موارد مندرج در این دستورالعمل باشد.

**۷- مراجع**

۷-۱- دستورالعمل صدور، تمدید و تجدید گواهینامه های شایستگی و مهارت دریانوردان.

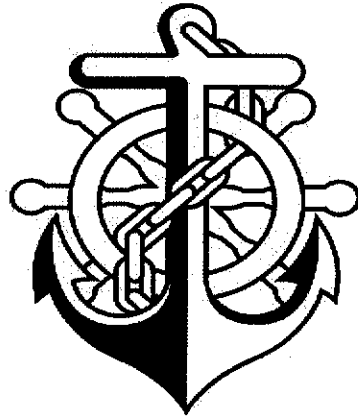
۷-۲- دستورالعمل اجرایی برگزاری دوره آموزشی تطبیقی سمت افسر مهندس سوم بر روی کشتی های با قدرت رانش کمتر از ۳۰۰۰ کیلووات سفرهای نزدیک به ساحل .

۷-۳- دستورالعمل صدور مجوز و نظارت بر اجرای دوره ها در مراکز آموزشی دریانوردی.

**۸- ضامم**

ندارد


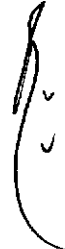





**PMO**

***The Code of Practice for Conducting Third Engineer Officer  
on Ships of Propulsion Power KW<3000 Engaged on Near  
Coastal Voyages Upgrading Training Course***

**P6-W103**

Revision No.	Date of revision	Comment on revision	provider	approving amendments authority	endorsing amendments authority
02	25/AUG/2014	STCW Convention, as amended	N.Alipour Head of Seafarers' Standards' Directorate 	H.Mirzaei Director General of Seafarers' Affairs 	S.A.Estiri PMO's Deputy for Maritime Affairs 





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## Introduction

Ports and Maritime organization (P.M.O) of the Islamic republic of Iran in performing its duty and in exercising its prerogative resulting from article 192 of the Islamic republic of Iran maritime code, 1964 and paragraph 10 of article 3 of P.M.O manifesto, 1970 enabling it to issue any document, certificate or license for ships, masters, officers and other ship personnel and also in accordance with the provisions of the international convention on standards of training, certification and watch keeping for seafarers (STCW), 1978, as amended adopted by the Islamic consultative assembly in 1996 and taking into account regulations I/11, paragraph 4 of the mentioned Convention, develops this "code of Practice for Conducting Third Engineer Officer on Ships of Propulsion Power KW<3000 Engaged on Near Coastal Voyages Upgrading Training Course " which is applicable after endorsement by the of board of executives of Ports & Maritime Organization.

**NOTE:** The title of Ports and Shipping Organization changed to Ports and Maritime Organization dated 29.04.2008 through parliamentary act and approved by Islamic council assembly.





## 1 Objective

The objective of this code of practice is to specify the minimum requirements for conducting Third Engineer Officer on Ships of Propulsion Power KW<3000 Engaged on Near Coastal Voyages Upgrading Training Course.

## 2 Scope of application

This code of practice is applicable to all approved training centers that conduct Third Engineer Officer on Ships of Propulsion Power KW<3000 Engaged on Near Coastal Voyages Upgrading Training Course.

## 3 Definition

For the purpose of this code of practice, unless expressly provided otherwise;

### 3-1 Approved

Means approved by the Seafarer's Standards Directorate in accordance with the PMO's Codes of practices.

### 3-2 Approved Seagoing Service / Documentary Evidence

Means approved sea going service required to be presented for participating in a training course, maritime examination and issuance of certificate. These documentary evidence should be inserted in CDC and authenticated by company or ship owner or ship owner's associations and in addition be presentable in a form of computer sheet, official letter or other forms as defined in the annex to this code of practice.

### 3-3 Certificate of Competency (COC)

Means a certificate issued and endorsed for masters, officers and GMDSS radio operators in accordance with the provisions of chapters II, III, IV or VII of the STCW Convention and entitling the lawful holder thereof to serve in the capacity and perform the functions involved at the level of responsibility specified therein.

### 3-4 Certificate of Proficiency (COP)

Means a certificate, other than a certificate of competency issued to a seafarer, stating that the relevant requirements of training, competencies or seagoing service in the STCW Convention have been met.





### **3-5 Code of Practice**

Means all national rules, regulations and requirements specified in this document which have been drafted by the PMO's General Directorate of Maritime affairs and endorsed by the PMO's board of executive.

### **3-6 Company**

Means the owner of the ship or any other organization or person such as the manager, or the bareboat charterer, who has assumed the responsibility for operation of the ship from the ship owner and who, on assuming such responsibility, has agreed to take over all the duties and responsibilities imposed on the company by these Codes of practices.

### **3-7 Course Completion Certificate or Documentary Evidence**

Means a certificate issued through the training center, after successfully completion of training program by the applicants

### **3-8 Engineer officer**

Means an officer qualified in accordance with the provisions of regulation III/1, III/2 or III/3 of the Convention

### **3-9 ISPS Code**

Means the International Ship and Port Facility Security (ISPS) Code adopted on 12 December 2002, by resolution 2 of the Conference of Contracting Governments to the International Convention for the Safety of Life at Sea (SOLAS), 1974, as may be amended by the Organization.

### **3-10 Master**

Means the person having command of a ship

### **3-11 Medical Fitness Certificate**

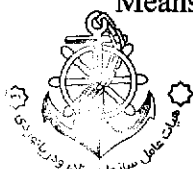
Means a certificate issued by the PMO's recognized medical practitioner to the candidates who found to be medically fit.

### **3-12 Merchant Ship**

Means any ship (other than servicing vessel, mobile offshore platform, fishing and naval ships) used for carriage of cargoes, passenger and/or provisions

### **3-13 Month**

Means a calendar month or 30 days made up of periods of less than one month.







### **3-14 PMO**

Means Ports & Maritime Organization (PMO) of the Islamic Republic of Iran.

### **3-15 Port's Monitoring Office**

Means the deputy of general directorate in ports in which the directorate of examinations & seafarers' documents is included and on behalf of seafarers' standards directorate is responsible for approving and monitoring training courses conducted in the province that port is situated

### **3-16 Propulsion Power**

Means the total maximum continuous rated output power, in kilowatts, of all the ship's main propulsion machinery which appears on the ship's certificate of registry or other official document.

### **3-17 Seagoing service**

Means service on board a ship relevant to the issue or revalidation of a certificate or other qualification.

### **3-18 Seagoing Ship**

Means a ship other than those which navigate exclusively in inland waters or in waters Within, or closely adjacent to, sheltered waters or areas where port regulations apply.

### **3-19 Security duties**

include all security tasks and duties on board ships as defined by chapter XI-2 of the International Convention for the Safety of Life at Sea (SOLAS 1974, as amended) and the International Ship and Port Facility Security (ISPS) Code

### **3-20 STCW Convention**

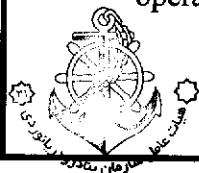
Means international convention on standards of training, certification and watch keeping for Seafarers, 1978, as amended.

### **3-21 STCW Code**

Means the seafarers' training, certification and watchkeeping (STCW ) code as adopted by the 1995 conference resolution 2, as it may be amended by the international maritime organization.

### **3-22 Support Level**

Means the level of responsibility associated with performing assigned tasks, duties or responsibilities on board a seagoing ship under the direction of an individual serving in the operational or management level.





**3-23 Third Engineer Officer**

Means officer in charge of an engineering watch qualified in accordance with the relevant provisions of the Code of practice for issuing, revalidation, renewal certificates of competency and proficiency for seafarers.

**3-24 Training center**

Means maritime university/center/ directorate/ department/company and/or any organization conducting maritime training course approved by PMO.

**3-25 Unlimited Voyages**

Means voyages not limited to the near coastal voyages.

**4- Responsibilities**

4-1 Central monitoring office is responsible for revising this code of practice.

4-2 General Director of Seafarers' Affairs is responsible for approving amendments to this code of practice.

4-3 Deputy of maritime affairs is responsible to endorse amendments to this code of practice on behalf of PMO's board of executive.

4-4 Training centers are to conduct training course in accordance with this Code of practice.

4-5 Central monitoring office is responsible for supervising the implementation of this code of practice in training centers.





## 5- Procedure

### 5-1 course objective

The objective of this course is to upgrade the competencies of trainees to those set out in paragraph 5-6 of the "code of practice for conducting third engineer on ships of propulsion power KW<3000 engaged on near coastal voyages.

### 5-2 course duration

5-2-1 A minimum of 79 hours theoretical, for each trainee.

5-2-2 Maximum daily contact hours for each trainee is 8.

### 5-3 number of trainees

5-3-1 the maximum number of trainees in each course is 20.

5-3-2 the number of trainees may be increased to 30 when the relevant facilities, teaching aids and class-room space are increased as per criteria set out in the code of practice for approving and monitoring training courses and is approved by the relevant monitoring office.

### 5-4 Course entry requirement

The course trainees should, at least;

5-4-1 hold valid medical fitness certificate issued by a medical practitioner recognized by the PMO;

5-4-2 hold valid certificate of competency as third engineer officer for Ships of Propulsion Power KW<3000 Engaged on Near Coastal Voyages, or above mentioned course completion certificate.

### 5-5 Expected Knowledge, Understanding and Proficiency

5-5-1 Knowledge of how machineries work in engine room under supervision of ship senior engineers.

5-5-2 Gaining information and proficiency in repairing and maintaining machineries in engine room under supervision of ship senior engineers.

5-5-3 Ability to take engineering watch in the engine room independently.

5-5-4 Proficiency in practicing safeties in the vicinity of working environment and at the time of taking duties.

5-5-5 Proficiency in practicing and protecting environmental safeties;

5-5-6 Ability to manage and practice superior instructions as well as being able to communicate in the working environment.





**5-6 course syllabi (79 hours Theoretical)**

***FUNCTION 4 : MARINE ENGINEERING AT THE OPERATIONAL LEVEL (39 hrs.T)***

***Competence 4-1: Maintain a safe engineering watch (4 hrs.T)***

***4-1-1-Safety and emergency procedures; changing-over of remote/automatic to local control of all system (0.5 hrs.T)***

***Knowledge and understanding of:*** Stating what is meant by emergency in accordance with components of the machinery; Remote and local control of all machineries; Limitations of each; Actions to be taken prior to change over from remote to local and vice versa; Correct change over procedure; The key important parameters that may affect the safe operation of machinery while on local control; Safeties and automation which are by passed /affected when change over takes place; Personal attendance while in local control; Points and parameters to pay more attention while control position is shifted; Slowdown and shutdown activation /reset of main machinery in both remote and local control; Being familiar with the operation & procedure of the changing /taking over of the remote /local control of the main engine and steering gear systems.

***4-1-2-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 (0.5 hrs.T)***

***Knowledge and Proficiency in:*** Mustering; The immediate actions to be taken while fire and other accidents occur; Time constrains; Correct actions; Minimize errors; Fast response; Sounding the alarms when the situation so demands and take all possible measures to prevent damage to the ship, its cargo and persons on board; Information given to bridge /chief engineer as appropriate; Personal safety/minimize the fire hazards in engine room specially oil, rectifying leakages, oil impregnated laggings, oil returns, double skin pipes ,alarms ,oil leak tanks/ including overflow tanks alarm, sounding pipes/self closing, oil fire extinguishing, storage tank temperatures; Measures to be taken to protect the environment from pollution by the ship and that applicable pollution prevention regulation are complied with; All damage control and fire fighting systems are in readiness in emergencies.

***4-1-3-Engine-room resource management, knowledge of engine-room resource management principles, including: (3 hrs.T)***

***4-1-3-1-Allocation, assignment, and prioritization of resources (1 hr.T)***

***Knowledge and understanding of:*** The main tenets of resource management relate to the non-technical skills associated with the social interaction between team members, situation awareness and the decision-making, Planning and Prioritizing; Efficient use of resources and delegation; Proper arrangements for watchkeeping personnel shall be ensured in accordance with the situations; Any limitation in qualifications or fitness of individuals shall be taken into account when deploying watchkeeping personnel; Understanding of watchkeeping personnel regarding their individual roles, responsibility and team roles shall be established; Identification of cause of problem and timely correct response; Environmental issues; Safety of Operations.





**4-1-3-2-Effective communication (0.5 hr.T)**

**Knowledge and understanding of:** Communications, Methodical and logical approach to fault diagnosis and problem solving and Error Trapping; Watchkeeping personnel shall understand information and how to respond to information from each station/installation/equipment; Information from the stations/installations/equipment shall be appropriately shared by all the watchkeeping personnel; Watchkeeping personnel shall maintain an exchange of appropriate communication in any situation; and; Watchkeeping personnel shall notify the master/chief engineer officer/officer in charge of watch duties without any hesitation when in any doubt as to what action to take in the interest of safety.

**4-1-3-3-Assertiveness and leadership (0.5 hr.T)**

**Knowledge and understanding of:** Leadership and Workload Management; Human Factors and Human Error; Contingency Planning; The officer in charge of watch duties shall maintain a proper watch, making the most effective use of the resources available, such as information, installations/equipment and other personnel.

**4-1-3-4-Obtaining and maintaining situational awareness (0.5 hr.T)**

**Knowledge and understanding of:** Situational Awareness Management; Risk Assessment and Risk Management; Emergency Preparedness; Watchkeeping personnel shall understand functions and operation of installations/equipment, and be familiar with handling them.

**4-1-3-5-Consideration of team experience (0.5 hr.T)**

**Knowledge and understanding of:** Co-operation and Teamwork, Identification of and breaking error chains, team building and Development.

**Competence 4-2: Use internal communication systems (1 hrs.T)**

**4-2-1-Operation of all internal communication systems on board (1 hrs.T)**

**4-2-1-1-Transmission and reception of messages (0.5 hrs.T)**

**Knowledge of:** Means to be provided for communicating orders from navigating bridge to the position in the machinery space or in the control room; Principle operation of an engine room telegraph; Appropriate mean of communication provided to any other positions from which the engines controlled, purpose of using engineer's alarm and where they are located; Means of communication provided between the navigation bridge and the steering gear compartment; Means of local communication provided between the main machinery control room and the engineer officer's accommodation; Means provided in a centralized control position with alarm panels and instrumentation indicating any alarm; Alarm system provided for all important pressures, temperatures and other essential parameters; Alarm for automatic change-over; Communicating through the medium of normal ship board reporting procedure; The officers and crew should communicate with each other in a common language; Principles of using public address, talk back system; Sound power phone, internal walkie talkie and telephone exchange on board the ship; Distinguishing between the various alarms.





**4-2-1-2-Communication recordings (0.5 hr.T)**

**Knowledge and proficiency in:** Ship's movement recording during maneuvering and passage in the navigation bridge and in engine control room; Automatic and manual recording of important and essential parameters in engine log book; Standing orders and special instructions of the chief engineer officer; Recording of reports for ship staff and machinery performances; Records of any events related to the main and auxiliary machinery occurred during the engineering watch.

**Competence 4-3: Operate main and auxiliary machinery and associated control systems (32 hrs.T)**

**4-3-1-Basic construction and operation principles of machinery systems, including: (25 hrs.T)**

**4-3-1-1-Basic engineering science, mechanics and hydromechanics (15 hrs.T)**

**1-Static (0.5 hrs.T)**

**Knowledge and proficiency in:** Definition of mass, force, weight, scalar and vector quantities; Vector diagrams, resultant and equilibrium; Parallelogram of forces to obtain the resultant of two forces; Triangle of forces; Polygon of forces; Equilibrium in the polygon of forces.

**2-Kinematics (0.5 hrs.T)**

**Knowledge and proficiency in :** Definition of linear motion, speed, calculating mean speed, linear and resultant velocity and acceleration; Newton's first law; Solving simple numerical and graphical problems related to objectives.

**3-Dynamics (0.5 hrs.T)**

**Knowledge and proficiency in:** Definition of force of gravity, inertia, momentum and friction; Newton's second law; Accelerating force; Coefficient of friction; Friction force required to overcome friction on a horizontal plane; Solving simple numerical problems related to objectives.

**4-Friction (0.5 hrs.T)**

**Knowledge and proficiency in:** Categories of friction; Relation between kinetic and limiting values of friction force; Apparent friction force with regard to rolling resistance; Principles of ball and roller bearings; Effect of area and surface finish on dry friction; Boundary friction; Effect of heavy loading and low speed on bearings working under boundary conditions.

**5-Inertia (0.5 hrs.T)**

**Knowledge of:** Definition of mass in terms of inertia; Relation of mass to weight; Inertia force; Active and reactive forces; Active resistance and its components.





**6-Circular motion (0.5 hrs.T)**

**Knowledge of:** Forces due to circular motion; centrifugal forces and related formula.

**7-Periodic Motion (0.5 hrs.T)**

**Knowledge of:** Simple harmonic motion; Variation of velocity and acceleration of piston in a reciprocating engine; Definition of periodic time, frequency and amplitude.

**8-Dynamics of rotation (0.5 hrs.T)**

**Knowledge of:** Linear and angular acceleration; Accelerating torque.

**9-Work, power and energy (0.5 hrs.T)**

**Knowledge of:** Definition of work as force  $\times$  distance and its unit; Definition of potential and kinetic Energy; Definition of inertia; Conversion of energy; Deficiency of energy in terms of input and output; Define power as energy transfer/time taken; Unit of power.

**10-Impulse and momentum (0.5 hrs.T)**

**Knowledge of:** Impulse of a force; Momentum of a body; Angular impulse; Angular momentum.

**11-Hydrostatics (0.5 hrs.T)**

**Knowledge of:** Definition of volume, density as mass over volume, relative density.

**12-hydrodynamics (0.5 hrs.T)**

**Knowledge of:** Energies stored in a liquid; Potential, pressure and kinetic energy; Definition of "head of a liquid"; Rate of flow; potential and kinetic energy per unit weight in terms of liquid head.

**13-Thermodynamics and heat transmission (6 hrs.T)**

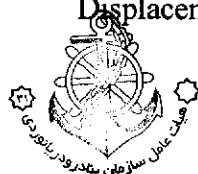
**13-1-Heat transfer (0.5 hrs.T)**

**Knowledge of:** Methods of heat transfer (Induction, radiation and conduction); Factors influencing the rate of heat transfer by conduction, convection and radiation; Developing an equation for the temperature drop across the outer surfaces of a three-layer composite wall.

**Proficiency in:** Solving simple problems concerning above objectives

**13-2-Thermodynamic energy (0.5 hrs.T)**

**Knowledge of:** The term "the conservation of energy" and its application to the flow of fluid in a system; Steady-flow energy equation (SFEE); Potential and kinetic energy; Internal energy; Displacement energy; Heat transfer; External work done; First law of thermodynamics.





**13-3-Energy change (0.5 hrs.T)**

**Knowledge and proficiency in:** "Non-flow" equation and its application; Solving simple problems concerning energy changes in practice.

**13-4-Vapours (0.5 hrs.T)**

**Knowledge and Understanding in:** Process of steam generation from water or generation of vapor from any other liquid at constant pressure; Relationship between temperature change and different phases; Vapor phase; Saturated vapor; Dry vapor; Wet vapor; Dryness fraction and superheated vapor conditions.

**13-5-Behavior of gases (1 hrs.T)**

**Knowledge of:** Boyle's law; Charles' law; specific heat capacity at constant volume ( $c_v$ ) and at constant pressure ( $c_p$ ); Effect of heating gases at constant volume and constant pressure; Dalton's law of Partial Pressure.

**Proficiency in:** Solving problems related to above objectives.

**13-6-Thermodynamic processes (0.5 hrs.T)**

**Knowledge of:** thermodynamic process; The 2nd law of thermodynamics; Constant pressure, volume and temperature processes; Isothermal and adiabatic processes.

**13-7--Work transfer (0.5 hrs.T)**

**Knowledge of:** relation of area on a P.V diagram to the work done when a fluid exerts constant pressure on a piston in a cylinder; Work transfer for a vapor or ideal gas; Work transfer.

**13-8-Marine heat engines, refrigeration and air compressor (2 hrs.T)**

**13-8-1-Heat engines (1 hrs.T)**

**Knowledge and Understanding in:** Ideal gas cycles as those which use perfect gaseous; Constant volume cycle (Otto Cycle); Constant Pressure (Diesel Cycle); Dual Combustion Cycle; Joule cycle (Gas Turbine Cycle); Carnot Cycle and thermodynamic processes in each cycle; Definition of swept volume and its unit; Mean effective pressure (m.e.p) and its unit; Indicated power produced in a 4 and 2 stroke engines and its unit; Solving simple numerical problems related to the objective.

**13-8-2-Refrigeration (0.5 hrs.T)**

**Knowledge and Understanding in:** Reversed Carnot Cycle (Refrigeration cycle); Working fluids used; Using of tables of thermodynamic properties; Four main components of refrigeration plant and their function; Direction of flow of working fluid and energy level in the cycle.







**13-8-3-Theory of air/gas compression (0.5 hrs.T)**

**Knowledge and Understanding in:** Compression of air/gas (Isothermal, polytropic and adiabatic); Corresponding pressure-volume diagram of an air compressor, showing suction, delivery, and clearance volume; Factors governing valve opening and closing in a compressor; Swept volume and effective swept volume; Definition of volumetric efficiency and need for high volumetric efficiency; Meaning of the term "free air delivery"; Reason for cooling of air and need for using intercoolers; Application of " $Pv^n = \text{constant}$ " during compression process; Application of " $Pv^n = \text{constant}$ " on air storage tank.

**14-Industrial chemistry (3 hrs.T)**

**14-1-Fundamentals (0.5 hrs.T)**

**Knowledge and Understanding in:** Definition of an atom, a molecule, chemical element, chemical compound, mixture, an oxide and chemical reaction; Meaning of solution, solubility, a saturated solution, suspension and precipitation.

**14-2-Acidity/Alkalinity (0.5 hrs.T)**

**Knowledge and Understanding in:** Composition of an atom and result of losing or gaining electron; Hydrogen and hydroxyl ions; PH value of a solution.

**14-3-Corrosion (1 hrs.T)**

**Knowledge and Understanding in:** Formation of metallic hydroxide when iron is immersed in an acidic solution (State boiler water should be alkaline and free of oxygen); Fundamental process of corrosion; Common engineering materials which produce passive oxide films; Main causes of corrosion; Galvanic cell components; Electrolyte; And anode and common metals selected as relative anodes; Sacrificial anodes; Galvanic action and means of reducing it; Pitting corrosion; Corrosion fatigue; Major factors affecting the corrosion process; Methods of surface protection.

**14-4-Fuels and lubricants (1 hrs.T)**

**Knowledge and Understanding in:** Carbon, hydrogen, sulfur and ash content of marine fuels; Flash point and its importance for marine fuels and lubricants; Flash point temperature of petrol, kerosene, marine diesel fuel, heavy fuel oil and lubricating oil; Minimum closed flash point of marine fuels when stored in engine room; Viscosity and necessity for increase of temperature of some fuel oils; Test of flash point and viscosity on fuels and lubricants; Importance of them with respect to storage and transferring.

**4-3-1-2-Marine diesel engine (4 hrs.T)**

**4-3-1-2-1-Engine types (2 hrs.T)**

**Knowledge of:** Ways and methods of scavenging 2- stroke; Different type of turbochargers (Radial & axial); Principle components of turbochargers such as impeller, turbine, turbine blades, labyrinth seals, bearings, inducer, diffuser and etc.; Describes in simple terms the principal features of a





typical "V" type medium speed diesel engine; Principle components of a large bore 2- stroke diesel engines and the material of manufacture (Bed plate, Crank shaft, Frame, Connecting rod, Cross head arrangement, camshaft, chain and gear, piston, Cylinder block, Tie rod, Liner and cylinder head); Engine speed control mechanism including governor to maintain the normal running speed under condition of variable load; How engine over speed is prevented.

#### ***4-3-1-2-2-Engine Operation and Safeties (2 hrs.T)***

***Knowledge of:*** Internal combustion engines; Compression ignition engines and processes occur in such engine; Spark ignition engines and processes in such engines; Combustion process in compression ignition engines; Processes in 2 and 4 stroke engines; Describes, with the aid of diagrams, the distribution of lubricating oil to the main engine; Turbocharger washing during running (Dry and water washing); Turbocharger surging (Causes and remedies); Running engine while turbocharger is out of service.

***Knowledge of:*** Importance of keeping scavenge air spaces drained and clean; Correct procedure and actions during scavenge air space fire while engine is running; Starting air line explosion (Causes and remedies).

***Proficiency in:*** Sketching typical indicator diagrams for 2- stroke and 4- stroke engines; Using of engine builders manuals to obtain applicable information.

***Knowledge of:*** Starting air system including preparation for starting, stopping and reversing, when maneuvering and when at full speed.

***Familiarization with:*** Main components of an air starting system including main starting air valve, air starting valve, air starting distributor and etc.; The purpose of a turning gear and the need for interlocks; To be familiar with the safety devices employed in the system.

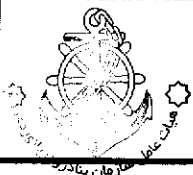
#### ***4-3-1-3-Marine steam turbine (1 hrs.T)***

***Knowledge of:*** Steam turbine construction, lubrication; Impulse and reaction turbines; H.P & L.P turbines; Materials of blades and other components; Bearings; Thrust bearings; Turbine glands and gland steam systems; Sequential nozzle operation; Vacuum pumps; Air ejectors; Extraction pumps; Gland condensers; Vibration; Procedures for warming through turbine installations; Warming up procedure from cold; Shut down procedures; Preparing the turbine for sea; Standby period components and materials used; Turbine safety devices (Over speed and excessive axial movement trip mechanism; Low vacuum trip; Lubricating oil pressure trip).

#### ***4-3-1-4-Marine gas turbine (1 hrs.T)***

##### ***4-3-1-4-1-Operation principles (0.5 hrs.T)***

***Knowledge of:*** Explaining how a gas turbine is used for; Describing the feature of a gas turbine; Describing the operation principles in terms of four processes, compression, combustion (heating), expansion and exhaust; Comparing a gas turbine with a steam turbine in terms of advantages and disadvantages; Describing the types of gas turbines.





**4-3-1-4-2-Basic construction (0.5 hrs.T)**

**Knowledge of:** Using visual aids, describes the three main components of gas turbine as: (Compressor; combustion chamber; turbine); Describing the types of compressors and their features; Describing the types of combustion chambers and their features; Describing the types of turbine and their features; Lists the attached equipment and explains their feature and functions in simple terms.

**4-3-1-5-Marine boiler (1 hrs.T)**

**Knowledge of:** Different types of boilers including: Composite and packaged; Construction of boilers: Furnace and combustion chamber; Tubes and tube plates; Water and steam drum; Combustion system of boiler; Boiler mountings (Safety valves; Main stop valve; Feed check valve; Water level indicator; Low water alarms; Blow down valve; Scum valve; Drain valve; Air vents; Soot blower; Pressure gauge connection; Man hole and hand hole doors); Waste heat utilization; Boiler operation; Boiler water testing and treatment and boiler control.

**4-3-1-6-Shafting installations, including propeller (1 hrs.T)**

**Knowledge of:** Water and oil lubricated stern tubes; Seals and lubricating systems; Couplings; Methods of reversing the direction of thrust; Thrust block; Controllable pitch propeller; CPP bridge control; Propellers fitting and removal.

**4-3-1-7-Other auxiliaries, including various pumps, air compressor, purifier, fresh water generator, heat exchanger, refrigeration, air-conditioning and ventilation systems (1 hrs.T)**

**4-3-1-7-1-Purifier (0.5 hrs.T)**

**Knowledge and understanding of:** Differentiate between static and dynamic separation; Differentiate between purifying and clarifying; Purification process of fuel oil; Correct and safe operating procedure for centrifuges.

**4-3-1-7-2-Fresh water generator (0.5 hrs.T)**

**Knowledge and Understanding of:** Methods of obtaining vapour from sea water; Reasons for using low-pressure fresh water generators.

**4-3-1-8-Deck machinery (1 hrs.T)**

**Knowledge of:** Construction and operating mechanism of deck machineries including mooring winch and windlass, boat winch, hatch cover systems, cargo handling gears and gang way system.

**4-3-2-Safety and emergency procedures for operation of propulsion plant machinery, including control systems (1 hrs.T)**

**Knowledge and proficiency in:** Emergency operation of the main engine from emergency stand; Main engine safeties including slow down and shut down; How they operate; How to reset; Main





engine control system and its malfunctions; Procedure of local and emergency operation of steering gear system; Ensuring that all machinery and equipment involved of propulsion plant is in a state of immediate readiness and that an adequate reserve of power is available for steering gear and other requirements; Being informed of potentially hazardous conditions which may adversely affect the machinery or jeopardize the safety of life, ship or environment.

***4-3-3-Preparation, operation, fault detection and necessary measures to prevent damage for the following machinery items and control systems: (6 hrs.T)***

***4-3-3-1-Steam boiler and associated auxiliaries and steam systems (1 hrs.T)***

***Knowledge and proficiency of:*** Preparation of steam boiler for flash up; Test of all safeties; Function of control system; Water level monitoring; Operation; Boiler common faults and malfunction; Alarms; Shutdowns; Correct operation and avoiding damage; Damage caused by overheating, excess pressure, water shortage and burner failure.; Function of steam drum, Hotwell, Circulating and feed pumps, Condenser, Safety valves, Burners.

***4-3-3-2-Auxiliary prime movers and associated systems (1 hrs.T)***

***Knowledge of:*** Function of Auxiliary prime mover parts, components and systems; Preparation before putting on load; Function and test of safeties(Electrical and mechanical); Load sharing; Correct operation; Running parameters; Maintenance as per manufacturer manual; Early fault detection; Alarms; Correct maintenance; Avoiding and minimizing damage.

***4-3-3-3-Other auxiliaries, including refrigeration, air-conditioning and ventilation systems (4 hrs.T)***

***4-3-3-3-1-Purifier and fuel oil treatment (1 hrs.T)***

***Knowledge and proficiency in:*** Explaining the operation of a purifier; Explaining the function of gravity disk; Sludge discharging mechanism of an oil purifier; Approximate temperatures of the oil necessary both in the supply tank and immediately prior to centrifuging; Explaining precautions for starting purifiers and checking points to ensure a good working order; Describing the correct procedures for the disposal of waste oil, sludge residue.

***4-3-3-3-2-Air Compressor (1 hrs.T)***

***Knowledge and proficiency in:*** Stating that cylinder lubrication must be kept to a minimum; Stating that cylinder lubricating oil should not have a flashpoint below 210°C and the use of synthetic lubricating oil to reduce a hazard; Describing the attention required to keep the intake air filter working effectively; Explaining the reason for fitting drain valves after air coolers; Describing the starting-up and stopping procedures; Explaining the principles upon which air compressors are run automatically; Describing the required quality for compressed air that is to be used in control systems.





**4-3-3-3-Evaporators and distillers (1 hrs.T)**

**Knowledge and proficiency in:** Describing the need for starting fresh water generator and the limitation of its use; Explaining the starting procedure for fresh water generator; Explaining why the density of the brine must be carefully controlled; Describing the type of scale deposited on the heating surfaces; Explaining how the scale described in the above objective is removed; Describing the function of a distiller as that of condensing fresh water from the vapour produced in an evaporator; Stating that if, during the evaporation process, a temperature of 75°C is not achieved, chemical agents must be added to the water to destroy any harmful bacteria which may be present; Explaining how the water is made potable.

**4-3-3-4-Refrigeration (1 hrs.T)**

**Knowledge and proficiency in:** Preparation and precautions for starting a refrigeration system; Stating precautions and checking points on a refrigeration system during running; Stating how the operating conditions is identified; Stating what malfunctions/troubles likely to occur in refrigeration equipment; Describing the effect in refrigeration unit of air, moisture and oil; Explaining how to charge refrigerant into a refrigeration system and collection of gas in recovery bottle; Explaining how to charge lubricating oil into a refrigerator; Explaining how to remove air from a refrigeration system.

**Competence 4-4: Operate fuel, lubrication, ballast and other pumping systems and associated control systems (2 hrs.T)**

**4-4-1-Operational characteristics of pumps and piping systems, including control systems (1 hrs.T)**

**Knowledge and proficiency in:** The performance will deteriorate if the temperature of the liquid being handled approaches that at which vapor are produced at the pressure in the suction pipe; Performance deteriorates if the viscosity of the fluid increases; Stating that, if there is no positive head at the inlet to a centrifugal pump, a priming device must be used; The correct procedures for starting up and stopping.

**4-4-2-Oily-water separators (or-similar equipment) requirements and operation (1 hrs.T)**

**4-4-2-1-Oily water separator (1 hrs.T)**

**Knowledge and proficiency in:** Stating the principles of oil content meter attached to oily water separators/similar equipment; Explaining how to prevent oil being mixed into discharging bilge when oil content exceeds 15 ppm; Stating that the dumping of oil or oil-water mixtures is strictly prohibited; Stating that there is a legal maximum oil content of water to be discharged overboard.





**FUNCTION 5 : ELECTRICAL, ELECTRONIC AND CONTROL ENGINEERING AT  
THE OPERATIONAL LEVEL (12 hrs.T)**

**Competence 5-1: Operate electrical, electronic and control systems (7 hrs.T)**

**5-1-1-Basic configuration and operation principles of the following electrical,  
electronic and control equipment: (7 hrs.T)**

**5-1-1-1-Electrical equipment: (4.5 hrs.T)**

**5-1-1-1-1- Introduction: (1 hrs.T)**

**Knowledge and understanding of:** A review on Simple electric circuit; Ohm's Law; Series and parallel circuits; Electromotive force; Voltage; Units of current, Resistance, Voltage, Energy; Wheatstone bridge; Distribution of current in circuits; Meaning of KWh; Current divider and voltage divider circuits; Common theorems used in analyzing electric circuits ( KVL and KCL laws, thevenin and Norton, super-position and max power transfer); Magnetic flux and magnetic circuits; Hysteresis curve and losses, Flux density and intensity, m.m.f.; Magnetic field strength; Relative permeability; Reluctance; Role of air gap and its minimizing.

**5-1-1-1-2-Generator and distribution systems (1.5 hrs.T)**

**5-1-1-1-2-1- Introduction: (0.5 hrs.T)**

**Knowledge and understanding of:** Electric machines; Motoring and generating; Classification of electric machines; Structure of rotating electric machines; Machine output equations; E.M.F equations; Torque and speed equation.

**5-1-1-1-2-2-D.C. generator (4 hrs.T)**

**Knowledge and understanding of:** Simple generators with a split ring and its waveform plus commutator and brushes; A practical shunt D.C. generator; Generators classification; Losses and efficiency; DC generators application on board and deck machinery.

**5-1-1-1-2-3-A.C. Generator (0.5 hrs.T)**

**Knowledge and understanding of:** Resistive, capacitive and inductive circuits; Single phase and 3-phase alternating current/voltage theories; Phasors; Active and reactive powers; Apparent power and Power factor; A.C generators operation; Electrical routine checks and maintenances.

**5-1-1-1-3-Electrical motors including starting methodologies (1 hrs.T)**

**5-1-1-1-3-1-D.C. Motors (0.5 hrs.T)**

**Knowledge and understanding of:** A simple D.C. motor; Motor equations; Motor classification; Speed control; Losses and efficiency; Starting and applications; Different types; The Speed, torque and power curves with results most common type on board, series type.





**5-1-1-1-3-2-A.C. Motors (0.5 hrs.T)**

**Knowledge and understanding of:** Synchronous motors; Production of a rotating magnetic field; Synchronous speed; Types of rotor; Squirrel and double cage rotors; Wound rotors; Motor speed and slip; Torque-speed curves.

**5-1-1-1-4-High-voltage installations (0.5 hrs.T)**

**Knowledge and understanding of:** Advantages of utilising High Voltage; Major Risk Factors in HV systems; Maritime HV installations and safety working procedures.

**5-1-1-1-5-Sequential control circuits and associated system devices (0.5 hrs.T)**

**Knowledge and understanding of:** A State diagram; A Sequential function chart (SFC); Elements of state diagrams; States and transitions.

**5-1-1-2-Electronic equipment: (1.5 hrs.T)**

**5-1-1-2-1-Characteristics of basic electronic circuit elements (0.5 hrs.T)**

**Knowledge and understanding of:** Conductors, insulators and semiconductors; Crystal structure; P-type and N-type materials; Diode; Forward and reverse bias; Diode as a switch; Half-wave rectifier; Full-wave rectifier; Transistor symbols.

**5-1-1-2-2-Flowchart for automatic and control systems (0.5 hrs.T)**

**Knowledge and understanding of:** Understanding manual and automatic control system; The feedback control systems; Reference input; Controlled output; Controller, actuator, plant, transducer; The meaning of set point.

**5-1-1-2-3-Functions, characteristics and features of control systems for machinery items, including main propulsion plant operation control and steam boiler automatic controls (0.5 hrs.T)**

**Knowledge and understanding of:** Block and flow diagrams the various simple machineries control systems.

**5-1-1-3-Control systems: (1 hrs.T)**

**5-1-1-3-1-Various automatic control methodologies and characteristics (0.5 hrs.T)**

**Knowledge and understanding of:** Split type control; Integrated control system; U.M.S ship characteristics.





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***5-1-1-3-2-Proportional- Integral- Derivative (PID) control characteristics and associated system devices for process control (0.5 hrs.T)***

***Knowledge and understanding of:*** Proportional control (P-type); Proportional band; Gain; Proportional control action; Off-set in the system; Derivative and differential controller; D-type derivative action signal; Derivative action time; Integral controller I-type; Integral action signal; Integral action time; Multiple term controllers; Controller's actions in response to process change.

***Competence 5-2: Maintenance and repair of electrical and electronic equipment (5 hrs.T)***

***5-2-1-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 (1 hrs.T)***

***Knowledge and proficiency in:*** Dangers that can be encountered with electricity; Minimization of the risk; The secondary hazard; Electricity as a form of energy; The amount of shock current (threshold limit); The body resistance; The applied voltage; The effect of frequency; The duration of contact. Safe Electrical Systems/Equipments; Protective Devices; Safe Working Practices; Safety Planning; Proper Maintenances; Special operating procedures; Lockout/tag out High Voltage; Effective isolation of power supply; Clear notification; Safeguard against Direct Contact with Live Electrical system; Adequate insulation of live conductors; Adequate Isolation; Interlocking devices; Safeguards against Indirect Contacts Ground Fault Conditions; Indirect contact with electrical current; Grounding/Earthing on ships; Safe designed equipment; Working on board ship with electric hand tools; Disconnection of fuses and breakers; Automatic Protection; Use of lower voltages, 110 volts or lower suitable for lighting; Electrical safeties in Hazardous area; Documentation of permit to work on hazardous areas; Use of the instruments in hazardous area; Ex- type devices; Need for a step-down device; Emergency procedures in the event of an accident; Equipment emergency shutdown procedure; Electric shock first aid procedure; The need for first-aid training.

***5-2-2-Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment (0.5 hrs.T)***

***Knowledge and proficiency in:*** Maintenance of general electrical equipments; Main and emergency lightings; Fuses and protective devices; Replacement procedure of fuses in 3- phase and high voltage system.

***5-2-3-Detection of electric malfunction, location of faults and measures to prevent damage (0.5 hrs.T)***

***Knowledge and proficiency in:*** Detecting and correcting faults in motors, starters and protection equipments; Common faults in power supply system and alternators; Low insulation readings of electrical equipments; Insulation Resistance tests and causes of failure.







**5-2-4-Construction and operation of electrical testing and measuring equipment  
(1 hrs.T)**

**Knowledge and proficiency in:** Methods of measurement of current (I), voltage (V), resistance (R) and power (P); The importance of insulation readings IR; Megger equipment and safety concerns of electronic devices; Meaning of Continuity test and insulation test; Instrument transformers (CT's and VT's) and safeties; Sensors and transducers ; Calibration and testing.

**5-2-5-Function and performance tests of the following equipment and their configuration:  
(2 hrs.T)**

**5-2-5-1-Monitoring systems (0.5 hrs.T)**

**Knowledge and proficiency in:** Unmanned machinery space; Purpose of fully integrated control rooms; Computerized systems; Monitoring of different physical quantities (speed of ship, temperature measurements, air pressure measurement, tanks levels bilge and sludge, viscosity of fuel).

**5-2-5-2-Automatic control devices (0.5 hrs.T)**

**Knowledge and proficiency in:** The propulsion control systems, remote control of the main engines from telegraph, maneuvering lever in the wheelhouse and control room; Automatic start-reverse-stop and speed setting signal to the governor.

**5-2-5-3-Protective devices (0.5 hrs.T)**

**Knowledge and proficiency in:** Essentiality of protecting electrical equipment; Protection of alternators: The over Current Inverse Time relay; Over Current Trip Instantaneous; Negative Phase Sequence; Differential measurement of current; Earth leakage relay; Under and over voltage; Under and over frequency; Lock out; Reverse power; Preferential trip.

**5-2-6-The interpretation of electrical and simple electronic diagrams (0.5 hrs.T)**

**Knowledge and Understanding of:** Block diagram; Wiring diagram; Single line diagram; Power and control diagram; The symbols of electrical and electronic components; Block diagram of main engine automation; Direct on line starter power and circuit diagram.





**FUNCTION 6 : MAINTENANCE AND REPAIR AT THE OPERATIONAL LEVEL  
(4 hrs.T)**

**Competence 6-1: Appropriate use of hand tools, machine tools and measuring instruments  
for fabrication and repair on board (2.5 hrs.T)**

**6-1-1-Properties and parameters considered in the fabrication and repair of  
systems and components (2.5 hrs.T)**

**6-1-1-1-Basic metallurgy, metal and processes (0.5 hrs.T)**

**Knowledge of:** Basic heat treatment processes, such as tempering, annealing, normalizing and hardening and their objectives; Heat treatment processes for common carbon steels and properties obtained in each case.

**Proficiency in:** Identifying samples of various metals; Carrying out basic heat treatment.

**6-1-1-2-Non-metallic materials (0.5 hrs.T)**

**Familiarization With:** Polymers and other non-metallic materials commonly used and their applications in marine plants.

**6-1-1-3-Materials under load (0.5 hrs.T)**

**Knowledge of:** Definition and types of stress; Strain in materials; Types of loading on materials; Definition of tensile, compressive and shear forces; Behavior of material under tensile, compressive and shear forces; Definition of elastic limit, yield point, ultimate strength, breaking strength, as applied to an elastic material; Definition and application of hook's law.

**6-1-1-4-Vibration (1 hrs.T)**

**Knowledge of:** Vibration; Vibration frequency; Causes of vibration with regard to unbalanced rotational and reciprocating forces; Main sources of vibration on a ship and its effects; Transmission of vibration; Anti-vibration materials; Stating that if a component is vibrating a reversing stress is present in the material; Stating that in normal working conditions the stresses due to vibrations are well within limits allowed for in the design; Stating that vibrations in a component may be from different sources, which can cause resonance and magnify the effect; Stating that if vibrations become excessive, the stresses induced can cause permanent damage; Stating that machinery should not be allowed to operate either at or close to a critical speed; Stating that critical speed ranges should be passed through as quickly as possible; Methods of reducing and importance of eliminating vibration.





**Competence 6-2: Maintenance and repair of shipboard machinery and equipment  
(1.5 hrs.T)**

**6-2-1-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 (0.5 hrs.T)**

**Knowledge and proficiency in:** Use of safe working practice principle; Outline International Safety Management (ISM) code and Safety Management System (SMS); Implementation of safety procedures.

**6-2-2-Design characteristics and selection of materials in construction of equipment  
(0.5 hrs.T)**

**Knowledge of:** Basic metallurgy, metal and processes, Non-metallic materials, Materials under load, Vibration as mentioned in sec 3-1-1; Selection of materials according to design characteristics and construction of equipment.

**6-2-3-The interpretation of piping, hydraulic and pneumatic diagrams (0.5 hrs.T)**

**Knowledge and proficiency in:** Refer to on board training scheme machinery modulling and traceability of hydraulic and pneumatic piping system.





**FUNCTION 3 : CONTROLLING THE OPERATION OF THE SHIP AND CARE  
FOR PERSONS ON BOARD AT THE OPERATIONAL LEVEL (23 hrs.T)**

**Competence 3-1: Ensure compliance with pollution-prevention requirements (2 hrs.T)**

**3-1-1-Prevention of pollution of the marine environment, Knowledge of the precautions  
to be taken to prevent pollution of the marine environment (1 hrs.T)**

**3-1-1-1-International convention relating to intervention on the high seas in cases  
of oil pollution casualties, 1969 (0.5 hrs.T)**

**Knowledge of:** Describes the rights of Parties to the Convention to intervene on the high seas following a maritime casualty.

**3-1-1-2-International convention on civil liability for oil pollution damage,  
1969 (CLC 1969) Competence (0.5 hrs.T)**

**Knowledge of:** Convention (Ship; Owner; Oil; Pollution damage; Preventive measures; Incident); Occurrences to which the Convention applies; Owner of a ship is strictly liable for any oil pollution damage caused by the ship as the result of an incident; Exceptions to liability.

**3-1-2-Anti-pollution procedures and all associated equipment (0.5 hr.T)**

**Knowledge of:** Major points of typical shipboard oil pollution emergency plan (SOPEP), a detailed description of the actions to be taken by persons on board in event of any pollution.

**3-1-3-Importance of proactive measures to protect the marine environment (0.5 hrs.T)**

**Knowledge, understanding and proficiency in:** Actions to ensure that a positive environmental reputation is maintained in respect to environmental damage; Offence under international law for pollution of the sea; Prohibition of dumping of oil or oil water mixture to sea; Legal maximum oil content of water to be discharged overboard; Requirement of pumping bilges through an approved oily water separator; Recording of information in log book which must be entered in the oil record book when pumping bilges; Precautions to be taken to avoid spilling when bunkering purpose of an incinerator for disposal of sludge and refuse; General requirement for discharge of effluent from a sewage plant; Responsibilities of master, officers and ratings on board for protecting the marine environment.





**Competence 3-2: Maintain seaworthiness of the ship (12 hrs.T)**

**3-2-1-Ship stability, Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment (7 hrs.T)**

**3-2-1-1-Understanding of the Working knowledge and application of Fundamentals of naval architecture (4 hrs.T)**

**Knowledge of:** Wetted surface area; Wetted surface area calculation: (Calculating wetted surface area using transverse girths making; Calculating wetted surface area using Taylor's approximate formula); Stating the rules for area, volume and second moment of area of similar bodies; Similar figure and example; Pressure exerted by a liquid; Load on an immersed plane; Second moment of area; Theorem of parallel axes; The position of resultant force on submerged plane areas, i.e.. Center of pressure; Determining the position of the center of pressure; Solving problems involving foreseen submerged areas and calculation of the position of center of pressure (Limited to rectangular and circular shapes); Stress and strain diagram; Shearing force on bulkhead and stiffeners; Examples; Archimedes principle; Applying Archimedes principle to volume of displacement at any given draught is represented by the area of water plane area curve to that draught; Calculating values of displacement for a range of draught and plot the displacement curve; Buoyancy; Relating buoyancy to displacement; LCB; VCB at any given draught; Position of the VCB; TPC; Deriving formula for TPC; Producing the curve of TPC against draught; Using TPC to determine the change in mean draught due to the addition or removal of small masses; Water plane area coefficient; Mid ship section area coefficient; Block coefficient; Prismatic coefficient; Solving problems relating to the coefficients of form specified; Stating Simpson's first rule for three ordinates; Demonstrating how Simpson's rule may be applied with intermediate ordinates; Using Simpson's rule to determine the first moment of area of a plane about an ordinate; Calculating the centroid of a plane; Using the theorem of parallel axis to determine the second moment of area of a plane about its neutral axis; Using Simpson's rule to determine first moment of area of a plane; Calculating the second moment of area of a water plane about the transverse axis passing through its centroid.

**3-2-1-2-Ship stability, Working knowledge and application of Stability (3 hrs.T)**

**Knowledge of:** Center of gravity; Longitudinal center of gravity (LCG); Vertical center of gravity (VCG); The importance of the position of the center of gravity in stability and trim calculation; moment of force; Changes in vertical , Longitudinal and transverse center of gravity due to loading, discharging or moving one or more masses; Calculating or moving one or more masses; Solving problems involving suspended masses; Calculating the change in vertical center of buoyancy due to a change in mean draught; Initial stability; Diagrams of stable, unstable and neutral; Tender and stiff ship; Transferred loads; Deriving an expression for the distance of the transverse metacentre above the center of buoyancy; Heights of center of buoyancy and metacentre above the keel calculated at regular intervals of draught and plotted to form the metacentric diagram; Calculating height of metacentre above keel for vessels of ship form and of simple geometric form; Solving problems relating to stability at small angles of heel; Producing an expression for transverse metacentric height due to moving a small mass across the ship; Amendments to obtain the light ship displacement and re-calculating the final light ship displacement and kg from and inclining experiment ; The application of the wall- sided formula; Constructing statical stability curves using Cross of stability.





***3-2-1-3-Trim and stress tables, diagrams and stress-calculating equipment (3 hrs.T)***

**Knowledge, understanding and proficiency in:** Applying the concepts of longitudinal stability; How trim occurs; Longitudinal center of floatation (LCF); Loading or discharging of masses for maintaining the same trim; Longitudinal meta center and longitudinal meta centric height; Moment to change trim of ship by one centimeter (MCT1C); Calculating change of trim resulting from added, discharged and transferred loads; Constructing shear force and bending moment diagrams; Curves of weights, buoyancy and loads; Preparing shear force and bending moment diagrams for box shape vessels only; Using trim to find the position of the center of flotation; Loading a weight to keep the after draught constant.

***3-2-2-Understanding of the fundamentals of watertight integrity (1 hrs.T)***

**Knowledge of:** Effect of bilging on transverse stability; Permeability and stowage factor; Purpose of non watertight longitudinal subdivision of tanks; Moment of statical stability; Initial stability at large angles of heel; Effect of varying freeboard on stability; Movement of a ship with negative metacentric height; Dynamical stability; Load line rules for satisfactory stability.

***3-2-3-Understanding of fundamentals actions to be taken in the event of partial loss of intact buoyancy (1 hrs.T)***

**Knowledge and Understanding in:** Reserve buoyancy; Evaluating changes in draughts (Including the effect of permeability) due to bilging amidships compartment; Effect of bilging on longitudinal stability (trim); Find the final draughts due to bilging.

***Competence 3-3: Monitor compliance with legislative requirements (1 hrs.T)***

***3-3-1-Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment (1 hrs.T)***

**Basic working Knowledge of:** The relevant IMO conventions relating to Ship inspections; Marine machinery inspection; Hull construction; Hull inspection; Registration of ships; Steering appliances and equipment; Life saving equipment; Boat and fire drills; Fire detection and extinguishing equipment; Dangerous goods shipping; Oil pollution prevention; Sewage pollution prevention; Garbage pollution prevention; Pollutant discharge reporting; Safe working practices; Shipping casualties reporting; Tackling; Crewing; Engagement and discharge of seafarers; Rights of seafarers; Maintenance of discipline; Distressed seafarers; Provisions, health and accommodation; The international labour code, as applicable to shipping industry in relation occupational health and safety; International Convention for the Control and Management of Ship's Ballast Water Sediments, 2004.





***Competence 3-4: Application of leadership and team working skills (8 hrs.T)***

***3-4-1-Working knowledge of shipboard personnel management and training (1 hrs.T)***

***Knowledge of:*** Term "Management"; Following management activities: (Planning; Organizing and Staffing; Directing; Controlling); Roles of company's objectives and goals; Management policy with respect to ships; Managerial issues on: (Operations; Finance; Communications); The company's expectations for ship's officers; Organizing the staff for emergency duties and the use of safety equipment; Organization of repairs and surveys; Training of staff for both normal and emergency duties; Supervision of staff in the absence of ideal safe working conditions.

***3-4-2-A knowledge of related international maritime conventions and recommendations and national legislation (0.5 hrs.T)***

***Knowledge of:*** General knowledge of Islamic Republic of Iran national legislations for implementing international agreement and conventions.

***3-4-3-Ability to apply task and workload management, including: (2 hrs.T)***

***3-4-3-1-Planning and coordination (0.5 hrs.T)***

***Knowledge of:*** Planning and use of resources for executing a job; Maintenance planning system; Main elements and objectives of a maintenance planning; Planning system on maintenance books and planning board; Operation cycle of a maintenance planning system based on time schedule; Planning in preparation for emergency action.

***3-4-3-2-Personnel assignment (0.5 hrs.T)***

***Knowledge of:*** Evaluating personnel abilities; Assignment of different maintenance jobs to carry out by competent personnel; Preparation of a maintenance planning system for a ship.

***3-4-3-3-Time and resource constraints (0.5 hrs.T)***

***Knowledge of:*** Fuel consumption; Reasons for off hire; Port time; Engine efficiency; Machinery break down; Hull corrosion and cracking; Marine growth; Class survey; Lack of spare parts and service facilities; Maintenance in terms of possible reduction in off hire, repair work and fuel consumption and/or increase in speed.

***3-4-3-4-Prioritization (0.5 hrs.T)***

***Knowledge of:*** Maintenance jobs according to their importance or urgency, and in relation to the maintenance budget and return on investment; Maintenance planning systems.





***3-4-4-Knowledge and ability to apply effective resource management: (2.5 hrs.T)***

***3-4-4-1-Allocation, assignment, and prioritization of resources (0.5 hrs.T)***

**Knowledge of:** Resources are allocated and assigned as needed in correct priority to perform necessary tasks; Identify type and scale of the tasks; Initiate actions conform to the emergency procedures and contingency plans for the ship; The order of priority, and the levels and time scales of solving problems and informing personnel on board, are relevant to the nature of the emergency and reflect the urgency of the problem, in order to take promptly.

***3-4-4-2-Effective communication on board and ashore (0.5 hrs.T)***

**Knowledge of:** English language to enable the officer to use maker's manuals and to perform engineering duties; Communicating clearly and understand others; Transmitting information relating to machinery components by means of simple drawings with supplementary notes and specifications; Demonstrating "effective communication" (Oral, Written & Non-Verbal) with others; Interpretation and carry out verbal instructions.

***3-4-4-3-Decisions reflect consideration of team experiences (0.5 hrs.T)***

**Knowledge of:** Processing of group meeting management; Sources of organizational conflict; Techniques for preventing group conflicts; Analyses some important factors that may affect group behavior, discipline and the amount of work done by the crew; Efficient method of establishing an open communication style on board that encourages challenges and appropriate responses from the team; Need for evaluation of outcomes effectiveness; Team member(s) share accurate understanding of current and predicted engine room and associated systems state, and of external environment, and take necessary actions.

***3-4-4-4-Assertiveness and leadership, including motivation (0.5 hrs.T)***

**Knowledge of:** Transactional leadership; Transformational leadership; Democratic leadership; Autocratic leadership; Directive leadership; Supportive leadership; Participative leadership; Achievement-oriented leadership; Factors that influence the way the leaders' behavior affects subordinates' response: (Job pressure; Job satisfaction; Subordinates' need for information; Subordinates' expectations); Assessment of personnel competence and capabilities and operational Requirements with effective leadership behaviors in order to tackle the jobs.

***3-4-4-5-Obtaining and maintaining situational awareness (0.5 hrs.T)***

**Knowledge of:** Keeping the operation of the propulsion plant under control during any situation; responding to bridge maneuvers at any time; Informing the bridge or a superior officer of any abnormal situations; Preparing the main and auxiliary machinery for maneuverings operations; Determining order of priority among problems encountered; Resolving problems in an orderly manner; Writing appropriate entries in a log book and notice unusual readings; Writing appropriate entries in the Oil Record Book; Bringing the propulsion system back on line after a power failure; Transferring controls from bridge to engine room.







**3-4-5-Knowledge and ability to apply decision-making techniques: (2 hrs.T)**

**3-4-5-1-Situation and risk assessment (0.5 hrs.T)**

**Knowledge of:** Identifying potential risk on board; Importance of carryout situation and risk assessment before commencing major operation; Risk assessment procedure; Objective and scope of assessment; Implementation of risk reduction measure and preventive actions for the risk factors; The potential risk in safety and health activities for the ship and crew; The change of working condition and operational circumstances and personal resource.

**3-4-5-2-Identify and consider generated options (0.5 hrs.T)**

**Knowledge of:** Preparation and plan of risk assessment; Method of risk assessment; Risk grade; Countermeasures for the risk assessment; Risk control affairs on shipboard; Identification of new risk; Monitoring and improvement.

**3-4-5-3-Selecting course of action (0.5 hrs.T)**

**Knowledge of:** Preparation, implementation and general management of risk assessment plan; Setting up and distribution of standards for the risk assessment and grade; Training ship' personnel for the technique of the risk assessment and risk control.

**3-4-5-4-Evaluation of outcome effectiveness (0.5 hrs.T)**

**Knowledge of:** Review the effectiveness for risk assessment; Evaluate periodically the implementation of the risk assessment and risk control; Updating of safety and health information related to task in charge.





### **5-7 facilities and equipment required for conducting the course**

Apart from those facilities, equipments and or requirements mentioned in Code of practice for approval and monitoring of maritime training courses followings have to be provided:

5-7-1 Classroom with air conditioning facilities, sufficient lighting and other facilities, suitable for delivering theoretical subjects

5-7-2 library with related technical books and references

### **5-8 Lecturers and instructors minimum qualifications**

Lecturers and instructors shall have completed a course in instructional techniques (TFT) in one of the training centers approved by the PMO, and;

5-8-1 for lecturing in theoretical subjects should;

5-8-1-1 possess minimum general diploma which is approved by ministry of education.

5-8-1-2 possess valid third engineer certificate of competency for ships of  $KW \geq 750$  engaged on unlimited voyages with minimum 12 month of seagoing service in that rank; Or

5-8-1-3 For lecturing theoretical subjects general engineering knowledge , motor and naval architecture lecturers must possess valid second engineer certificate of competency for ships of  $KW < 3000$  engaged on unlimited voyages as well as having one year of seagoing service in that rank.

5-8-1-4 For lecturing electro-technology subjects as mentioned in this code of practice lecturers must possess at least relevant Master of Science degree or have electro technology valid certificate of competency with one year of seagoing service experience on ships of  $KW \geq 3000$  engaged on unlimited voyages.

5-8-1-5 holders of Master of Science degree in ship architecture and shipbuilding or chief officer certificate of competency for ships of  $GT \geq 3000$  engaged on unlimited voyages with six month of seagoing service experience can be assigned in teaching ship stability and ship construction subjects.

5-8-2 for delivering practical training should;

5-8-2-1 This code of practice does not need practical training.





## **5-9 Assessment and Certification**

5-9-1 upon successful completion of the examination which is carried out during and at the end of the course, the trainee will be awarded relevant course completion certificate issued by the approved training center; and

5-9-2 finally, Seafarers' Examination and Documents Directorate of the PMO will issue a CoC for those candidates who have passed above mentioned PMO competency assessments and fulfill other relevant certification requirements set out in the "Codes of practices for issuing, revalidation and renewing certificates for seafarers".

## **5-10 revalidation/renewal of certificates**

5-10-1 CoPs and CoCs will be revalidated and renewed in accordance with provisions of the "Codes of practices for issuing, revalidation and renewing certificates of competency for seafarers".

## **5-11 course approval:**

5-11-1 It will be carried out as per code of practice for approval and monitoring of maritime training courses.

## **6-Records**

6-1 All records which present the implementation of the content of this code of practice.

## **7- References**

- 7-1 Code of practice for approval and monitoring of maritime training courses;
- 7-2 Code of practice for Conducting Third Engineer Officer on Ships of Propulsion Power KW<3000 Engaged on Near Coastal Voyages Upgrading Training Course;
- 7-3 Code of practice for issuing revalidation and renewing certificates of competency for seafarers.

## **8- Appendixes**

Nil.

