



سازمان بنادر و دریانوردی

دستور العمل اجرایی برگزاری دوره آموزشی تطبیقی سمت افسر مهندس دوم بر روی

کشتی های با قدرت رانش ≥ 3000 کیلووات یا بیشتر - سفرهای نامحدود

The Code of Practice for Conducting Second Engineer Officer on Ships of $KW \geq 3000$ Engaged on Unlimited Voyage Upgrading Training Course

کد مدرک : P6-W98

شماره بازنگری	تاریخ بازنگری	شرح تغییرات (علت و ممل)	تهیه کننده	تأیید کننده	تصویب کننده
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صفحه: ۱ از ۱۲



کد مدرک : P6-W98/1

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دستورالعمل اجرایی برگزاری دوره آموزشی تطبیقی ست افسر مهندس دوم بر روی کشتی های با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نامحدود
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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 نگهداری دریانوردان (STCW- as amended) مصوب مرداد ماه سال ۱۳۷۵ مجلس شورای اسلامی و با عنایت به بند ۴ از مقرره I/11 کنوانسیون مذکور ، این "دستورالعمل اجرایی برگزاری دوره آموزشی تطبیقی سمت افسر مهندس دوم بر روی کشتیهای با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نامحدود" 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 دوم بر روی کشتی های با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نامحدود
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۱- هدف از تدوین

هدف از تدوین این دستور العمل ارائه حداقل نیازمندیهای برگزاری دوره آموزشی تطبیقی سمت افسر مهندس دوم بر روی کشتی های با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نامحدود می باشد.

۲- دامنه کاربرد

این دستور العمل برای کلیه مراکز آموزشی مورد تایید سازمان و مجری برگزاری دوره آموزشی تطبیقی سمت افسر مهندس دوم بر روی کشتی های با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نامحدود کاربرد دارد.

۳- تعاریف

۳-۱ مصوب (Approved)

به معنای مصوبات اداره استانداردهای دریانوردان مطابق با دستورالعمل های سازمان بنادر و دریانوردی می باشد

۳-۲ گواهی خدمت دریایی مورد تایید (Approved 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 می بایست علاوه بر ثبت در شناسنامه دریانوردی ، تأییدیه 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 است.

۳-۳ گواهینامه شایستگی (Certificate of Competency)

به معنای گواهینامه صادره و یا شناسایی شده ای است که مطابق الزامات فصل های ۲، ۳، ۴، و ۷ کنوانسیون برای فرماندهان، افسران و افسران مهندس الکترونیک صادر و یا تایید می شود و دارنده ی قانونی آن محق به خدمت در مقام و عمل به وظایف مربوطه در سطح مسئولیت مشخص شده در آن است.





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۳-۴ دستگاه نظارت مرکز (Central Monitoring Office)

به معنای اداره یا بخشی که وظیفه صدور مجوز فعالیت آموزش دریانوردی و نظارت بر مراکز آموزشی را بر عهده دارد. دستگاه نظارت در ستاد سازمان ، اداره استانداردهای دریانوردان می باشد. مدیر کل امور دریانوردان نیز جزء دستگاه نظارت مرکز بوده و می تواند صدور مجوز فعالیت آموزش دریانوردی و نظارت بر مراکز آموزش دریانوردان را تایید نماید.

۳-۵ افسر سر مهندسی (Chief Engineer Officer)

به معنای افسر ارشد مهندسی است که مسئول رانش مکانیکی و عملیات و نگهداری تاسیسات الکتریکی و مکانیکی کشتی است .

۳-۶ 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.

۳-۷ 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 مسئولیت های محول شده بر شرکت توسط این دستورالعملها را بر عهده گرفته است.

۳-۸ 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 می دهد.





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۳-۹ افسر مهندس (Engineer Officer)

به معنای افسری است که مطابق با الزامات مقرر ۳/۱، ۳/۲، ۳/۳ و ۳/۳ (III/3, III/2, III/1) کنوانسیون دارای صلاحیت است.

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 جهت متقاضیانی که از نظر پزشکی از سلامت برخوردار باشند، صادر می گردد.

۳-۱۲ مرکز صدور گواهینامه پزشکی (Medical Fitness Certificate Issuing Center)

به معنای مرکزی است که صدور گواهینامه سلامت پزشکی توسط پزشک معتمد سازمان برای فرد متقاضی انجام می پذیرد.

۳-۱۳ 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.

۳-۱۴ ماه (Month)

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

۳-۱۵ افسر (Officer)

به معنای عضوی از خدمه شناور به غیر از فرمانده است که بر اساس قوانین و مقررات ملی و یا بین المللی انتخاب شده باشد.





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۳-۱۶ سازمان (Ports & Maritime Organization of Iran) (Islamic Republic):

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

۳-۱۷ 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.

۳-۱۸ 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.

۳-۱۹ افسر مهندس دوم (Second Engineer Officer)

به معنای افسر مهندسی است که جانشین افسر سر مهندس است و مسئولیت رانش مکانیکی و عملیات و نگهداری تاسیسات الکتریکی و مکانیکی کشتی را در مواقع عدم توانایی سر مهندس بر عهده دارد.

۳-۲۰ کنوانسیون (STCW Convention)

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

۳-۲۱ آئین نامه ی کنوانسیون (STCW Code)

به معنای آئین نامه ی آموزش، صدور گواهینامه ها و نگهبانی دریانوردان (STCW) که طی قطعنامه ی شماره ۲ کنفرانس 1995 تصویب که ممکن است توسط سازمان بین المللی دریانوردی بر اساس اصلاحیه های بعدی تغییر یابد.

۳-۲۲ سفرهای نامحدود (Unlimited Voyages)

به معنای سفرهای بین المللی که محدود به سفرهای نزدیک به ساحل نباشد.





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۴- مسئولیت ها

- ۴-۱- مسئولیت بازنگری این دستورالعمل بر عهده دستگاه نظارت مرکز (اداره استانداردهای دریانوردان) می باشد.
- ۴-۲- مسئولیت تایید صلاحیه ها به این دستورالعمل بر عهده اداره کل امور دریانوردان می باشد.
- ۴-۳- مسئولیت تصویب صلاحیه 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 (اداره استانداردهای دریانوردان) می باشد.

۵- روش اجرا

۵-۱- هدف از برگزاری دوره آموزشی

هدف از برگزاری دوره آموزشی ، آماده نمودن فراگیران برای کسب توانمندی های مندرج دریند ۲-۶-۵ این دستورالعمل می باشد.

۵-۲- طول دوره

۵-۲-۱- طول دوره حداقل ۴۰۸ ساعت که شامل ۳۱۶ ساعت به صورت نظری (تئوری) ، ۲۰ ساعت عملی و ۷۲ ساعت تمرین می باشد.

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





سازمان بازرسی دریانوردی

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۳-۵- تعداد شرکت کنندگان در دوره

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

۲-۳-۵- در صورت افزایش حداقل فضا، تجهیزات و امکانات مرتبط کمک آموزشی بر اساس دستورالعمل نحوه 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.

۴-۵- شرایط ورود به دوره

۱-۴-۵- دارا بودن گواهینامه مهندس دوم بر روی کشتیهای با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نا محدود و یا گواهی موفقیت آمیز طی دوره فوق.

۲-۴-۵- دارای گواهینامه سلامت پزشکی معتبر بر اساس دستورالعمل مصوب سازمان

۵-۵- دانش، درک و مهارت مورد انتظار

۱-۵-۵- کسب اطلاعات کافی در خصوص راه بری نیروی انسانی و ماشین آلات موتور خانه

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

۳-۵-۵- کسب توانایی بر عهده گیری مدیریت مستقل فنی کشتی در غیاب افسر سر مهندس

۴-۵-۵- کسب مهارت در اتخاذ تدابیر لازم و عملی به جهت پیاده سازی قوانین ایمنی

۵-۵-۵- کسب مهارت در اتخاذ تدابیر لازم به جهت حفاظت از محیط زیست

۶-۵-۵- کسب توانایی در مدیریت و پیاده سازی دستورات مافوق و ایجاد ارتباط در محیط کاری و همچنین

آموزش نفرات تحت نظر





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دستورالعمل اجرایی برگزاری دوره آموزشی تطبیقی سمت افسر مهندس دوم بر روی کشتی های با قدرت رانش ≥ 3000 کیلووات یا بیشتر - سفرهای نامحدود
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۶-۵- عناوین دروس و ریز مواد درسی

عناوین دروس و ریز مواد درسی مربوطه برای داوطلبین دوره آموزش تطبیقی سمت افسر مهندس دوم بر روی کشتی های با قدرت رانش ≥ 3000 کیلووات یا بیشتر- سفرهای نامحدود ، به شرح ذیل می باشد.

۱-۶-۵ حداقل مواد درسی دوره آموزش تطبیقی سمت افسر مهندس دوم بر روی کشتی های با قدرت رانش ≥ 3000 کیلووات یا بیشتر- سفرهای نامحدود ، در بخش انگلیسی این دستورالعمل می باشد.

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:

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

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

۸-۵- شرایط مدرسین و مربیان دوره

مدرسین و مربیان دوره های آموزشی مندرج در این دستورالعمل می بایست علاوه بر گذراندن دوره مدرسین و ممتحنین دریانوردی (TFT) و آشنایی با اصلاحیه ۲۰۱۰ مانیل به کنوانسیون مورد تأیید سازمان، دارای حداقل مدارک و تجارب مشروحه زیر باشند:

۱-۸-۵- مدرسین

۱-۸-۵-۱- دارای گواهینامه معتبر شایستگی افسر سرمهندس بر روی کشتی های با قدرت رانش ≥ 3000

کیلووات یا بیشتر- سفرهای نامحدود و دو سال خدمت دریایی در آن سمت و یا یک سال خدمت

دریایی در سمت سر مهندس بر روی کشتی های با قدرت رانش ≥ 3000 کیلووات یا بیشتر -

سفرهای نامحدود و همچنین دارای یک سال تجربه تدریس دوره های مهندسی دریایی باشد.





کد مدرک : P6-W98/1
شماره صفحه : ۱۱ از ۱۲

دستورالعمل اجرایی برگزاری دوره آموزشی تئوریک سمت افسر مهندس دوم بر روی کشتی‌های با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نامحدود
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۵-۸-۱-۲- جهت آرایه مواد درسی الکتروتکنولوژی دریایی این دستورالعمل دارندگان مدرک فوق لیسانس مرتبط یا گواهینامه معتبر شایستگی افسر مهندس الکترونیک که حداقل ۳ سال بر روی کشتی‌های با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نامحدود خدمت نموده اند، می توانند مدرس بخشهای الکتروتکنولوژی دریایی باشند.

۵-۸-۱-۳- دارندگان مدرک فوق لیسانس در رشته های معماری و سازه کشتی ویا فرمانده بر روی کشتی های با ظرفیت ناخالص ۳۰۰۰ یا بیشتر سفر های نامحدود با حداقل ۱۲ ماه خدمت دریایی در آن سمت می توانند مدرس بخشهای آرشیتکت کشتی باشند.

۵-۸-۲- مریبان

۵-۸-۲-۱- گواهینامه معتبر شایستگی مهندس دوم بر روی کشتیهای با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نامحدود و حداقل ۱۲ ماه خدمت دریایی در آن سمت یا.

۵-۸-۲-۲- لیسانس مرتبط (مهندسی کشتی، مهندسی کشتی سازی یا مهندسی مکانیک) با حداقل ۲ سال تجربه کاری .

۵-۸-۲-۳- برای آرایه دروس "برق عملی" دارندگان گواهینامه شایستگی افسر مهندس الکترونیک با ۱۲ ماه خدمت دریایی در آن سمت یا لیسانس برق با دو سال تجربه کاری مورد نیاز می باشد.





دستورالعمل اجرایی برگزاری دوره آموزشی تئوریک ست انفرمنندس دوم بر روی کشتی های با قدرت رانش ... ۳۰۰ کیلووات یا بیشتر - سرفای نهمدد
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۵-۹- ارزیابی و صدور گواهینامه

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

۵-۹-۲- متعاقبا اداره امتحانات و اسناد دریانوردن سازمان (در تهران و یا بنادر) 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.

۵-۱۰- 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.

۵-۱۱- روش تأیید دوره

بر اساس مفاد مندرج در دستورالعمل نحوه صدور مجوز و نظارت بر اجرای دوره ها در مراکز آموزش دریانوردی.

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- دستور العمل اجرایی برگزاری دوره آموزشی و آزمون های شایستگی دریانوردی سمت افسر مهندس دوم بر روی کشتی های با قدرت رانش ۳۰۰۰ کیلووات یا بیشتر - سفرهای نامحدود.

۷-۲- دستورالعمل صدور مجوز و نظارت بر اجرای دوره ها در مراکز آموزشی دریانوردی.

۸- ضمیمه

ندارد





PMO

The Code of Practice for Conducting Second Engineer Officer on Ships of $KW \geq 3000$ Engaged on Unlimited Voyage Upgrading Training Course

P6-W98

Revision No.	Date of revision	Comment on revision	Draft provider	approving amendments authority	endorsing amendments authority
1	2014/07/28	STCW Convention, as amended	Head of Seafarers' Standards' Directorate	Director General of Seafarers' Affairs <i>H. Mirzaei</i>	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 second engineer officer on ships of propulsion power KW \geq 3000 engaged on unlimited voyages upgrading training course" which is applicable after endorsement by the 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 Second Engineer Officer on Ships of Propulsion power $KW \geq 3000$ engaged on Unlimited Voyages upgrading training course.

Scope of application

This code of practice is applicable to all approved training centers that conduct Second Engineer Officer on Ships of Propulsion power $KW \geq 3000$ engage on Unlimited Voyages upgrading training course.

2 Definition

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 Central Monitoring Office

Central monitoring office which is responsible for approving and monitoring training courses is the Seafarer's standard directorate of the PMO.

3-5 Chief Engineer Officer

Means the senior engineer officer responsible for the mechanical propulsion and the operation and maintenance of the mechanical and electrical installations of the ship.





3-6 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

3-7 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.

3-8 Course Completion Certificate or Documentary Evidence

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

3-9 Engineer officer

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

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 Medical fitness certificate Issuing Center

Means a center in which candidates are to be tested medically as per requirement of relevant Code of Practice

3-13 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

3-14 Month

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

3-15 Officer

Means a member of the crew, other than the master, designated as such by national law or regulations or, in the absence of such designation, by collective agreement or custom.





3-16 PMO

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

3-17 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.

3-18 Seagoing service

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

3-19 Second Engineer Officer

Means the engineer officer next in rank to the chief engineer officer and upon whom the responsibility for the mechanical propulsion and the operation and maintenance of the mechanical and electrical installations of the ship will fall in the event of the incapacity of the chief engineer officer.

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 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 5-6-2 of the "code of practice for conducting second engineer officer on ships of $KW \geq 3000$ engaged on unlimited voyage training course

5-2 course duration

- 5-2-1 A minimum of 408 hours which includes 316 theoretical, 20 hours exercise and 72 hours practical 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.





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 certificate of competency as second engineer officer for ships of KW \geq 3000 engaged on unlimited 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 as well as leading working personnel;
- 5-5-2 Proficiency in maintaining machineries in engine room and deck;
- 5-5-3 Ability to manage engine department personnel independently;
- 5-5-4 Proficiency in practicing safeties;
- 5-5-5 Proficiency in practicing and protecting environmental safeties;
- 5-5-6 Ability to manage and practice superior instructions as well as educating personnel under command in working environmental.





5-6 Course Minimum Syllabus (116 hours Theoretical, 20 hours Practical, 48 hours Exercise)

**FUNCTION 4 : MARINE ENGINEERING AT THE MANAGEMENT LEVEL
(36 hrs. T, 1 hr.P)**

Competence 4-1: Manage the operation of propulsion plant machinery (18 hrs.T)

4-1-1-Design features and operative mechanism of the following machinery and associated auxiliaries: (18 hrs.T)

4-1-1-1-Marine diesel engine (4 hrs.T)

4-1-1-1-i-Fuel injection (2 hrs.T)

Knowledge of: Modern VIT systems; Fuel quality setting (FQS); Latest fuel common rail features.

4-1-1-1-ii-Starting and reversing (2 hrs.T)

Knowledge of : Different design of distributors; First and second start concept; Fuel limit; Starting and reversing system malfunctions; Fault tracing and detection.

4-1-1-2-Marine steam turbine (10 hrs.T)

Knowledge of: Steam turbine construction, lubrication; Impulse and reaction turbines; H.P and 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.

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

Knowledge of: Analysis the flow of air and gas through a simple marine gas turbine; Identifying the materials and construction of a gas turbine compressor, combustion system, and turbine for single and two shaft design; Discussing the design features related to maintenance requirements associated with optimum performance of a marine gas turbine plant; Describing with the aid of sketches the operative mechanism of a marine gas turbine (Lubrication system; Fuel system; Starting system; Monitoring and control system; Other ancillary equipment).

Competence 4-2: Plan and schedule operations (4 hrs.T)

4-2-1-Theoretical knowledge (4 hrs.T)

4-2-1-1-Propulsive characteristics of diesel engines, steam and gas turbines, including speed, output and fuel consumption (4 hrs.T)

4-2-1-1-i-Engine Performance (4 hrs.T)

Knowledge of: Propeller curve; Propeller design point; Fouled hull; Sea margin and heavy propeller; Continuous service rating; Engine margin; Constant ship speed lines; Limits for continuous operation; Limits for overload operation; Maximum continuous rating (MCR) and normal continuous rating (NCR).





Competence 4-3: Operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery (14 hrs.T, 1 hr.P)

4-3-1-Practical knowledge (14 hrs.T, 1 hr.P)

4-3-1-1-Operating limits of propulsion plant (1 hr.T)

Knowledge and proficiency in: Following maker's instruction to avoid operation over hazardous limits such as over speed, Over load, Over stress, Vibration and critical speed; Methods of measuring the load capacity of the engine in accordance with technical specifications; Speed increase procedure to avoid thermal and mechanical over stress; Methods of checking performance against bridge orders.

4-3-1-2-Functions and mechanism of automatic control for main engine (12 hrs.T)

4-3-1-2-i-Control fundamentals and systems (10 hrs.T)

Knowledge of: Operational amplifiers; Electrical supply; Controllers and basic control theory (Disturbances and time delays and means to reduce them); Control theory (Changing set points; Basic control system design; First order and second order systems; Transfer functions; Control system stability; Natural frequency and control systems; Time lag and time constant; System response); Tuning (System response; Control loop tuning); Signal transmission systems (Digital communication bus and fibre optic signal transmission systems); Final control elements (Control valve trim; Selecting control valves and their actuators; Valve sizing); Electronic PID controllers (Single loop digital controllers; Manual and automatic tuning of electronic controllers); General requirements of automatic control equipment and safety devices (Monitoring system; Safety system; System independence; Local control; Failure mode and effect analysis; Power supply); Remote control-diesel propulsion (Malfunctions-alarm, engine slow down, engine stop).

4-3-1-2-ii-Main engine control (2 hrs.T)

Knowledge and proficiency in: Main engine control diagrams; Experience in automatic and remote control of main engine; Speed increase; Speed reduction; Crash maneuvering; Safety features including shut down and slow down; Reset of safeties.

4-3-1-3-Functions and mechanism of automatic control for auxiliary machinery including but not limited to: (1 hr.T, 1 hr.P)

4-3-1-3-1-Generator distribution systems (1 hr.T, 1 hr.P)

Knowledge and proficiency in: Instrumentation and safety in main switchboard construction and generator and distribution system ; Reverse power protection; Fault tracing in distribution circuits; Auxiliary diesel generator alarm and shut down; Automatic starting of propulsion auxiliaries; Electrical equipment for tankers and hazardous areas and safety systems.





FUNCTION 5 : ELECTRICAL, ELECTRONIC AND CONTROL ENGINEERING AT THE MANAGEMENT LEVEL (40 hrs.T, 19 hrs.P, 48 hrs.E)

Competence 5-1: Manage operation of electrical and electronic control equipment (24 hrs.T, 6 hrs.P, 48 hrs.E)

5-1-1-Theoretical knowledge (24 hrs.T, 6 hrs.P, 48 hrs.E)

5-1-1-1-Marine electro technology, electronics, power electronics, automatic control engineering and safety devices (9 hrs.T, 1 hr.P)

5-1-1-1-i-Electromagnetism (1 hr.T)

Knowledge of: The effects of magnetic fringing and magnetic leakage; The effect of a nonmagnetic core; How eddy-current loss occurs and design features used to minimize such losses; Necessities for air gap in magnetic circuits and its relative permeability; Comparing electrical and magnetic circuits; Series, parallel and complex magnetic circuits; Application of magnetism in ship control and automation.

5-1-1-1-ii-A.C. Circuit Theory, Power Factor and its improvement (2 hrs.T, 1 hr.P)

Knowledge of: Static and dynamic inductions; The effect of changing current and its associated magnetic flux on the induced e.m.f. in a coil; Power produced by shipboard installations; Self-inductance (L); Henry(H); Induced e.m.f. formula; Inductive reactance (x_L); Instantaneous voltage and current formulas in an A.C. circuit; Average power formula in different circuits; Circuit transient response for active loads; Application of circuit transient response in ships control and instrumentation, e.g., sensors; The effect of different values of inductance and resistance on power consumption; Resonance concepts and its specifications plus its applications in circuits, including communication networks; Resonant frequency and quality factors, wave bands and noise reduction; Ratings of electrical equipment; Active and reactive power components; How resonance can occur in parallel circuits.

Proficiency in: Sketching graphs showing the variation of current, applied voltage and back e.m.f over one cycle when an A.C. is applied to: A choke having inductance; A circuit with only pure resistance; Combining V-I phasor diagrams with impedance, voltage and current phasor diagrams and their corrections; The use of apparent power in practice; Uses the application of phasor summation to solve simple problems in parallel circuits; Methods of obtaining resultant powers and power factor in a multi- load network either single or three phase systems.

5-1-1-1-iii-Cells and Batteries (2 hrs.T)

Knowledge of: IEEE requirements for batteries and control gear installation; The capacity and variation of voltage for different rates of discharge for lead - acid and alkaline batteries of both normal and low - resistance types; Proper operation, handling and maintenance of different types of batteries.





5-1-1-1-iv-Electronics (4 hrs.T)

1-Properties of Crystals (0.5 hr.T)

Knowledge of: The effect of arsenic, phosphorus and boron on silicon crystal.

2-Passive Components (0.5 hr.T)

Knowledge of: The concept of oscillation; A silicon temperature sensor compared to a thermistor.

3-Diodes (0.5 hr.T)

Knowledge of: The fact that diodes are suitable crystals (usually silicon) which have a 'junction' of p-and n-type material.

4-Rectifiers and Rectification (1 hr.T)

Knowledge of: The components of LED circuits and their purposes; Application of LEDs; Comparison between the different types of rectifiers; The purposes of different components in a rectifier circuit; Methods of testing rectifier's diodes while in circuit and while out.

Proficiency in: Sketching curves of voltage and current for a zener diode, light-emitting diode (LED).

5-Transistors (0.5 hr.T)

Knowledge of: Junction or bipolar transistors, and different regions; The forward transfer ratio (h_{fe}); Effect of voltage feedback on amplifier gain; Input-output impedances and impedance matching.

Proficiency in: Sketching a typical circuit diagram for an npn transistor connected in the common-emitter mode; Demonstrating objectives above in the laboratory.

6-Thyristors (SCR) (0.5 hr.T)

Knowledge of: Principle construction of 'triode'; The fact that it is essentially an 'on/off' or switching device, that a thyristor is a large-current small-voltage device, with a very low resistance (only a fraction of an ohm) in its forward, or 'conducting' state; How a 'triac' is constructed.

7-Heat Sinks (0.5 hr.T)

Knowledge of: How safe working temperature of a semiconductor is achieved and controlled.

5-1-1-2-Design features and system configurations of automatic control equipment and safety devices for the following: (4 hrs.T, 3 hrs.P)

5-1-1-2-1-Generator and distribution system (4 hrs.T, 3 hrs.P)





5-1-1-2-1-i-Polyphase Supplies; A.C. Generators; Automatic Voltage Regulation and A.C. Switchgear (Main Circuit Breaker); Generators Protection; Synchronizing and Load Sharing (2 hrs.T, 1 hr.P)

Knowledge of: The effect of the following loads on power factor: Filament lighting; Heating; Induction motors; Fluorescent lighting; Transformers; Partly loaded motors; Cage - type motors; All safety rules and regulations, minimum required values and setting for marine generators in various classification societies; A.V.R. performance, trouble- shootings, rules, regulations, settings, care and maintenance; The main criteria governing the operation of a circuit breaker; Possible internal generator faults and appropriate action; Using generator load test characteristics speed/ active power and voltage/ reactive power to explain: flat, isochronous and drooped sharing of load; All requirements regarding droop; Automatic and manual load sharing processes; Effects of loss of excitation, loss of fuel and overall power factor altering on a good and proper load sharing.

Proficiency in: Carrying out routine checking on trips.

5-1-1-2-1-ii-Cables (1 hr.T, 1 hr.P)

Knowledge of: Comparing continuous A.C. current ratings of single core cable with different insulating materials; Cables care and maintenance.

Proficiency in: Attempts practically for calculating current carrying capacity of ship cable for continuous operation or calculating the cable cross sectional areas on tables given in various classification societies.

5-1-1-2-1-iii-Lightings and lamps (1 hr.T, 1 hr.P)

Knowledge and proficiency in: The navigation lights circuit, rules and regulations and surveying; The Stereo- boscopic effect relating to fluorescent lamps and the methods of minimizing it.

5-1-1-3-Design features and system configurations of operational control equipment for electrical motors (7 hrs.T, 2 hrs.P)

5-1-1-3-i-D.C.Motors, A.C. (Induction) Motors, Motor Control & Protection

(1 hr.T, 1 hr.P)

D.C. Motors:

Knowledge of: D.C. motors application on deck machinery; Braking D.C. motors: frictional, dynamic action and plugging types; Modern methods of D.C. motors speed control.

A.C. Motors:

Knowledge and proficiency in: Principle of starting and speed control; Max. starting and running torques; Supply voltage reduction on running and starting torques; All losses occurring in induction motors; Typical problems, their causes and remedies; The need for separate temperature- sensing devices; Effect of running an induction motor on reduced voltage; Magnetic brake, its types, application, and simple diagram; Ingress protection codes by their standard chart and application; Differential protection relay and its usage; How back protection is carried out for induction motors;





Function of a high- rupturing - capacity (HRC) fuse; Situations where miniature circuit breakers (MCB s) are used, their maximum capacity and how both overload and short circuits are handled; Range of capacity of molded - case circuit breakers (MCCBs); Criteria which influence the selection of fuses for, motor circuit protection.

5-1-1-3-ii-Transformers as Static A.C. Machines (1 hr.T, 1 hr.P)

Knowledge and proficiency in: How essential supplies can be ensured with a star/ delta transformer; Why three single - phase transformers are sometimes used in place of one three- phase transformer; Why delta- delta 3Ph- transformer is the best suited for marine use; Magnetic amplifiers, static and rotary types.

5-1-1-3-iii-Deck Machinery (4 hrs.T)

Knowledge and proficiency in: Machinery used for lowering loads are fitted with a fail - safe brake system; Principles of coil - operated brake suitable for winches and other deck machinery; How speed of lowering is controlled on the cable lifter of a windlass; How excessive forces on the cable are avoided when lifting the anchor; The need for the various speeds of a windlass; How dynamic braking is applied to the slewing movement; The principle of the swinging- derrick cargo- handling system; Factors influence drum speed; Given a basic circuit for a potentiometer control; Indicating the different speed connections when: lifting, lowering, in the off position with dynamic braking; The purpose of a load discriminator, reverse - delay relay, voltage lock- out, contactor lock - out, torque - limit relay, time- delay relay; Field control and voltage control methods on speed control; Application of the ward - Leonard system to the control of deck machinery; The function of booster control, a reducer, Warping winches and capstans; The purpose and setting of a torque - limit relay in the control; System of a warping winch or capstan, including the provision for emergency heavy pulls; Speed variation necessary when handling slack ropes; A.C. systems used for winch controls; Possible effect on the generators if direct on - line cage motors are used for winches; Principle of a three- speed cage winch motor; How the cage motor has been applied to windlass operation; Control arrangement of a capstan drive using a two - speed cage motor; Principle of a slip- ring motor drive to a warping winch, including: Reversing, overload, torque limiting, speed control, fail - safe braking; Electrical steering system on board, including: Manual and Automatic steering of a vessel; Electronic methods of speed control; The PWM frequency converter and its power components; Development of Ward- Leonard system in various fields, such as position control and velocity or rate control; All safety, care and maintenance aspects of deck- machinery.

5-1-1-3-iv-Insulation Testing (1 hr.T)

Knowledge of: The drying out procedure for machines which have been accidentally exposed to, or immersed in, seawater, referring to: Ventilation, maximum temperature, heat source, internal heating, recording insulation resistance and temperature, variation of insulation resistance during the drying time, acceptable insulation resistance; Insulation classes together with ambient and hot spot temperatures with methods of measuring them.

5-1-1-4-Design features of high-voltage installations (4 hrs.T)

Knowledge and proficiency in: Economical necessities for large ships and their standards common at 3.3, 6.6 and even 11 Kv; Reduction of size of conductors and current value; Distribution system types on such H.V ships; Systems working at 3.3 KV are normally designed to operate with an





earthed neutral via a resistor; Normal limit allowed for an earth- fault current; Sketches arrangement of earthing with resistors for a 3.3 KV system; A mixed system of earthing; Electric propulsion system; Synchro-convertors and cyclo-convertors; Functional, operational and safety requirements for a marine high-voltage system; Assigning qualified personnel to carry out maintenance and repair of high-voltage switchgear of various types; High voltage system advantages; Advantages of an insulated system; High voltage circuit breakers; Cable; Fuses; Remedial action necessary during faults in a high-voltage system; Switching strategy for isolating components of a high-voltage system; Selection of suitable apparatus for isolation and testing of high-voltage equipment; Switching and isolation procedure on a marine high-voltage system, complete with safety documentation; Performance of insulation resistance and polarization index on high-voltage equipment.

5-1-1-5-Features of hydraulic and pneumatic control equipment (48 hrs.E)

1-Hydraulic Control Equipments (24 hrs.E)

Knowledge and proficiency in: System components; Hydraulic circuits; Hydraulic system fitting and maintenance; Describing with the aid of computer aided drawing or workshop facilities the operation of conventional electro-hydraulic marine type crane incorporated with P.L.C.; Describing the function of each component in the system; Fault finding and possible remedies.

2-Pneumatic Control Equipment (24 hrs.E)

Knowledge and proficiency in: Pneumatic circuits; Pneumatic system fitting and maintenance components and troubleshooting; Describing with the aid of computer aided drawing or workshop facilities the principle operation of electro-pneumatic control systems of Main engine, auxiliary engine and etc.

Competence 5-2: Manage trouble-shooting, restoration of electrical and electronic control equipment to operating condition (16 hrs.T, 13 hrs.P)

5-2-1-Practical knowledge (16 hrs.T, 13 hrs.P)

5-2-1-1-Troubleshooting of electrical and electronic control equipment (7 hrs.T, 5 hrs.P)

5-2-1-1-i-Electric Shock and Electrical Interference (1 hr.T, 1 hr.P)

Knowledge and proficiency in: Signal interference and shielding resulted in low level signal of many sources e.g. fluorescent lamps, switching power supplies, motors, radio transmitters or even faulted grounding (ground-loop interference); Types of equipment susceptible to interference; Common sources of interference; Typical examples of ship's cables susceptible to interference and the necessary precautions; Main points of maintenance of equipment and cabling to preserve compatibility; Capacitive interference and its minimizing.

5-2-1-1-ii-Ships Electrical Surveying Requirements (1 hr.T)

Knowledge and proficiency in: The importance of relevance electrical surveying; Items which are electrically under surveying with their time intervals; All the guide-notes of surveying for: Generators, circuit breakers and switch boards, protection relays, cables, insulation resistance,





motors and starters, emergency power supply equipments, steering gear, navigation lights, unattended machinery spaces (UMS) ships, tankers and their hazardous areas.

5-2-1-1-iii-Tankers (1 hr.T)

Knowledge and proficiency in: The dangerous or hazardous spaces of a tanker; Requirement for lighting in a pump- room; Recommendations for tankers carrying cargoes with a closed - cup flash point in excess of 60° C; Selection of type of protection according to hazardous areas; Imbalance of lead and return wires of a circuit with respect to earth; What are certification bodies, certification bodies overseas and equipment identification tags.

5-2-1-1-iv-Test Equipment (1 hr.T, 1 hr.P)

Knowledge and proficiency in: Practical use of meggers, multimeters and CRO; Care and precautions for carrying out open, short and insulation measurement test.

5-2-1-1-v-Logical six step troubleshooting procedure (1 hr.T, 1 hr.P)

Knowledge and proficiency in: Symptom identification; Symptom analysis; Probable faulty function; Localizing of faulty function; Localizing trouble to circuit; Failure analysis.

5-2-1-1-vi-Calibrate & Adjust Transmitters & Controllers (1 hr.T, 1 hr.P)

Knowledge and proficiency in: Differential pressure transmitter calibration; Electronic temperature transmitter calibration; The operation of a PID controller; Tuning a PID controller; Governors and controllable pitch propeller control; Tests, faults, and remedies.

5-2-1-1-vii-Control System Fault Finding (1 hr.T, 1 hr.P)

Knowledge and proficiency in: Fault finding methods; Governor faults; Evaluation and rectification of common control systems; Testing alarm and monitoring systems; Electric power supply for control systems.

5-2-1-2-Function test of electrical, electronic control equipment and safety Devices (1 hr.T, 1 hr.P)

Knowledge and proficiency in: Function test of Over Current Relay (OCR), Relays and magnetic contactors, Timers, Fuses, MCCB, ACB, Diodes, Silicon Controlled Rectifier (SCR), Temperature, Pressure and Level transmitters, Over speed Protection Devices, Flame Scanners and Fire Detecting System.

5-2-1-3-Troubleshooting of monitoring systems (2 hrs.T, 2 hrs.P)

5-2-1-3-i-General requirements (1 hr.T, 1 hr.P)

Knowledge and proficiency in: Sequential monitoring; Computer data storage; Data logging and VDU displays; Assessment of operating condition and automatic adjustment; Machinery condition monitoring; Alarm system, with automatic reset; Manual reset; Lock in means; Time delay; Event recorder and first in flooding alarm.





5-2-1-3-ii-Test and calibrations of sensors and transducers of monitoring system(1 hr.T, 1 hr.P)

Knowledge and proficiency in: Testing and calibration of pressure sensor and transducer, temperature sensor and transducer, flow sensor and transducer, level sensor and transducer, tachometer sensor and transducer, viscometer sensor and transducer.

5-2-1-4-Software version control (6 hrs.T, 5 hrs.P)

5-2-1-4-i-General requirements (1 hrs.T)

Knowledge of: Typical safety systems; Machinery auto start-up; Reduction of power; Shut downs; Level detections; Safe programmed policies and calibration or pre-settings; All With on board testing and maintenance following rules and regulations.

5-2-1-4-ii-Programmable logic controllers (PLC) (2 hr.T, 2 hr.P)

Knowledge and proficiency in: Basic of PLC operation; Comparison between hard-wired and programmable control operation; Advantages of PLCs; Binary number conversion; Digital logic gates and its practical application; Inputs and output modules and configuration of PLCs; Understanding of ladder logic and PLCs programming; Human machine interface (HMI) and alteration of parameters in the program; Basic software version and control of access; Maintenance of Electronic Control Equipment and PLC Controlled processes; Checking the program validity and faultfinding and restoration of process with the help of PLCs.

5-2-1-4-iii-Microcontrollers (1 hr.T, 1 hr.P)

Knowledge and proficiency in: Introduction to microcontroller; Basics of microcontroller; Analog to digital convertor; Digital interfaces; Serial peripheral interface; Communication with PC; Code integration.

5-2-1-4-iv-Digital Techniques (2 hr.T, 2 hr.P)

Knowledge and proficiency in: Basic Logic gates and derived Logic gates, Boolean algebra; Principles and operation of digital integrated circuits (TTL and CMOS), adders, flip flops, registers, counters, multiplexers, encoders and decoders; Memories, RAM, ROM, PROM, EPROM, UV PROM; Microprocessors, principles of operation, input/output functions, application in marine control systems, programs, alteration of values; Single integrated circuit containing a processor core, memory, and programmable input/output peripherals; Program memory in the form of NOR flash or OTP ROM is also often included on chip and RAM; Microcontrollers- designed for embedded applications and real time response to events; Typical input and output devices- switches, relays, solenoids, LEDs, radio frequency devices, and sensors for data such as temperature, humidity, light level etc.; Description and use of General Purpose Input/ Output pins (GPIO); Analog-to-digital convertor (ADC); Digital-to-analog convertor (DAC).





FUNCTION 3 : CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR PERSONS ON BOARD AT THE MANAGEMENT LEVEL (40 hrs.T)

Competence 3-1: Control trim, stability and stress (1 hr.T)

3-1-1-Knowledge of IMO recommendations concerning ship stability

3-1-1-i- Damage control (1 hr.T)

Knowledge of: International Code of Intact Stability 2008 (2008 IS code); Damage control plan; AA max.

Competence 3-2: Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea, security and protection of the marine environment (4 hrs.T)

3-2-1-Knowledge of relevant international maritime law embodied in international agreements and conventions, Regard shall be paid especially to the following subjects: (4 hrs.T)

3-2-1-1-Certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and the period of their legal validity (1 hr.T)

Knowledge of: ISM related certificates; How each certificate may be obtained and the period of their validity.

3-2-1-2-Maritime declaration of health and the requirements of the International Health Regulations (2 hrs.T)

Knowledge of: The International Health Regulations (IHR), as an international legal instrument; The Member States of world Health Organization (WHO); International community responds to acute public health risks that have the potential to cross borders and threaten people worldwide; Entry into force; Require countries to report certain disease outbreaks and public health events to WHO; Building on the unique experience of WHO in global disease surveillance, alert and response; The rights and obligations of countries to report public health events, And establish a number of procedures that WHO must follow in its work to uphold global public health security.

3-2-1-3-Responsibilities under international instruments affecting the safety of the ships, passengers, crew or cargo (1 hr.T)

Knowledge of: International convention on standards of training, certification and watch keeping for seafarers 1978, as amended by the resolution 1 of the 1995 conference (STCW 95), as amended by the 2010 conference (STCW 2010) updates.

Competence 3-3: Maintain safety and security of the vessel, crew and passengers and the operational condition of life-saving, firefighting and other safety systems (3 hrs.T)

3-3-1-A thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea) (3 hrs.T)





3-3-1-1-Organization of fire and abandon ship drills (2 hrs.T)

Knowledge and understanding of: Importance of fire and abandon ship drills; Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month; Limitations of these drills when 25% of the crew have not participated in abandon ship and fire drills on board that particular ship in the previous month; Abandon ship and fire drills should be organized and managed in such a manner that fulfill requirements of SOLAS convention; Fire drills should be planned in such a way that due consideration is given to regular practice in the various emergencies that may occur depending on the type of ship and its cargo; The equipment used during drills shall immediately be brought back to its fully operational condition, and any fault and defects discovered during the drills shall be remedied as soon as possible; The drills shall be organized, as far as practicable, as if there were an actual emergency.

3-3-1-2-Actions to limit damage and save the ship following fire, explosion, collision or grounding (1 hrs.T)

Knowledge and proficiency in: Contingency plans for response to emergencies; Means of limiting damage and salvaging the ship following a fire or explosion; Procedures for abandoning ship.

Competence 3-4: Use leadership and managerial skills (32 hrs.T)

3-4-1-Knowledge of shipboard personnel management and training (4 hrs.T)

Knowledge of: 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; Management; Functions, characteristics and skills of engineers, supervisor and managers; Crew management; Staff appraisal; Training needs analysis; Planning and organization of training programs; Training methods; Debriefing after training exercises; Evaluation of training programs; Maintenance techniques; Machinery maintenance, surveys planning and organization; An insight into Reliability Centered Maintenance.

3-4-2-Ability to apply task and workload management, including: (8 hrs.T)

3-4-2-1-Planning and coordination (2 hrs.T)

Knowledge of: Main elements and objectives of maintenance planning; Minimum requirements for a maintenance planning; Planning based on maintenance books and planning on board; Planning in preparation for emergency action.

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

Knowledge of: Methods of evaluating personnel abilities, assignment of different maintenance jobs to carry out by competent personnel, preparation for maintenance.





3-4-2-3-Time and resource constraints (2 hrs.T)

Knowledge and proficiency in: Fuel consumption; Off hire; Port time class survey; 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.

3-4-2-4-Prioritization (2 hrs.T)

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

3-4-3-Knowledge and ability to apply effective resource management: (10 hrs.T)

3-4-3-1-Allocation, assignment, and prioritization of resources (2 hrs.T)

Knowledge of: Resources allocated and assigned as needed in correct priority to perform necessary tasks; Type and scale of the tasks; Actions conforming to the emergency procedures and contingency plans for the ship, in order of priority, 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.

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

Knowledge of: English language to enable the officers to use makers' manuals and to perform engineering duties; Communicating clearly and to understand others; Transmitting information relating to machinery components by means of simple drawings with supplementary notes and specifications; Verbal and non-verbal communication; Report writing; Presentation; Group discussion; Meetings.

3-4-3-3-Decisions reflect consideration of team experience (2 hrs.T)

Knowledge of: Current and predicted engine room and associated systems condition, and of external environment; Team working; Group dynamics; Approaches to team building committees.

3-4-3-4-Assertiveness and leadership, including motivation (2 hrs.T)

Knowledge of: Assessment of personnel competence and capabilities and operational requirements with effective leadership behaviors in order to tackle the jobs.

3-4-3-5-Obtaining and maintaining situation awareness (2 hrs.T)

Knowledge and proficiency in: Operation of the propulsion plant under control during any situation; Response to bridge maneuvers at any time; Switchboard parameters at a normal value and to keep electrical power available for ship and bow-thruster; Different pumping systems; To inform the bridge or a superior officer of any abnormal situation; The main and auxiliary machinery for maneuvering operations; Manage boiler operation during maneuvering; Determine order of priority among problems encountered; Resolve problems in an orderly manner; Write appropriate entries in a log book and notice unusual readings; Write appropriate entries in the Oil Record Book;





Manually bring the electrical power system back to working order after a power failure; Bring the propulsion system back on line after a power failure; Transfer controls from bridge to engine room.

3-4-4-Knowledge and ability to apply decision-making techniques: (8 hrs.T)

3-4-4-1-Situation and risk assessment (2 hrs.T)

Knowledge of: Potential risk on board; 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 operational circumstances and personal resource.

3-4-4-2-Identify and generate options (2 hrs.T)

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

3-4-4-3-Select course of action (2 hrs.T)

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

3-4-4-4-Evaluation of outcome effectiveness (2 hrs.T)

Knowledge of: Review of the effectiveness of risk assessment; Periodical evaluation of implementation of the risk assessment and risk control; Updating safety and health information related to tasks.

3-4-5-Development, implementation, and oversight of standard operating Procedures (2 hrs.T)

Knowledge of: Project planning and controlling processes, GANTT charts, Critical Path Method, Program Evaluation and Review Techniques; Application of Fault Tree Analysis and similar Reliability Engineering; Techniques to solve practical shipboard problems.





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 .

5-7-3- Mechanical laboratory

- 1- Small scale refrigeration unit with sufficient instrumentation to determine the condition of the refrigeration at important stages.
- 2- Laboratory equipment to perform common tests and analysis on fuels and lubricating oils.
- 3- Testing machine for testing tensile, hardness, impact, fatigue, creeping and torsion.
- 4- Non-destructive test bench for dye penetrate, magnetic particle tests, radio graphic and ultrasonic crack detection.
- 5- Valves: Diaphragm-operated control valve with motor, correcting element and positions, miter valve, vee-ported valve, piston actuator, butterfly valve, wax-element control valve, solenoid valve.

Controllers: Working models to demonstrate the production of:

- a- Proportional control
- b- Integral action
- c- Derivative action

5-7-4- Electrical and electronic engineering laboratory/ workshop

A.C and D.C electrical power supplies, ammeters and voltmeters with appropriate shunts, etc. to extend their range; instruments incorporating the Wheatstone bridge, potentiometers, multiunit indicators and recorders, thermocouples, ohm-meters, insulation and continuity testers, multimeters, oscilloscopes, a selection of insulating materials, a selection of open-front and dead-front switchboards, reverse-current trips, preferential trips, instruments or trips, a selection of resistors, inductors and of capacitors, a synchronous A.C generator, induction motors, an A.C switchboard, an A.C circuit breaker, ammeter and voltmeter transformers, a selection of semiconductors (to include diodes, transistors, thyristors, rectifiers, etc.), connector blocks, connecting wire, switches, circuit boards, commercially produced training kits, A.C motor starters and a speed controller, a shore supply connection box, a selection of cables, examples of watertight, hose proof, waterproof deck watertight and submersible motors, a selection of D.C motors, starters and a charging system, samples of equipment for which the safety levels are flameproof, explosion proof increased safety, intrinsically safe and pressurized.





5-7-5- Instrumentation laboratory and workshop

- 1- Thermometers and pyrometers: Mercury in steel, vapor-pressure, gas-filled, bimetallic, resistance, thermistor-type, thermocouple.
- 2- Manometers: Wide-cistern, inclined-tube, mercury.
- 3- Pressure gauges: Bourdon tube, diaphragm, Schaffer, differential twin bellows, strain gauge, pressure gauge testing equipment.
- 4- Level-measuring devices: Float, probe element, displacement chamber, pneumaticator gauge.
- 5- Flow measurement: Rotometer.
- 6- General: mechanical tachometer, viscometer, a detector using a photoelectric cell, i.e.
 - a- For oil in water
 - b- For smoke density
 - c- For oil mist
 - d- For flame
- 7- Selection of fire detectors, explosive gas detector, oxygen analyzer, CO₂ analyzer, relative humidity meter, sectioned pneumatic transducer with negative feedbacks, pneumatic receiver integrator.

5-8 Lecturers and instructors minimum qualifications

Lecturers and instructors shall have completed a course in instructional techniques (TFT) and familiarization training on 2010 Manila amendment in one of the training centers approved by the PMO, and;

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

5-8-1-1 For lecturing theoretical subjects mentioned in this code of practice as mentioned in chart 5-6-1 column 1, 2, 3 and 4 lecturers must possess valid chief engineer certificate of competency for ships of $KW \geq 3000$ engaged on unlimited voyages as well as having one year of seagoing service in that rank.

5-8-1-2 For lecturing electro-technology subjects as mentioned in this code of practice lecturers must possess at least relevant Master of Science degree or have valid electro technology certificate of competency with three years of seagoing service experiences on ships of $KW \geq 3000$ engaged on unlimited voyages.

5-8-1-3 holders of Master of Science degree in ship architecture and shipbuilding or Master certificate of competency for ships of $GT \geq 3000$ engaged on unlimited voyages can be assigned in teaching ship stability and ship construction subjects.

5-8-2 for delivering practical training should;

5-8-2-1 have minimum second engineer valid certificate of competency for ships of $KW \geq 3000$ engaged on unlimited voyages as well as having one year of seagoing service in that rank.

5-8-2-2 Possess minimum Bachelor of Science in mechanical or ship building engineering with minimum two years of working experiences.





5-8-2-3 For electro-technology practical subjects possess electro-technology certificate of competency and 12 month of seagoing service experience or have minimum relevant Bachelor Science degree and two years of working experiences.

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 subsequently, in accordance with provisions of the "Codes of practices for issuing, revalidating and renewing certificates of competency and certificates of proficiency for seafarers" and upon completion of application form and payment of relevant fee, a certificate of competency will be issued by the Seafarers Examinations and Documents Directorate of the PMO.

5-10 revalidation/renewal of certificates

CoPs and CoCs will be revalidated and renewed in accordance with provisions of the Code of practice for issuing, revalidation and renewal for certificate of competency and certificates of proficiency for seafarers.

5-11 course approval

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

6- Records

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 second engineer officer on ships of $KW \geq 3000$ engaged On unlimited voyage training course and competency assessments.
- 7-3 Code of practice for issuing revalidating and renewing certificates of competency and certificates of proficiency for seafarers.

8- Appendixes

Nil

