

1. Title	Supervise the repairs of high-speed engines and water-jet propellers for ships
2. Code	EMSRRM406A
3. Range	Apply the knowledge of repairing high-speed engines and water-jet propelling equipment to formulation of inspection procedures, and lead working groups to perform tasks of inspection and carry out frontline management duties so as to ensure normal operation of engine units.
4. Level	4
5. Credit	9
6. Competency	<p style="text-align: center;"><u>Performance Requirements</u></p> <p>6.1 Know about the structure of high-speed engines and water-jet propellers for ships</p> <p style="text-align: center;"><u>High-speed engines (1500RPM or above)</u></p> <ul style="list-style-type: none"> <li>◆ Understand the basic design concept and structural characteristics of high-speed engines for ships, such as assembly structure and drive mode</li> <li>◆ Understand the overall layout of high-speed engines and operation of high-speed ships, such as engine positions and channel connection of different systems</li> <li>◆ Master the processing characteristics and operating principles of the main components of high-speed engines for ships, such as bases, shafts, cranks, bearing, camshafts and axle drive</li> </ul> <p style="text-align: center;"><u>Water-jet propellers, such as water-jet and turbine</u></p> <ul style="list-style-type: none"> <li>◆ Understand the working principles and technical specifications of water-jet propellers, such as sizes and output of impeller blades</li> <li>◆ Master the overall layout of water-jet propellers and the names and functions of main components, including rudder control handle, stern frame seal, backflow device, sucking sheath, steering nozzle</li> <li>◆ Understand the specifications of the control system of water-jet propellers, such as steering adjustment, hydraulic operation, reverse control, electronic module operation and position adjustment</li> </ul> <p>6.2 Inspection items and methods for high-speed engines and water-jet propellers</p> <ul style="list-style-type: none"> <li>◆ Interpret and follow the technical instructions of operation and repair manuals, such as layout plans, technical data, specification sheets, control circuits, light signals and instrument information</li> <li>◆ Record repair data properly, such as the operation hours and working conditions of main components, and identify the sections which usually fail according to instructions and preventive measures against damage</li> </ul>

	<p data-bbox="386 1323 730 1480">6.3 Professionalism in repairing high-speed engines and water-jet propellers for ships</p> <ul style="list-style-type: none"> <li data-bbox="778 248 1469 450">◆ Identify the impact of the accessory devices of the high-speed engine, such as turbocharger, air filtration, fresh water circulation, sea water circulation, fuel oil supply, oil filtration, dipstick and centre cooling systems, on the failure of the main machine</li> <li data-bbox="778 461 1469 999">◆ Survey, calibrate, maintain and repair the high-speed engine units of ships according to appropriate measures and procedures and repair manual instructions, including: <ul style="list-style-type: none"> <li data-bbox="836 584 1398 651">• Removing and reassembling the foundation and chassis</li> <li data-bbox="836 674 1453 875">• Repairing and replacing cylinder heads, cylinder sleeves, pistons, pressure rings, oil rings, shaft dowel pin, links, valve gear, speed governors, auxiliary drives, collection cavities, supercharged coolers and turbochargers</li> <li data-bbox="836 887 1430 999">• Maintaining and inspecting the systems related to discharging, lubrication, cooling, starting , fuel and instruments</li> </ul> </li> <li data-bbox="778 1010 1453 1167">◆ Understand the drive arrangements of the engines and water-jet propellers for ships, such as the normal positions relating to alignment of slave axis and axial line and speed relay</li> <li data-bbox="778 1178 1461 1290">◆ Master the proper procedures of removing, repairing, replacing, calibrating and assembling the main components of water-jet propellers for ships</li> <li data-bbox="778 1323 1461 1816">◆ Make the following preparations for maintaining, repairing and replacing the parts of high-speed engines and water-jet propellers for ships <ul style="list-style-type: none"> <li data-bbox="836 1447 1461 1559">• Selecting appropriate instruments, materials and parts according to manufacturer’s instructions and repair requirements</li> <li data-bbox="836 1570 1445 1682">• Referring to installation and maintenance guidelines and implementing appropriate activities for maintenance and repairs</li> <li data-bbox="836 1693 1286 1738">• Assessing the urgency of repair items</li> <li data-bbox="836 1749 1414 1816">• Arranging repair procedures and coordinating the efforts</li> </ul> </li> <li data-bbox="778 1827 1430 1939">◆ Examine the consumption of general components, machinery, devices, equipment and control modules and give advice on repairs if necessary</li> <li data-bbox="778 1951 1142 1995">◆ Compile simple repair reports</li> </ul>
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7. Assessment Criteria	<p>The integrated outcome requirements of this unit of competency are:</p> <ul style="list-style-type: none"> <li>(i) Capable to select and use appropriate methods to examine the worn-out components of high-speed engines and water-jet propellers for ships and adopt appropriate measures to survey, calibrate, and repair the damaged sections;</li> <li>(ii) Capable to interpret the instructions of the installation and repair manuals and follow light signals and use appropriate instruments to identify the failures of high-speed engines and water-jet propellers; and</li> <li>(iii) Capable to select and use appropriate instruments, materials and parts to implement regular maintenance and preventive repairs for high-speed engines and water-jet propellers for ships according to instructions.</li> </ul>
8. Remarks	<p>The credit value of this unit of competency is set on the presumption that the person already possesses basic knowledge and techniques of mechanics and repairing internal combustion engines, and medium and high-speed diesel engines (such as EMSRRM208A “Repair diesel engines” and EMSRRM308A “Repair protection and indication devices of diesel engines”).</p>