

1. Title	Repair and maintain marine electrical equipment and systems
2. Code	EMSRRM306A
3. Range	Apply the techniques and knowledge of repairing marine electrical equipment to tasks of inspecting and replacing electrical system on ships so as to ensure reliability and smooth functioning of electrical installations under different situations.
4. Level	3
5. Credit	8
6. Competency	<p style="text-align: center;"><u>Performance Requirements</u></p> <p>6.1 Protection for and layout of marine electrical equipment and systems</p> <ul style="list-style-type: none"> ◆ Know about the marine power distribution systems ◆ Know about the required insulation features of electrical appliances on ships ◆ Know about the importance of the protective and explosion-proof features of installations ◆ Master emergency lighting and the continuity of remote control circuits and power disconnection and alarm devices ◆ Know about the cooling and ventilation for electrical installations and the effects of mechanical interlock, such as normal operating temperature, stability and protection ◆ Interpret the instruments and light signals on switchboards related to control of generators and operation of motors ◆ Know about the features of power distribution installations, such as: <ul style="list-style-type: none"> • Prevention trip • Differential protection • Overload protection • Earthing system • Flame-proof devices • Generators and battery charging • Parallel synchronization system <p>6.2 Methods of repairing and maintaining marine electrical equipment and systems</p> <ul style="list-style-type: none"> ◆ Understand the electrical system by reading the overall wiring diagram of the ship and the wiring diagrams of different electrical installations (such as basic wiring, power network and control circuit) <ul style="list-style-type: none"> • Identifying the impact of the failures on the auxiliary electrical installations and electrical system ◆ Analyze the data of the main instruments and the light signals on the switchboard and identify the sections where failures usually occur, and preventive measures against damage

	<p data-bbox="405 1115 730 1312">6.3 Professionalism in repairing and maintaining electrical equipment and system on ships</p> <ul style="list-style-type: none"> <li data-bbox="778 248 1465 360">◆ Adopt reasonable measures and procedures or follow repair manual instructions to perform the tasks of surveying, calibrating and maintaining electrical units on ships <li data-bbox="778 376 1445 488">◆ Adopt appropriate measures for performing the following tasks according to actual situations and conditions and manufacturer’s repair instructions <ul style="list-style-type: none"> <li data-bbox="836 504 1385 571">• Removing, replacing and connecting electrical installations on ships <li data-bbox="836 586 1404 654">• Control of asynchronous AC electrical units and protection equipment <li data-bbox="836 669 1404 736">• Maintaining and repairing generators and power restriction device circuits <li data-bbox="836 752 1302 786">• Rewinding AC and DC generator coils <li data-bbox="836 801 1091 835">• Balancing of rotors <li data-bbox="778 846 1437 1003">◆ Implement the work processes of maintaining, removing, replacing and connecting batteries, including the use of electrohydraulic densimeter to assess the degree of discharging <li data-bbox="778 1014 1477 1081">◆ Master the screen configuration, operation and programming procedures of programmable controllers on ships <li data-bbox="778 1115 1461 1182">◆ Make the following preparations for maintaining, repairing and replacing the parts of the electrical system on ships: <ul style="list-style-type: none"> <li data-bbox="836 1198 1461 1310">• Selecting appropriate instruments, materials and parts according to manufacturer’s instructions and repair requirements <li data-bbox="836 1326 1445 1438">• Referring to electrical wiring diagrams and implementing appropriate activities for maintenance and repairs <li data-bbox="836 1453 1286 1487">• Assessing the urgency of repair items <li data-bbox="836 1503 1326 1570">• Allocating repair items and making work arrangements <li data-bbox="778 1592 1430 1704">◆ Examine the consumption of the components of the electrical installations, equipment, units and switches on ships and give advice on repairs if necessary <li data-bbox="778 1727 1145 1760">◆ Compile simple repair reports
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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"> (i) Capable to select and use appropriate methods to identify the consumption of the components of different electrical installations and units on ships and adopt appropriate measures to survey, calibrate and repair damaged components; (ii) Capable to interpret the data of the main instruments and the light signals on the switchboards, and use appropriate programmable controllers to identify the causes of the failure of the electrical system; and (iii) Capable to select and use appropriate instruments, materials and parts to perform general tasks of maintaining/repairing marine electrical equipment and of rewinding coils for motors.
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 electrical appliances and of applying general electrical materials and common instruments/electrical equipment.</p>