

1. Title	Install electrical equipment and wiring of trains
2. Code	EMRAIN304A
3. Range	Install electrical equipment and wiring of trains according to installation instructions and drawings, and test, adjust and set such equipment and wiring.
4. Level	3
5. Credits	9
6. Competency	<p style="text-align: center;"><u>Performance Requirements</u></p> <p>6.1 Construction and basic working principles of electrical system and equipment of trains</p> <ul style="list-style-type: none"> <li>◆ Understand the structure and basic working principles of electrical system of trains</li> <li>◆ Understand the basic working principles of major electrical equipment of trains</li> </ul> <p>6.2 Methods and procedures of installing and adjusting electrical system and equipment of trains</p> <ul style="list-style-type: none"> <li>◆ Able to read installation instructions and electrical engineering drawings and select suitable information for use</li> <li>◆ Install the following electrical system equipment of trains according to the installation instructions and drawings <ul style="list-style-type: none"> <li>• Pantograph</li> <li>• Lightning arrestors</li> <li>• Main power cables</li> <li>• Vacuum circuit breakers / air circuit breakers</li> <li>• Transformers</li> <li>• Electricity return brushes</li> </ul> </li> <li>◆ Test and adjust the following electrical traction control system equipment of trains according to the installation instructions and drawings <ul style="list-style-type: none"> <li>• Traction motors</li> <li>• Electronic control units</li> <li>• Circuit protection devices</li> <li>• Gearbox</li> </ul> </li> <li>◆ Install and adjust the following inverter system and equipment of trains according to the installation instructions and drawings <ul style="list-style-type: none"> <li>• Main inverters</li> <li>• Motor-alternators</li> <li>• Electronic control units</li> <li>• Circuits and equipment protection devices</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>◆ Install and test the following loop protection circuits of trains according to the installation instructions and drawings <ul style="list-style-type: none"> <li>• Train door loop protection circuits</li> <li>• Brake loop protection circuits</li> </ul> </li> <li>◆ Use typical tools and instruments for installing and checking electrical system of trains effectively</li> </ul> <p>6.3 Professionalism in installing electrical system and equipment of trains</p> <ul style="list-style-type: none"> <li>◆ Capable to follow the requirements of installation instructions to ensure that the procedures and quality of installation are up to standard</li> <li>◆ Understand the safety guidelines and codes of practice in handling installation and testing of electrical system and equipment of trains</li> </ul>
7. Assessment Criteria	<p>The integrated outcome requirement of this unit of competency is:</p> <ul style="list-style-type: none"> <li>(i) Capable to install a pantograph correctly and adjust the upthrust of the carbon brush of the pantograph as required;</li> <li>(ii) Capable to install the main inverter or motor-alternator correctly and adjust its output voltage and frequency as required; and</li> <li>(iii) Capable to test the continuity, insulation and performance of the train door loop protection circuit.</li> </ul>
8. Remarks	<p>The credit value of this unit of competency is set on the presumption that the person already possesses basic electrical knowledge and electrical wiring techniques.</p>