

**SKILLS FRAMEWORK FOR PUBLIC TRANSPORT  
TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE DOCUMENT**

<b>TSC Category</b>	Rail Systems Maintenance					
<b>TSC</b>	Automatic Fare Collection Sales Devices Maintenance					
<b>TSC Description</b>	Implement preventive and corrective maintenance activities of Automatic Fare Collection (AFC) sales devices					
<b>TSC Proficiency Description</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Level 5</b>	<b>Level 6</b>
	<b>PTP-RSM-1003-1.1</b>	<b>PTP-RSM-2003-1.1</b>	<b>PTP-RSM-3003-1.1</b>	<b>PTP-RSM-4003-1.1</b>		
	Carry out scheduled maintenance work on Automatic Fare Collection (AFC) sales devices	Conduct corrective maintenance on Automatic Fare Collection (AFC) sales devices	Troubleshoot faulty Automatic Fare Collection (AFC) sales devices to locate faults and recommend rectification methods	Diagnose root causes of Automatic Fare Collection (AFC) sales devices failure and review maintenance plans to prevent fault recurrence		
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>Functional relationships between AFC sales devices and other AFC systems</li> <li>Operating principles and functions of AFC sales devices</li> <li>Types of AFC sales devices</li> <li>Types of AFC sales device components that includes:                             <ul style="list-style-type: none"> <li>Electronic Control Unit</li> <li>Payment Handling Unit</li> <li>Interfacing module</li> <li>Passenger Display Unit</li> <li>Power Supply Unit</li> <li>Security Token</li> <li>Ticket Transport Subsystem</li> <li>Contactless Smart Card Reader/ Writer (CSCRW)</li> </ul> </li> <li>Procedures for servicing AFC sales devices in accordance to organisational procedure, Work Instruction (WI) and/or</li> </ul>	<ul style="list-style-type: none"> <li>Functional relationships between AFC sales devices and other AFC systems</li> <li>Operating principles, schematic diagrams and functions of AFC sales devices</li> <li>Types of AFC sales devices</li> <li>Types of AFC sales device components that includes:                             <ul style="list-style-type: none"> <li>Electronic Control Unit</li> <li>Payment Handling Unit</li> <li>Electronic Control Unit</li> <li>Interfacing module</li> <li>Passenger Display Unit</li> <li>Power Supply Unit</li> <li>Security Token</li> <li>Ticket Transport Sub-system</li> <li>Contactless Smart Card Reader/ Writer (CSCRW)</li> </ul> </li> <li>Common failures of AFC sales devices</li> </ul>	<ul style="list-style-type: none"> <li>Procedures for conducting system functional checks on AFC sales devices</li> <li>Common fault symptoms in AFC sales devices</li> <li>Methods of locating and rectifying faults</li> <li>Types and usage of troubleshooting techniques, equipment and tools</li> <li>Safety guidelines on use of tools and equipment in troubleshooting AFC sales devices</li> </ul>	<ul style="list-style-type: none"> <li>Factors affecting AFC sales devices performance</li> <li>Failure investigation and prevention methods</li> <li>Methods and tools for diagnostic analysis</li> <li>Organisational maintenance procedures, Work Instructions (WI) and Original Equipment Manufacturer (OEM) technical recommendations</li> <li>Types and methods of functional tests on AFC sales devices</li> <li>Functional relationships between AFC systems and the overall rail systems</li> </ul>		

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	<p>Original Equipment Manufacturer (OEM) technical manuals</p> <ul style="list-style-type: none"> <li>• Types and usage of tools and equipment for carrying out preventive maintenance on AFC sales devices</li> <li>• Safety guidelines on use of tools and equipment for preventive maintenance on AFC sales devices</li> <li>• Types and usage of Personal Protective Equipment (PPE) for AFC sales devices maintenance</li> <li>• Organisational maintenance documentation and fault reporting procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Types of errors and warning logs of AFC sales devices</li> <li>• Procedures for conducting system performance checks on AFC sales devices</li> <li>• Procedures to rectify faults on AFC sales devices</li> <li>• Types and usage of tools and equipment for carrying out corrective maintenance on AFC sales devices</li> <li>• Safety guidelines on use of tools and equipment for corrective maintenance on AFC sales devices</li> <li>• Types and usage of Personal Protective Equipment (PPE) for AFC sales devices maintenance</li> </ul>				
<b>Abilities</b>	<ul style="list-style-type: none"> <li>• Perform preparation work to conduct preventive maintenance on AFC sales devices</li> <li>• Perform serviceability checks on AFC sales devices</li> <li>• Follow organisational procedures, WI and/or OEM technical manuals to carry out preventive maintenance on AFC sales devices</li> <li>• Adhere to safety guidelines and operating instructions for tools and equipment during maintenance work</li> <li>• Record AFC sales devices maintenance activities and report</li> </ul>	<ul style="list-style-type: none"> <li>• Interpret work orders and prepare for corrective maintenance</li> <li>• Apply power isolation procedures</li> <li>• Apply fault identification procedures to determine causes of AFC sales devices failures</li> <li>• Dismantle AFC sales devices for corrective maintenance</li> <li>• Carry out repair and/or replace faulty components</li> <li>• Reassemble and reinstate AFC sale devices</li> <li>• Perform functional tests on AFC sales devices</li> </ul>	<ul style="list-style-type: none"> <li>• Use troubleshooting software, tools, equipment and methods to locate and analyse causes of AFC sales devices faults</li> <li>• Recommend corrective actions for identified faults on AFC sales devices</li> <li>• Implement procedures on safe usage of tools and equipment during maintenance work</li> <li>• Analyse maintenance work documented for AFC sales devices to identify possible workflow improvements to prevent fault recurrence</li> </ul>	<ul style="list-style-type: none"> <li>• Establish structured failure investigation and specify functional testing requirements</li> <li>• Perform fault tree analyses to diagnose root cause failure of AFC sales devices</li> <li>• Review organisational AFC sales devices maintenance procedures</li> <li>• Propose new and/or enhanced maintenance WI in reference to OEM technical recommendations</li> <li>• Monitor overall maintenance progress of AFC sales devices to ascertain effectiveness of maintenance plan</li> </ul>		

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	occurrences of potential faults identified	<ul style="list-style-type: none"> <li>• Apply operating and safety measures in operating tools and equipment during maintenance work</li> <li>• Record and collate documentation of AFC sales devices maintenance work</li> </ul>		<ul style="list-style-type: none"> <li>• Develop long-term solutions through analysing diagnostic data to prevent faults and failures recurrence</li> <li>• Develop troubleshooting, rectification and fault analysis methods</li> <li>• Develop test procedures for system performance checks</li> <li>• Coordinate AFC sales devices maintenance with other rail systems maintenance needs</li> </ul>		
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