RAIL TECHNICIANS

Technician/ Senior Technician (Mechanical and Electrical)

Job description: The Technician/ Senior Technician (Mechanical and Electrical) performs preventive and corrective maintenance of mechanical and electrical systems at various rail premises. The technician assists in the preparation of maintenance work, performs routine maintenance, conducts fault analysis and testing to improve the reliability of mechanical and electrical systems. The technician also provides technical guidance and on-the-job coaching to the team. The technician also supervises the work of contractors and external stakeholders in ensuring compliance to safety requirements and operating standards.

Current Job Tasks	Future view of job tasks	Impact at task-level
1. Perform preventive maintenance of mechanical and electrical systems and assist in conducting fault analyses by collecting and analysing data to identify root causes of failures	• Continue to interpret mechanical and electrical systems health data collected from fire protection systems, lift systems, air-conditioning systems to identify potential failure modes. • RPA can ensure that mechanical and electrical systems data is collected and analysed via centralized systems which will reduce the need for human intervention.	
2. Perform corrective maintenance through conducting repair and modifications of electronics, electrical and mechanical equipment and mechanical and electrical systems	• Continue to perform repair work. • Predictive technology such as condition monitoring and sensors can streamline the troubleshooting process and reduce manual effort.	
3. Prepare tools, vehicles and equipment required by ensuring they are in working order, obtain the maintenance schedule and retain a proper record of maintenance activities.	• Continue to conduct visual checks on tools, vehicles and equipment to maintain working condition. • Data analytics would support the preparation of standardized reports, conduct digital data logging and documentation.	
4. Supervise work of contractors and external stakeholders and ensure adherence to safety requirements and operating standards such as ISOs, Workplace Safety and Health Act, etc.	• Human intervention and judgment remain critical in overseeing operations and ensuring compliance. • Digital tools such as ERP will generate standardized reports, conduct digital data logging and documentation as part of vendor and stakeholder management.	

A MEDIUM proportion of the job tasks will be impacted by the key trend, thus minimising or changing the current job tasks

MEDIUM degree of change

Within the next **5 – 20 years**, the job role(s) could potentially undergo

REDESIGN

Current/future skills

To take on adjacent/ new job role(s) the skills below will observe these changes:

- Escalator and Travellator Maintenance =
- Condition-Based Assets Monitoring Management =
- Report Writing =
- Rail Regulatory Compliance =
- Vendor Management =
- WSH Confined Spaces =
- WSH Electrical Safety =
- Problem Solving =
- Data Usage and Implementation ▲
- Internet of Things Application ▲
- Robotics and Automation Application ▲
- Sensor Monitoring Management ▲

Job Adjacency

The job holder could potentially take on adjacent job roles as:

- Technician / Senior Technician (Power) – 86.0

Legend for job tasks & skills

High impact · Medium impact · Low impact

Declining skills · Adjacent skills · Emerging skills

Legend for job adjacency

Pivot score shows job fit between current to future job role derived from Faethm. The higher the score, the easier the transition. A pivot score of >75 is deemed as a good fit for the future role.

5-year skills impact analysis for rail technicians

Job tasks today	Job tasks in 5 years	Job skills in 5 years	Job task impact	Job role impact	Job role transition
1. Perform preventive maintenance of trains and rail systems and assist in conducting fault analyses by collecting and analysing data to identify root causes of failures	Continue to interpret system health data to identify potential failure modes, collected and analysed by RPA through centralized systems which will reduce the need for human intervention	Track Access Management Condition-Based Assets Monitoring Management Robotics and Automatic Application Data Usage and Implementation	 Medium degree of impact	 Redesign	1. Technician / Senior Technician (Permanent Way and Civil Structure) 2. Technician/ Senior Technician (Power) 3. Technician / Senior Technician (Rolling Stock/ Engineering Trains) 4. Technician / Senior Technician (Mechanical and Electrical) 5. Rail operations control management
2. Perform corrective maintenance through conducting repair and modifications of trains and rail systems	Continue to perform repair work but predictive technology such as condition monitoring and sensors can streamline the troubleshooting process and reduce manual effort	Problem Solving Sensor Monitoring Management Internet of Things Application			
3. Prepare tools, vehicles and equipment required by ensuring they are in working order, obtain the maintenance schedule and retain a proper record of maintenance activities	Continue to conduct visual checks on tools, vehicles and equipment to maintain working condition	Equipment Maintenance and Housekeeping Maintenance Scheduling Report Writing			
4. Supervise work of contractors and external stakeholders and ensure adherence to safety requirements and operating standards	Human intervention and judgment remain critical in overseeing operations and ensuring compliance but digital tools such as ERP will generate standardized reports, conduct digital data logging and documentation as part of vendor and stakeholder management	Rail Regulatory Compliance Vendor Management Robotics and Automation Application Internet of Things Application			
Declining Functions	Manual inspection, documentation, report generation, data entry				
Emerging Functions	Predictive maintenance, implementation of RPA applications, data analytics (i4.0)				

Table 12: 5-year skills impact for rail technicians

10-year skills impact analysis for rail engineers

Job tasks today	Job tasks in 10 years	Job skills in 10 years	Job task impact	Job role impact	Job role transition
1. Perform preventive maintenance of trains and rail systems and assist in conducting fault analyses by collecting and analysing data to identify root causes of failures	Continue to interpret system health data to identify potential failure modes, collected and analysed by RPA through centralized systems which will reduce the need for human intervention	Track Access Management Condition-Based Assets Monitoring Management Robotics and Automation Application Data Usage and Implementation	 Medium degree of impact	 Redesign	1. Technician / Senior Technician (Permanent Way and Civil Structure) 2. Technician/ Senior Technician (Power) 3. Technician / Senior Technician (Rolling Stock/ Engineering Trains) 4. Technician / Senior Technician (Mechanical and Electrical) 5. Rail operations control management
2. Perform corrective maintenance through conducting repair and modifications of trains and rail systems	Continue to perform repair work but predictive technology such as condition monitoring and sensors can streamline the troubleshooting process and reduce manual effort	Problem Solving Sensor Monitoring Management Internet of Things Application			
3. Prepare tools, vehicles and equipment required by ensuring they are in working order, obtain the maintenance schedule and retain a proper record of maintenance activities	RPA will automate tasks such as equipment maintenance, maintenance scheduling and report writing, with the ability to store information on centralised systems to ensure accessibility	Equipment Maintenance and Housekeeping Maintenance Scheduling Report Writing Robotics and Automation Application			
4. Supervise work of contractors and external stakeholders and ensure adherence to safety requirements and operating standards	Human intervention and judgment remain critical in overseeing operations and ensuring compliance but digital tools such as ERP will generate standardized reports, conduct digital data logging and documentation as part of vendor and stakeholder management	Rail Regulatory Compliance Vendor Management Robotics and Automation Application Internet of Things Application			
Declining Functions	Manual inspection, documentation, report generation, data entry				
Emerging Functions	Predictive maintenance, implementation of RPA applications, data analytics (i4.0)				

Table 13: 10-year skills impact for rail technicians

20-year skills impact analysis for rail engineers

Job tasks today	Job tasks in 20 years	Job skills in 20 years	Job task impact	Job role impact	Job role transition
1. Perform preventive maintenance of trains and rail systems and assist in conducting fault analyses by collecting and analysing data to identify root causes of failures	Continue to interpret system health data to identify potential failure modes, collected and analysed by RPA through centralized systems which will reduce the need for human intervention	Track Access Management Condition-Based Assets Monitoring Management Robotics and Automation Application Data Usage and Implementation	 Medium degree of impact	 Redesign	1. Technician / Senior Technician (Permanent Way and Civil Structure) 2. Technician/ Senior Technician (Power) 3. Technician / Senior Technician (Rolling Stock/ Engineering Trains) 4. Technician / Senior Technician (Mechanical and Electrical) 5. Rail operations control management
2. Perform corrective maintenance through conducting repair and modifications of trains and rail systems	Continue to perform repair work but predictive technology such as condition monitoring and sensors can streamline the troubleshooting process and reduce manual effort	Problem Solving Sensor Monitoring Management Internet of Things Application			
3. Prepare tools, vehicles and equipment required by ensuring they are in working order, obtain the maintenance schedule and retain a proper record of maintenance activities	RPA will automate tasks such as equipment maintenance, maintenance scheduling and report writing, with the ability to store information on centralised systems to ensure accessibility	Equipment Maintenance and Housekeeping Maintenance Scheduling Report Writing Robotics and Automation Application			
4. Supervise work of contractors and external stakeholders and ensure adherence to safety requirements and operating standards	Human intervention and judgment remain critical in overseeing operations and ensuring compliance but digital tools such as ERP will generate standardized reports, conduct digital data logging and documentation as part of vendor and stakeholder management	Rail Regulatory Compliance Vendor Management Robotics and Automation Application Internet of Things Application			
Declining Functions	Manual inspection, documentation, report generation, data entry				
Emerging Functions	Predictive maintenance, implementation of RPA applications, data analytics (i4.0)				

Table 14: 20-year skills impact for rail technicians