### TSC Category
Process Monitoring Management

### TSC
Autonomous Systems Technology Application

### TSC Description
Integrate autonomous systems and technologies in operational workflows, including processes, maintenance, logistics and plant surveillance, to enhance productivity and precision, and reduce reliance on manual tasks.

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<thead>
<tr>
<th>TSC Proficiency Description</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>Level 6</th>
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<tr>
<td>Apply procedural knowledge of autonomous systems and technologies to execute operational tasks</td>
<td>Diagnose faults in the use of autonomous technologies and systems</td>
<td>Evaluate the suitability of applying autonomous technologies and systems in plant operation, maintenance, logistics and surveillance</td>
<td>Drive decisions on selection and adoption of autonomous technologies and systems and formulate new processes to enhance operational efficiency and reliability</td>
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### Knowledge
- Types of autonomous technologies and their process control systems utilised in plant operation, maintenance, logistics and surveillance tasks
- Methods of operating autonomous systems for plant operation, maintenance, logistics and surveillance tasks
- Electrical safety rules related to the use of autonomous technologies
- Types of sensors and actuators used in autonomous technologies
- Procedures for installing actuators and sensors
- Principles of autonomous technologies
- Procedures for setting up and inspecting autonomous systems and technologies
- Approaches to oversee operation, maintenance, logistics and surveillance tasks that use autonomous systems and technologies
- Principles of plant and system operations, maintenance, logistics and surveillance
- Types and applications of control loop components and controllers
- Electrical safety rules related to the use of autonomous technologies
- Range of application for autonomous technologies
- Methods of evaluating resources and skills to carry out operation, maintenance, logistics and surveillance tasks using autonomous technologies
- Principles of electro-pneumatics
- Types of logic control programmes
- Concepts pertaining to performance specifications and analyses of autonomous systems
- Best practices in autonomous technologies
- Electrical safety rules related to the use of autonomous technologies
- Organisational processes
- Organisational quality guidelines
- Methods of developing detailed operating procedures for autonomous technologies
- Methods to influence the adoption of new technologies
- Impact of autonomous technologies on plant operation, maintenance, logistics and surveillance processes
- Principles of change management
- Prediction and decision algorithms
- Principles of machine learning or artificial intelligence
- Principles of systems interfacing

### Abilities
- Operate autonomous technologies by following manufacturers’ instructions and operating procedures
- Oversee the use of autonomous technologies
- Diagnose faults in the use of autonomous technologies
- Evaluate various autonomous technologies and systems to compare strengths and limitations
- Determine range of application, resources, skill requirements and feasibility for
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<th>Follow safety procedures when operating autonomous technologies</th>
<th>Identify and report any issues with autonomous technologies</th>
<th>Install sensors and actuators in specified locations for the application of autonomous technologies, where applicable</th>
<th>Technologies for operation, maintenance, logistics and surveillance, and suggest solutions</th>
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<tr>
<td>Apply corrective actions for automatic and manual shut-down of autonomous systems during critical and emergency situations</td>
<td>Review and incorporate feedback on the operations of autonomous technologies into updated operation, maintenance, logistics and surveillance procedures</td>
<td>of autonomous technologies</td>
<td>Evaluate the feasibility of autonomous systems for plant operation, maintenance, logistics and surveillance processes</td>
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<td>Apply optimisation techniques to improve automated processes efficiency and reliability</td>
<td>Assess improvements to operation, maintenance, logistics and surveillance processes</td>
<td>autonomous technologies</td>
<td>Develop technical operating procedures for autonomous systems</td>
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<td>Drive autonomous technologies and systems into day-to-day operations</td>
<td>Ensure procedures and operations are implemented according to plans and requirements</td>
<td>Evaluate the feasibility of autonomous systems for plant operation, maintenance, logistics and surveillance using autonomous technologies</td>
<td>Formulate processes and procedures for plant operation, maintenance, logistics and surveillance using autonomous technologies</td>
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<td>Ensure procedures and operations are implemented according to plans and requirements</td>
<td>Refine parameters of autonomous processes to improve operational efficiency</td>
<td>Determine post-processing procedures for plant operation, maintenance, logistics and surveillance using autonomous technologies</td>
<td>Determine technological requirements to enable interfacing of the different systems</td>
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