<table>
<thead>
<tr>
<th>TSC Category</th>
<th>Process Improvement</th>
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<tbody>
<tr>
<td>TSC</td>
<td>Systems Engineering Thinking</td>
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<tr>
<td>TSC Description</td>
<td>Optimise inter-disciplinary engineering application by applying process knowledge and analytical techniques to provide engineering solutions and practices through an integrated and multidisciplinary approach</td>
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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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<td>PTP-SYS-4007-1.1</td>
<td>PTP-SYS-5007-1.1</td>
<td>PTP-SYS-6007-1.1</td>
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<td></td>
<td>Implement systems engineering thinking concepts to lead engineering applications</td>
<td>Lead inter-disciplinary teams to manage cross disciplinary engineering applications using system engineering thinking concepts</td>
<td>Establish strategies to drive the use of systems engineering thinking to ensure safe, reliable and sustainable engineering applications</td>
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**Knowledge**

- Principles and concepts of systems engineering and systems thinking
- Principles of system requirements, integration, verification and validation
- Methods of systems integration
- Types of engineering statistical methods and applications
- Asset management concepts
- Risk and cost-benefit analysis methods

- Principles and concepts of engineering management
- Principles and concepts of systems engineering and systems thinking
- Systems modelling and simulation
- Methods of systems integration
- Intelligent transportation systems
- System safety concepts
- Asset management concepts
- Risk and cost-benefit analysis methods

- Leading technologies and technological advancements within the industry
- Industry best practices in systems engineering methods and techniques
- Integrated engineering system modelling methods and interdisciplinary approaches
- Asset management concepts
- Risk and cost-benefit analysis methods

**Abilities**

- Utilise system engineering thinking approaches to analyse engineering application and solutions
- Draw functional linkages across various engineering sub-systems to provide initial hypothesis
- Review the viability and applicability of systems engineering applications

- Provide technical advice and guidance for system review, modification and/or enhancement related engineering applications
- Drive engineering applications using system engineering thinking concepts to integrate various engineering disciplines and sub-systems

- Develop cross-disciplinary insights to mentor engineering teams
- Inculcate system engineering thinking concepts to drive service reliability, and optimise sustainable engineering applications
- Establish the direction of engineering system review through the use of...
<table>
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<tr>
<th>• Provide technical and cost-benefits justifications for new, modified and/or enhance engineering applications</th>
<th>• Facilitate systems modelling and simulation in public transport engineering application</th>
<th>• Run risk impact modelling and simulation in engineering applications</th>
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<tbody>
<tr>
<td>• Integrate emerging technologies to improve engineering capability, service safety and reliability, yield and quality</td>
<td>system engineering thinking concepts</td>
<td>Establish communication strategies with internal and external stakeholders to provide technical and economic justification on adoption of new and/or sustainable engineering applications</td>
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