Using the Framework:
The Systems Engineering competency framework is generic in purpose. It can, and
indeed should, be tailored before use. It can be
applied in the context of an organisation, a
project, an individual and/or a training programme.

The Framework describes the competencies of
Systems Engineering rather than the
competencies of an individual Systems Engineer.

It is acknowledged that a well rounded systems
engineer will need other competencies,
knowledge, skills and abilities tailored to their
particular role or area in which they operate.

Many organisations have tailored the
framework and are actively using it to:

- Identify individual’s and the organisation’s
  competencies in Systems Engineering
- Identify learning and development
  opportunities
- Standardise job roles and descriptions
- Aid recruitment and direct interview
  questions
- Develop Systems Engineering training
  programmes

Evaluation:
A Guide to Competency Evaluation is also
available and is designed as a companion to the
Systems Engineering Competencies Framework
document. It gives guidance on how to evaluate
people against the competency framework.

What are the Competencies?

Systems Thinking
- Systems concepts
- Super-system capability issues
- Enterprise and technology environment

Holistic Lifecycle view
- Determine and manage stakeholder requirements
- System design:
  - Architectural design
  - Concept generation
  - Design for...
  - Functional analysis
  - Interface management
  - Maintaining design integrity
  - Modelling and simulation
  - Select preferred solution
  - System robustness
- Integration & Verification
- Validation
- Transition to operation

Systems Engineering Management
- Concurrent engineering
- Enterprise integration
- Integration of specialisms
- Lifecycle process definition
- Planning, monitoring and controlling

For more information visit:
http://www.incoseonline.org.uk

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INCOSE UK SE Competencies Working Group

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Does your organisation know what
makes a good systems engineer?
The Competency Framework can help!

What are the Competencies based on?
The Systems Engineering Competencies
developed are consistent with the following:

- International Standards Organisation
  ISO15288
- EIA632
- INCOSE Systems Engineering Body of
  Knowledge & Handbook
COMPETENCY AREA - Systems Thinking: System Concepts

**Description:**
The application of the fundamental concepts of systems engineering. These include understanding what a system is, its context within its environment, its boundaries and interfaces and that it has a lifecycle.

**Why it matters:**
Systems Thinking is a way of dealing with increasing complexity. The fundamental concepts of Systems Thinking involves understanding how actions and decisions in one area affect another, and that the optimisation of a system within its environment does not necessarily come from optimising the individual system components.

**Effective Indicators of Knowledge and Experience**

<table>
<thead>
<tr>
<th>Awareness</th>
<th>Supervised Practitioner</th>
<th>Practitioner</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is aware of the need for systems concepts</td>
<td>Understands systems concepts</td>
<td>Able to identify and manage complexity with appropriate techniques in order to reduce risk</td>
<td>Able to review and judge the suitability of systems solutions and the planned approach</td>
</tr>
<tr>
<td>Aware of the importance of: system lifecycle</td>
<td>Understands the system lifecycle in which they are working</td>
<td>Able to predict resultant system behavior</td>
<td>Has coached new practitioners in this field</td>
</tr>
<tr>
<td>hierarchy of systems</td>
<td>Understands system hierarchy and the principles of system partitioning in order to help manage complexity</td>
<td>Able to define system boundaries and external interfaces</td>
<td>Has championed the introduction of novel techniques and ideas in this field which produced measurable improvements</td>
</tr>
<tr>
<td>system context</td>
<td>Understands the concept of emergent properties</td>
<td>Able to assess the interaction between humans and systems, and systems and systems.</td>
<td>Has contributed to best practice</td>
</tr>
<tr>
<td>interfaces</td>
<td>Can identify system boundaries and understands the need to define and manage the interfaces</td>
<td>Able to guide supervised practitioner</td>
<td></td>
</tr>
</tbody>
</table>