

Systems Engineering is an interdisciplinary approach that provides the means to enable the realisation of successful complex systems. It focuses on:

- Defining & scoping customer needs and required functionality early in the development cycle.
- The development of an agreed System Specification.
- The application of architectural & design skills to decompose the System Specification into a structured hierarchy of progressively smaller but cohesive sub-systems and well defined interfaces.
- Continuous change, release & configuration management of the System, it's sub systems and interfaces.
- Structured validation, verification and integration of the sub-systems whilst continuously considering the complete system problem.

Systems Engineering integrates all the disciplines and specialty groups into a cohesive team effort forming a structured development process that proceeds from concept, to production, to operation to end-of-life. Systems Engineering considers both the business and the technical needs of all customers with the goal of providing a quality product that meets the user needs.

A fundamental tenet of the Systems Engineering practice is to engineer the whole (the system) as a set of integrated cohesive parts. This is opposed to focusing the engineering effort just on the parts that when cobbled together, will most likely exhibit poor cohesion, incompatibility, inconsistencies, fragile interfaces and will most likely not meet user needs.

### What exactly is a "system" then?

An *integrated set of elements that accomplish a defined set of objectives*  
\*\*As Defined by the [International Council On Systems Engineering](#) (INCOSE)

### What does "*Integrated set of Elements*" mean?

Users, sub-systems, components, HW, SW, Support Services, Training, Processes, Information, environment, etc

### What does "*Defined set of Objectives*" mean?

Conformance to ALL of the requirements.

[Technical Specs, Contracts Statement of Work, Corporate Operating Procedures, Regulatory Standards etc].

### Why is Systems Engineering Important to Australia?

Systems Engineering delivers major benefits to a wide range of industrial sectors where complex projects are undertaken. These advantages include reducing your project risk, improving likelihood of success, and delivery of lower life cycle costs. Industrial Sectors where Systems Engineering practices can provide positive effects in terms of successful project outcomes include:

- Defence and Aerospace
- Telecommunications
- Information and Communications Technology (ICT)
- Intelligent Transport
- Medical Engineering
- Civil Infrastructure (power stations, offshore mining, energy networks)
- Emergency Services
- National Security