



Australian Government

MEA730 Apply systems engineering procedures to airworthiness engineering design project management

Release: 2

MEA730 Apply systems engineering procedures to airworthiness engineering design project management

Modification History

Release 2. Equivalent to MEA730 Apply systems engineering procedures to airworthiness engineering design project management with amended prerequisite codes.

Application

Systems engineering procedures are applied in setting up management procedures for engineering design projects involving the design of complex systems that require the integration of subsystems and/or components by a multi-discipline engineering team. The management processes may relate to all design stages and may include the development of systems software. In the production and life-cycle management stages, systems engineering design stage output data may be used in the application of configuration management (CM) procedures (MEA729 Apply configuration management procedures in airworthiness engineering management) and/or to support the application of integrated logistic support (ILS) (MEA139 Perform aviation maintenance-related integrated logistic support management activities) where justified by system size and complexity or where required by contract.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA135	Use computers in aviation maintenance-related integrated logistic support activities
MEA162	Write aviation technical publications

Competency Field

Airworthiness engineering management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes. Performance criteria describe the performance needed to demonstrate achievement of the element.

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|----|--|-----|--|
| 1. | Analyse and document system requirements | 1.1 | Identify and document customer or contractual system requirements and relevant regulatory requirements |
| | | 1.2 | Set up a systems engineering team and allocate responsibilities |
| | | 1.3 | Analyse system requirements and define functional requirements and design constraints |
| 2. | Perform functional analysis and allocation | 2.1 | Decompose system functions to lower-level functions applicable to system design |
| | | 2.2 | Allocate design constraints to all functional levels |
| | | 2.3 | Define and refine internal and external functional interfaces |
| | | 2.4 | Define, refine and integrate functional architecture |
| | | 2.5 | Review functional analysis outcomes against requirements and revise where necessary |
| | | 2.6 | Develop and document the functional baseline |
| 3. | Manage preliminary design activities | 3.1 | Coordinate the development of performance specifications for the system and components |
| | | 3.2 | Define alternatives for system concepts, components and system elements |
| | | 3.3 | Select preferred product and process solutions |
| | | 3.4 | Define and refine internal and external physical interfaces |
| | | 3.5 | Define and refine system software requirements |
| | | 3.6 | Develop and document the allocated baseline |
| 4. | Manage the detail design activities | 4.1 | Coordinate the development of item, process and material specifications |
| | | 4.2 | Coordinate the development of software specifications |
| | | 4.3 | Coordinate the development of engineering drawings and associated material/component/hardware lists |
| | | 4.4 | Coordinate the development of item performance |

		specifications
	4.5	Determine product review and design verification procedures
	4.6	Develop and document the product baseline
5.	Provide oversight of production and delivery	5.1 Apply product review and verification procedures and initiate action to remedy design or production deficiencies
		5.2 Ensure that all relevant regulatory requirements are being met
6.	Provide for life-cycle management of the system, components and software	6.1 Where there is a contractual requirement for application of CM, provide the technical data package and define the configuration items and baselines
		6.2 Where there is a contractual requirement for ILS, provide the technical data package and data required for the development of the relevant ILS plans
		6.3 Where there are no contractual requirements regarding life-cycle management, deliver the technical data package and develop procedures for the management of the configuration of the system, system components and software that meet relevant regulatory requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

- Systems engineering process management:**
- The systems engineering process is a comprehensive process for the design and integration of complex systems that cover a range of engineering disciplines. The actual design work will be performed by appropriately qualified specialist engineers and the

	management process ensures that the design activities are coordinated and integrated into a system that meets specified performance requirements and complies with relevant airworthiness regulations
System requirements analysis:	• System requirements analysis involves inputs, such as customer needs and objectives, regulatory requirements and the technology base. It must clarify and define functional requirements and design constraints
Functional analysis and allocation:	• Functional analysis and allocation provides a greater understanding of what the system has to do and allocates overall system performance requirements to lower level subsystem and component functions. In so doing, it provides information essential to optimising physical solutions
Baselines:	• The functional, allocated and product baselines document a product at a specific stage of design definition. The functional baseline describes system level requirements, the allocated baseline describes design requirements for items below systems level and the product baseline describes the product physical detail
Technical data packages include:	• Engineering drawings and associated lists • Technical manuals • Manufacturing part programs • Verification provisions • Spares provisioning lists • Specifications developed for the system and system components • Specifications and standards from international and national bodies (government and non-government) • Relevant regulatory standards and requirements
Reference materials include:	• System Engineering Fundamentals, Dept of Defence Systems Management College • NASA/SP-2007-6105 Rev 1 NASA Systems Engineering Handbook • Project Documentation Document SPEC-0064 Rev A, ATST System Engineering Plan • 7th Annual Conference on Systems Engineering Research 2009 (CSER 2009), Systems Thinking or Systems Engineering
Airworthiness regulations are found in:	• AAP7001.053 Technical Airworthiness Management Manual • Civil Aviation Safety Regulations (CASRs) and related documentation/publications

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>