DATA ITEM DESCRIPTION

1. DID NUMBER: DID-ENG-MGT-SEMP-2-
2. TITLE: SYSTEMS Engineering Management PLAN
3. DESCRIPTION and intended use

The Systems Engineering Management Plan (SEMP) describes the Contractor’s strategy, plans, methodologies and processes for the management of a fully integrated engineering program in accordance with the Contract. The SEMP describes the relationships between concurrent activities as well as between sequential activities, to demonstrate that a fully integrated engineering program has been achieved.

The Contractor uses the SEMP to provide the primary direction and guidance to the technical team responsible for conducting the scope of work.

The Commonwealth uses the SEMP as a benchmark against which Contractor performance and changes in technical risk can be evaluated.

1. INTER-RELATIONSHIPS

The SEMP shall be consistent with, and subordinate to, the Project Management Plan (PMP).

The SEMP shall be the single planning and controlling document for all engineering program activities and related efforts, and shall have authority over, and give direction to, any subordinate engineering plans.

The SEMP inter-relates with the following data items, where these data items are required under the Contract:

Integrated Support Plan (ISP);

Configuration Management Plan (CMP);

Verification and Validation Plan (V&VP); and

Quality Plan (QP).

1. APPLICABLE DOCUMENTS

The following documents form a part of this DID to the extent specified herein:

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| --- | --- |
| ANSI/EIA-632-2003 | *Processes for Engineering a System* |
| AS/NZS ISO/IEC/IEE 12207:2019 | *Systems and Software Engineering - Software life cycle processes* |
|  | The specialty engineering standards identified in the SOW (eg, in relation to system safety, system security and Electromagnetic Environmental Effects (E3)) |

1. Preparation Instructions
   1. Generic Format and Content

The data item shall comply with the general format, content and preparation instructions contained in the CDRL clause entitled ’General Requirements for Data Items’.

When the Contract has specified delivery of another data item that contains aspects of the required information, the SEMP shall summarise these aspects and refer to the other data item.

The data item shall include a traceability matrix that defines how each specific content requirement, as contained in this DID, is addressed by sections within the data item.

* 1. Specific Content
     1. Technical Plan Summary

The SEMP shall describe the objectives, scope, constraints, and assumptions associated with the Contractor’s systems engineering program.

Risks associated with the Contractor’s systems engineering program, including risks associated with the development and implementation of the required products, shall be documented in the Risk Register; however, the SEMP shall describe the risk-management strategies associated with any risks where the mitigation strategy underpins the overall systems engineering program (clause 6.2.5 refers).

The SEMP shall define its relationship to other planning documentation, including subordinate engineering plans and key non-technical plans such as the PMP.

The SEMP shall define the scope and purpose of subordinate engineering plans, including the interrelationships between subordinate plans.

* + 1. Systems Engineering Key Activities

The SEMP shall describe the Contract technical objectives, with reference to the proposed solution and with particular emphasis on the technical products to be delivered and the extent of development required for them.

The SEMP shall identify the key engineering elements and events of the Contract, including the key events in the lifecycle of each product in the design hierarchy, the interrelationships between them, and those significant engineering events within the Contract schedule.

* + 1. Engineering Management

The SEMP shall define the engineering organisation for the Contract, including the key engineering positions and the partitioning of engineering effort between the various Contractor and Subcontractor organisations.

The SEMP shall describe how technical effort will be coordinated to meet cost, schedule and performance objectives.

The SEMP shall summarise planned personnel needs, applicable to the various phases of the Contract, by discipline and level of expertise.

The SEMP shall identify the standards (eg, EIA-632 and ISO 12207) to be utilised by the Contractor and Subcontractors to undertake the Systems Engineering, Software, Configuration Management (CM), and Verification and Validation (V&V) program activities, including the proposed tailoring of those standards to meet requirements of the Contract.

* + 1. Systems Engineering Process

The SEMP shall define the tailored application of the Contractor’s Systems Engineering process to the activities of the Contract, including:

the major products and/or increments to be delivered;

the major outcomes to be achieved;

the major Systems Engineering tools that will be used for the Contract;

the methods for documentation and control of engineering and technical information, including expected specifications and Configuration Baselines;

the methods and tools for analysis and Validation of system requirements;

the required implementation tasks, including the integration and assembly of the system; and

the approach, methods, procedures and tools to be used for systems analysis and control, including establishing and maintaining requirements traceability.

* + 1. Technical Risk Management

Risks associated with the Systems Engineering program shall be documented in the Risk Register; however, the SEMP shall describe the risk management strategies associated with any global, engineering-related risks.

* + 1. Software Development and Management

The SEMP shall define the tailored application of the Contractor’s Software processes to the activities of the Contract, including:

the integration of Software activities into the systems engineering program for the various products and/or increments to be delivered;

the management of Software development activities undertaken by Subcontractors; and

the development of Software being undertaken by the Contractor.

* + 1. Verification and Validation

The SEMP shall, for the Contractor’s V&V program:

describe the V&V strategy, particularly describing how the V&V activities are integrated into the systems engineering program for the various products and/or increments to be delivered;

summarise the V&V program activities and schedule;

describe the use of the VCRM and the extent to which previous V&V results are proposed to be used for Acceptance Verification purposes;

describe the process for recording Failure reporting and analysis, and the approach to regression testing; and

identify the requirements for Commonwealth Personnel and other resources in order to conduct the V&V program.

* + 1. Configuration Management

The SEMP shall describe the Contractor’s CM methodology, processes and activities for meeting the CM requirements of the Contract, including:

the approach planned to establish and maintain Configuration Control and audit of identified system products and processes;

the requirements for establishing Configuration Baselines and the documentation to be used to define each baseline; and

the approach planned to establish and maintain control of external and internal interfaces, including (if applicable) the conduct of Interface Control Working Groups (ICWGs).

* + 1. System Reviews

The SEMP shall describe the approach planned for the conduct of all System Reviews (ie, Mandated System Reviews (MSRs) and Internal System Reviews) required under the Contract.

The SEMP shall describe the objectives for each engineering-related System Review and the relationship between each System Review and other engineering program activities.

Note: The following clause only relates to the engineering-related System Reviews. The main governing plans for each of the Level 2 subject area clauses in the SOW address the other System Reviews (eg, the PMP addresses project management System Reviews, the ISP addresses ILS-related System Reviews, and the CMP or SEMP addresses CM-related System Reviews).

The SEMP shall detail the following information for each of the engineering-related System Reviews, incorporating the associated SOW requirements (including entry criteria, exit criteria and checklist items) for these System Reviews and supplemented where required by the Contractor’s internal processes:

the organisations and individuals involved in the review and their specific review responsibilities;

the proposed review venue;

the pre-requisites for the conduct of the review (ie, entry criteria);

the checklist items to be addressed during the System Review, including the documentation to be reviewed;

the essential review completion criteria (ie, exit criteria); and

the applicable Milestone criteria specified in Attachment C, Delivery Schedule.

* 1. Specific Content – Specialty Engineering
     1. Growth, Evolution and Obsolescence

If a growth, evolution and Obsolescence program is required under the Contract, the SEMP shall, for the growth, evolution and Obsolescence program:

describe the technical measures and methods to be used to identify and assess candidate elements (ie, those system elements that are candidates for change over the LOT due to the evolution of technology, changes to threats or user needs, or Obsolescence), including hardware and Software items, and the primary candidate elements to be addressed under the program;

describe the application of design aspects (eg, modularity and ‘open architectures’) to improve system growth, facilitate evolution, and to counter Obsolescence;

identify the steps to be undertaken during the acquisition phase to balance technological maturity and Obsolescence risks, and solutions to minimise the complexity (and cost) of through-life upgrades; and

identify the steps to be undertaken during the support phase to maintain effective and supportable equipment configurations and the expected need for upgrades.

* + 1. Integrated Reliability, Maintainability and Testability Engineering

If an Integrated Reliability, Maintainability and Testability (IRMT) engineering program is required under the Contract, the SEMP shall, for the Contractor's IRMT engineering program:

outline the IRMT engineering activities, tools, and the products to be generated, consistent with the design activities and the integration of COTS / MOTS items;

identify the standards to be used (including those identified at clause 5.1), and describe the application of those standards to meet the IRMT-related requirements of the Materiel System;

describe the sources, methods and systems to be used to obtain, analyse and record IRMT-related data from internal and external sources;

describe how IRMT engineering program activities and outputs are integrated into the system engineering program for the various products, including identifying the outputs to be provided for the System Reviews; and

describe the Verification methods to be applied for the IRMT engineering program.

* + 1. Human Engineering

If a Human Engineering (HE) program is required under the Contract, the SEMP shall, for the Contractor's HE program:

identify the standards to be used (including those identified at clause 5.1), and that have been used for COTS / MOTS items, and describe the application of those standards to meet the HE requirements of the Materiel System;

describe the expectations of the Contractor with respect to the Commonwealth in order to ensure the HE objectives are met;

describe the activities, including system functional requirements analysis, equipment design and procedures development activities, to be undertaken in order to meet the HE program required under the Contract;

describe how HE program activities and outputs are integrated into the system engineering program for the various products, including identifying the outputs to be provided for the System Reviews; and

describe the Verification methods to be applied for the HE program.

* + 1. Electromagnetic Environmental Effects

If an Electromagnetic Environmental Effects (E3) program is required under the Contract, the SEMP shall, for the Contractor's E3 program:

identify the standards to be used (including those identified at clause 5.1), and that have been used for COTS / MOTS items, and describe the application of those standards to the Materiel System;

identify the E3-related requirements applicable to the Materiel System, including Certification and regulatory requirements;

describe the approach to ensure that the E3-related requirements are met and all applicable Certifications are obtained;

describe how E3 program activities and outputs are integrated into the system engineering program for the various products, including identifying the outputs to be provided for the System Reviews; and

describe the Verification methods to be used to assess that the Materiel System’s E3-related requirements have been met.

* + 1. System Safety

The SEMP shall, for the Contractor's system safety program:

identify the standards to be used (including those identified at clause 5.1), and that have been used for COTS / MOTS items, and describe the application of those standards to meet the system safety required under the Contract;

identify the Materiel Safety-related requirements applicable to the operation and support of the Materiel System, including Certification and regulatory requirements, and describe the approach to ensure that the Materiel Safety-related requirements are met and all applicable Certifications are obtained;

describe how system safety program activities and outputs are integrated into the system engineering program for the various products, including identifying the outputs to be provided for the System Reviews;

describe the hazard analyses to be undertaken to identify and assess health and safety hazards and risks in the Materiel System, and to eliminate hazards and reduce associated risks so far as is reasonably practicable;

describe the Verification methods to be used to assess the minimisation of Materiel Safety-related risks and the treatment of those residual risks; and

describe the approach to managing Materiel Safety data and the provision of documentary evidence to the Commonwealth, and regulatory authorities when applicable, in order to demonstrate that the Materiel System is, so far as is reasonably practicable, without risks to health and safety.

* + 1. System Security

If a system security program is required under the Contract, the SEMP shall, for the Contractor's system security program:

identify the standards to be used (including those identified at clause 5.1), and that have been used for COTS / MOTS items, and describe the application of those standards to meet the system security requirements of the Contract;

identify the security-related requirements applicable to the Materiel System and summarise the approach to ensure that the security-related requirements are met;

if the Contractor will support the Commonwealth to obtain and/or maintain Security Authorisations in relation to ICT security and cyber security:

identify each Security System-of-Interest (SSoI) and the Targets of Security Assessment (ToSAs) within each SSoI;

identify, as applicable, the System Owner, security requirements authorities, Security Authorisation authorities, and other Associated Parties;

describe the technical requirements that must be met in relation to each SSoI/ToSA (eg, as set out in the Governing Security Documents);

describe the risk management processes to be applied, including to conduct security threat and risk assessments and for maintaining a risk register; and

explain the Contractor’s role in achieving Security Authorisations to be obtained for each SSoI/ToSA;

if ‘Cyber Security Assessment Information’ is required, describe how this data item is to be prepared and how the security risk assessment details will be maintained;

describe how system security program activities and outputs are integrated into the system engineering program for the various products, including identifying the outputs to be provided for the System Reviews; and

describe the Verification methods to be used to assess that the Materiel System’s security-related requirements have been met.

* + 1. System Certification

If the Mission System requires Certification in accordance with the Contract, the SEMP shall, for the Contractor’s system Certification program:

identify the Certification requirements, including related design standards, and the applicable certificating authorities that will be involved in the Certification process;

describe the approach to the collection, collation and presentation of Objective Evidence required for Certification; and

outline the Certification process to be followed and the interrelationships between the Certification process and applicable Milestones.

* + 1. Environmental Engineering

If an environmental engineering program is required under the Contract, the SEMP shall, for the Contractor's environmental engineering program:

identify the standards to be used (including those identified at clause 5.1), and that have been used for COTS / MOTS items, and describe the application of those standards to meet the environmental engineering requirements of the Contract;

identify the environmental-related requirements, including regulatory requirements and environmental-protection aspects of the design, applicable to the operation and support of the Materiel System;

describe the approach to ensure that the environmental-related requirements are met and all applicable Certifications are obtained;

describe how environmental engineering program activities and outputs are integrated into the system engineering program for the various products, including identifying the outputs to be provided for the System Reviews; and

describe the Verification methods to be used to assess that the Materiel System’s environmental-related requirements have been met.