DATA ITEM DESCRIPTION

1. DID NUMBER: DID-PM-MEAS-MEASP-V5.3
2. TITLE: Measurement Plan
3. DESCRIPTION AND INTENDED USE

The Measurement Plan describes how the information needs of the Contractor and the Commonwealth under the Contract will be addressed to provide an objective basis for informed decision making. Typically, this will require the specification of the measurement data to address identified information needs and the procedures for the collection, analysis, and reporting of measurement data across all aspects of the Contract (eg, project management, engineering, logistics, Verification and Validation, and quality). The Measurement Plan provides a formal basis of understanding between the Contractor and the Commonwealth on how the measurement program will be executed to meet contractual requirements.

The Contractor uses the Measurement Plan to satisfy agreed Contractor and Commonwealth information needs regarding Contract progress, risks and issues, system performance, quality and other Contract requirements.

The Commonwealth uses the Measurement Plan to monitor the Contractor’s measurement program and to determine whether the program will satisfy Commonwealth information needs.

1. INTER-RELATIONSHIPS

The Measurement Plan is subordinate to the following data items, where these data items are required under the Contract:

Project Management Plan (PMP); or

Support Services Management Plan (SSMP).

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

Contract Master Schedule (CMS);

Support Services Master Schedule (SSMS);

Contract Status Report (CSR);

Systems Engineering Management Plan (SEMP);

Software Management Plan (SWMP);

Software Support Plan (SWSP);

Integrated Support Plan (ISP);

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:

|  |  |
| --- | --- |
| AS/NZS ISO/IEC/IEEE 15939:2022 | Systems and software engineering - Measurement process |

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’.

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. General

The Measurement Plan shall:

describe the Contractor’s processes and organisational relationships for defining, collecting, analysing and reporting measurement data to satisfy identified information needs; and

identify the information needs of the Contractor and the Commonwealth under the Contract, unless these needs are being delivered separately in accordance with clause 6.3.1 of this DID.

* + 1. Measurement Organisation

The Measurement Plan shall identify the organisations involved in the measurement program, their role, responsibilities under the Contract, and the relationships between them.

Key individuals within each organisational entity shall be identified, together with the individuals’ responsibilities with regard to the measurement program.

* + 1. Measurement Approach

The Measurement Plan shall describe the approach to be applied in satisfying information needs through the measurement program.

* + 1. Selection of Contract Information Needs

The Measurement Plan shall describe the process to be used to identify, prioritise, and select information needs for inclusion in the measurement program.

* + 1. Measurement Information Model

The Measurement Plan shall describe the measurement information model to be used within the measurement program to link the information needs to other Contract processes, products and resources.

Note: Refer to AS/NZS ISO/IEC/IEEE 15939 Annex A for guidance on measurement information models.

The measurement information model shall describe how relevant attributes of Contract processes, products and resources are quantified and converted to indicators that provide a basis for decision-making.

The measurement information model shall clearly link the Contract objectives, information needs and the selected measures.

* + 1. Selection of Measures

The Measurement Plan shall define the criteria to be used to select measures in accordance with the priority of the information needs.

Note: See AS/NZS ISO/IEC/IEEE 15939 Annex C for example criteria.

* + 1. Tools and Databases

The Measurement Plan shall identify the tools and databases to be used within the measurement program.

Note: Typically, these tools would include graphical presentation tools, data collection tools (eg static code analysers and test coverage monitors), data analysis tools, and databases.

* + 1. Data Collection and Storage Procedures

The Measurement Plan shall include the procedures for the collection, storage and verification of measurement data. Where these procedures are available to the Commonwealth elsewhere under the Contract, a reference to them shall suffice.

The Measurement Plan shall specify how and when data is to be collected and how and where the collected data is to be stored and verified.

Note: Further guidance can be found in AS/NZS ISO/IEC/IEEE 15939 Annex F.

* + 1. Data Analysis Procedures

The Measurement Plan shall include the procedures for analysis of information products. Where these procedures are available to the Commonwealth elsewhere under the Contract, a reference to them shall suffice.

The Measurement Plan should specify the data analysis method(s) for evaluating the information products. The range of tools that would be needed to perform the data analysis should also be identified.

* + 1. Reporting Procedures

The Measurement Plan shall include the procedures for the reporting of information products. Where these procedures are available to the Commonwealth elsewhere under the Contract, a reference to them shall suffice.

Note: See AS/NZS ISO/IEC/IEEE 15939 Annex G for guidance.

* + 1. Measurement Evaluation

The Measurement Plan shall specify the points in time and/or the events (such as Mandated System Reviews) when the effectiveness of the measurement program is to be reviewed.

The Measurement Plan shall specify the criteria to be applied when evaluating the measurement process.

Note: Example criteria for the evaluation of a measurement process can be found in AS/NZS ISO/IEC/IEEE 15939 Annex E.

* + 1. Configuration Management

The Measurement Plan shall identify the procedures for configuration management of measurement data, data definitions and the measurement plan itself, appropriately cross-referenced to the governing plan for configuration management (eg, the Configuration Management Plan (CMP)).

Where these procedures are available to the Commonwealth elsewhere under the Contract, a reference to them shall suffice.

* + 1. Constraints

The Measurement Plan shall identify any constraints relating to the measurement program, such as confidentiality constraints on the data and information products, and describe any actions or precautions to be applied to manage these constraints.

* 1. Annex – Information Needs and Measures Specification
     1. Delivery

Where the CDRL specifies the delivery of a data item entitled, ‘Information Needs and Measures Specification’, the requirements of this clause 6.3 shall be delivered as a stand-alone entity in accordance with the CDRL requirements for this data item. Otherwise, the requirements of this clause 6.3 shall be included as an annex to the Measurement Plan.

* + 1. Contract Information Needs

The ‘Information Needs and Measures Specification’ shall identify all Contract information needs (ie, those required by the Commonwealth as well as those required for the Contractor’s own use), together with their relative priority and relevance within the measurement program.

* + 1. Measurement Specifications

The ‘Information Needs and Measures Specification’ shall include the following information in a tabular format for each information need to be addressed by the measurement program:

|  |  |
| --- | --- |
| Information Need Description | |
| 1. Information Need: | 1. Identify what the measurement user (eg. manager or team member) needs to know in order to make informed decisions. |
| 1. Information Category: | 1. Identify the standard information category name (such as Schedule and Progress), or indicate that this is a new category. |
| Measurable Concept | |
| 1. Measurable Concept: | 1. Describe the concept (an idea for satisfying the information need by using relevant entities and their attributes). |
| Entities and Attributes | |
| 1. Relevant Entities: | 1. Identify the entity (object) that is to be measured. Entities include process or product elements of a contract. |
| 1. Attributes: | 1. For each entity, identify one or more attributes (properties or characteristics) that will be quantified. [Note: for automated measurement, this must be the precise database element or other direct source of data.] |
| Base Measure Specification | |
| 1. Base Measures: | 1. Identify base measures to support the information need. A base measure is a measure of a single attribute defined by a specified measurement method (eg. planned number of lines of code, cumulative cost to date). As data is collected, a value is assigned to a base measure. |
| 1. Measurement Methods: | 1. Identify the logical sequence of operations that define the counting rule to calculate each base measure (such as counting semicolons for code size). |
| 1. Type of Method: | 1. Identify the type of method used, either subjective (relying on human judgment) or objective (quantification). |
| 1. Scale: | 1. Identify the set of values, or set of categories, for the attribute measured (eg. integer values greater than 0). |
| 1. Type of Scale: | 1. Identify the type of scale - ratio (numeric data, 0 to infinity), interval (numeric data, 1 to infinity), ordinal (rankings), or nominal (categories). |
| 1. Unit of Measurement: | 1. Identify the standardised quantitative amount that will be counted to derive the value of each base measure, such as an hour or an A4 page of text. Include any information necessary to interpret or normalise the measure. For example, to compare ‘lines of code’ may require the unit to be defined as ‘lines of C code’ or ‘lines of Ada code’. |
| Indicator Specification | |
| 1. Indicator Description and Sample: | 1. Provide a description and a display of one or more measures (base and derived) to support the user in deriving information for analysis and decision-making. An indicator is often displayed as a graph or chart. |
| 1. Analysis Model: | 1. Describe algorithms to be used with the measures. As needed, describe the underlying model of expected behaviour of the measures over time. |
| 1. Decision Criteria: | 1. Identify thresholds, limits, and targets used to trigger action or further investigation. |
| 1. Indicator Interpretation: (sample chart) | 1. For sample measures only, describe how the indicator in question was interpreted, and what decisions were made as a result. |
| Derived Measure Specification | |
| 1. Derived Measure: | 1. Describe any derived measures used. A derived measure is developed as a function of two or more values of base measures. |
| 1. Measurement Function: | 1. Identify the formula used to calculate each derived measure. |
| Data Collection Procedure (For Each Base Measure) | |
| 1. Frequency of Data Collection: | 1. Identify how often a measure will be collected (eg. monthly, weekly). |
| 1. Responsible Individual: | 1. Identify who is responsible for data collection and validation. |
| 1. Phase or Activity in which Collected: | 1. Identify lifecycle phases or activities when this data is collected. |
| 1. Tools Used in Data Collection: | 1. Identify tools used for data collection. |
| 1. Verification and Validation: | 1. Identify methods used to verify and validate the data. |
| 1. Repository for Collected Data: | 1. Identify where the identified data will be stored. |
| Data Analysis Procedure (For Each Indicator) | |
| 1. Frequency of Data Reporting: | 1. Identify how often an indicator will be generated (eg. monthly, weekly), including when the data will be delivered to the Commonwealth. |
| 1. Responsible Individual: | 1. Identify who is responsible for data analysis. |
| 1. Phase or Activity in which Analysed: | 1. Identify the lifecycle phase or activity during which analysis will be performed. |
| 1. Source of Data for Analysis: | 1. Identify the source of the data to be analysed. |
| 1. Tools Used in Analysis: | 1. Identify any tools to be used in the analysis. |
| 1. Review, Report, or User: | 1. Identify where the analysis will be reported and used (eg. System Review, monthly program review). |
| Additional Information | |
| 1. Additional Analysis Guidance: | 1. Provide any additional guidance that the measurement analyst should consider during the analysis. Indicate related indicators or measures. Indicate any additional decision criteria that may be considered at a later date. |
| 1. Implementation Considerations: | 1. Provide any implementation considerations that the measurement analyst should keep in mind. Identify any lessons learned or guidance. |

* + 1. Evaluation of Measurement Information Products

The ‘Information Needs and Measures Specification’ shall specify the criteria to be applied when evaluating the extent to which measurement information products support the satisfaction of information needs.

Note: Example criteria for the evaluation of information products can be found in AS/NZS ISO/IEC/IEEE 15939 Annex D.