DATA ITEM DESCRIPTION

1. DID NUMBER: DID-ENG-MGT-SINTP-V5.3
2. TITLE: SYSTEM INTEGRATION PLAN
3. DESCRIPTION and intended use

The System Integration Plan (SINTP) describes the Contractor's strategy, plans, methodologies and processes for undertaking system integration in order to meet the requirements of the Contract. For the purposes of the SINTP, system integration includes those activities necessary to:

to synthesise a set of system elements into a Mission System that satisfies the system requirements (ie, the Mission System Functional Baseline (FBL)), architecture and design; and

integrate the Mission System with external systems (including, if applicable, as part of platform integration and/or site integration) so that the Mission System and the external systems interface with each other and interoperate in a manner that satisfies the Mission System FBL when the Mission System is operated and supported in accordance with the Operational Concept Document (OCD).

The Contractor uses the SINTP to record the plan for the integration process, aligned with the maturity of the design of the Mission System, that:

demonstrates a coherent and well-founded program of integration activities that can effectively manage risk;

identifies the organisations (including Subcontractors) that are undertaking system integration activities, their role and scope of work, and respective responsibilities;

describes the systems and processes to be used for undertaking system integration;

identifies the system integration activities to be executed in each phase of the Contract, with particular attention to early preparation and planning activities; and

describes the Integration System that provides the physical and support capabilities for integrating and Verifying the system.

The Commonwealth uses the SINTP to:

understand and evaluate the Contractor’s plans for system integration;

gain visibility into the plans for the Contractor’s integration activities and design of the associated Integration System;

understand the Commonwealth’s role in the integration process, particularly the elements to be delivered by the Commonwealth (eg, Government Furnished Equipment (GFE) and Government Furnished Services (GFS)) that enable the integration process; and

assist with the identification of risks that require Commonwealth action.

For the purposes of this DID, ***Integration System*** means the physical and support capabilities necessary for integrating and Verifying the system, including:

simulators, stimulators, laboratory equipment and test tools necessary to perform the system integration operations;

one or more parallel test lines (ie, replicated Mission System equipment) necessary to meet Contract schedule requirements; and

all physical facilities, plant, equipment and support services such as floor space, power, air conditioning, communications and security.

1. INTER-RELATIONSHIPS

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

Project Management Plan (PMP); and

System Engineering Management Plan (SEMP).

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

System Review Plan (SRP);

Verification and Validation Plan (V&VP);

Integrated Support Plan (ISP); and

Software Management Plan (SWMP).

1. Applicable Documents

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

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| 1. Nil |  |

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 SINTP should 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. System Integration Overview

The SINTP shall provide:

an overview of the Contractor’s design for the Mission System, particularly focussing on those aspects of the solution that lead to integration requirements;

a list of the major system integration milestones;

an overview of the system integration key factors, including:

the key design drivers;

any assumptions underpinning the design decisions;

any constraints or limitations with the design, including any integration constraints that influence system requirements, architecture, or design, including interfaces; and

any elements of the Integration System that may transition to the Support System; and

a description of the various strategies that the Contractor will use to mitigate system integration risks (eg, early integration activities, early evaluation of GFE/GFS, use of test beds, and use of simulation and/or stimulation).

The SINTP shall provide an overview of the system integration activities for the Contract, including:

the activities to be conducted in preparation for conducting system integration, including planning, design, scheduling, execution, and the establishment of tools and facilities as part of the Integration Systems necessary to ensure that the independently developed parts can be successfully assembled;

the system integration activities for the Mission System to:

successively combine system elements to form complete or partial system configurations in an appropriate integration environment;

successively combine system elements with external systems (or elements or representations of those external systems) in an appropriate integration environment to ensure that the Mission System will interface with and, if required, interoperate with the external systems, as envisaged under the Contract, including (if applicable) for the purposes of platform integration and site integration;

progressively validate that the design solution will meet its design intent, and gain confidence that it will satisfy user needs and meet the requirements of the Mission System FBL; and

ensure that the design solution is at a state where Acceptance Verification can be expected to pass with a minimum of difficulty; and

the activities of the integration team in supporting the conduct of system-level Acceptance Verification to make certain everything runs as intended and issues are resolved as quickly as possible.

* + 1. System Integration Organisation

The SINTP shall describe the organisational roles, relationships and divisions of responsibility between the respective organisations that either will be, or are envisaged to be, providing system integration expertise, specifically identifying:

the roles and responsibilities of the Contractor and Subcontractors; and

the roles and responsibilities of the key staff involved in systems integration, including those staff from the Contractor, Approved Subcontractors, and the Original Equipment Manufacturers (OEMs) for the Mission System, its major subsystems, and significant system integration components.

The SINTP shall describe the Contractor’s teaming arrangements (eg, Integrated Product Team (IPT)) for achieving the system integration requirements, including a description of the relationships with Contractor internal teams, Subcontractor teams, and other Commonwealth teams (eg, hardware and software development teams and Verification and Validation (V&V) teams).

The SINTP shall describe the envisaged Commonwealth responsibilities and any assumptions in regard to the role of the Commonwealth in relation to system integration.

* + 1. Integration System

The SINTP shall describe the Integration System that provides the physical and support capabilities for integrating and Verifying the system, including:

the process for its definition;

its basis of provisioning;

its design and content, including any major developmental or critical components;

the timing of its implementation and use with respect to other project milestones and activities; and

the proposed future use of all or part of the Integration System as part of the Support System.

The SINTP shall describe the interfaces between the Mission System and the Integration System, particularly addressing the interfaces that are key to mitigating the risks arising out of system integration.

* + 1. System Integration Details

The SINTP shall describe the succession of builds and/or increments for implementing the Mission System, including the orchestration of the order of development and delivery of each element (ie, hardware, software or aggregation), simulation / stimulation elements, and test equipment.

The SINTP shall describe the processes and activities for assembly of the Mission System that:

are consistent with the architectural design;

successively combine pairs or groups of system elements to form complete or partial system configurations in an appropriate integration environment;

progressively validate that the design solution will meet its design goals, and gain a level of confidence that the design solution will satisfy user needs and meet the requirements of the Mission System FBL; and

ensure the design solution is at a state where Acceptance Verification can be expected to pass with a minimum of difficulty.

The SINTP shall describe the process and activities for integrating the Mission System with any required external systems (including, if applicable, for the purposes of platform integration and/or site integration), including, in relation to external interfaces:

identifying those interfaces where the associated standards or technology are still in the process of development, including describing the associated strategies for managing and implementing these interfaces;

identifying any high-risk interfaces, including describing the associated risk-mitigation strategies for developing and implementing these interfaces;

describing the means and processes of controlling and managing changes to interface requirements and associated design, which may affect compatibility with other systems and equipment, including the establishment and conduct of Interface Control Working Groups (ICWGs) with Subcontractors, the Commonwealth and Associated Parties; and

describing the relationship between the Contractor’s activities for interface management and those of the Commonwealth, and other parties, including requirements for Commonwealth participation, and the provision of specific Government Furnished Material (GFM), Government Furnished Facilities (GFF), and GFS.

The SINTP shall define the system-integration activities performed for the Mission System necessary to:

install the hardware and software elements;

verify that the installation of each new element is satisfactory to proceed;

generate and maintain a ‘system integration work flow matrix’ that lists all system operation and design elements that need to be validated during integration and the necessary sequence of these, including as applicable:

testing to be performed on each OEM component or other standalone component to be evaluated prior to integration;

set up and start up for each item under test (ie, each component, interface, group of items or integrated system being tested);

the configuration of, and the states and modes for, each item under test;

the pairwise integration of components, including expected interface checks and function and performance checks;

group-level integration of components, including interface, functional thread and function and performance checks;

system-level integration, including, as applicable, the function and performance of concurrent and parallel operations, group interactions, normal and high-load operations and longevity testing; and

system-of-system-level integration, including, as applicable, the function and performance of the system when operating with the external systems, system capacity testing, and exercising of failure modes for the system and the external systems;

exercise the system in such a manner to:

discover all security vulnerabilities, errors and omissions associated with expected system design behaviour and performance (eg, using integration procedures for design validation), including, where applicable, when the system is integrated with external systems;

discover all errors and omissions associated with the Verification of system requirements (eg, using modified procedures that balance efficiency and confidence in future verification activities);

confirm that human-system interfaces and Training procedures are correct;

confirm that it will meet the user needs and scenarios consistent with the OCD (eg, checking threads of expected end-to-end system use that align with the OCD, for example that a “day in the life” procedure exercises properly);

confirm useability with user participation;

ensure that Security Authorisations are maintained throughout the system integration activities; and

with V&V personnel, confirm that the system will be ready for Acceptance Verification with low risk of change;

track all errors and omissions to closure;

generate and monitor and schedule the design changes necessary to correct the errors and omissions; and

perform regression testing, as necessary.

* + 1. System Increment Integration Details

The SINTP shall describe the following, including for each integration build / increment (as applicable) leading up to the final assembly and evaluation of the system:

software and hardware items included in the build / increment;

system-under-test diagrams, showing the fractional part of the system being integrated and subject to test;

system capabilities included in the build / increment;

system functional threads addressed by the build / increment;

any requirements that may be Verified in the build / increment;

interfaces and messages to be validated in the build / increment;

all required GFE and GFS needed to support the activity;

required integration tools; and

the integration objectives for the build/increment against the categories of:

installation and checkout;

duration/stability evaluation;

functionality evaluation;

performance evaluation;

availability evaluation;

functional thread assessment;

operational procedures to be executed;

Training Materials, to be validated to confirm that they are ready for use;

regression testing; and

transition to Acceptance Verification.

* + 1. System Integration Monitoring and Control

The SINTP shall describe the monitoring and control mechanisms to be implemented by the Contractor to ensure that the system integration activities are progressing appropriately against the plan, including:

the integration measurement data to be collected, analysed and reported by the Contractor, including the integration measures to be applied to Approved Subcontractors; and

the tolerances to be applied to the key integration measures, including in relation to the Approved Subcontractors.

The SINTP shall describe the how visibility of the Contractor's integration activities, including progress against the plan, will be provided to the Commonwealth, including at Mandated System Reviews and Internal System Reviews.