MSR ChecklisT

1. Identification: MSR-CHECKLIST-SDR-V5.3
2. TITLE: System Definition Review Checklist
3. DESCRIPTION and intended use

The objectives of the System Definition Review (SDR) are to:

enable the Functional Baselines (FBLs) for the Mission System and Support System to be established in accordance with the Contract;

confirm that the Contractor’s system-level designs for both the Mission System and Support System are complete and balanced, including to validate that the system requirements for both the Mission System and Support System are complete, verifiable, achievable and realistic;

demonstrate convergence on, and achievability of, technical requirements for both the Mission System and the Support System; and

demonstrate readiness to initiate the subsequent system design phase for both the Mission System and the Support System.

This MSR Checklist sets out the Commonwealth’s requirements and minimum expectations for the conduct of an SDR.

1. INTER-RELATIONSHIPS

The SDR shall be conducted in accordance with the Approved System Review Plan (SRP), and shall be consistent with the following data items, where these data items are required under the Contract:

Systems Engineering Management Plan (SEMP);

Integrated Support Plan (ISP); and

Verification and Validation Plan (V&VP).

Primarily, the SDR addresses the requirements embodied in the:

System Specification (SS); and

Support System Specification (SSSPEC),

which have been derived from analyses of such documents as the Function and Performance Specification (FPS), the Operational Concept Document (OCD), and other regulatory and stakeholder requirements as defined by the SOW.

Note: The Status column in the following three tables indicates whether or not the associated Checklist items are able to be tailored by the Contractor in its SRP, based on the following definitions:

1. Mandatory items are not to be tailored;
2. Highly Desirable items should not be tailored, but may be tailored depending upon the specifics of the Contract and the Contractor’s internal processes; and
3. Optional items may be tailored, based upon the specifics of the Contract and the Contractor’s internal processes.

Notwithstanding the Status assigned to each Checklist item, the items are to be included in the SRP if they are applicable.

1. Review Entry Criteria

| Item | Entry Criteria | Status |
| --- | --- | --- |
|  | 1. All data items required to be delivered before, and linked to, the SDR have been delivered and the Commonwealth Representative considers the data items to be suitable for the purposes of conducting SDR. | 1. Mandatory |
|  | 1. The OCD has been reviewed to ensure that the operational and support concepts and scenarios for the Mission System and Support System are current. Proposed changes to the OCD to address any inconsistencies between the OCD and the SS/SSSPEC have been Approved by the Commonwealth Representative. | 1. Mandatory |
|  | 1. Proposed Deviations to the FPS, to address any conflicts between the proposed SS or SSSPEC requirements and the FPS, have been Approved by the Commonwealth Representative. | 1. Mandatory |
|  | 1. All documentation to form part of the Functional Baselines for both the Mission System and Support System has been placed under configuration control. | 1. Mandatory |
|  | 1. Specification requirements for both the Mission System and the Support System have documented traceability to their source. | 1. Mandatory |
|  | 1. Verification methods for both the Mission System and the Support System have documented traceability to their source. | 1. Mandatory |
|  | 1. The Contractor has reviewed the Contract plans to assess their consistency with the requirements for both the Mission System and Support System. | 1. Highly Desirable |
|  | 1. Action items from any previous System Reviews affecting SDR have been successfully addressed or action plans agreed with the Commonwealth Representative. | 1. Mandatory |
|  | 1. The Commonwealth has reviewed the system requirements for both the Mission System and the Support System and all comments have been addressed to the satisfaction of the Commonwealth Representative. | 1. Mandatory |

1. Review Checklist

| Item | Checklist Item | Status |
| --- | --- | --- |
|  | 1. Were all entry criteria satisfied before starting SDR? | 1. Mandatory |
|  | 1. Has the impact of Approved and pending CCPs been assessed? | 1. Highly Desirable |
|  | 1. Have all Commonwealth Representative review comments against data items delivered for the purposes of SDR been adequately addressed? | 1. Mandatory |
|  | 1. Have all Commonwealth-Approved sources of requirements been used to elicit requirements? | 1. Mandatory |
|  | 1. Do the system requirements for both the Mission System and the Support System accurately reflect the needs, expectations, constraints and interfaces of stakeholders (eg, sponsor, user, operator, maintainer, and other system managers)? | 1. Mandatory |
|  | 1. Have all conflicts between the initial Commonwealth requirements and other stakeholder (eg, government regulatory organisations and other Defence stakeholders) requirements been resolved? | 1. Mandatory |
|  | 1. Are the Mission System requirements necessary and sufficient to ensure that the system can be used and supported in accordance with the operational concepts and scenarios documented in the OCD? | 1. Mandatory |
|  | 1. Are the Support System requirements necessary and sufficient to ensure that the Mission System can be supported in accordance with the operational and support concepts and scenarios documented in the OCD, while also achieving any support-related Australian Industry Activities (AIAs) set out in the Contract? | 1. Mandatory |
|  | 1. Has an appropriate allocation of functions and requirements between the Mission System and Support System been made (eg, trade-offs associated with the levels of built-in test / diagnostics)? | 1. Mandatory |
|  | 1. Have conflicts between the Mission System and Support System requirements been resolved? | 1. Mandatory |
|  | 1. Have all assumptions made, with respect to defining system requirements for both the Mission System and the Support System, been analysed to ensure that they are consistent with the systems being designed and developed? | 1. Mandatory |
|  | 1. Do the system requirements for both the Mission System and the Support System satisfy the requirements of the Contract and, if applicable, the Contract (Support) (eg, applicable standards, practices, SOW, SEMP and ISP)? | 1. Mandatory |
|  | 1. Are the requirement statements well formulated individually and as sets? | 1. Mandatory |
|  | 1. Has the requirements traceability between the SS/SSSPEC and the source documents (eg, FPS, OCD) been updated and finalised since SRR? Is the accompanying rationale sufficient? | 1. Mandatory |
|  | 1. Have all requirements variances, voids and conflicts been resolved? | 1. Mandatory |
|  | 1. Do the Mission System and Support System requirements have feasible and acceptable Verification strategies and methods? | 1. Mandatory |
|  | 1. Are the Acceptance Verification criteria agreed with the Commonwealth Representative? | 1. Mandatory |
|  | 1. Are all external interface requirements for the Mission System consistent with the documentation of the external interfaces? | 1. Mandatory |
|  | 1. Are all system interface requirements for the new elements of the Support System consistent with the documentation of the interfaces for the existing support infrastructure? | 1. Mandatory |
|  | 1. Are interface requirements for both the Mission System and the Support System defined to an appropriate level of detail for this stage of the Contract? | 1. Mandatory |
|  | 1. Are the system boundaries for both the Mission System and Support System well defined? | 1. Mandatory |
|  | 1. Are all system interfaces for both the Mission System and the Support System well understood and do all external systems have matching expectations for the system? | 1. Mandatory |
|  | 1. Have all of the Support System elements that will form a part of, or be resident on, the Mission System been identified? Have the implications of these elements been addressed in the System Specification? In particular, consider:    1. Software applications resident on the Mission System, such as Computer Based Training (CBT) and Interactive Electronic Technical Publications (IETPs);    2. Training simulation modules;    3. Spares and Support and Test Equipment (S&TE);    4. Maintenance workshops (eg, on a ship);    5. failure and fault diagnostic systems;    6. data logging systems;    7. built-in test equipment, including diagnostic Software; and    8. hard copy manuals. | 1. Mandatory |
|  | 1. Are there any updates to the requirements for Government Furnished Material (GFM), particularly Government Furnished Equipment (GFE), currently documented in the Contract, including the timeframes for delivery? | 1. Mandatory |
|  | 1. Have the system requirements, for both the Mission System and the Support System, been assigned to the applicable system logical models? | 1. Mandatory |
|  | 1. Have the Logical Solution Representations for the Mission System been developed to adequately capture the system behaviour and the required behaviour of the subsystems? | 1. Mandatory |
|  | 1. Have the Logical Solution Representations for the Support System been developed to adequately capture the system behaviour and the required behaviour of the Support System Constituent Capabilities? | 1. Mandatory |
|  | 1. Have the Logical Solution Representations for the Mission System been partitioned and assigned to physical system design elements? | 1. Mandatory |
|  | 1. Are system states and modes for both the Mission System and the Support System adequately defined? | 1. Mandatory |
|  | 1. Are timelines of behaviour (eg, time-based sequences and relationships between system elements, events and activities) defined for both the Mission System and Support System, in particular for critical operational and support issues? | 1. Mandatory |
|  | 1. Are data and control flows and interactions defined for both the Mission System and Support System? | 1. Mandatory |
|  | 1. Have the failure modes, effects and the associated criticality for both the Mission System and, if applicable, Support System been analysed, and is the expected system behaviour on failure adequately captured? | 1. Mandatory |
|  | 1. Has bi-directional traceability for the Mission System been established between system and subsystem requirements, system requirements and Logical Solution Representations, and Logical Solution Representations and subsystem designs? | 1. Highly Desirable |
|  | 1. Have potential Support System alternatives been evaluated with respect to Life Cycle Cost (LCC), benefits, and risks? | 1. Mandatory |
|  | 1. Has a final allocation of Support System requirements been made to each of the Support System Constituent Capabilities? | 1. Mandatory |
|  | 1. Has a hierarchy of MOEs for both the Mission System and Support System been developed that derive from critical operational issues and lead to specific performance measures in the SS and SSSPEC? | 1. Mandatory |
|  | 1. Have key Technical Performance Measures (TPMs) been identified and have the status of these TPMs been reported against their respective progress? | 1. Mandatory |
|  | 1. Are the updated/completed System and Subsystem Specifications for the Mission System adequate and cost effective in satisfying validated mission requirements? | 1. Mandatory |
|  | 1. Is the updated/completed SSSPEC adequate and cost effective in satisfying validated operational and support requirements, including any support-related AIAs? | 1. Mandatory |
|  | 1. Does the set of Subsystem Specifications represent a complete, consistent and optimised synthesis of the Mission System requirements, including to confirm that the SS is complete, verifiable, achievable and realistic? | 1. Mandatory |
|  | 1. Have the technical program risks for both the Mission System and Support System been identified, ranked, and appropriate mitigation strategies defined? | 1. Mandatory |
|  | 1. Have the results of significant trade studies been presented, for example:    1. sensitivity of selected mission requirements versus realistic performance parameters and cost estimates;    2. system centralisation versus decentralisation;    3. automated versus manual operation;    4. Reliability, Availability and Maintainability (RAM);    5. commercially-available items versus new developments;    6. testability trade studies (ie, allocation of fault detection/isolation capabilities between elements of built-in test, on board/on-site fault detection/isolation subsystem, separate S&TE, and manual procedures);    7. size and weight;    8. desired propagation characteristics versus reduction of interference to other systems (optimum selection frequencies);    9. supportability for both the Mission System and Support System;    10. functional allocation between hardware, Software, firmware and personnel/procedures;    11. cost versus performance versus supportability;    12. sensitivity of performance parameters versus cost;    13. design versus manufacturing consideration;    14. make versus buy;    15. Software-development schedule; and    16. on-equipment versus off-equipment maintenance tasks, including S&TE impacts. | 1. Mandatory |
|  | 1. Has the analysis, assessments and trade-off studies recommended any additional special studies or development efforts? | 1. Highly Desirable |
|  | 1. Have the results of Commonwealth-directed trade studies been presented, and have the implications for the requirements and design of the Mission System and Support System been addressed? 2. Have the agreed outcomes from Commonwealth-directed trade studies presented at previous reviews been incorporated into the requirements and design for the Mission System and Support System? | 1. Optional |
|  | 1. Has design feasibility and system effectiveness for the Mission System been evaluated? | 1. Mandatory |
|  | 1. Have Engineering Support functions developed by the Contractor been reviewed to determine that support concepts are valid, technically feasible, and understood. In particular, has attention been given to:    1. design management of the Mission System and major Support System Components over the Life-of-Type (LOT) of the Mission System;    2. the network of design and design-related authorities that will contribute to the Engineering Support function over the LOT of the Mission System;    3. configuration management over the LOT of the Mission System, including the linkages between the Acquisition and In‑Service Phases;    4. provision of Verification and Validation during the In‑Service Phase; and    5. management of the Engineering Information System (EIS) during the In‑Service Phase. | 1. Mandatory |
|  | 1. Have Maintenance Support functions developed by the Contractor been reviewed to determine that support concepts are valid, technically feasible, and understood. In particular, has attention been given to:    1. RAM considerations in the updated System and Subsystem Specifications;    2. Maintenance design characteristics of the system;    3. Corrective Maintenance and Preventive Maintenance requirements;    4. special equipment, tools, or material required;    5. item Maintenance analysis compatibility with required maintenance program when weapon is deployed;    6. specific Configuration Item support requirements;    7. Maintenance-related trade-off studies and findings (includes commercially-available equipment, Software fault diagnostic techniques);    8. logistic cost impacts;    9. support procedures and tools for Software, which facilitate Software modification, improvements, corrections and updates; and    10. S&TE concept. | 1. Mandatory |
|  | 1. Have Supply Support functions developed by the Contractor been reviewed to determine that support concepts are valid, technically feasible, and understood. In particular, has attention been given to:    1. supply pipelines for each of the states and modes of the Support System;    2. interfaces between organisational entities along the supply pipeline;    3. inventory management and asset tracking mechanisms and interfaces;    4. lines of communication and divisions of responsibility;    5. packaging, handling, storage and transportation considerations; and    6. linkages to the maintenance concepts. | 1. Mandatory |
|  | 1. Has system effectiveness for the Support System been evaluated, including for each of the Support System Constituent Capabilities? | 1. Mandatory |
|  | 1. Have Support System cost, schedule and risk drivers been identified and evaluated, and mitigation strategies implemented? | 1. Mandatory |
|  | 1. Has the capability of the selected configuration to meet the requirements of the System and Subsystem Specifications been evaluated? | 1. Mandatory |
|  | 1. Has the allocation of Mission System requirements to subsystems/ Configuration Items been evaluated? | 1. Highly Desirable |
|  | 1. Has the allocation of inter- and intra- system interface requirements for both the Mission System and Support System been evaluated? | 1. Mandatory |
|  | 1. Have all entries marked "not applicable (N/A)" or "to be determined (TBD)" been identified and explained by the Contractor? | 1. Highly Desirable |
|  | 1. Have specific design concepts, which require development toward advancing the state-of-the-art, been evaluated? | 1. Optional |
|  | 1. Have high risk areas or design concepts requiring possible advances of the state-of-the-art been identified, and prepared approaches to the problem reviewed? | 1. Optional |
|  | 1. Producibility Analysis and Manufacturing: 2. Have the requirements for manufacturing methods and processes been updated? 3. Has the production feasibility and risk analyses addressed at the SRR been updated and expanded? 4. Has the production capability been reviewed to assess the facilities, materials, methods, processes, equipment and skills necessary to perform the development and production efforts? 5. Have requirements to upgrade or develop manufacturing capabilities been identified? 6. Have the management controls and the design and manufacturing engineering approaches been presented to ensure that the equipment is producible? 7. Has a review of trade-off studies for design requirements against the requirement for producibility, facilities, tooling, production test equipment, inspection, and capital equipment for intended production rates and volume been presented? | 1. Highly Desirable |
|  | 1. Have prepared test programs been reviewed for sufficiency and compatibility with the specified threat environment and existing simulation test facilities? | 1. Optional |
|  | 1. Have specific subsystems/components which may require "hardware proofing" and high-risk Long Lead Time Items (LLTIs) been evaluated? | 1. Highly Desirable |
|  | 1. Growth, Evolution and Obsolescence: 2. Have the likely areas for future change or expansion over the LOT been considered and reviewed since SRR? 3. Have lower-level requirements adequately captured the need for future change or expansion in the likely areas? 4. Have the appropriate standards for external interfaces and for internal architecture been considered to ensure the solution is robust over the LOT? 5. Have additional elements, over and above those documented in the Growth Plan, that could cause obsolescence problems early in the system life-cycle been identified? | 1. Mandatory |
|  | 1. Reliability, Maintainability and Testability (RMT): 2. Have reliability, maintainability and testability been specified as measurable requirements or prioritised design goals for both the Mission System and the Support System Components? 3. Are the support concepts documented in the OCD valid and feasible in light of the specified RMT requirements and the allocation of these requirements to subsystems? 4. Do the requirements in the SSSPEC enable the Mission System maintainability and, if applicable, testability requirements to be met? 5. Does the analysis of the RMT requirements indicate any areas of risk, particularly with respect to feasibility? 6. Do the maintainability characteristics of the Mission System accord with the concepts for operational and deployed maintenance? | 1. Mandatory |
|  | 1. Logistics Engineering (Transportability): 2. Have transportability issues with the hardware and the software media been addressed for both the Mission System and Support System, including the use of differing transportation modes? 3. Have the environmental implications of the differing transportation modes been addressed? | 1. Highly Desirable |
|  | 1. Logistics Engineering (Standardisation): 2. Has the use of commercially available and standard parts been evaluated? 3. Does the proposed design utilise standard off-the-shelf elements to the maximum practicable extent? | 1. Highly Desirable |
|  | 1. Human Engineering: 2. Has human engineering including personnel numbers, skill levels and workload, both for operation and maintenance been analysed and adequately addressed in the requirements for both the Mission System and Support System? | 1. Mandatory |
|  | 1. Electromagnetic Environment Effects: 2. Has the interference caused by the external environment to the system and the system to the external environment been evaluated? 3. Have the allocated performance characteristics of all system transmitters and receivers been evaluated to identify potential intra- system electromagnetic (EM) incompatibilities? 4. Have non-design, spurious and harmonic system performance characteristics and their effect on electromagnetic environments of operational deployments been evaluated? | 1. Mandatory |
|  | 1. Safety: 2. Have all Materiel Safety issues that affect the requirements and design of the Mission System and Support System, including hazard analyses, been addressed? 3. Has an analysis of failure modes been undertaken to determine the safety implications of those modes? 4. Have the identified hazards and their risk classifications been agreed by the Commonwealth Representative? | 1. Mandatory |
|  | 1. Security: 2. Have all security issues that affect the requirements and design of the Mission System and Support System been addressed, including in relation to physical security, Emanation Security (EMSEC), Information and Communications Technology (ICT) security and cyber security? 3. Have appropriate security evaluations, Certifications and Security Authorisations been programmed into Contract plans and schedules? | 1. Mandatory |
|  | 1. Regulatory: 2. Have appropriate regulatory issues been addressed in the system requirements for both the Mission System and the Support System? For example, consider:    1. Australian Communications and Media Authority (ACMA) regulatory requirements,    2. environmental requirements,    3. EMI/EMC regulatory requirements,    4. Materiel Safety requirements,    5. system security requirements (eg, for Certification and Security Authorisations), and    6. ADF regulatory / assurance framework requirements. | 1. Mandatory |
|  | 1. Environmental: 2. Have the proposed designs for both the Mission System and Support System been reviewed for interaction with the natural environment, including the implications associated with temperature, humidity, vibration, shock, pressure, wind, salt, spray, sand, and dust? 3. Have the ranges and extremes of environmental requirements been specified and addressed in the designs of both the Mission System and Support System? 4. Have the operational and support concepts documented in the OCD been analysed to address environmental considerations for all phases of activity (eg, operations, maintenance, transportation, and storage)? 5. Have all proposed environmental tests been reviewed for compatibility with the specified natural environmental conditions? | 1. Mandatory |
|  | 1. Have all risks identified prior to SDR been reported against? | 1. Mandatory |
|  | 1. Does the Contractor’s proposed solution for both the Mission System and Support System represent a minimised LCC solution, as demonstrated in accordance with the Approved governing plan for LCC (eg, LCC Management Plan (LCCMP))? | 1. Mandatory |
|  | 1. Have any Contractor-provided proposals to reduce LCC been addressed (eg, as documented in the LCC Report and Model (LCCRM))? | 1. Highly Desirable |
|  | 1. Are Contract plans and schedules consistent with the system requirements and design for both the Mission System and Support System? | 1. Highly Desirable |
|  | 1. Does the Contractor's management of technical requirements with subcontractors and vendors allow the Contract needs to be achieved? | 1. Mandatory |
|  | 1. Are appropriate procedures, tools and resources in place for the conduct of subsequent supportability analyses in accordance with applicable plans? Analysis examples include Failure Modes, Effects and Criticality Analysis (FMECA); Reliability Centred Maintenance (RCM); task analysis; Level Of Repair Analysis (LORA); and performance needs (Training) analysis. | 1. Mandatory |

1. Review Exit Criteria

| Item | Exit Criteria | Status |
| --- | --- | --- |
|  | 1. All checklist items have been addressed to the satisfaction of the Contractor and the Commonwealth Representative. | 1. Mandatory |
|  | 1. All major problem and risk areas relating to the requirements and design for the Mission System and Support System have been identified and resolved and, for minor problems and risks areas, corrective action plans have been recorded and agreed by the Commonwealth Representative. | 1. Mandatory |
|  | 1. The system-level designs for the Mission System and Support System are consistent with the requirements (including OCD, FPS, draft SS and draft SSSPEC), balanced, achievable, and sufficiently mature to support the design and development activities of the next phase. | 1. Mandatory |
|  | 1. Both the Contractor and the Commonwealth Representative consider that:    1. the system requirements for both the Mission System and Support System are complete, verifiable, achievable and realistic; and    2. the Functional Baselines for the Mission System and Support System (which, for clarity, include the Verification requirements, the external interface requirements and the traceability requirements defined in the SOW) are able to be established in accordance with the Contract. | 1. Mandatory |
|  | 1. Plans for the next phase are deemed to be realistic and achievable by both the Contractor and the Commonwealth Representative. | 1. Mandatory |
|  | 1. Plans for the measurement and analysis program for the next phase have been agreed by the Commonwealth Representative, including the measures to be collected, associated collection methods, and analysis techniques. | 1. Mandatory |
|  | 1. All risks identified during the course of SDR have been documented and analysed. | 1. Mandatory |
|  | 1. The risks with proceeding to the next phase are acceptable to the Commonwealth Representative. | 1. Mandatory |
|  | 1. All major action items have been closed. | 1. Mandatory |
|  | 1. All minor action items have been documented and assigned with agreed closure dates. | 1. Mandatory |
|  | 1. Review minutes have been prepared, Approved, and distributed in accordance with the Contract. | 1. Mandatory |