



OFFICE OF DEPUTY MINISTER

Director Land Command Systems Program Management



CANADIAN
ARMED FORCES

ANNEX A

STATEMENT OF WORK

December 2022

LAND C4ISR

CORE NETWORK

SUSTAINMENT SERVICES



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1 INTRODUCTION

1.1 Purpose

- 1.1.1 This Statement of Work (SOW) defines the Core Network work in support of the Land Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance Capability (Land C4ISR Capability). The Core Network is one of the four Functional Groupings that were identified at the enterprise level during the definition phase. The purpose was to clearly define the scope of work for each functional grouping. This SOW defines the work that is required for the Core Network Functional Grouping specifically. Further details are provided in Figure 3 of this document.

1.2 Scope

- 1.2.1 The scope of work will predominately include delivery of the sustainment services, which is based on the items identified in Appendix A2 – Director Land Command Systems Program Management (DLCSPM) standard System Breakdown Structure and Responsibility Matrix (DLCSPM-SBSRM-2021). The main purpose of this appendix is to identify the responsibilities of Department of National Defence (DND) and the contractor for the Core Network Functional Grouping. As the items of Land C4ISR Capability are part of a continuously evolving system, the items in DLCSPM-SBSRM-2021 standard may continually evolve throughout the contract period. The changes within the DLCSPM-SBSRM-2021 standard will be effected through, but not limited to, Core Work and Additional Work Requirements (AWRs) that will be performed during the contract period.
- 1.2.2 Canada reserves the right to amend the list of Products, Sub-Systems and Systems from time to time, as determined to be necessary by the Technical Authority (TA) or Technical Office of Primary Interest (Tech OPI) and approved by the Contracting Authority (CA).
- 1.2.3 The responsibilities of the Land C4ISR Core Network sustainment Contractor will include but is not limited to the following:
- i. System Engineering Management,
 - ii. Quality Management,
 - iii. Core Network Architecture,
 - iv. System and Sub-System Engineering,

- v. Product, Sub-System and System Integration,
- vi. Product Development,
- vii. Development Security Operations,
- viii. Cyber Security Engineering,
- ix. Field Support Services,
- x. Speciality Engineering Support Services,
- xi. Production Services,
- xii. Integrated Logistics Support.

1.3 Background and Land C4ISR Capability High Level Description

1.3.1 The Government of Canada has given the Canadian Armed Forces (CAF) clear direction concerning its vision for defence, in which Canada is:

- i. **Strong at home**, its sovereignty well-defended by a Canadian Armed Forces, also ready to assist in times of natural disaster, other emergencies, and search and rescue,
- ii. **Secure in North America**, active in a renewed defence partnership in NORAD and with the United States,
- iii. **Engaged in the world**, with the Canadian Armed Forces doing its part in Canada's contributions to a more stable, peaceful world, including through peace support operations and peacekeeping.

1.3.2 In order to meet these objectives, Canada needs an agile, multi-purpose, combat-ready military, operated by highly trained, well-equipped personnel. At any given time, the Government of Canada can call upon the CAF to undertake missions for the protection of Canada and Canadians, and the maintenance of international peace and stability. The CAF must be prepared to:

- i. Detect, deter and defend against threats to, or attacks on Canada,
- ii. Detect, deter and defend against threats to, or attacks on North America in partnership with the United States, including through NORAD,
- iii. Lead and contribute forces to NATO and coalition efforts to deter and defeat adversaries, including terrorists, to support global stability,
- iv. Lead and contribute to international peace operations and stabilization missions with the United Nations, NATO, and other multilateral partners,
- v. Engage in capacity building to support the security of other nations and their ability to contribute to security abroad,
- vi. Provide assistance to civil authorities and law enforcement, including counterterrorism, in support of national security and the security of Canadians abroad,
- vii. Provide assistance to civil authorities and nongovernmental partners in responding to international and domestic disasters, or major emergencies,
- viii. Conduct search and rescue operations.

1.3.3 Further, the CAF will be prepared to simultaneously:

- i. Defend Canada, including responding concurrently to multiple domestic emergencies in support of civilian authorities,
- ii. Meet its NORAD obligations,
- iii. Meet commitments to NATO Allies under Article 5 of the North Atlantic Treaty,
- iv. Contribute to international peace and stability through:
 - a. Two sustained deployments of ~500-1500 personnel, including one as a lead nation,
 - b. One time-limited deployment of ~500-1500 personnel (6-9 months duration),
 - c. Two sustained deployments of ~100-500 personnel,
 - d. Two time-limited deployments (6-9 months) of ~100-500 personnel,
 - e. One Disaster Assistance Response Team (DART) deployment, with scalable additional support,
 - f. One Non-Combatant Evacuation Operation, with scalable additional support.

1.3.4 To carry out these missions, the CAF requires a fully integrated tactical network, capable of providing flexible, multi-role, and combat-capable communications to the military. It also requires connectivity to other federal government departments, governments of other countries, international organizations, non-governmental organizations, private volunteer organizations, and private business ventures.

1.3.5 Land C4ISR Capability primarily supports the Canadian Army in operations by providing commanders with the information and information services required to make effective and timely Command and Control (C2) decisions about their operations and missions. As such, it enables the Canadian Army to:

- i. Plan and direct operations,
- ii. Manage operational information,
- iii. Achieve situational awareness,
- iv. Exchange information.

1.3.6 Land C4ISR Capability is an interconnected network of digital communications and information systems by which the data needed to plan, direct, and control tactical land operations is communicated, stored, processed, and displayed. Figure 1 - Land C4ISR Capability Conceptual Diagram shows a high-level diagram of the Land C4ISR Capability, depicting the systems, the vehicles, the dismounted soldiers, and the sub-networks that interconnect them. The DLCSPM, as the TA for the Land C4ISR Capability, retains Total System Responsibility (TSR), and is responsible for the life cycle management of the Land C4ISR from architectural development through systems engineering and integration, fielding, in-service support, and finally disposal. As such, DLCSPM will manage the sustainment of the Land C4ISR Capability by an Integrated Product Team (IPT).

1.3.7 DLCSPM will be responsible for ensuring that the right system is being built while the Contractor must be responsible for ensuring the system is being sustained and continuously enhanced to meet the Canadian Army's needs.

1.3.8 Doctrinally the Land C4ISR Capability is divided into the following constituent systems:

- i. **Tactical Command and Control Information Systems (TacC2IS):** TacC2IS are the interconnected Information Systems (IS) that provide an integrated network of computers with specific software applications that deliver information processing support for commanders and staffs at all levels.
- ii. **Tactical Communications (TacComms):** TacComms are the physical Communications Systems (CS) that enable commanders at all levels to have access to a fully integrated, secure communications network that provides the capability to exercise C2 through voice and data communications. TacC2IS is transported over TacComms.
- iii. **Intelligence, Surveillance and Reconnaissance (ISR):** ISR are the sensors and analysis capabilities used to gather and process tactical information into useful intelligence.

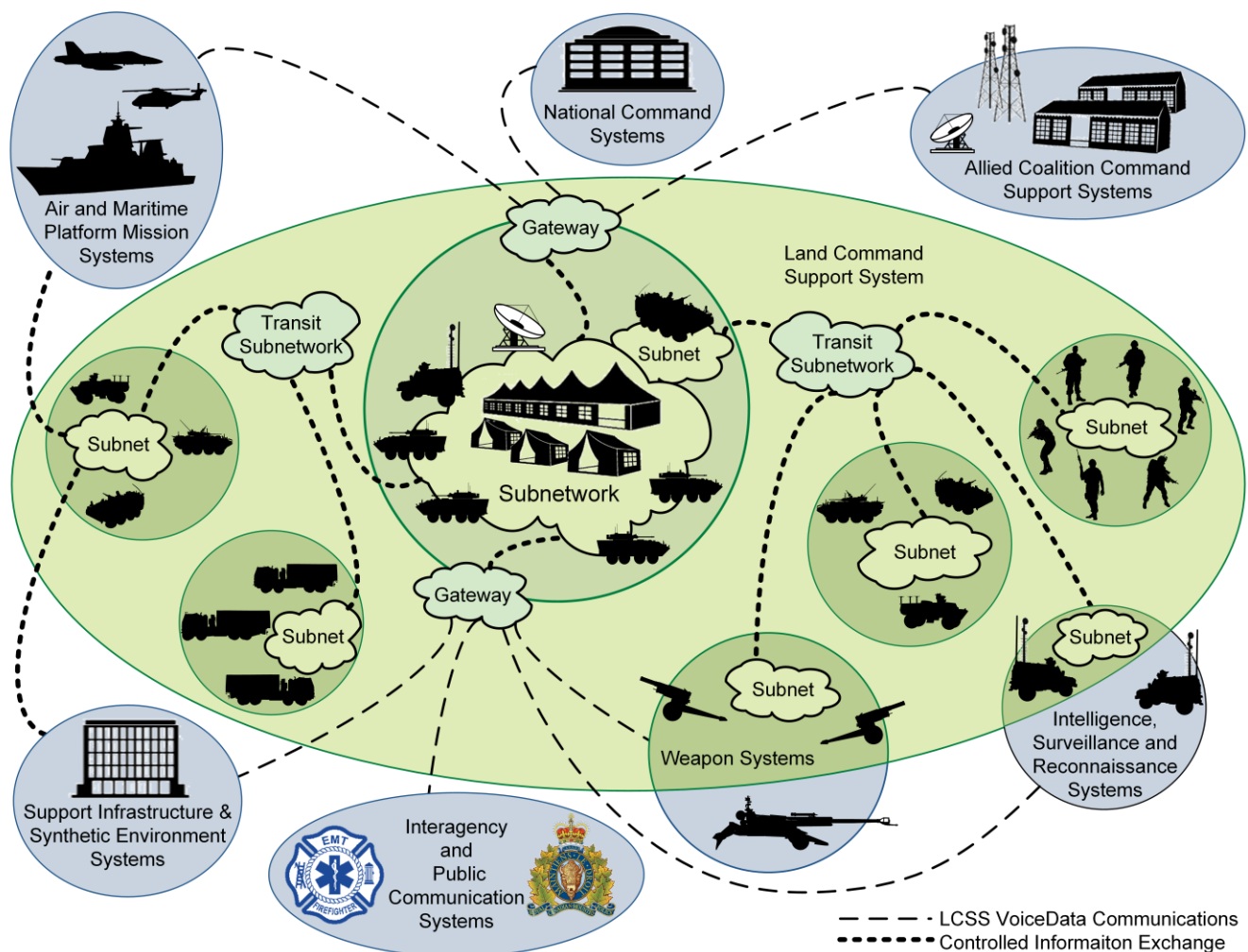


Figure 1
Land C4ISR Capability Conceptual Diagram

1.3.9 The operational concept for CAF land operations is based on Land Operations 2021 (ISBN: 978-0-662-44742-9) and the evolving Signals in Land Operations (B-GL-351-002/FP-001). This concept is sometimes referred to as the Land C4ISR context, which is represented in Figure 1 - Land C4ISR Capability Conceptual Diagram. Whereas Figure 2 depicts Land C4ISR in the battle space.

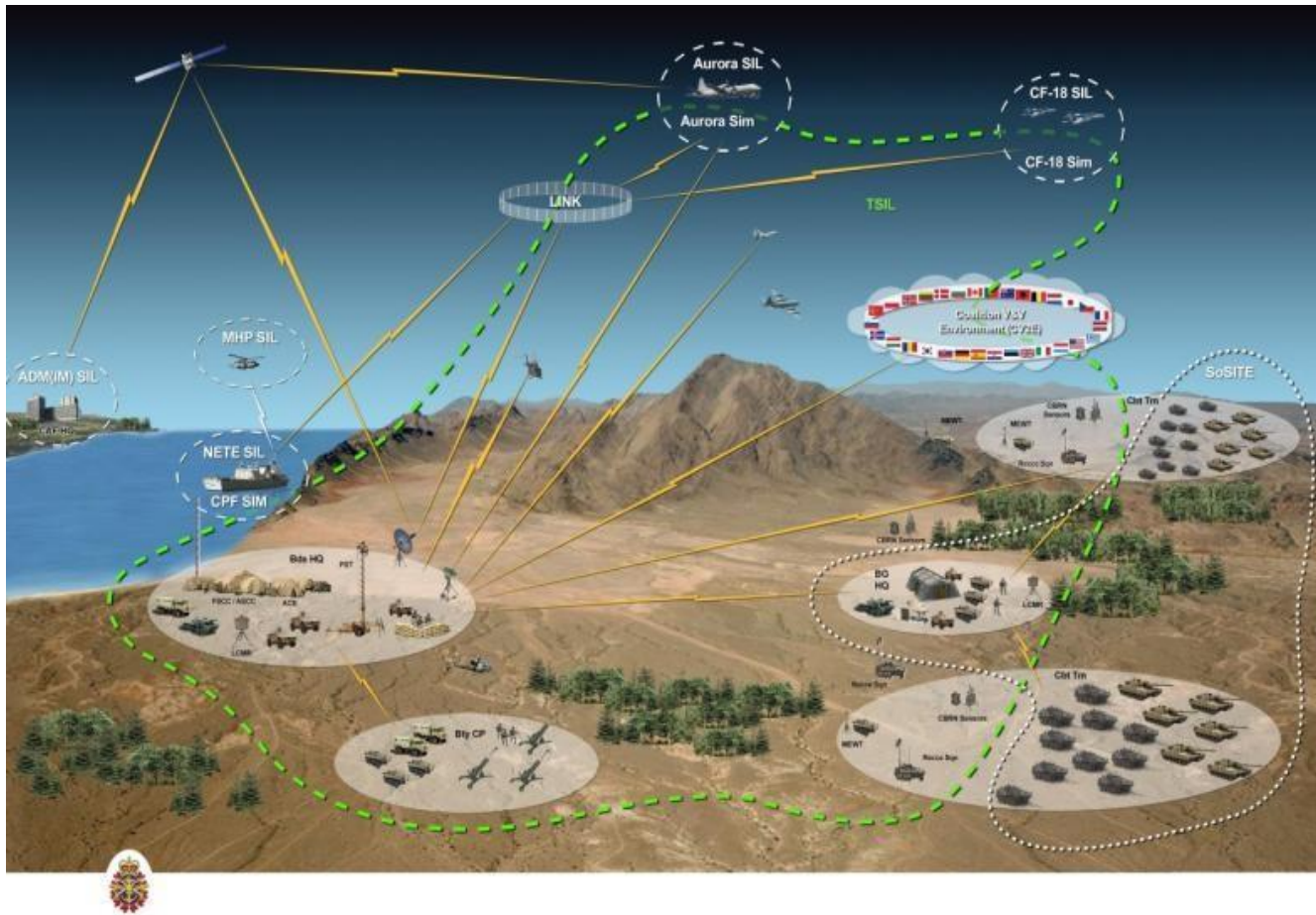


Figure 2

Land C4ISR in the Battle Space

For the purpose of this overview, the Land C4ISR Capability is considered to be the Army/Land Force Operated Communication and Information hardware and software that is used to provide commanders with the required C2 services. In the context of the Land C4ISR, however, the Army operates jointly and seamlessly with all other environments. In order to meet the CAF's operational requirements effectively and efficiently, DLCSPM jointly supports a number of applications, services, and standards.

1.4 Practical Application – Land C4ISR Capability

1.4.1 The practical application is more complex than the doctrinal description above. The current Land C4ISR Capability is divided into essentially three domains or systems and two enablers. These domains are characterized by their information and security requirements, and thus resulted in two technical implementations. The systems are the combination of various sub-systems that, when combined, deliver a capability to the CAF. The key difference from the doctrine described above is that all three of the doctrinal sub-systems are present in the three domains as well as the two enablers to a varied degree. The domains and enablers in the Land C4ISR Capability are:

- i. **Soldier Domain.** The soldier domain is characterized by the smallest information requirements. It is normally found in the dismounted (non-vehicle based) environment from the soldier up to the company level. It is short range, small data, and operates at the secure, but unclassified level.
- ii. **Mobile Domain (MD).** The MD is normally employed in mounted (vehicle based) environment from Platoon to the Battle Group (BG) level. Generally, it is characterized by a mobile ad-hoc network (MANET), with a medium data requirement operating at the SECRET security classification. The primary means of communication is voice. The supporting data network is highly mobile and is based on the idea of digitizing a soldier's paper map. It is not client-server based and there is no expectation of guaranteed delivery of messages.
- iii. **Headquarters Domain (HQ Domain).** The HQ Domain is normally employed at the BG and higher in the command elements of these units and formations. It is characterized by high and rich data requirements. Fundamentally, it operates like a field deployable enterprise network, running a variety of client-server applications and databases. It also is the domain that links to National or Coalition systems via gateways. It can be described as transportable, but not mobile; meaning network laydown and configuration is relatively stable. It also operates at the SECRET level, with increased security protection due to the volume of data utilized on this network.
- iv. **ISTAR enabler.** ISR contains the sensors and analytical tools enabling the Canadian Army to conduct Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR). It delivers substantial capability to the Canadian Army. Some Products and Sub-Systems leverage or connect to the MD and HQ Domains to transport or store their information, while others operate as stand-alone systems in their own right and provide capability without any of the three domains.
- v. **Simulation enabler.** Simulation contains simulation Systems, Sub-Systems, and Products to enable the Canadian Army to train (tactics and C2 procedures), force generate, and force develop. It delivers an engineered and integrated Synthetic Training Environment (STE) in support of the Future Integrated Training Environment (FITE). These simulation enablers connect to the MD and HQ Domains to support Canadian Army constructive training, and DLCSPM experimentation and systems engineering emulation and network testing.

1.5 Sustainment Model

1.5.1 The Land C4ISR Capability Sustainment model includes the four Functional Groupings listed below and in Figure 3 – Sustainment Model:

- i. **Land C4ISR System of Systems (SoS) Engineering and Integration (E&I).** This functional grouping consists of the overall Land C4ISR Capability architecture and design. This functional grouping defines the user needs and resulting system requirements. To then take those system requirements and further refine and define the Land C4ISR architecture and overall connection and interconnection patterns. System engineering will then refine those requirements to determine what standards are to be employed by all

Sub-Systems to integrate into the domains or overall Land C4ISR Capability. This functional grouping is also responsible for the overall integration of the other three functional groupings and the resulting verification and validation of the MD and HQ Domains and the ISTAR and Simulation enablers to form the Land C4ISR Capability.

- ii. **Land C4ISR Core Network.** This functional grouping is based on all services that are common across all domains and forms the backbone of the overall Land C4ISR Capability. Engineering activities within this functional grouping revolve around utilizing the standards and connecting patterns developed in the Land C4ISR SoS E&I Functional Grouping and applying them to the sub-system and product design of the Land C4ISR Core Network. It is comprised of hardware, firmware, software, and databases.
- iii. **Land C4ISR Applications.** This functional grouping is based on all user facing services and software, which leverage the MD and HQ Domains to provide capability to the end user. Information generated by services and software in this functional grouping is then transported by the Land C4ISR Core Network sub-system from its origin to destination. This functional grouping is information based and comprised largely of software and databases, with no involvement in hardware or firmware development.
- iv. **Land C4ISR ISTAR.** This functional grouping is comprised of standalone Systems, integrated Sub-Systems and Products for specialized ISR services. When integrated into the MD and HQ Domains, the Sub-Systems and Products pass information over the Land C4ISR Core Network and interact with the Land C4ISR Applications.

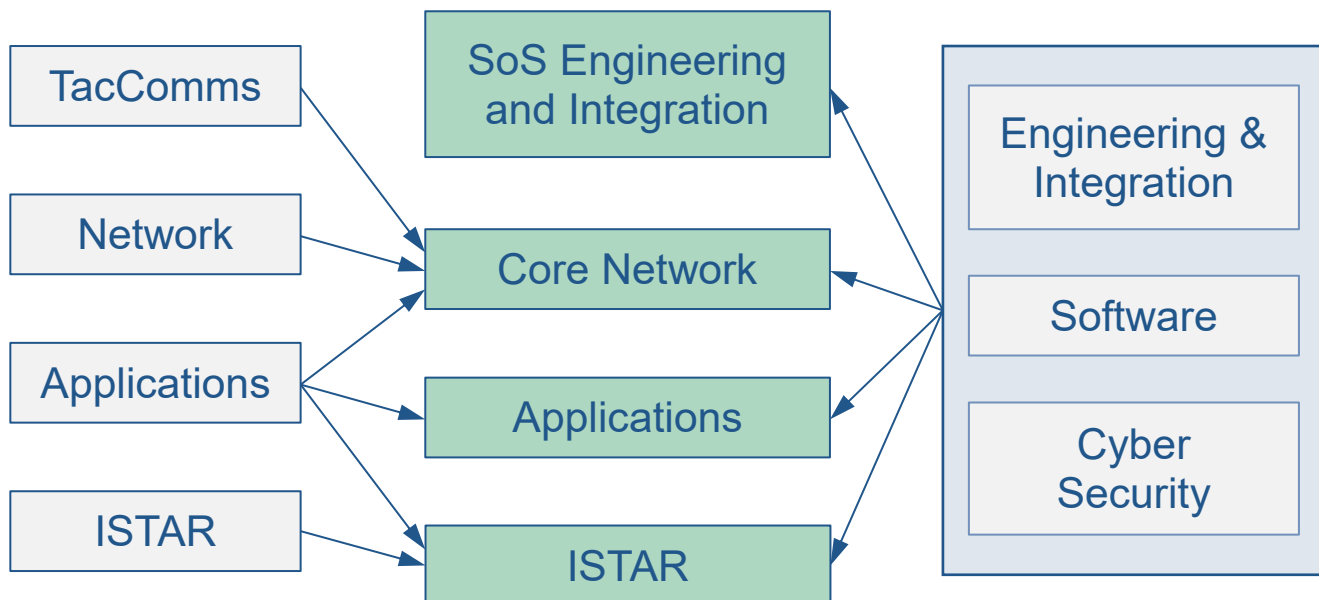


Figure 3
Sustainment Model



2 GENERAL REQUIREMENTS

2.1 Applicable Documents

2.1.1 Glossary and Definitions

2.1.1.1 The glossary and definitions that support this SOW are identified at Appendix A1.

2.1.2 Technical Standards, Specifications and Publications

2.1.2.1 The standards, specifications, and publications that support this SOW are identified at Appendix A2.

2.2 Technical Authority - Roles, Authorities and Responsibilities

2.2.1 Technical Office of Primary Interest

2.2.1.1 The Technical Office of Primary Interest (Tech OPI) is a DND employee delegated by the TA to exercise certain authorities, on their behalf, in accordance with this SOW and any additional work arising that may be authorized in accordance with the task authorization process.

2.2.2 Integrated Product Team

2.2.2.1 DND oversees the overall management of the Land C4ISR Capability within an Integrated Product Team (IPT) structure. In order to manage the Land C4ISR Capability while working in a collaborative manner, each IPT member serves as a conduit for information between each individual area of responsibility and associated stakeholders.

2.2.2.2 An IPT will exist at various levels. Each IPT is defined and has specific roles and objectives as outlined in the DLCSPM-SEP-2021 standard. All IPTs are defined in the DLCSPM-SEP-2021.

2.2.3 Design Authority

2.2.3.1 The Design Authority will make design decisions regarding a system element or elements under design, or modifications within the boundaries defined by stated requirements and constraints, including resource limitations placed upon the person or organization exercising this authority.

2.2.3.2 DLCSPM retains Total System Responsibility (TSR) as well overall Design Authority over all work done under this Contract for the Land C4ISR Capability. For Additional Work Requirements (AWRs), the TA may delegate design responsibility to an IPT.



3 REQUIREMENTS

3.1 Core Work

- 3.1.1 Core Work is comprised of the requirements described in Section 4 and Section 5 of this SOW that must be performed on a regular and ongoing basis over the duration of the contract period.
- 3.1.2 The Contractor must perform the following services, using the Contractor's proposed Core Work Personnel (CWP), on a regular and ongoing basis that includes:
 - i. Core Management Work,
 - ii. Core Engineering Management Work.
- 3.1.3 The Contractor, at its own discretion, must decide the make-up of its proposed CWP. The Contractor's proposed CWP is defined as the set of proposed personnel that must be provided by the Contractor, as deemed necessary to deliver the Core Work.
- 3.1.4 The Contractor must identify, in its approved Project Management Plan (PMP), the proposed CWP and how the Core Work will be managed by the proposed CWP. The Contractor must not utilize the proposed CWP to deliver AWRs. The Contractor must only use the identified proposed CWP to manage Core Work.
- 3.1.5 The Contractor must provide a separate team to deliver AWRs.

3.2 Additional Work Requirements

- 3.2.1 Beyond Core Work, a substantial portion of the Work to be performed under the Contract will be through Additional Work Requirements (AWRs) processes. The Contractor must deliver AWRs on an "as and when requested basis" using Task Authorizations.
- 3.2.2 The Contractor may be asked to perform AWRs, related to the engineering, integration, sustainment and support services of hardware, firmware, and software system elements within the Land C4ISR Capability as described in Section 6 of this SOW.
- 3.2.3 Additionally, the Contractor may also be asked to recommend and perform preventive, corrective, perfective, adaptive and emergency maintenance on the Product.
- 3.2.4 In the case of software and firmware, the Contractor will be provided with source code and detailed design documentation as appropriate. In the case of hardware, the Contractor will be provided with a technical data package, including design documentation where applicable. In all cases, the TA will provide the appropriate licenses or rights to use technical data or source code.



4 CORE MANAGEMENT WORK

4.1 General

- 4.1.1 The Contractor must perform Core Management Work on an on-going basis throughout the contract period.
- 4.1.2 The Contractor must plan, organize, and control all work described in this SOW including AWRs.

4.2 Project Management Plan

- 4.2.1 The Contractor must prepare, deliver, update, maintain, and implement a PMP in accordance with CDRL 100.001, DID 100.001.
- 4.2.2 The Contractor must implement and maintain the PMP that has been approved by DND.
- 4.2.3 The PMP must encompass management of all contractual activities such as initiate, plan, execute, control, and closeout all the work as defined in the CDRLs and DIDs.
- 4.2.4 The Contractor must adhere to the provisions of the approved PMP.
- 4.2.5 Project management activities must include, but are not limited to services outlined in CDRL 100.001 and DID 100.001.

4.3 Monitoring and Control

The Contractor must implement monitoring and control as outlined in the following sub-sections.

4.3.1 *Monthly Progress Reports*

- 4.3.1.1 The Contractor must prepare and submit Monthly Progress Reports in accordance with CDRL, DID 100.002.

4.3.2 *Progress Review Meetings*

- 4.3.2.1 The Contractor must conduct Progress Review Meetings (PRMs) bi-annually at the senior management level, between the Contractor, the Contracting Authority (CA), the Procurement Authority (PA), and the Technical Authority (TA). These PRMs must encompass the total program status as of the review date, and must present, for resolution, all known problems as of that date.

4.3.3 Progress Review Agenda and Minutes

- 4.3.3.1 The Contractor must prepare, submit for approval, and update the agenda for the PRM in accordance with CDRL, DID 100.003.
- 4.3.3.2 The Contractor must prepare, submit for approval, and update minutes of the PRM in accordance with CDRL, DID 100.004.

4.3.4 Ad-hoc Meetings and Reviews

- 4.3.4.1 Working level meetings will be held to review the status of individual tasks, their progress, and relative priorities. No action affecting task cost, or task duration limits, may be taken as a result of these meetings.

4.4 DND 626 - Task Authorization

4.4.1 Management and Priority

- 4.4.1.1 The TA will authorize tasks using the “DND 626 Form - Task Authorization” The TA will establish the priority of DND 626 Task Authorizations for AWRs. Should a change be made to the priority of an existing task, the Contractor must inform the TA of the impact that this change will have on other on-going tasks. The TA will decide on any necessary adjustment in priority, cost, schedule, and scope of on-going tasks.
- 4.4.1.2 The Contractor must manage authorized tasks as outlined in the following subsections.

4.4.2 Task Initiation and Planning

- 4.4.2.1 Unless specified otherwise, the Contractor must submit a proposal that includes:
 - i. An implementation plan, as applicable,
 - ii. A work breakdown structure, as applicable,
 - iii. A schedule, as applicable,
 - iv. A breakdown of the required resources and their Level of Effort-material, sub-contracted services and travel requirements, as applicable, in accordance with AWRs process.
- 4.4.2.2 If DND requests assistance from the Contractor with Task definition, this must not be construed as authority to proceed with any work.

4.4.3 Task Execution and Control

- 4.4.3.1 When a DND 626 Task Authorization is issued, the Contractor must:
 - i. Assign a Task Lead responsible to oversee the Task and maintain status,
 - ii. Assign resources to complete in accordance with Task requirements and budgetary estimates,
 - iii. Identify and implement any special reporting or metric requirements,
 - iv. Initiate and implement a risk management plan for any and all risks, and
 - v. Commence work on the Task in accordance with the approved schedule.

- 4.4.3.2 The Contractor must manage all pertinent information related to the task, including the original DND 626 Task Authorization, Task amendments, subsequent revisions, and any relevant data or documents.
- 4.4.3.3 On an ongoing basis during the execution of tasks, the Contractor must:
- i. Track and report tasks based on the DND 626 Task Authorizations numbers,
 - ii. Monitor tasks to ensure that the task progress and financial expenditures are in line with approved tasking and report status to the CA, PA and TA on a regular basis,
 - iii. Maintain task scheduling and tracking,
 - iv. Implement a performance monitoring and continuous improvement process to ensure that tasks are completed in accordance with the approved schedule and funding.

4.4.4 Task Closure

- 4.4.4.1 When the Work identified in the DND 626 Task Authorization is complete the Contractor must for each task:
- i. Prepare a final report in accordance with CDRL 100.006,
 - ii. Formally close out the task to ensure that there are no further charges accumulated against the task in accordance with the PMP.

4.4.5 Indigenous Procurement Plan

- 4.4.5.1 The Contractor must prepare, submit, and manage an Indigenous Procurement Plan (IPP) in accordance with CDRL and DID 100.006.

4.5 Risk Management

- 4.5.1 The Contractor must develop and implement a risk management plan to conduct the Work, in accordance with the PMP. Risk Management must include the following, but not limited to:
- i. Risk identification including risk quantification,
 - ii. Analysis,
 - iii. Planning,
 - iv. Tracking and Control.
- 4.5.2 The Contractor must execute Risk Management in accordance with the PMP.

4.6 Integrated Logistics Support Plan

- 4.6.1 The Contractor must establish and maintain an Integrated Logistics Support Plan (ILSP).
- 4.6.2 The Contractor must prepare and submit an ILSP in accordance with CDRL 300.001.

4.7 Government Furnished Assets

- 4.7.1 The Contractor must, as part of Core Management Work, implement a Government Furnished Assets (GFA) Management Plan in accordance with the process identified in Appendix A3 – Logistic SOW.
- 4.7.2 Canada will provide to the Contractor, through a loan agreement, Government Furnished Assets (GFA), including Government Furnished Equipment (GFE), Government Furnished Vehicles (GFV), Government Furnished Information (GFI), and Government Supplied Material (GSM), including Controlled Goods to be used to support the Work.
- 4.7.3 The GFI may include, but not limited to, Commercial Off-The-Shelf (COTS) software, Military Off-the-shelf (MOTS) software, Government Off-The-Shelf (GOTS) software licenses, media and associated documentation, and other technical documentation.
- 4.7.4 The GFE may include, but not limited to, MOTS and COTS hardware to enable the Contractor to engineer, integrate and test.
- 4.7.5 The Contractor must prepare a GFA Report in accordance with CDRL 100.005.

4.8 Travel

- 4.8.1 Contractor's personnel may be required to travel to TA specified locations in support of the work. The Contractor must manage travel and accommodations for their personnel. The Contractor must obtain written approval from DND for all travel and accommodations, for non-core work, prior to incurring any expense. The Contractor must obtain TA's approval in writing for all travel in advance before travelling.
- 4.8.2 In the event of a deployment to a theatre of operations, DND will assist in arranging travel and accommodations. The Contractor must ensure that its personnel have all documentation required to complete the assigned task.



5 CORE ENGINEERING MANAGEMENT WORK

5.1 General

- 5.1.1 The Contractor must perform Core Engineering Management Work on an on-going basis throughout the contract period.
- 5.1.2 This section describes the elements of the work that must be delivered as Core Engineering Management Work. This includes, but is not limited to the following:
 - i. System Engineering Management,
 - ii. Contractor's Team Composition,
 - iii. Quality Management.

5.2 System Engineering Management

5.2.1 *System Engineering Management Plan (SEMP)*

- 5.2.1.1 The Contractor must implement and manage a SEMP in accordance with the standard DLCSPM-SEP-2021. The purpose of the SEMP is to describe the overall process to be established and implemented to perform the engineering work of this SOW.
- 5.2.1.2 The Contractor must prepare, submit and maintain the SEMP in accordance with CDRL 200.001.

5.2.2 *Configuration Management and Data Management (CM-DM) Services*

- 5.2.2.1 The Contractor must prepare a Configuration Management and Data Management (CM-DM) Plan in accordance with CDRL and DID 400.001.

5.2.3 *Engineering Document Management*

- 5.2.3.1 The Contractor must manage the engineering documents that they produce, following DND's directed document management processes as identified in the standard DLCSPM-SEP-2021.

5.2.4 Change Management

5.2.4.1 Baseline Configuration Control

- i. The Contractor must maintain and deliver baseline configuration control services for the Land C4ISR Capability. Canada may require multiple baselines of the Land C4ISR Capability at any particular time, for example, maintenance of an in-service configuration-controlled baseline simultaneous with maintenance of a development stream and test event configuration-controlled baseline. Definitions of these baselines are found in Appendix A1 – Glossary and Definitions.
- ii. The Contractor must maintain baseline configuration control in a format to be approved by the TA after contract award.
- iii. Canada will own the master copy of approved and delivered configuration baselines through the designated system of record.

5.2.5 Configuration Change Management

- 5.2.5.1 The Contractor must perform configuration change management in accordance with the standard DLCSPM-SEP-2021.

5.3 Additional Required Personnel

In addition to the Contractor's proposed CWP, the Contractor must provide the following personnel listed below as part of the Contractor's proposed CWP.

5.3.1 Contractor's Core Network Lead Engineer

- 5.3.1.1 The Contractor must designate an individual as its Core Network Lead Engineer to advise the TA on Core Network design and interfaces by acting as the engineering focal point for the IPT. The Core Network Lead Engineer must have the requisite authority within the Contractor's organization for all engineering matters related to the Core Network engineering work of the SOW.

5.3.2 Contractor's Core Network Engineering Manager

- 5.3.2.1 The Contractor must designate an individual as its Core Network Engineering Manager to advise on Land C4ISR Capability engineering management activities to the TA.

5.4 Quality Management Plan

- 5.4.1 The Contractor must establish and maintain a Quality Management Plan (QMP).
- 5.4.2 The Contractor must prepare and submit a QMP in accordance with CDRL 400.002.



6 Additional Work Requirements

6.1 General

- 6.1.1 This section describes the Sustainment Services that the Contractor must deliver on an “as and when requested basis”.
- 6.1.2 In broad terms AWRs will be separated by work elements described in the list below. Detailed scope of each AWR will be developed in concert with the Contractor and provided in the form of a Task SOW or a Performance Work Statement (PWS), as applicable, in accordance with the Task Authorization processes described in the contract. The duration of AWRs may vary in length depending on the scope of the work required.
- 6.1.3 The Contractor must provide the following services on an “as and when requested basis”, but not limited to:
- i. Core Network Architecture,
 - ii. System and Sub-System Engineering,
 - iii. Product, Sub-System and System Integration,
 - iv. Product Development,
 - v. Development Security Operations,
 - vi. Cyber Security Engineering,
 - vii. Field Support Services,
 - viii. Specialty Engineering Support Services,
 - ix. Production Services,
 - x. Integrated Logistics Support.
- 6.1.4 Services subject to this section may be issued to the Contractor via a single all-encompassing AWR or multiple AWRs.

6.2 Core Network Architecture

- 6.2.1 The role of Architecture team is defined in the DLCSPM-SEP-2021.
- 6.2.2 The Contractor must maintain and deliver the Land C4ISR Core Network architecture as a part of the IPT work. Overall SoS and System architecture will be developed by the SoS E&I Contractor in concert with Canada.
- 6.2.3 Upon request, the Contractor must provide updates and recommended changes to the DLCSPM-SBSRM-2021.

6.3 System and Sub-System Engineering

- 6.3.1 The role of System and Sub-System Engineering teams are defined in the DLCSPM-SEP-2021.
- 6.3.2 Upon request, the Contractor must provide engineering services, including, but not limited to the following:
- i. Network Gateways,
 - ii. Network Infrastructure:
 - a. Information Architecture,
 - b. User work stations,
 - c. Servers,
 - d. Tactical Vehicle Networks,
 - e. Network services (directory, routing, switching, etc.),
 - iii. Bearer Services (both Terrestrial and Beyond Line of Sight),
 - iv. Information Management,
 - v. Collaboration Services,
 - vi. Geomatics and Meteorological Services,
 - vii. Network Security,
 - viii. System Management.
- 6.3.3 Upon request, the Contractor must provide support to DND to facilitate the effective evaluation, design, development, prototyping, production, qualification and incorporation of changes, modifications and updates to maintain or improve system fitness, and system elements' reliability, manufacturability and maintainability.

6.4 Product, Sub-System and System Integration

- 6.4.1.1 The role of Product, System and Sub-System Integration teams are defined in the DLCSPM-SEP-2021.
- 6.4.1.2 Upon request, the Contractor must implement a Core Network integration and test program. This includes both Product, Sub-System testing and System testing for the discrete systems identified in the DLCSPM-SBSRM-2021 for which the Contractor assumes Full Support. It must encompass both continuous integration as well as verification test cycles.

6.5 Product Development

- 6.5.1.1 The role of Product Development teams are defined in the DLCSPM-SEP-2021. Depending on the particular product, the Contractor must tailor their development team based on the two types of development services outlined below.
- 6.5.1.2 Upon request, the Contractor must provide Product design, engineering and development services for the list of products they are responsible for Full Support as outlined in the DLCSPM-SBSRM-2021, including any new requirements.

6.5.2 Software & Firmware Engineering and Development

- 6.5.2.1 Upon request, the Contractor must provide software and firmware engineering support services for the Products outlined in DLCSPM-SBSRM-2021 standard. Activities involving the development of these Products may include, but are not limited to:
- i. Recommend and evaluate software engineering changes and perform a system impact analysis thereto,
 - ii. Design, develop and integrate software modifications,
 - iii. Design, develop and integrate new software system elements,
 - iv. Software Qualification Testing,
 - v. Support to System & SoS Integration,
 - vi. Support to System & SoS Verification and Validation Testing.
- 6.5.2.2 The activities must be conducted in accordance with the associated process defined in SEMP.

6.5.3 Hardware Development

- 6.5.3.1 Upon request, the Contractor must to provide hardware engineering support services engineering support services for the products outlined in DLCSPM-SBSRM-2021 standard. Activities involving the development of these products may include, but are not limited to:
- i. Recommend and evaluate hardware engineering changes and perform a system and component impact analysis thereto,
 - ii. Design, develop and integrate prototypes,
 - iii. Hardware Architecture, Hardware product and System Element Design,
 - iv. Prototyping,
 - v. Sub-System Integration,
 - vi. Hardware Testing and Qualification activities,
 - vii. Production of pre-production equipment from engineering drawings,
 - viii. Production of limited quantities of Land C4ISR System elements from manufacturing drawings to meet Immediate Operational Requirement,
 - ix. Technical Data Package Production and Delivery sufficient to support third-party manufacturing,
 - x. Support to System & SoS Integration,
 - xi. Support to System & SoS Verification and Validation Testing.
- 6.5.3.2 Hardware engineering services consists of electrical, electronic and mechanical engineering activities performed on Land C4ISR Products, and on the platforms upon which they are installed. These services also include the necessary manufacturing and pre-production of equipment configurations, modification and installation kits. These are primarily to verify and validate system deployment concepts, and to develop the installation and modification instructions.

6.6 Development Security Operations

- 6.6.1 The role of Development Security Operations team is defined in the DLCSPM-SEP-2021.
- 6.6.2 Upon request, the Contractor must conduct Development Security Operations work in support of Continuous Integration and Continuous Delivery (CI/CD) pipeline operations. The Contractor must perform the following work:
- i. Provide Hardware (HW) and Software (SW) datacenters and related infrastructure,
 - ii. Quarterly report status of Continuous Integration and Continuous Delivery pipeline health.

6.7 Cyber Security Engineering

- 6.7.1 The role of Cyber Security Engineering team is defined in the DLCSPM-SEP-2021.
- 6.7.2 Upon request, the Contractor must provide a variety of Cyber Security Engineering services to support DND. These services include the following:
- i. Cyber security engineering and integration,
 - ii. Technical investigations,
 - iii. Release and baseline patch management,
 - iv. Security vulnerability assessment and penetration testing,
 - v. Security Architecture,
 - vi. Engineering network security.
 - vii. Cross Domain Solution Engineering.

6.8 Field Support Services

- 6.8.1 The role of Field Support Services team is defined in the DLCSPM-SEP-2021. The Contractor must provide Field Service Representatives (FSR).
- 6.8.2 Field Support Services involves a variety of activities, both within and outside of Canada in support of the ongoing deployment and use of the Land C4ISR Capability in the field.
- 6.8.3 Upon request, the Contractor must provide Field Support personnel for locations in North America within seven (7) calendar days of receipt of TA's notification and anywhere in the world within 14 calendar days of receipt of TA's notification.
- 6.8.4 The Contractor must carry out requested work at locations specified in the task authorization. Contractor's personnel may be requested to be deployed overseas on Named Exercises and Named Operations. When this location is in a theatre of operations, the TA will identify the threat in sufficient detail to allow the Contractor to assess the risk and make the appropriate arrangements.

- 6.8.5 Upon request, the Contractor must provide expert technical assistance at specified locations for particular activities or events of known duration. This may include, but is not limited to:
- i. Reporting, diagnosing and developing workarounds for problems with the software elements of the System, encompassing all aspects of the Products' and Sub-Systems' functionality, operating manuals, training and usage,
 - ii. Assisting with on-site configuration of Products and Sub-Systems,
 - iii. Assessing the usage of the Products and Sub-Systems as well as recommending changes to training and standard operating procedures, as warranted,
 - iv. Assisting with field upgrades, installation, re-installation and modifications of the Products and Sub-Systems.

6.8.6 Operational Test and Evaluation

- 6.8.6.1 Upon request, the Contractor must provide support for Operational Test and Evaluation (OT&E) exercises, including, but not limited to:
- i. Field engineering exercises,
 - ii. Field validation exercises.
- 6.8.6.2 The Contractor must provide the services via a FSR in support of OT&E, which will include, but are not limited to:
- i. Planning, definition, scheduling and coordination of tests,
 - ii. Providing specific technical expertise,
 - iii. Conduct and evaluation of tests,
 - iv. Analysis of test results,
 - v. Provide test reports.
- 6.8.6.3 Upon request, the Contractor must provide fully qualified personnel to perform work at location(s) as required by the TA. Travel and accommodations are the responsibilities of the Contractor. All travel must be authorised in accordance with Section 4.8.

6.9 Supplemental Engineering Support Services

- 6.9.1.1 Supplemental Engineering Support Services are those which support the development and deployment of the Land C4ISR Capability, but are not necessarily part of the Capability itself. Upon request, the Contractor must provide Speciality Engineering Support Services including, but not limited to the following:
- i. Reliability, Availability, Maintainability and Durability (RAMD),
 - ii. Radio Frequency Safety (RFS) Engineering Services,
 - iii. Electromagnetic Environmental Effects (E3),
 - iv. E3 and EMSEC Testing,
 - v. Canadian Armed Forces (CAF) Platforms – Land C4ISR Capability Installation Services,
 - vi. Emissions Security.

6.9.2 Reliability, Availability, Maintainability and Durability

- 6.9.2.1 Reliability, Availability, Maintainability and Durability (RAMD) may include, but is not limited to:
- i. Failure monitoring and analysis of components sent to the Contractor,
 - ii. RAMD analysis (such as Failure Reporting and Corrective Action System (FRACAS)) to investigate failures and develop corrective action,
 - iii. Assessment of the effectiveness of built-in-test features and related procedures in the identification of failures,
 - iv. Identification of training needs, where such training will enhance the reliability, availability and maintainability of the System,
 - v. Conduct of component life and repair and overhaul business case studies.

6.9.3 Radio Frequency Safety (RFS) Engineering Services

- 6.9.3.1 Upon request, the Contractor must support DND's Radio Frequency Safety Program, including:
- i. Provision of RFS engineering analyses and provide assessments,
 - ii. Provision of RFS developmental testing IAW DND standards,
 - iii. Provision of developmental RFS Test Plans, Procedures and Reports,
 - iv. Conduct of developmental equipment and vehicle RFS testing and perform RFS troubleshooting on non-compliant systems or platforms.
- 6.9.3.2 The RFS Program advice, planning and test plan maintenance is Core Work. Conduct of assessments and tests are AWRs.

6.9.4 Emission Security (EMSEC) and Electromagnetic Environmental Effects (E3)

- 6.9.4.1 In support of the continuing integration and certification of the Land C4ISR Capability with other tactical systems in Canadian Army platforms, the Contractor, upon request, must conduct testing to ensure that all system elements are electromagnetically compatible with collocated equipment. EMSEC and E3 requirements primarily include the following:
- i. Electromagnetic Compatibility (EMC),
 - ii. External RF Electromagnetic Environment (EME),
 - iii. Electromagnetic Interference (EMI),
 - iv. Emission Control (EMCON),
 - v. Radio Performance and Co-site evaluation,
 - vi. Power Quality,
 - vii. Grounding and Bonding,
 - viii. Electrostatic Discharge,
 - ix. TEMPEST,
 - x. NONSTOP.

- 6.9.4.2 Upon request, the Contractor must implement an EMSEC & E3 Program to control, investigate and improve the system E3 and EMSEC performance and to qualify new hardware to the system E3 and EMSEC requirements. Additionally, the Contractor must develop, maintain and deliver the E3 Test Plan and a database of E3 test results of Products and Sub-Systems to provide inputs on impact analysis studies to determine E3 degradation with respect to any modifications, changes in configuration, time and usage of the Land C4ISR Capability.
- 6.9.4.3 Upon request, the Contractor must provide the following security engineering services:
- i. Provide technical assistance to DND designated designers and maintainers,
 - ii. Provide technical assistance to DND designated designers and maintainers to ensure they understand EMSEC requirements, procedures and methodologies (e.g. Preventative Maintenance Critical Features Reports),
 - iii. Review all engineering change requests, specification change notices, notice of revisions, material change notices, and part substitutions to determine impact on the E3 and/or EMSEC performance of the Land C4ISR Capability and System elements.
- 6.9.4.4 Upon request, the Contractor must provide an Electro-Magnetic Environment (EME) Control Engineer to review system modifications and EME related data that have the potential to affect the System's baseline characteristics. E3 and EMSEC requirements must be qualified and maintained across the Land C4ISR Capability and all system elements subject to TA direction.
- 6.9.4.5 Upon request, the Contractor must provide a TEMPEST Authority to review Land C4ISR System element modifications, engineering change requests, specification change notices, material change notices and parts substitutions and TEMPEST related data that have the potential to affect the EMSEC Qualification Baseline. The TEMPEST Authority must hold a valid Certified TEMPEST Professional, Level II qualification provided by Canada's Communications Security Establishment (CSE) or the US National Security Agency (NSA).

6.9.5 E3 and EMSEC Testing

- 6.9.5.1 Upon request, the Contractor must conduct E3 and EMSEC testing in accordance with the DLCSPM-SEP-2021 Standard, and including but is not limited to:
- i. Conducted Emissions Tests in accordance with MIL-STD-461 (version as specified by TA), CE101, CE102, CE103,
 - ii. Conducted Susceptibility Tests in accordance with MIL-STD-461 (version as specified by TA), CS101, CS103, CS104, CS105, CS114, CS115, CS116,
 - iii. Radiated Emissions Tests in accordance with MIL-STD-461 (version as specified by TA), RE102, RE103,
 - iv. Radiated Susceptibility Tests in accordance with MIL-STD-461 (version as specified by TA), RS103, RS105,

- v. Radio Performance and Co-site evaluation including Source-Victim testing to evaluate range, receive sensitivity and other radio performance and platform compatibility indicators and impacts in accordance with MIL-STD-464 (version as specified by TA),
- vi. Power Quality Tests in accordance with MIL-STD-1275 (version as specified by TA),
- vii. Electrostatic Discharge (ESD) Tests in accordance with MIL-STD-1686 (version as specified by TA),
- viii. Bonding and grounding tests IAW MIL-STD-464 (version as specified by TA),
- ix. Perform security engineering analyses including security fault analyses, RED signal analyses for TEMPEST and NONSTOP testing,
- x. Conduct/supervise equipment, Product and Sub-System security testing including TEMPEST and NONSTOP qualification and acceptance testing, product integration testing,
- xi. Prepare and review test plans, procedures and reports.

6.9.5.2 All tests above may be required to be executed to the full spectrum as specified in the standards referenced.

6.9.6 Canadian Armed Forces (CAF) Platforms – Land C4ISR Capability Installation Services

- 6.9.6.1 The Platform Sub-System is a Land C4ISR Sub-System which consists of all of the items necessary to mount, power and interconnect each item of equipment in an Army platform which requires communication connectivity. A Platform Sub-System Communication Suite (Comm Suite) is defined for each Platform and communication suite type. Each Platform Comm Suite is defined by a Platform System Diagram (PSD), an Installation Kit Electronic Equipment (IKEE), an Adaptor Kit Electronic Equipment (AKEE), Vehicle Preparation Instructions (VPI), Installation Instructions (II) and a Bill of Material (BoM). Each Platform Sub-System Comm Suite is designed, prototyped and qualified before it is considered frozen and delivered as a Technical Data Package (TDP). Each Platform Comm Suite is identified by a unique code assigned by Canada.
- 6.9.6.2 Upon request, the Contractor must provide platform integration engineering support services including, but not limited to:
- i. Generate and maintain Land C4ISR Vehicle Platform Installation Requirements documents,
 - ii. Generate and maintain Land C4ISR Installation PSDs,
 - iii. Develop Land C4ISR Platform Installation Designs,
 - iv. Design and develop modification and installation kits, and instructions,
 - v. Prototype Land C4ISR Platform Installations kits including E3 and EMSEC solutions,
 - vi. Conduct integration, testing and qualification activities, including Platform level E3 and EMSEC testing,
 - vii. Develop VPIs and Platform IIs,

- viii. Develop and Maintain Land C4ISR Platform Installation TDPs,
- ix. Develop and maintain content for Land C4ISR sections of Platform Manuals,
- x. Cable Design.

6.9.6.3 The Land C4ISR Capability encompasses connections to other Vehicle Platform Systems including, but not limited to:

- i. Tactical Vehicle Sensors,
- ii. Vehicle Navigation Systems,
- iii. Turret Systems,
- iv. Weapons Systems,
- v. Video Systems,
- vi. Automotive Systems.

6.10 Production Services

6.10.1 Upon request, the Contractor must develop and/or provide operational and production grade military specification hardware for laboratory and field test environments.

6.11 Integrated Logistics Support

6.11.1 The role of the Integrated Logistics Support (ILS) team is defined in the DLCSPM-SEP-2021.

6.11.2 Upon request, the Contractor must provide a variety of ILS services to support DND's Life Cycle Material Management (LCMM) function in accordance with Appendix A3 – Logistics SOW. These services may include, but are not limited to:

- i. Integrated Logistics Support Plan (ILSP),
- ii. Obsolescence management support services,
- iii. Government-Industry Data Exchange Program (GIDEP) Participation,
- iv. Diminishing Manufacturing Sources and Material Shortages,
- v. Material Change Notices,
- vi. Training Support,
- vii. ILS Documentation.

6.11.3 Integrated Logistics Support Plan

6.11.3.1 Upon request, the Contractor must prepare, submit and maintain the Land C4ISR ILSP in support of the DND in accordance with CDRL and DID 300.001 as part of the engineering process. This plan may be generic to the Core Network Functional Grouping and evolve over time or might be developed on a baseline-by-baseline cadence.

6.11.4 Obsolescence Management

- 6.11.4.1 Upon request, the Contractor must provide obsolescence management engineering services. The Contractor must collaborate with the TA in resolving Land C4ISR obsolescence issues in a proactive manner.
- 6.11.4.2 The Contractor must notify the DND when product elements, both hardware and software, are approaching their end of life. In addition, the Contractor must advise the DND of all high-risk components. Components are considered high-risk if the OEM has publicly disclosed that the component in question will be obsolete within the lifetime of the product. For high-risk components, the Contractor must advise the DND within one month and provide recommendations, and feasibility of available alternatives, or should no alternative be available, of developmental approaches to mitigating the obsolescence gap.
- 6.11.4.3 Upon request, the Contractor must prepare and submit an obsolescence report to the TA, which identifies for current and intended Land C4ISR Products and obsolescence related issues. The obsolescence report must be prepared and submitted in accordance with CDRL 200.002. The Contractor may be required to advise the TA of potential, or actual obsolescence with recommended solutions to allow the TA to make an informed decision.
- 6.11.4.4 Upon request, the Contractor must collaborate with the TA in developing obsolescence strategies that maximize operational availability while minimizing life cycle costs.

6.11.5 Government-Industry Data Exchange Program (GIDEP) Participation

- 6.11.5.1 Upon request, the Contractor must actively participate in the GIDEP in accordance with the GIDEP Operations Manual, SO300-BT-PRO-010.

6.11.6 Diminishing Manufacturing Sources and Material Shortages

- 6.11.6.1 Upon request, the Contractor must review, through the period of performance of the Contract, the GIDEP Diminishing Manufacturing Source (DMS) notices and other supplier notifications for applicability to system components for all Land C4ISR Products included in the DLCSPM-SBSRM-2021. The Contractor must notify the TA within seven (7) calendar days of any DMS situation that affects equipment maintenance and repair applicable to this Functional Grouping.

6.11.7 Material Change Notices

- 6.11.7.1 Whenever the Contractor makes any engineering changes that affect end items such as part numbers, drawing numbers, manufacturer's code, quantities and applicability changes made to component parts, the Contractor must prepare and deliver Material Change Notices (MCNs) in accordance with D-012-100-215/SF-000.

6.11.8 Training Support

- 6.11.8.1 Upon request, the Contractor must provide training to personnel designated by DND. The Training Support services include, but are not limited to:
- i. Conduct training needs analysis,
 - ii. Provide training material including courseware in a manner that can be incorporated into System, SoS or Canadian Army training material,
 - iii. Develop training plans and syllabuses in a manner that can be incorporated into System, SoS or Canadian Army training material,
 - iv. Training services.

6.11.9 ILS Documentation

- 6.11.9.1 Upon request, the Contractor must produce and deliver all ILS data and documentation, such as, but not limited to, System element ILS Plans, Logistics Support Analyses, Recommended Spare Parts Lists, Initial Provisioning Conferences, etc.
- 6.11.9.2 Upon request, the Contractor must provide documentation services including:
- i. Preparing and updating User Manuals,
 - ii. Preparing and updating Technical Data Packages.

