Annex B – Resource Category Description

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Annex B Description of resource category for this Request for Supply Arrangement

Numbering of resource category codes is used for compatibility purposes only, as follow:

A : System and Software Development

M : Project management

S : Science and Technology

E : Military Expertise

G : Systems Engineering

Numbering of code « A - System and Software Development » comes from the resource numbering of Task-Based Informatics Professional Services (TBIPS) of Public Services and Procurement Canada.

In each RFP, the relevance of the dipomes will be evaluated by the evaluation team. To be considered acceptable by the Government of Canada, each diploma must be from a recognized Canadian university or college or by equivalent establishments recognized by a recognized Canadian credential-assessment service if the diploma or certificate was obtained abroad. The list of recognized organizations is posted on the website of the Canadian Information Centre for International Credentials at the following address: http://cicic.ca.

1. SYSTEM AND SOFTWARE DEVELOPMENT

This section comprises the resource categories required to perform comprehensive work in System and Software Development, as described in Annex C ST Fields and Topics:

1 - Architect

A.1 - Software Architect
A.2 - Enterprise Architect
A.3 - Systems Architect
A.4 - Data Architect

2 - Analyst

A.5 - Software Analyst
A.6 - Business Analyst
A.7 - Data Modeling Analyst
A.8 - Data Administration Analyst
A.9 - Security Analyst
A.10 - Network Analyst
A.11 - Test Coordinator Analyst
A.12 - Geomatics Analyst

3 - Lead Developer

A.13 - Software Lead Developer
A.14 - Geomatics Lead Developer

4 - Programmer

A.15 - Software Programmer
A.16 - Database Programmer
A.17 - Tester Programmer
A.18 - System Administration Programmer

5 - Specialist

A.19 - Scenario Developer Specialist
A.20 - Training Developer Specialist

1.1 A.1 - Software Architect

Main role: The role of the *Software Architect* is to make high-level design choices, to dictate technical standards, including coding standards, tools, or platforms, so as to advance business goals rather than to place arbitrary restrictions on the choices of developers. The *Software Architect* typically works at the solution level (focused on the solution by providing very detailed systems or component interactions with multiple teams using a detailed design) or at the application level (focused on the component re-use and maintainability, centered on a single application and a single project using very detailed design). The *Software Architect* is required to manage the always increasing development complexity of software systems especially for the development of multi-tier applications such as the development of Web-based software systems.

Experience Levels:

- Level 1:
    - At least 5 years experience in the software system development, and

- At least 1 year experience as a Software Architect.

- Level 2:
  - At least 8 years experience in the software system development, and
  - Expertise in 3-Tier software architecture and Service-Oriented architecture, and
  - At least 3 years experience as a Software Architect.
- Level 3:
  - At least 13 years experience in the software system development, and
  - Expertise in 3-Tier software architecture and Service-Oriented architecture, and
  - At least 6 years experience as a Software Architect.

The required services may include, but are not limited to the following:

- Break-down the high-level system architecture into detailed workflows, interface designs, report layouts, database diagrams and application diagrams.
- Limit the choices available during development by choosing a standard of pursuing application development and by creating, defining or choosing an application framework for the application.
- Subdivide a complex application, during the design phase, into smaller, more manageable pieces.
- Grasp the functions of each component within the application.
- Understand the interactions and dependencies among components.
- Communicate the concepts of components and their interactions and dependencies to the developers.
- Share and communicate ideas both verbally and in writing to executive staff, business sponsors, and technical resources in clear concise language that is the parlance of each group.
- Use UML in communicating the overall system design to developers and other team members.
- Survey market landscape for solution insights, direction, vendors, and methods.
- Analyze and evaluate alternative technology solutions to meet business problems.
- Provide information, direction and support for emerging technologies.
- Monitor industry trends to ensure that solutions fit with government and industry directions for technology.
- Perform impact analysis of technology changes.
- Provide expertise to identify and translate system requirements into software design documentation.
- Work with Technical Writers to ensure quality internal and external client-oriented documentation.
- Develop formalized solution methodologies.
- Interface and coordinate tasks with internal and external technical resources.
- Oversee aspects of project life cycle, from initial kickoff through requirements analysis, design and implementation phases for projects within solution area.

- Provide quality assurance for services within solution area.

Technical Expertise and Examples of Technical Solutions:

Level 1, Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Software architecture	Software architecture description, Use-cases storyboard, Navigation maps
Client design	Screen mock-ups, Application user interfaces design
Integration design	Data access layer, Integration design patterns
Object-Oriented Analysis and Design	UML, OO design pattern, CASE tools
TCP/IP networking	TCP/IP addresses, Sockets, Ports
Documentation framework	IEEE-12207, RUP
Configuration and change management	Source code control, Change requests
Testing	Integration testing, Acceptance testing, Performance testing
Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
3-Tier software architecture and Service-Oriented Architecture	Web services architecture, UDDI, 3-Tier Java EE architecture, 3-Tier .NET architecture, RESTful service architecture
Client Tier design	Web browser user interface design, RIA, Portable devices user interaction design
Presentation Tier design	SSO, Session management, Access control
Business Logic Tier design	Software interface design description, Web services design, Business logic design

1.2 A.2 - Enterprise Architect

Main role: The role of the *Enterprise Architect* is to work with stakeholders, to build a holistic view of the organization's strategy, processes, information, and information technology assets. The *Enterprise Architect* takes this knowledge and ensures that the business and IT are in alignment. The enterprise architect links the business mission, strategy, and processes of an organization to its IT strategy, and documents this using multiple architectural models or views that show how the current and future needs of an organization will be met in an efficient, sustainable, agile, and adaptable manner.

Experience Levels:

- Level 2:

- At least 8 years experience in the software system development, and
- 2 to 4 years experience as an Enterprise Architect.

- Level 3:
  - At least 13 years experience in the software system development, and
  - At least 5 years experience as an Enterprise Architect.

The required services may include, but are not limited to the following:

- Operate across organizational and computing "silos" to drive common approaches and expose information assets and processes across the enterprise.
- Deliver an architecture that supports the most efficient and secure IT environment meeting a company's business needs.
- Evaluate the enterprise's business/ICT architecture, determine its consistency and integration with the DND's business/ICT strategies, assess the degree of its alignment with DND Enterprise Architecture and recommend changes to the business/ICT architecture to improve its alignment with these external factors.
- Identify future business/ICT requirements against the current enterprise architecture, perform gaps analyses, develop Requirements for Technology Architectures (RTA), and prepare migration strategies.
- Assess the feasibility of migrating from the current state to the target business architecture and enabling technologies and identify the risks associated with migrating to the target business architecture and technologies and make recommendations for risk mitigation.
- Identify business and technology trends that create opportunities for business improvement, advise business and ICT Senior Executives on ICT trends and emerging technologies and the impact on the organization's and government ICT architectures and business strategies, model "What if" scenarios and recommend appropriate changes to the existing architecture and ICT infrastructure, and recommend alternative solutions, methodologies and strategies.
- Produce an architectural evolution plan, recommend prioritization of architecture evolution initiatives, and develop and/or implement an architecture evolution plan.
- Develop strategies that allow an organization to carry out its mandate and functional responsibilities, and that govern the organization’s actual and planned capabilities in terms of computers, data, information, human resources, communication facilities, software and management responsibilities.
- Identify and evaluate critical success parameters, factors and performance measurements.
- Manage the development and implementation of an architectural improvement plan;
- Provide training to enable any of the above.
- Advise regarding business strategy and processes in support of transformation and change management activities.
- Create presentations and present to various stakeholders, and facilitate meetings and discussions.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Enterprise architecture	The Open Group TOGAF, Zachman framework, DNDAF, Sparx Systems Enterprise Architect CASE tool, Oracle Designer CASE tool, BPWin, SAP, Oracle PeopleSoft
System architecture	System definition use-cases

1.3 A.3 - Systems Architect

Main role: The role of the *Systems Architect* is to produce the high-level design of the system to be implemented by establishing the basic structure of the system, defining the essential core design features and elements that provide the framework for all that follows, and are the hardest to change later. The *Systems Architect* provides the system view of the users' vision for what the system needs to be and do, and the paths along which it must be able to evolve, and strives to maintain the integrity of that vision as it evolves during detailed design and implementation.

Experience Levels:

- Level 2:
  - At least 8 years experience in the software system development, and
  - 2 to 4 years experience as a Systems Architect.
- Level 3:
  - At least 13 years experience in the software system development, and
  - At least 5 years experience as a Systems Architect.

The required services may include, but are not limited to the following:

- Develop system architectures frameworks and strategies, either for an organization or for a major application area, to meet the system.
- Define the system architecture to be used in the projects.
- Identify the policies and system requirements that drive out a particular solution.
- Analyze and evaluate alternative technology solutions to meet business problems.
- Perform cost-benefit analyses to determine whether requirements are best met by manual, software, or hardware functions, making maximum use of commercial off-the-shelf or already developed components.
- Sub-allocate the system requirements to major components or subsystems that are within the scope of a single Lead Developer.
- Layer the architecture for keeping the architecture sufficiently simple at each layer so that it remains comprehensible to a single mind.
- Ensures the integration of all aspects of technology solutions.
- Monitor industry trends to ensure that solutions fit with government and industry directions for technology.

- Analyze and document functional requirements to identify information, procedures and decision flows.
- Define and document interfaces of manual to automated operations within application sub-systems, to external systems and between new and existing systems.
- Define input/output sources, including detailed plan for technical design phase, and obtain approval of the system proposal.
- Identify and document system specific standards relating to programming, documentation and testing, covering program libraries, data dictionaries, naming conventions, etc.
- Perform system architectural modeling to ensure consistency of the design with existing work.
- Select the development language to be used for the project.
- Assess the impact of the new requirements on existing applications.
- Monitor the need for architectural changes as the project progresses.
- Develop test plans for testing the system.
- Ensure functionalities have been implemented according to specifications.
- Define assumptions and constraints of architecture with regard to physical structure and data collection.
- Develop post-implementation plan for monitoring/tracking architecture stability.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Software system architecture	System architecture description, System definition use-cases, System requirements
Functional architecture	IDEF methodology, UML/EUML, EFD
Software architecture	Software architecture description, Use-cases storyboard, Navigation maps
Documentation framework	IEEE-12207, RUP
Integration Design	Data access layer design, Integration design patterns
Testing	Integration testing, Acceptance testing, Performance testing.
High performance computing	Beowulf clusters, Windows HPC, Rocks Clusters
Private cloud computing	VMware vSphere, Ubuntu Enterprise Cloud

1.4 A.4 - Data Architect

Main role: The role of the *Data Architect* is to assume both strategic and tactical responsibility for developing and maintaining the Architecture and Data Models for corporate and project specific initiatives. This responsibility includes the identification of data most valuable to the department, the integration of this data, and the development of core relating data models. The resulting data models will be based on data architecture and modeling design principles and tenets.

Experience Levels:

- Level 2:
  - At least 8 years experience in the software system development, and
  - At least 2 years experience as a Data Architect.
- Level 3:
  - At least 13 years experience in the software system development, and
  - At least 5 years experience as a Data Architect.

The required services may include, but are not limited to the following:

- Comply with corporate data architectures, strategies and frameworks, including enterprise data warehouse activities.
- Analyze and evaluate alternative data architecture solutions to meet business problems/requirements to be incorporated into the corporate data architecture.
- Review corporate architecture strategies and directions, data requirements, and business information needs and devise data structures to support them.
- Apply data warehouse design principles and tenets.
- Provide expertise relating to data issues associated with multi-users, multi-dimensional analysis and multi-level access.
- Assume responsibility to maintain data coherence and persistence.
- Set up a metadata registry that will allow the domain-specific stakeholders to maintain their own data elements.
- Perform the logical data modeling.
- Perform the physical data modling.
- Develop a data strategy and associated policies.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Relational Database Modeling and design	UML, Sparx Systems Enterprise Architect CASE tool, ERWin, ORACLE designer CASE tool
Data Integration design	ETL tools

Data analysis design	Data Warehouse, OLAP, Crystal Reports
Data trends design	Data mining, Business intelligence
Integration design	Data access layer design, Integration design patterns
Testing	Integration testing, Acceptance testing, Performance testing.
Documentation framework	IEEE-12207, RUP
Configuration and change management	Source code control, Change requests

1.5 A.5 - Software Analyst

Main role: The role of the *Software Analyst* is to research problems, to plan solutions, to recommend software and systems, and to coordinate development to meet business or other requirements.

Experience Levels:

- Level 1:
  - At least 5 years experience in the software system development, and
  - At least 2 years experience as a Software Analyst.
- Level 2:
  - At least 7 years experience in the software system development, and
  - Expertise in 3-Tier software analysis and Service-Oriented architecture, and
  - At least 4 years experience as a Software Analyst.
- Level 3:
  - At least 10 years experience in the software system development, and
  - Expertise in 3-Tier software analysis and Service-Oriented architecture, and
  - At least 6 years experience as a Software Analyst.

The required services may include, but are not limited to the following:

- Write user requests into technical specifications.
- Write technical requirements from the business requirements document.
- Plan a system flow from the ground up.
- Provide multiple approaches to problem-solving.
- Develop cost analysis, design considerations, and implementation time-lines.
- Interact with the Lead Developer to understand software limitations.
- Provide use cases and flowcharts during system development.
- Document requirements or contribute to user manuals.
- Develop and document screen, report and interface requirements.
- Gather and analyze information to establish the functional needs of a system or project.

Technical Expertise and Examples of Technical Solutions:

Level 1, Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Client design	Screen mock-ups, Application user interfaces design
Integration design	Data access layer, Integration design patterns
Object-Oriented Analysis and Design	UML, OO design pattern, CASE tools
TCP/IP networking	TCP/IP addresses, Sockets, Ports
Documentation framework	IEEE-12207, RUP
Configuration and change management	Source code control, Change requests
Testing	Unit testing, Integration testing, Acceptance testing, Performance testing
Object-Oriented programming	Java, C#, C++
Integrated Development Environment	Eclipse, MS Visual Studio .NET
Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
3-Tier software architecture and Service-Oriented Architecture	Web services architecture, UDDI, 3-Tier Java EE architecture, 3-Tier ASP.NET architecture, RESTful service architecture
Client Tier design	Web browser user interface design, RIA, Portable devices user interaction design
Presentation Tier design	SSO, Session management, Access control
Business Logic Tier design	Software interface design description, Web services design, Business logic design
Client Tier programming	HTML, JavaScript, DHTML, RIA Ajax
Presentation Tier programming	JSP, Servlet, ASP
Business Logic Tier programming	EJB, Session and entity beans, .NET enterprise services, SOAP, WSDL
Web Application programming	J2EE/JEE, ASP.NET

Application server programming	Red Hat JBOSS, Microsoft IIS, Microsoft .NET framework

1.6 A.6 - Business Analyst

Main role: The role of the *Business Analyst* is to analyze business processes and models and their integration with technology.

Experience Levels:

- Level 2:
  - At least 7 years experience in the software system development, and
  - 3 to 5 years experience as a Business Analyst.
- Level 3:
  - At least 10 years experience in the software system development, and
  - At least 6 years experience as a Business Analyst.

The required services may include, but are not limited to the following:

- Analyse existing capabilities and requirements, develop redesigned frameworks and recommend areas for improved capability and integration.
- Provide advice in defining new requirements and opportunities for applying efficient and effective solutions; identify and provide preliminary costs of potential options.
- Provide expert advice on key initiatives that enable the organization to deploy high-impact business processes that are focused, accountable and measurable.
- Provide expert advice on developing and integrating and/or assist in implementing process and information models between processes to eliminate information and process redundancies.
- Analyze business functional requirements to identify information, procedures and decision flows;
- Review existing work processes and organizational structure and identify and recommend new processes and organizational structures.
- Evaluate existing procedures and methods, identify and document items such as database content, structure, application subsystems and develop data dictionary.
- Develop and document detailed statements of requirements.
- Analysis and development of business success “critical success factors”.
- Identify candidate processes for re-design; prototype potential solutions, provide trade-off information and suggest a recommended course of action.
- Evaluate existing procedures and methods, identify and document database content, structure, and application subsystems, and develop data dictionary.
- Define and document interfaces of manual to automated operations within application subsystems, to external systems, and between new and existing systems.
- Perform information modelling in support of BPR implementation.
- Perform cost/benefit analysis of implementing new processes and solutions.
- Create presentations and present to various stakeholders, and facilitate meetings and discussions.

- Participate in change impact analysis and change management activities.
- Participate in organizational realignment (job re-design organizational re-structuring).
- Establish acceptance test criteria with client.
- Coordinate development of training and coordination with other stakeholders.
- Use business, workflow and organizational software tools.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Enterprise architecture	The Open Group TOGAF, Zachman framework, DNDAF, Sparx Systems Enterprise Architect CASE tool, Oracle Designer CASE tool, BPWin, SAP, Oracle PeopleSoft
System architecture	System definition use-cases
Software architecture	Software architecture description, Use-cases storyboard, Navigation maps
Documentation framework	IEEE-12207, RUP
Testing	Integration testing, Acceptance testing, Performance testing.

1.7 A.7 - Data Modeling Analyst

Main role: The role of the *Data Modeling Analyst* is to define and analyze data requirements needed to support the business processes of an organization by producing conceptual data models with associated data definitions and by implementing the conceptual model in a logical data model.

Experience Levels:

- Level 2:
  - At least 7 years experience in the software system development, and
  - 3 to 5 years experience as a Data Modeling Analyst.
- Level 3:
  - At least 10 years experience in the software system development, and
  - At least 6 years experience as a Data Modeling Analyst.

The required services may include, but are not limited to the following:

- Design, develop and maintain Logical Data Models.
- Analyze proposed changes to databases from the context of the Logical Data Model.
- Provide technical expertise in the use and optimization of data modeling techniques to team members.
- Provide technical assistance, guidance and direction in terms of data analysis and modeling to team members.

- Provide assistance to project team and business users relating to data issues and data analysis concepts.
- Participate in the development of data modeling and metadata policies and procedures.
- Participate in data analysis as a result of new/updated requirements.
- Apply approved changes to logical data models.
- Improve modeling efficiency through recommendations on how to better utilize current metadata repositories.
- Comply with corporate repository metadata directions.
- Provide input to refinement of data architectures.
- Participate in data architecture refinement.
- Define access strategies.
- Construct, monitor and report on work plans and schedules.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Relational database modeling and design	UML, Sparx Systems Enterprise Architect CASE tool, ERWin, ORACLE designer CASE tool
Relational database programming	SQL, PL/SQL, Oracle DB, SQL Server DB, PostgreSQL DB, pgAdmin, SQL Server Management Studio, Memcached
Testing	Unit testing, Integration testing, Acceptance testing, Performance testing.
Documentation framework	IEEE-12207, RUP
Configuration and change management	Source code control, Change requests

1.8 A.8 - Data Administration Analyst

Main role: The role of the *Data Administration Analyst* is to ensure that data systems such as databases are available at all to the users and programs that need them, to monitor and improve data systems performance and capacity, to plan for future expansion requirements, and to co-ordinate and implement security measures to safeguard the data systems.

Experience Levels:

- Level 2:
  - At least 7 years experience in the software system development, and
  - 3 to 5 years experience as a Data Administration Analyst.
- Level 3:
  - At least 10 years experience in the software system development, and
  - At least 6 years experience as a Data Administration Analyst.

The required services may include, but are not limited to the following:

- Keep data systems such as databases and datawarehouses alive, healthy, and recoverable in case of disasters.
- Define new database structures.
- Define data conversion strategy.
- Define database conversion specifications.
- Customize database conversion routines.
- Finalize Conversion Strategy.
- Collaborate with the users in order to maintain and safeguard the database.
- Identify requirements for improvements to existing databases by determining users' information requirements and system performance and functional requirements.
- Maintain data dictionaries.
- Develop and implement procedures that will ensure the accuracy, completeness, and timeliness of data stored in the database.
- Mediates and resolves conflicts among users' needs for data.
- Develop and implement security procedures for the database, including access and user account management.
- Advise programmers, analysts, and users about the efficient use of data.
- Maintain configuration control of the database.
- Perform and/or coordinate updates to the database design.
- Control and coordinate changes to the database, including the deletion of records, changes to the existing records, additions to the database.
- Develop and coordinate back-up, disaster recovery and virus protection procedures regarding the data systems.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Database Administration	PostgreSQL DBA tools, Oracle DBA tools, SQL Server DBA tools
Relational database programming	SQL, PL/SQL, Oracle DB, SQL Server DB, PostgreSQL DB, pgAdmin, SQL Server Management Studio, Memcached
Testing	Acceptance testing, Performance testing.

1.9 A.9 - Security Analyst

Main role: The role of the *Security Analyst* is to analyze the organization’s enterprise system in order to recommend, develop and advice on various security levels such as the authentication, the authorization, the integrity and the auditing of the systems in order to provide the required level of

protection to the information technology assets (e.g., data in a database or on the file system, or a system resource) of the organization.

Experience Levels:

- Level 2:
  - At least 7 years experience in the software system development, and
  - 3 to 5 years experience as a Security Analyst.
- Level 3:
  - At least 10 years experience in the software system development, and
  - At least 6 years experience as a Security Analyst.

The required services may include, but are not limited to the following:

- Develop IT security policies, standards, guidelines and procedures.
- Review existing security policies, standards, guidelines and procedures and provide advice as to their appropriateness and effectiveness.
- Conduct compliance audits of IT operations, application systems and infrastructure.
- Conduct security threat and risk assessments of IT facilities, application systems and communications.
- Conduct reviews of backup and recovery plans.
- Investigate security incidents and report cause and related weaknesses and recommend remedies.
- Design the security framework and implementing the security components of IT infrastructure required to protect assets and to support application systems.
- Provide advice on the security aspects of application systems under development.
- Develop and deliver IT Security awareness and training programs.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Authentication design	SSO, digital certificates, HTTPS
Authorization design	LDAP, ACL
Integrity design	Digital signatures
Auditing design	Logging and monitoring the system
Security attacks design	IP spoofing, DNS spoofing, Trapdoors, Logic Bombs, Worms, Trojan Horses, Ciphers and Keys, SSL/TLS protocols, Botnets, Rootkits
Penetration testing	Nmap, Nessus, Wireshark
Forensics	Structured investigation, computer crimes, password cracking, MFT investigation
Hacker techniques and incident handling	Cracking packages on the Web

1.10 A.10 - Network Analyst

Main role: The role of the *Network Analyst* is to design, implement and troubleshoot computer networks and its associated security, and to solve network-related problems.

Experience Levels:

- Level 2:
  - At least 7 years experience in the software system development, and
  - 3 to 5 years experience as a Network Analyst.
- Level 3:
  - At least 10 years experience in the software system development, and
  - At least 6 years experience as a Network Analyst.

The required services may include, but are not limited to the following:

- Analyze the targeted system and network infrastructure and publish design guidelines and recommendations to guide any solution design and implementation.
- Advise on the procurement of system and network equipment to support the growing needs of the systems under development.
- Coordinate installation, operation, maintenance, resolution of hardware and software problems, monitoring of traffic, capacity planning, system backup and user training for a Local Area Network.
- Evaluate and recommend new data communication hardware and software.
- Maintain interface with vendor representatives and other computing resources to resolve hardware and software problems.

- Coordinate installation of network hardware, software for use with personal computers and mainframe/personal computer interaction, and network upgrades according to vendor instructions.
- Prepare procedure manuals and documentation for internal use.
- Develop a network disaster recovery plan.
- Develop techniques to improve system throughout and optimize hardware utilization.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
System Administration	Windows 2003 Server, Windows 2008 Server, Ubuntu, Windows 7, Windows XP, Cisco devices, SNMP, Syslog, Nagios
Network protocols	OSI model with layers protocol
Configuration of Network equipment	Routers, Switches, Hubs, Gateways, Access points, Network Interface Cards, Networking cables, Network bridges, Modems, ISDN adapters, Firewalls
Network traffic analysis	Wireshark, Ethereal, NetFlow analyzer
WAN/LAN configuration	Mixed 10Gb and 1Gb Ethernet networks, network topology, fiber optic networks, SAN networks
VPN configuration	CISCO devices, OpenVPN

1.11 A.11 - Test Coordinator Analyst

Main role: The role of the *Test Coordinator Analyst* is to provide the planning and the coordination of the testing activities throughout the duration of the system development by managing and monitoring test plans for all levels of testing.

Experience Levels:

- Level 2:
  - At least 7 years experience in the software system development, and
  - 3 to 5 years experience as a Test Coordinator Analyst.
- Level 3:
  - At least 10 years experience in the software system development, and
  - At least 6 years experience as a Test Coordinator Analyst.

The required services may include, but are not limited to the following:

- Manage walkthroughs and reviews related to testing and implementation readiness.
- Develop and implement an overall testing strategy, plans and activities.
- Provide subject matter expertise regarding testing tools and techniques.

- Develop standards and processes to follow regarding system integration testing, and system readiness assessment.
- Ensure that the standards established by the Quality Assurance plans are applied by reviewing work plans and interim deliverables.
- Develop test scenarios and test scripts.
- Establish software testing procedures for unit test, integration testing and regression testing with the emphasis on automating the testing procedures.
- Establish software testing procedures for user acceptance testing.
- Establish a validation and verification capability which assumes functional and performance compliance.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Master test planning	IEEE 829-1998 format test plan outline
System testing design	Unit and integration testing
Acceptance testing design	Elaboration of test cases
Performance testing design	Web performance load test
Test automation design	Code-driven testing

1.12 A.12 - Geomatics Analyst

Main role: the role of the Geomatics Analyst is to design, develop, and operate systems for collecting and analyzing spatial information about the land, the oceans, natural resources, and manmade features. Geomatics analyst applications include integrating science and technology from both new and traditional disciplines such as geodesy, Global Positioning System (GPS), Global Navigation Satellite Systems (GNSS), surveying (including land, cadastral, aerial, mining and engineering surveying), cartograph (computer and digital mapping), Geographic Information Systems (GIS), computer-aided design (CAD), computer aided visualization, hydrography computing, navigation computing, topographic computing, spatial computing, remote sensing, photogrammetry and image understanding.

Experience Levels:

- Level 2:
  - At least 7 years experience in the software system development, and
  - 3 to 5 years experience as a Geomatics Analyst.
- Level 3:
  - At least 10 years experience in the software system development, and
  - At least 6 years experience as a Geomatics Analyst.

The required services may include, but are not limited to the following:

- Provide guidance and advice in the field of applied geomatics. This includes knowledge of earth positioning principles and technologies (e.g. GPS), satellite and airborn imagery

acquisition and processing, three-dimensional terrain modelling techniques and usage as well as general principles in digital cartography.

- Provide guidance and advice in the implementation of COTS and FOSS geospatial technologies.
- Provide guidance and advice in the implementation of standards–based geospatial technologies such as contained in the OGC and ISO set of standards.
- Provide guidance and advice in the cataloguing, exchange and exploitation of commercial and military data formats.
- Provide guidance and advice in the storage, access and retrieval of geospatial data, whether these come from vector or raster sources.
- Develop and document detailed statements of requirement.
- Analyze functional requirements to identify information, procedures and decision flows.
- Evaluate existing procedures and methods, identify and document database content, structure and application sub-systems, and develop data dictionary.
- Define and document interfaces of manual to automated operations within sub-systems, to external systems and between new and existing systems.
- Define input/output sources, including a detailed plan for technical design phases.
- Design and document in detail all system components, their interfaces and operational environment.
- Design data structures and files, sub-systems and modules, programs, batch, on line, and production monitoring procedures, testing strategy and systems.
- Document system design, concepts and facilities, and present them for approval.
- Produce an operational system including all forms, manuals, programs, data files and procedures.
- Perform analysis and modeling.
- Restructure data from various sources and in diverse formats.
- Create, update and maintain procedures and standards.
- Create, update, revise and documents data sets.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Applied geomatics orientations and design	GPS, Earth positioning, Satellite imagery, Airborn imagery, 3-D terrain, Digital cartography
Standards-based geospatial applications orientations and design	OGC standards (WMS, WMTS, WFS, WCS, CSW, GML, KML, SLD, SWE), ISO standards (ISO-19115, ISO-19139, ISO-19119, ISO-19136, ISO-19111), Commercial GIS formats (ESRI, Intergraph, MapInfo, Erdas, DigitalGlobe, GeoEye, Radarsat, Adobe, Autodesk, Oracle, Microsoft), DIGEST military formats (VPF, RPF, DTED), Open-source GIS data formats (GML,KML, OSM, Postgres)
Orientations and design for the implementation of geospatial technologies	Commercial GIS systems (ESRI, Intergraph, MapInfo, Google, Microsoft), Web-Mapping Servers (Minessota MapServer, ArcGIS Server, Google Earth Server, Deegree), Web-Mapping Client APIs (Google Maps 2D/3D, OpenLayers, ArcGIS APIs)

1.13 A.13 - Software Lead Developer

Main role: The role of the *Software Lead Developer* is to ensure the feasibility of implementing the overall architecture and design of the system to be developed, to provide directives to the team of programmers for implementing and programming the targeted system solution and to implement and program the system solution and the associated components.

Experience Levels:

- Level 1:
  - At least 5 years experience in the software system development, and
  - At least 1 year experience as a Software Lead Developer.
- Level 2:
  - At least 7 years experience in the software system development, and
  - Expertise in 3-Tier software architecture and Service-Oriented architecture, and
  - At least 3 years experience as a Software Lead Developer.
- Level 3:
  - At least 10 years experience in the software system development, and
  - Expertise in 3-Tier software architecture and Service-Oriented architecture, and
  - At least 6 years experience as a Software Lead Developer.

The required services may include, but are not limited to the following:

- Ensure a proper underlying design for the software program to be developed.

- Oversee the work being done by any other Contractor software programmers working on the development of the software system.
- Act as a mentor for new or lower-level Contractor software programmers, as well as for all the members on the development team.
- Serve as an interface between the Contractor programmers and management.
- Work with the system users to determine what data will be used.
- Have supervisioral responsibilities of the Contractor personnel in delegating work and ensuring that software projects come in time and under budget.
- Provide technical advice to the management.
- Provide programmatic pespectives on requirements.
- Support the deployment and the experimentation of the software system to fulfil the needs of the experimentations such as providing logging/tracking mechanisms, storing experimentation data and producing results to be analyzed by the researchers.
- Select and use the best available Web development tools for linking the Internet based client to the departmental “back end” information delivery programs and databases.
- Develop and prepare diagrammatic plans for Web based service delivery over the Internet.
- Analyze the problems outlined by the architects and analysts in terms of such factors as style and extent of information to be transferred across the Internet.
- Design and code high-usability Web pages to meet requirements.

Technical Expertise and Examples of Technical Solutions:

Level 1, Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Client design	Screen mock-ups, Application user interfaces design
Integration design	Data access layer, Integration design patterns
Object-Oriented Analysis and Design	UML, OO design pattern, CASE tools
TCP/IP networking	TCP/IP addresses, Sockets, Ports
Documentation framework	IEEE-12207, RUP
Configuration and change management	Source code control, Change requests, Production of builds, Ant build tool, Packaging of applications
Testing	Integration testing, Acceptance testing, Performance testing, JUnit, NUnit
Living documentation	JavaDoc, Microsoft .NET Sandcastle
Integrated Development Environment	Eclipse, MS Visual Studio .NET

Level 1, Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Object-Oriented programming	Java, C#, VC, C++
Scripting programming	Perl, PHP, Ruby
Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
3-Tier software architecture and Service-Oriented Architecture	Web services architecture, UDDI, 3-Tier Java EE architecture, 3-Tier .NET architecture, RESTful service architecture
Client Tier design	Web browser user interface design, RIA, Portable devices user interaction design
Presentation Tier design	SSO, Session management, Access control
Business Logic Tier design	Software interface design description, Web services design, Business logic design
Client Tier programming	HTML, JavaScript, DHTML, XML, RIA Adobe flex Builder, RIA Microsoft Silverlight, RIA Ajax
Presentation Tier programming	JSP, Servlet, ASP.NET Web form, ASP.NET MVC
Business Logic Tier programming	EJB, Session beans, Entity beans, .NET Enterprise Services, Web services coding, SOAP, WSDL, HTTP, JMS
Integration Tier programming	Data access object, DLL, JDBC, JMS, RMI, JNDI, ODBC, ADO.NET
Web application programming	J2EE/JSE, ASP.NET
Application server programming	Red Hat JBOSS, Microsoft IIS, Microsoft .NET framework, Apache Tomcat

1.14 A.14 - Geomatics Lead Developer

Main role: The role of the *Geomatics Lead Developer* is to ensure the feasibility of implementing the overall architecture and design of the Geomatics system to be developed, to provide directives to the team of programmers for implementing and programming the targeted Geomatics system solution and to implement and program the system solution and the associated components.

Experience Levels:

- Level 2:
  - At least 5 years experience in the software system development, and
  - At least 2 years experience as a Geomatics Lead Developer.

- Level 3:
    - At least 8 years experience in the software system development, and
    - At least 4 years experience as a Geomatics Lead Developer.

The required services may include, but are not limited to the following:

- Ensure a proper underlying design for the Geomatic software program to be developed.
- Oversee the work being done by any other Contractor software programmers working on the the development of the Geomatic software system.
- Act as a mentor for new or lower-level Contractor software programmers, as well as for all the members on the Geomatic development team.
- Serve as an interface between the programmers and management.
- Work with the system users to determine what data will be used.
- Have supervisioral responsibilities of Contractor personnel in delegating work and ensuring that software projects come in on time and under budget.
- Provide technical advice to the management.
- Provide programmatic pespectives on requirements.
- Support the deployment and the experimentation of the Geomatic system to fulfil the needs of the experimentations such as providing logging/tracking mechanisms, storing experimentation data and producing results to be analyzed by the researchers.
- Develop and document detailed statements of requirement.
- Design the overall target architecture of the IT system to meet the formally established requirements (functional and non-functional) of a project.
- Ensure the preservation of strategic data assets as applications and technologies evolve.
- Set Data Policy and the technical solution for the management, storage, access, navigation, movement, and transformation of geospatial data.
- Specify recommended DBMS and ETL tools and technologies for structured and unstructured content and specificities of geospatial data.
- Design and develop applications based on the implementation of COTS and FOSS geospatial technologies.
- Design and develop applications based on the implementation of standards–based geospatial technologies such as contained in the OGC and ISO set of standards.
- Design and develop applications based on the state-of-the-art in cataloguing, exchange and exploitation of commercial and military geospatial data formats.
- Design and develop applications which involve the storage, access and retrieval of geospatial data, whether these come from vector or raster sources.
- Monitor and support the development of the system to ensure it is compliant with the target architecture and refining the target architecture as required.
- Ensure the integration of the system’s geospatial component architectures – data, application, infrastructure, etc., into the overall target system architecture.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Applied geomatics design and programming	GPS, Earth positioning, Satellite imagery, Airborn imagery, 3-D terrain, Digital cartography
Standards-based geospatial applications design and programming	OGC standards (WMS, WMTS, WFS, WCS, CSW, GML, KML, SLD, SWE), ISO standards (ISO-19115, ISO-19139, ISO-19119, ISO-19136, ISO-19111), Commercial GIS formats (ESRI, Intergraph, MapInfo, Erdas, DigitalGlobe, GeoEye, Radarsat, Adobe, Autodesk, Oracle, Microsoft), DIGEST military formats (VPF, RPF, DTED), Open-source GIS data formats (GML,KML, OSM, Postgres)
Design for the implementation of geospatial technologies	Commercial GIS systems (ESRI, Intergraph, MapInfo, Google, Microsoft), Web-Mapping Servers (Minessota MapServer, ArcGIS Server, Google Earth Server, Deegree), Web-Mapping Client APIs (Google Maps 2D/3D, OpenLayers, ArcGIS APIs)
Client design	Screen mock-ups, Application user interfaces design
Integration design	Data access layer, Integration design patterns
Object-Oriented Analysis and Design	UML, OO design pattern, CASE tools
TCP/IP networking	TCP/IP addresses, Sockets, Ports
Documentation framework	IEEE-12207, RUP
Configuration and change management	Source code control, Change requests, Production of builds, Ant build tool, Packaging of applications
Testing	Integration testing, Acceptance testing, Performance testing, JUnit, NUnit
Living documentation	JavaDoc, Microsoft .NET Sandcastle
Integrated Development Environment	Eclipse, MS Visual Studio .NET
Object-Oriented programming	Java, C#, VC, C++
Scripting programming	Perl, PHP, Ruby

1.15 A.15 - Software Programmer

Main role: The role of the *Software Programmer* is to plan, develop, test and document computer programs, applying knowledge of programming techniques and computer systems.

Experience Levels:

- Level 1:
  - 1 to 2 years experience as a Software Programmer.
- Level 2:
  - Expertise in programming 3-Tier software architecture and Service-Oriented architecture, and
  - 3 to 5 years experience as a Software Programmer.
- Level 3:
  - Expertise in programming 3-Tier software architecture and Service-Oriented architecture, and
  - At least 6 years experience as a Software Programmer.

The required services may include, but are not limited to the following:

- Evaluate user requests for new or modified programs.
- Determine the feasability of programming a solution according to cost and time required, the compatibility with current system, and computer capabilities.
- Advise on best courses of action related to lower level implementation details.
- Analyze, review and alter programs to increase operating efficiency or to adapt to new requirements.
- Write documentation to describe program development, logic, coding and corrections.
- Install and test program at user site.
- Monitor the program performance after implementation.
- Perform system, units and integration tests, and report on results obtained.
- Verify accuracy and completeness of programs by preparing sample data, and testing them by means of system test runs performed by various project participants.
- Provide and implement strategies to replicate sources of information that can not be directly accessed by the system.
- Code high-usability Web pages to meet requirements.

Technical Expertise and Examples of Technical Solutions:

Level 1, Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Object-Oriented Analysis and Design	UML, OO design pattern, CASE tools
TCP/IP networking	TCP/IP addresses, Sockets, Ports
Configuration and change management	Source code control, Change requests, Production of builds, Ant build tool, Packaging of applications

Testing	Integration testing, Acceptance testing, Performance testing, JUnit, NUnit
Living documentation	JavaDoc, Microsoft .NET Sandcastle
Integrated Development Environment	Eclipse, MS Visual Studio .NET
Object-Oriented programming	Java, C#, VC, C++
Scripting programming	Perl, PHP, Ruby
Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
3-Tier software architecture and Service-Oriented Architecture	Web services architecture, UDDI, 3-Tier Java EE architecture, 3-Tier .NET architecture, RESTful service architecture
Client Tier design	Web browser user interface design, RIA, Portable devices user interaction design
Presentation Tier design	SSO, Session management, Access control
Business Logic Tier design	Software interface design description, Web services design, Business logic design
Client Tier programming	HTML, JavaScript, DHTML, XML, RIA Adobe flex Builder, RIA Microsoft Silverlight, RIA Ajax
Presentation Tier programming	JSP, Servlet, ASP.NET Web form, ASP.NET MVC
Business Logic Tier programming	EJB, Session beans, Entity beans, .NET Enterprise Services, Web services coding, SOAP, WSDL, HTTP, JMS
Integration Tier programming	Data access object, DLL, JDBC, JMS, RMI, JNDI, ODBC, ADO.NET
Web application programming	J2EE/JSE, ASP.NET
Application server programming	Red Hat JBOSS, Microsoft IIS, Microsoft .NET framework, Apache Tomcat

1.16 A.16 - Database Programmer

Main role: The role of the Database Programmer is to write and modify databases, to create management systems for providing effective and efficient access to information stored in databases, and to determine the way the filing systems will be organized and accessed.

Experience Levels:

- Level 1:
    - 1 to 2 years experience as a Database Programmer.

- Level 2:
    - 3 to 5 years experience as a Database Programmer.
- Level 3:
    - Expertise in programming data integration, analysis and trends, and
    - At least 6 years experience as a Database Programmer.

The required services may include, but are not limited to the following:

- Define data system requirements by consulting Data Administration Analysts and system users about the types of information needed.
- Determine how data should be organized based on the data models produced by the Data Modeling Analysts.
- Construct, install and test the database system.
- Modify existing databases, as user needs change.
- Write manuals or explain database's function.
- Consult with others to assess the system performance and make modifications as required.
- Prepare reports on databases.
- Customize databases for specific needs.
- Troubleshoot problems with existing data systems.

Technical Expertise and Examples of Technical Solutions:

Level 1, Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
Relational database programming	SQL, PL/SQL, Oracle DB, SQL Server DB, PostgreSQL DB, pgAdmin, SQL Server Management Studio, Oracle Forms, Oracle Report, MySQL DB, Memcached
Testing	Unit testing, Integration testing, Acceptance testing, Performance testing
Configuration and change management	Source code control, Change requests
Level 3	
Technical Specialties	**Examples of Technical Solutions**
Data Integration programming	ETL tools
Data Analysis programming	Data Warehouse, OLAP, Crystal Reports
Data Trends programming	Data mining, Business intelligence

1.17 A.17 - Tester Programmer

Main role: The role of the *Tester Programmer* is to establish and operate software testing procedures for unit test, integration test, regression testing and performance testing with emphasis on automating the testing procedures.

Experience Levels:

- Level 1:
  - At least 2 years experience in the software system development, and
  - 0.5 to 1 year experience as a Tester Programmer.
- Level 2:
  - At least 5 years experience in the software system development, and
  - More than 1 year experience as a Tester Programmer.

The required services may include, but are not limited to the following:

- Establish and operate interoperability testing procedures to ensure that the interaction and coexistence of various software elements conform to appropriate departmental standards and have no unforeseen detrimental effects on the shared infrastructure.
- Establish departmental benchmarks and the tools to assess system performance.
- Establish a validation and verification capability which assumes functional and performance compliance of delivered or proposed solutions with defined user requirements.

Technical Expertise and Examples of Technical Solutions:

Level 1 and Level 2	
Technical Specialties	**Examples of Technical Solutions**
Testing	Integration testing, Acceptance testing, Performance testing, JUnit, NUnit
Object-Oriented programming	Java, C#, VC, C++

1.18 A.18 - System Administration Programmer

Main role: The role of the *System Administration Programmer* is to assume the responsibility to monitor, manage and support system architecture, hardware, servers, operating systems, network and application software including timely and reliable system administration procedures, setting up user access, user profiles, back-up and recovery and day-to-day computer system operations.

Experience Levels:

- Level 2:
  - At least 2 years experience as a System Administration Programmer.
- Level 3:
  - At least 5 years experience as a System Administration Programmer.

The required services may include, but are not limited to the following:

- Perform and provide installation, configuration, maintenance and troubleshooting services in support of server communication architecture, server to workstation and hardware/software, peripherals and related equipment.

- Deploy, configure, maintain and monitor active network equipment.
- Maintain user access and IT security practices and policies enforced by the department.
- Develop and maintain system backup strategies.
- Develop and maintain operating guidelines, procedures and standards in support of existing systems or newly introduced hardware, software or application releases.
- Provide advice and cost estimates to management on the purchase of new IT hardware and software to optimize the use of computer systems.
- Install, monitor, upgrade and maintain hardware and software including operating systems and application programs.
- Analyze system performance and recommend improvements.

Technical Expertise and Examples of Technical Solutions:

Level 2 and Level 3	
Technical Specialties	**Examples of Technical Solutions**
System Administration	Windows 2003 Server, Windows 2008 Server, Ubuntu, Windows 7, Windows XP, Cisco devices, SNMP, Syslog, Nagios
Network protocols	OSI model with layers protocol
Configuration of Network equipment	Routers, Switches, Hubs, Gateways, Access points, Network Interface Cards, Networking cables, Network bridges, Modems, ISDN adapters, Firewalls
VPN configuration	CISCO devices, OpenVPN

1.19 A.19 - Scenario Developer Specialist

Main role: The role of the *Scenario Developer Specialist* is to develop scenarios using techniques such as business storyboards where each application within a system or a system of systems would be invoked in a realistic manner in order to evaluate its business value for the organization when considered both as a standalone application or as a component interacting with the other components of the system.

Experience Levels:

- Level 2:
  - 1 to 2 years experience as a Scenario Developer Specialist.
- Level 3:
  - More than 2 years experience as a Scenario Developer Specialist.

The required services may include, but are not limited to the following:

- Using a multidisciplinary approach, get the participants to "think outside their particular box" and to learn about the convergence of the key trends that they will be most powerfully influenced by and must prepare for.
- Provide the research necessary to identify and monitor key trends, wildcard factors, predetermined events and critical uncertainties.

- Identify trends and events likely to influence the future of the organization using systems thinking and creativity.
- Explore the cross-impact of the various trends or factors on any particular organization.
- Invent scenarios to develop "all-weather" robust strategies.
- Review and update scenarios.
- Develop Master Scenario Events List (MSEL).

1.20 A.20 - Training Developer Specialist

Main role: The role of the *Training Developer Specialist* is to develop training material based on the capability provided by a system or a system of systems, and to provide the training to the systems' end users by means of the developed training material.

Experience Levels:

- Level 2:
  - 1 to 2 years experience as a Training Developer Specialist.
- Level 3:
  - More than 2 years experience as a Training Developer Specialist.

The required services may include, but are not limited to the following:

- Perform needs assessment/analysis for training purposes.
- Plan and monitor training projects.
- Perform job, task, and/or content analysis.
- Write criterion-referenced, performance-based objectives.
- Recommend instructional media and strategies.
- Develop performance measurement standards.
- Assess the relevant characteristics of a target audience.
- Prepare end-users for implementation of courseware materials.
- Develop training materials.
- Conduct training courses.
- Communicate effectively by visual, oral, and written form with individuals, small groups, and in front of large audiences.

2. MANAGEMENT

This section comprises the resource categories required to perform comprehensive management and support work in science and technology :

M.1 - Project Manager

2.1 M.1 - Project Manager

The role of the Project Manager (PM) is to plan, execute, control and finalize Contract tasks according to strict deadlines and budget. This includes acquiring resources and coordinating the efforts of contractor team members and third-party contractors or consultants in order to deliver deliverables according to the plan. The PM is the main point of contact between the Contractor's team and the DRDC representatives or Government authorities.

The PM must have at least a relevant Bachelor diploma in any of the following disciplines or another relevant discipline:

- Business and/or Management Science;
- Operations Research;
- Decision Support Systems;
- Applied Mathematics;
- Engineering;
- Computer Science.

Experience Levels

- Level 2: + than 5 and – than 10 years of experience as PM.
- Level 3: At least ten (10) years of experience as PM, or

  8+ years of experience with a recognized professional certification, e.g., PMI Project Management Professional (PMP).

The required services may include, but are not limited to the following:

- Provide project management services related to one or many of the following knowledge areas:
  - Project Integration Management
  - Project Scope Management
  - Project Schedule Management
  - Project Cost Management
  - Project Quality Management
  - Project Human Resource Management
  - Project Communications Management
  - Project Risk Management
  - Project Procurement Management
- Prepare formal Statement of Work, work breakdown structure and compliance charts.
- Define and document the objectives for the project; determine budgetary requirements, the composition, roles and responsibilities and terms of reference for the project team.
- Prepare draft evaluation plans, criteria and evaluation schedules.

- Plan and coordinate project management activities including financial and planning aspects.
- Plan and coordinate the activities of Contractor project personnel, external customers, Contractors and other support providers.
- Produce draft plans and sections for incorporation into the Project Implementation Plan.
- Manage the project during the development, implementation and operations startup by ensuring that resources are made available and that the project is developed and is fully operational within previously agreed time, cost and performance parameters.
- Formulate statements of problems; establish procedures for the development and implementation of significant, new or modified project elements to solve these problems, and obtain approval thereof.
- Prepare plans, charts, tables and diagrams to assist in analyzing or displaying problems; work with a variety of project management tools.
- Coordinate and prepare documentation in response to scheduled and unscheduled reports, returns and observations to update management on project progress.
- Give briefings on progress and concerns of project on an ongoing basis and at scheduled points in the life cycle.
- Meet stakeholders and other project managers, state problems and present decision points.
- Support transition activities.
- Provide advice with respect to military requirements.
- Provide advice on laboratory equipment upgrades and new capabilities.
- Record lessons learned.
- Execute Project Close Out.

Minimum Mandatory Qualifications

All Project Managers must possess, as a minimum:

- An undergraduate degree in any field from a recognized university and twenty-four (24) months of demonstrated project management experience, within sixty (60) months of bid closing, in one or several of the knowledge areas described in above,
- **-OR-**
  have successfully completed the equivalent of six months of full time Project Management Training or evidence of Project Management Institute accreditation and twelve (12) months of demonstrated project management experience, within thirty-six (36) months of bid closing, in one or several of the knowledge areas described above.

Required specialties may include but are not limited to:

- Microsoft Project, Microsoft Office.

3. SCIENCE AND TECHNOLOGY

This section comprises the following resource categories:

S.1 - Sensemaking Specialist

S.2 - Sensemaking Analyst

S.3 - Sensemaking Lead Developer

S.4 - Information/Knowledge Management Specialist

S.5 - Information/Knowledge Management Analyst

S.6 - Information/Knowledge Management Lead Developer

S.7 - Human-Computer Interaction and Visualisation Specialist

S.9 - Human-Computer Interaction and Visualisation Lead Developer

S.10 - Cognitive Engineering Specialist

S.11 - Operations Research Analyst

S.12 - Operations Research Lead Developer

S.13 - Decision Support Specialist

S.14 - Command and Control Specialist

S.15 - Experimentation Manager

S.16 - Data Scientist

3.1 S.1 - Sensemaking Specialist

The Sensemaking Specialist focuses on novel concepts and approaches to develop situational awareness and understanding in ambiguous situations of high complexity or uncertainty and make decisions.

This category is for work required to perform comprehensive analysis in Sensemaking, as described in Annex C ST Fields and Topics.

Experience Levels

- Level 3: 10+ years of experience, or

  5+ years of experience with a relevant Ph.D.

The required services may include, but are not limited to the following:

- Design individual and collective processes by which tacit knowledge (e.g., experience, expertise, and culture) is combined with real-time information to identify, form, and articulate appropriate models of the situation.
- Design capabilities to extract meaningful activities and patterns from the battlespace / operational environment picture and to share this awareness across the network with appropriate participants.
- Design capabilities to temporally project activities and patterns into alternative futures so as to identify emerging opportunities and threats.
- Design approaches to generate options, predict adversary actions and reactions, and understand the direct and indirect effects of particular courses of action in their social, political, and economic contexts.
- Design and implement information fusion systems based on related fields like artificial intelligence and data/information fusion.

- Design and implement expert systems.
- Develop decision analysis studies in one of several areas, including information imperfection modelling theories (e.g., probability, possibility and fuzzy sets theories), information correlation, data fusion theory, information fusion (including fusion models, e.g., JDL), classification theories, pattern recognition.
- Design and implementation of systems based on fields like artificial intelligence, optimisation, business intelligence and decision support and analysis.

3.2 S.2 - Sensemaking Analyst

The Sensemaking Analyst focuses on the processes and technologies to develop situational awareness and understanding in ambiguous situations of high complexity or uncertainty and make decisions.

This category is for work required to perform comprehensive development in Sensemaking, as described in Annex C ST Fields and Topics.

Experience Levels

- Level 2: + than 5 and – than 10 years of experience
- Level 3: 10+ years of experience

The required services may include, but are not limited to the following:

- Design and develop individual and collective processes by which tacit knowledge (e.g., experience, expertise, and culture) is combined with real-time information to identify, form, and articulate appropriate models of the situation.
- Develop decision analysis studies in one of several areas, collaboration tools and synchronization tools, distributed environments, adaptive intelligent interfaces, multi-agent systems, knowledge-based systems, coordination approaches, case-based reasoning, constraint satisfaction problem, distributed constraint satisfaction problem, reinforcement learning, evolutionary computation (co-evolution), pattern recognition.

3.3 S.3 - Sensemaking Lead Developer

The Sensemaking Lead Developer focuses on the processes and technologies to develop and implement situational awareness systems.

This category is for work required to perform comprehensive development in Sensemaking, as described in Annex C ST Fields and Topics.

Experience Levels

- Level 2: + than 5 and – than 10 years of experience
- Level 3: 10+ years of experience, or 5+ years of experience with a relevant Ph.D.

The required services may include, but are not limited to the following:

- Develop individual and collective processes by which tacit knowledge (e.g., experience, expertise, and culture) is combined with real-time information to identify, form, and articulate appropriate models of the situation.
- Develop decision analysis studies in one of several areas, collaboration tools and synchronization tools, distributed environments, adaptive intelligent interfaces, multi-agent systems, knowledge-based systems, coordination approaches, case-based reasoning, constraint satisfaction problem, distributed constraint satisfaction problem, reinforcement learning, evolutionary computation (co-evolution), pattern recognition.

- Oversee the work being done by any other software programmers working on the development of situational awareness systems.
- Act as a mentor for new or lower-level Contractor software programmers, as well as for all the members on the Contractor development team.
- Serve as an interface between the programmers and management.

3.4 S.4 - Information/Knowledge Management Specialist

The Information/Knowledge Management (IKM) Specialist focuses on novel concepts and approaches to support the discovery, creation, and dissemination of knowledge in the organization.

This category is for work required to perform comprehensive analysis in IKM, as described in Annex C ST Fields and Topics. The IKM Specialist must have experience and expertise in Information Management and Decision Support in a R&D environment in the following S&T topics:

- Knowledge Representation – Formalisms;
- Data Management;
- Information Management Services;
- Data Quality;
- Natural Language Processing;
- Multimedia;
- Document / Content management;
- Collaboration;
- Security / Privacy;
- Web Information Services.

The IKM Specialist must have at least a relevant Bachelor, Master or Ph.D. diploma in any of the following disciplines or another relevant discipline:

- Management Science;
- Management Information Systems;
- Knowledge Engineering;
- Computer Science;
- Computing and Information Systems;
- Computer Engineering;
- Computational Linguistics;
- Artificial Intelligence.

Experience Levels

- Level 1:
    - At least one (1) year of experience as a IKM Specialist with a relevant Bachelor diploma; or
    - a relevant Master or Ph.D. diploma.
- Level 2:
    - At least seven (7) years of experience as a IKM Specialist with a relevant Bachelor diploma; or

- at least five (5) years of experience as IKM Specialist with a relevant Master diploma; or
- at least three (3) years of experience as a IKM Specialist with a relevant Ph.D. diploma.

- Level 3:
  - At least twelve (12) years of experience as a IKM Specialist with a relevant Master diploma, or
  - at least ten (10) years of experience with a relevant Ph.D.

The required services may include, but are not limited to the following:

- Investigate mechanisms to facilitate information/knowledge sharing among users in order to develop shared situation awareness.
- Investigate different ways to search and retrieve information from large information sources (both structured and unstructured), with interactive capabilities;
- Investigate different ways to facilitate collaboration in the building of collective intelligence.
- Investigate different ways to organise and manage information and provide a contextual support.
- Exploit structures such as semantic networks, ontologies, and meta-data to establish links between domain models and information sources.
- Develop research and implementation strategies for knowledge management, information management, document and records management and data management. This includes project management of knowledge initiatives and retrieval of critical archived information.
- Investigate knowledge discovery techniques, including data and text mining, intelligent searches, document categorisation and summarisation.
- Analyse NLP systems and capabilities.

Required specialties may include but are not limited to:

- Knowledge representation languages, e.g., OWL, RDF, SPARQL, etc.
- Query languages (e.g., SPARQL);
- Conceptual modeling software tools;
- Data modeling software tools

3.5 S.5 - Information/Knowledge Management Analyst

The Information/Knowledge Management (IKM) Analyst focuses on the knowledge management processes and technologies to support the discovery, creation, and dissemination of knowledge in the organization.

This category is for work required to perform comprehensive development in IKM, as described in Annex C ST Fields and Topics.

Experience Levels

- Level 2: + than 5 and – than 10 years of experience
- Level 3: 10+ years of experience or 5+ years of experience with a relevant Ph.D.

The required services may include, but are not limited to the following:

- Design and develop conceptual and knowledge models.
- Design and develop ontologies, taxonomies and meta-data.

- Design knowledge mapping/cartography.
- Design information and knowledge representation.
- Organize information and knowledge artefacts, including use of related languages and tools (e.g. semantic indexing).
- Design electronic document management systems and information portals.
- Analyse knowledge discovery applications, including data and text mining, intelligent searches, document categorisation and summarisation.
- Design peer-to-peer and Web 2.0 information systems.
- Design information and knowledge management capabilities.
- Design, evaluate or test and implement NLP algorithms and processes.

Technologies could include but are not limited to:

- Knowledge representation languages (e.g., OWL, RDF, SPARQL), Metadata standards, Semantic web, Web services, Conceptual modeling software tools, Data modeling software tools.

3.6 S.6 - Information/Knowledge Management Lead Developer

The Information/Knowledge Management (IKM) Lead Developer focuses on the development of knowledge management processes and technologies to support the discovery, creation, and dissemination of knowledge in the organization.

This category is for work required to perform comprehensive development in IKM, as described in Annex C ST Fields and Topics.

Experience Levels

- Level 2: + than 5 and – than 10 years of experience
- Level 3: 10+ years of experience

The required services may include, but are not limited to the following:

- Develop conceptual and knowledge models.
- Develop ontologies, taxonomies and meta-data.
- Develop electronic document management systems and information portals.
- Develop knowledge discovery applications, including data and text mining, intelligent searches, document categorisation and summarisation.
- Develop peer-to-peer and Web 2.0 information systems.
- Develop information and knowledge management capabilities.
- Develop linguistic technologies including processing text and modeling language.
- Develop, test and implement NLP algorithms and processes.
- Oversee the work being done by any other Contractor software programmers working on the development of Information/Knowledge Management systems.
- Act as a mentor for new or lower-level Contractor software programmers, as well as for all the members on the development team.
- Serve as an interface between the Contractor’s programmers and management.

Technologies could include but are not limited to:

- Knowledge representation languages (e.g., OWL, RDF, SPARQL), Metadata standards, Semantic web, Web services, Conceptual modeling software tools, Data modeling software tools.

3.7 S.7 - Human-Computer Interaction and Visualisation Specialist

The role of the Human-Computer Interaction (HCI)[1] and Visualisation[2] Specialist is to study, design, evaluate and implement interactive visual representations of abstract data on computing systems to reinforce human cognition. The abstract data include both numerical and non-numerical data, such as text and geographic information.

This category is for work required to perform comprehensive analysis in HCI and Visualisation, as described in Annex C ST Fields and Topics. The HCI and Visualisation Specialist must have experience and expertise in a R&D environment in the following S&T topics:

- Information Visualization;
- Visual Analytics;
- Scientific Visualisation;
- Interaction Technology;
- Virtual /Augmented/Mixed Reality;
- Intelligent User Interfaces Smart Room Environments;
- Display Technology;
- Collaborative Working Technologies;
- Cognitive Engineering.

The HCI and Visualisation Specialist must have at least a relevant Bachelor, Master or Ph.D. diploma in any of the following disciplines or another relevant discipline:

- Computer Science;
- Computer Engineering;
- Electrical Engineering;
- Software Engineering
- School of Information;
- School of Computing.

Experience Levels

- Level 1:
  - At least one (1) year of experience as a HCI and Visualisation Specialist with a relevant Bachelor diploma; or
  - a relevant Master or Ph.D. diploma.
- Level 2:
  - At least seven (7) years of experience as a HCI and Visualisation Specialist with a relevant Bachelor diploma; or

1 Human-Computer Interaction (Wikipedia, accessed April 2013)

2 Information visualization (Wikipedia, accessed April 2013)

- at least five (5) years of experience as HCI and Visualisation Specialist with a relevant Master diploma; or
- at least three (3) years of experience as a HCI and Visualisation Specialist with a relevant Ph.D. diploma.

- Level 3:
  - At least twelve (12) years of experience as a HCI and Visualisation Specialist with a relevant Master diploma, or
  - at least ten (10) years of experience as a HCI and Visualisation Specialist with a relevant Ph.D. diploma.

The required services may include, but are not limited to the following:

At level 3:

- Conduct state-of-the-art studies and trend analysis on HCI and Visualization S&T.
- Formulate / explore innovative HCI and Visualization concepts, including Visual Analytics and Intelligent user interfaces.
- Design highly-interactive, complex visualisation tools and interfaces.
- Design collaborative user interfaces to support colocated and distributed groups of people, working in a synchronous or asynchronous mode.
- Conduct cognitive evaluation of highly-interactive, complex interfaces; including automated measurement of user performance and usability.
- Develop and document requirements specification and visual design for highly-interactive visualisation tools to improve situation awareness, collaboration and decision making capabilities.
- Use of Rapid Application Development (RAD) tools in the design of sketches, mock-ups or exploratory prototypes for displays, based on the analysis of user requirements.
- Design and implement information systems according to Human-Computer Interaction (HCI) and Visualisation factors.
- Define input/output sources, including a detailed plan for technical design phases.
- Provide guidance and advice in the field of HCI and visualization S&T including interface guidelines and standards.
- Analyze functional requirements to identify information, procedures and decision flows related to HCI and visualization.

At level 1 and 2:

- Design and implement highly-interactive, complex visualisation tools and interfaces.
- Use requirements specifications to implement proof-of-concept prototypes.
- Use Rapid Application Development (RAD) tools in the design of sketches, mock-ups or exploratory prototypes for displays, based on the analysis of user requirements.
- Design and implement information systems according to HCI and visualisation factors.
- Design, develop and document in detail all system components, their interfaces and operational environment.
- Design, develop and document highly visual and interactive applications.

- Design, develop and document applications intended for large displays down to mobile devices, and using novel interaction devices, such as surface computing or gesture-based interaction.
- Integrate non-traditional input/output devices.
- Design data structures and files, sub-systems and modules, programs, batch, on line, and production monitoring procedures, testing strategy and systems.
- Document system design, concepts and facilities, and present them for approval.
- Restructure data from various sources and in diverse formats.
- Create, update and maintain procedures and standards.
- Obtain, create, update, revise, manage and document (large) collections of data.

Without being restricted, the required specialities could include:

At level 3:

- Graphic & Visual design tools;
- Input/Output devices;
- Visual Analytics applications;
- Virtual reality software.

At level 1 and 2:

- Input/output devices,
- Visual Analytics applications,
- Virtual reality software,
- Open source visualization software,
- Wiki technologies,
- Flex, Silverlight, Ajax, ActiveX, C++, Delphi, HTML, XML, J2EE, Java, JavaScript, JDBC, JSP, .NET, OLAP, Oracle Spatial, Python, Perl, PowerBuilder , SQL Server (2005, 2008 Spatial and over), Visual Basic, Visual C++, Google Earth Server.

3.8 S.9 - Human-Computer Interaction and Visualisation Lead Developer

This category is for work required to perform comprehensive development in HCI and Visualisation, as described in Annex C ST Fields and Topics.

Experience Levels

- Level 2: more than 5 and less than 10 years of experience
- Level 3: 10+ years of experience

The required services may include, but are not limited to the following:

- Develop and implement highly-interactive, complex visualisation tools and interfaces.
- Use requirements specifications to implement proof-of-concept prototypes.
- Use Rapid Application Development (RAD) tools in the design of sketches, mock-ups or exploratory prototypes for displays, based on the analysis of user requirements.
- Implement information systems according to Human-Computer Interaction (HCI) and Visualisation factors.

- Develop and document in detail all system components, their interfaces and operational environment.
- Develop and document highly visual and interactive applications.
- Develop and document applications intended for large displays down to mobile devices, and using novel interaction devices, such as surface computing or gesture-based interaction.
- Integrate non-traditional input/output devices.
- Develop data structures and files, sub-systems and modules, programs, batch, on line, and production monitoring procedures, testing strategy and systems.
- Document system design, concepts and facilities, and present them for approval.
- Restructure data from various sources and in diverse formats.
- Create, update and maintain procedures and standards.
- Obtain, create, update, revise, manage and document (large) collections of data.
- Oversee the work being done by any other Contractor software programmers working on the development of HCI systems.
- Act as a mentor for new or lower-level Contractor software programmers, as well as for all the members of the Contractor development team.
- Serve as an interface between the programmers and management.

Required specialties could include but are not limited to:

- Input / Output devices, Flex, Silverlight, Ajax, ActiveX, C++, Delphi, HTML, XML, J2EE, Java, JavaScript, JDBC, JSP, .NET, OLAP, Oracle Spatial, Python, Perl, PowerBuilder , SQL Server (2005, 2008 Spatial and over), Visual Basic, Visual C++, Google Earth Server, Open source visualization software, Visual Analytics software, Group Ware, wiki technologies , virtual reality software.

3.9 S.10 - Cognitive Engineering Specialist

Cognitive Engineering is an interdisciplinary approach to designing computerized systems intended to support human performance (Roth, Patterson & Mumaw, 2002[3]). It encompasses the fields of human factors, human-computer interaction, cognitive psychology, computer science, artificial intelligence and other related fields.

This category is for work required to perform comprehensive analysis in Cognitive Engineering, as described in Annex C ST Fields and Topics. The Cognitive Engineering Specialist must have experience and expertise in a R&D environment in Cognitive Engineering S&T topics, which includes:

- Cognitive Engineering;
- Humans Factors.

The Cognitive Engineering Specialist must have at least a relevant Bachelor, Master or Ph.D. diploma in any of the following disciplines or another relevant discipline:

[3] Roth, E. M., Patterson, E. S., and Mumaw, R. J. Cognitive Engineering: Issues in User-Centered System Design. In J.J. Marciniak, Ed. Encylopedia of Software Engineering (2nd Edition). NY: John Wiley and Sons, 2002. Describes the use of CTA, CWA, ACWA, and computational cognitive modeling in the design of user-centered systems.

- Cognitive science;
- Cognitive systems;
- Human-computer interaction;
- Cognitive psychology;
- Computer science;
- Artificial intelligence.

Experience Levels

- Level 3: 10+ years of experience, or 5+ years of experience with a relevant Ph.D.

The required services may include, but are not limited to the following:

- Develop, administer, and analyse questionnaires and interviewing personnel (including high level decision makers).
- Conduct on-site studies using configurable laboratory or military test-beds or in a field environment under operational conditions. Compiling, analysing and interpreting the results of these studies including any limitations of the results.
- Apply Human Factors related standards and handbooks, e.g., MIL-STD-1472F, MIL-HBK-759C, MIL-HBK-46855.
- Gather and organize artefacts.
- Apply concept of System-of-Systems (SoS), human systems integration (HSI) and experience in applying HSI principles.
- Conduct risk assessment and perform risk modelling.
- Conduct research and development in artificial intelligence and apply the results in areas such as cognitive modeling, training and decision-aiding for complex systems, human behaviour simulation, intelligent-agent technologies, and eye-voice interfaces.
- Conduct Social Network Analysis.
- Develop intelligent training technologies, advanced human-computer interaction technologies, and human behavioural models.
- Conduct cognitive task analysis and develop executable human behavioural models.
- Manage and provide technical leadership for cognitive engineering projects.
- Design, conduct, and analyse a broad range of defence and security experiments, including specific psychological, and/or social-psychological and/or organizational issues in individual and team performance.
- Identify and decompose high level MOEs and MOPs and propose means of obtaining data for MOE and MOP measurement.
- Design and develop models in support of experiment design including competence working with software development tools.

Required specialties may include but are not limited to:

- G2, ReThink, Matlab, STK, C++ as well as JSAF, Strive, IPME and Linux.

3.10 S.11 - Operations Research Analyst

The Operations Research (OR) Analyst focuses on novel concepts, approaches and techniques to develop operations research and decision support solutions for complex situations under uncertainty.

This category is for work required to perform comprehensive analysis in OR and decision support, as described in Annex C ST Fields and Topics.

Experience Levels

- Level 2: more than 5 and less than 10 years of experience
- Level 3: 10+ years of experience, or 5+ years of experience with a relevant Ph.D.

The required services may include, but are not limited to the following:

- Develop approaches, techniques, algorithms for resource management and resource allocation, planning and scheduling, and operations management.
- Investigate multi-objective programming, multi-criteria analysis and operational research optimisation methods, to evaluate and compare options and to solve optimization problems.
- Formulate and apply mathematical modeling for the intelligence activities and processes that support decision making.
- Provide recommendations on how to improve mathematical algorithms.
- Develop collaboration and coordination approaches and tools.
- Design decision support systems and group decision support systems based on concepts and techniques from fields like artificial intelligence, optimisation and decision analysis.
- Develop operations research studies using mathematical programming, dynamic and stochastic programming, heuristics and meta-heuristics, robustness analysis, constraint satisfaction problem, distributed constraint satisfaction problem, network theory.

Required specialities may include but are not limited to:

- Expertise in any or all of the following,: resource allocation, resource scheduling, planning, baysian networks, multi-criteria analysis, multi-objective programming, optimization approaches/techniques/algorithms (mathematical programming, dynamic and stochastic programming, heuristics and meta-heuristics), networks, neural networks, planning, robustness analysis, searching, constraint satisfaction problems, fuzzy sets and systems, modeling and simulation, collaboration and synchronization tools, coordination approaches, group decision support systems.

3.11 S.12 - Operations Research Lead Developer

The Operations Research Lead Developer focuses on the development and implementation of algorithms to develop operations research and decision support solutions for complex situations under uncertainty.

This category is for work required to perform comprehensive development in OR and decision support, as described in Annex C ST Fields and Topics.

Experience Levels

- Level 2: more than 5 and less than 10 years of experience
- Level 3: 10+ years of experience

The required services may include, but are not limited to the following:

- Develop and implement mathematical algorithms, optimisation algorithms and multi-criteria methods.
- Develop and implement collaboration and coordination tools.
- Design and implement decision support systems and group decision support systems.
- Oversee the work being done by any other Contractor software programmers working on the development of decision support software systems.
- Act as a mentor for new or lower-level Contractor software programmers, as well as the Contractor development team.
- Serve as an interface between the programmers and management.

Required specialties could include but are not limited to:

- Matlab, MATHEMATICA, C++, JAVA, CPLEX.

3.12 S.13 - Decision Support Specialist

The Decision Support Specialist focuses are to study novel concepts and approaches to develop decision making awareness and understanding in ambiguous situations of high complexity or uncertainty and make decisions. He is responsible for collecting, consolidating, analyzing, benchmarking and disseminating information to support evaluation and decision-making in C2 to maximize military operations delivery.

This category is for work required to perform comprehensive analysis in Decision Support, as described in Annex C ST Fields and Topics. The Decision Support Specialist must have experience and expertise in a R&D environment in the following S&T topics:

- Adaptive Intelligent Interfaces, Decision Oriented Displays and Multi-agent Systems;
- Dashboard and Business Intelligence Systems, Self-regulated Systems, Control Systems;
- Collaboration and Coordination;
- Decision Making;
- Graph Theory;
- Heuristics, Meta-heuristics;
- Knowledge-based Systems;
- Mathematical Modeling & Optimisation;
- Modeling and Simulation;
- Multi-Criteria Analysis;
- Network Analysis;
- Resource Allocation;
- Resource Management and Logistics;
- Resource Visibility;
- Uncertainty.

The Decision Support Specialist must have a relevant Bachelor, Master or Ph.D. diploma in any of the following disciplines or another relevant discipline:

- Business and/or Management Science;

- Operations Research;
- Decision Support Systems;
- Simulation and Modelling;
- Logistics Management;
- Statistics;
- Applied Mathematics;
- Computer Science.

Experience Level:

- Level 1:
  - At least one (1) year of experience as a Decision Support Specialist with a relevant Bachelor diploma; or
  - a relevant Master or Ph.D. diploma.
- Level 2:
  - At least seven (7) years of experience as a Decision Support Specialist with a relevant Bachelor diploma; or
  - at least five (5) years of experience as a Decision Support Specialist with a relevant Master diploma; or
  - at least three (3) years of experience as a Decision Support Specialist with a relevant Ph.D. diploma.
- Level 3:
  - At least twelve (12) years of experience as a Decision Support Specialist with a relevant Master diploma; or
  - at least ten (10) years of experience as a Decision Support Specialist with a relevant Ph.D. diploma.

Without being restricted, the required services could include:

- Conduct state-of-the-art studies and trend analysis on topics related to Decision Support.
- Formulate/explore innovative Decision Support concepts, including Intelligent user interfaces.
- Apply analytical and problem solving approaches, and creative critical thinking approaches.
- Design highly-interactive, complex visualisation tools and interfaces.
- Conduct extensive data management and analysis studies.
- Create data models and database structures.
- Apply performance improvement approaches used in Command and Control.
- Analyze user requirements and create front-end Decision Support System solutions.
- Document user requirements.
- Develop approaches, techniques, algorithms for resource management and resource allocation, planning and scheduling, and operations management.

- Investigate multi-objective programming, multi-criteria analysis and operational research optimisation methods, to evaluate and compare options and to solve decision/optimization problems.
- Formulate and apply mathematical modeling for the C2 activities and processes that support decision making.
- Provide recommendations on how develop, improve or implement algorithms related to DSS.
- Develop collaboration and coordination approaches and tools.
- Design and implement decision support systems and group decision support systems based on concepts and techniques from fields like artificial intelligence, optimisation and decision analysis.
- Develop operations research studies using mathematical programming, dynamic and stochastic programming, heuristics and meta-heuristics, robustness analysis, constraint satisfaction problem, distributed constraint satisfaction problem, network theory.

Without being restricted, the required specialities could include:

- Matlab;
- Optimization software;
- Proficiency in SQL, SQL Server Reporting Services (SSRS), SQL Server Integration Services (SSIS) and SQL Server Analysis Services (SSAS);
- Demonstrated ability with MS SQL 2012, SharePoint 2010, Visual Studio 2010, Report Builder 3.0;
- Working knowledge and hands on experience with ETL configuration and implementation, including OLAP cubes to deliver analysis functionality;
- Practical knowledge of Dashboard tools such as SharePoint Designer, Dundas dashboard designer.

3.13 S.14 - Command and Control Specialist

In a military organization, Command and Control (C2)[4] is the exercise of authority and direction by a properly designated commanding officer over assigned and attached forces in the accomplishment of the mission. C2 functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. Commanding officers are assisted in executing these tasks by staff that provides a bi-directional flow of accurate and timely information between the commanding officer and his/her subordinate military units.

This category is for work required to perform comprehensive analysis in C2, as described in Annex C ST Fields and Topics. The Command and Control Specialist must have experience and expertise in a R&D environment in the following S&T topics:

- C2 Doctrine and Concepts;
- C2 Processes;
- C2 Tasks;
- Military C2 Organization;

[4] Command and Control (Wikipedia, accessed April 2013)

- C2 Systems (Applications).

The C2 Specialist must have a relevant Bachelor, Master or Ph.D. diploma in an engineering or science discipline with significant course work in C2, military and strategic studies, and operations research.

Experience Levels:

- Level 1:
  - At least one (1) year of experience as C2 Specialist with a relevant Bachelor diploma; or
  - a relevant Master or Ph.D. diploma.
- Level 2:
  - At least seven (7) years of experience as C2 Specialist with a relevant Bachelor diploma; or
  - at least five (5) years of experience as C2 Specialist with a relevant Master diploma; or
  - at least three (3) years of experience as C2 Specialist with a relevant Ph.D. diploma.
- Level 3:
  - At least twelve (12) years of experience as C2 Specialist with a relevant Master diploma; or
  - at least ten (10) years of experience as C2 Specialist with a relevant Ph.D. diploma.

Without being restricted, the required services could include:

- Review and synthesize the DND literature as well as pertinent open literature on C2 and C2 Information Systems.
- Interview key CAF stakeholders on an integrated C2 Information System vision, requirements and what should be included and excluded.
- Synthesize the concepts, requirements and challenges and enabling solutions for future C2 Information Systems.
- Prepare for a validation session of study results with the appropriate C4ISR and C2 leaders.
- Investigate different ways to assess enterprise shared awareness.
- Investigate, analyse, design or develop techniques and applications to solve current deficiencies in operational C2 systems.
- Conduct state-of-the-art studies on optimizing C2 structures.
- Provide guidance and advice in the field of C2 in dynamic engagements.
- Design, develop and document applications intended for better use of technology.

3.14 S.15 - Experimentation Manager

The role of the Experimentation Manager is to design, plan, conduct, manage, coordinate and support whole or parts of appropriate deployments, demonstrations and experiments.

For the purpose of this SOW, the Experimentation Manager must have experience and expertise in Experimentation in a R&D environment in the following S&T topics, as described in Annex C ST Fields and Topics:

- Military Exercises;

- Experimental Environments;
- Experimental Plan.

The Experimentation Manager must have a relevant Bachelor, Master or Ph.D. diploma in any of the following disciplines or another relevant discipline:

- Operations Research;
- Human-Computer Interaction;
- Cognitive Systems Engineering;
- Human Factors (or Ergonomics);
- Psychology (Cognitive / Social / Organization / Experimental);
- Military and Strategic Studies.

Experience Levels:

- Level 1:
  - At least one (1) year of experience as Experimentation Manager with a relevant Bachelor diploma; or
  - a relevant Master or Ph.D. diploma.
- Level 2:
  - At least seven (7) years of experience as Experimentation Manager with a relevant Bachelor diploma; or
  - at least five (5) years of experience as Experimentation Manager with a relevant Master diploma; or
  - at least three (3) years of experience as Experimentation Manager with a relevant Ph.D. diploma.
- Level 3:
  - At least twelve (12) years of experience as Experimentation Manager with a relevant Master diploma; or
  - at least ten (10) years of experience in experimentation with a relevant Ph.D. diploma.

Without being restricted, the required services could include:

At all levels:

- Support the deployment of any solution at system and network levels for testing, experimentation and deployment purposes.
- Support the deployment and the experimentation of test-beds to fulfil the needs of the experimentations such as managing logging and tracking mechanisms, storage of experimentation, production of results to be analyzed by the researchers.
- Provide technical assistance during the set-up and implementation phases of the experiments.
- Put in place the technical infrastructure to support the experimentation design.
- Populate databases with data pertaining to the scenarios;
- Gather and organize artifacts.
- Collect data and analyze results.

- Design and develop models in support of experiment design using software development tools.

At levels 2 and 3:

- Identify experimentation requirements at the conceptual and system levels.
- Design, conduct, and analyze a broad range of defence, security demonstrations or experiments, including specific psychological, social-psychological or organizational issues in individual and team performance.
- Design experimentation at the conceptual and system levels.
- Design Measures Of Effectiveness (MOEs) and Performance (MOPs).
- Identify and decompose high level MOEs and MOPs and propose means of obtaining data for MOE and MOP measurement.
- Manage experiments.
- Manage the deployment of any solution at system and network levels for testing, experimentation and deployment purposes.
- Manage the deployment and the experimentation of test-beds to fulfil the needs of the experimentations such as managing logging and tracking mechanisms, storage of experimentation, production of results to be analyzed by the researchers.
- Develops training methods and materials, such as curriculums and lectures.
- Develop scenarios.
- Advize on techniques (including installation of software and system tools) to capture the data necessary for analysis.
- Prepare experiment participants (in particular, training).
- Provide comprehensive post-experiment results and after action reports.
- Oversee the work being done by lower-level resources working on the same task.
- Participate in exercises as Subject Matter Expert.

3.15 S.16 - Data Scientist

The role of the Data Scientist is to analyze, design, deliver and implement analytics development projects.

For the purpose of this work, the Data Scientist must have experience and expertise in a R&D environment in the following S&T topics, as described in Annex C ST Fields and Topics:

- Data analytics;
- Statistics;
- Data analysis.;
- Artificial Intelligence and machine learning.

The Data Scientist must have a relevant Bachelor, Master or PhD concentrated on quantitative analysis (Mathematics, Science, Engineering, Computing) in data analytics, computer science, mathematics, statistics, economics, operations research, computational social science, quantitative finance, engineering or other data analysis fields, or another relevant discipline, or equivalent industry experience.

Experience Levels

- Level 1:
  - At least one (1) year of experience as Data Scientist with a relevant Bachelor diploma; or
  - a relevant Master or Ph.D. diploma.
- Level 2:
  - At least five (5) years of experience as Data Scientist with a relevant Bachelor diploma; or
  - at least five (3) years of experience as Data Scientist with a relevant Master diploma; or
  - at least three (2) years of experience as Data Scientist with a relevant Ph.D. diploma.
- Level 3:
  - At least ten (10) years of experience as Data Scientist with a relevant relevant Bachelor; or
  - At least eight (8) years of experience as Data Scientist with a relevant Master diploma; or
  - at least five (5) years of experience as Data Scientist with a relevant Ph.D. diploma.

Responsibilities could include but are not limited to:

- Analyze, design, deliver and implement analytics development projects.
- Understand the project objectives and requirements, then convert this knowledge into a data mining problem.
- Conduct research and experiments to solve complex problems using large volumes of data.
- Drive an initial data collection and proceed with activities in order to get familiar with the data, identify data quality problems, discover first insights into the data or detect interesting subsets to form hypotheses for hidden information.
- Manipulate complex datasets and work effectively with different data sources.
- Perform big data analytics on large volumes and wide varieties of data.
- Work with advanced hardware, software, and techniques to develop computational algorithms and statistical methods that find patterns and relationships in large volumes of data.
- Select and train appropriate predictive models.
- Thoroughly evaluate the model and review the steps executed to construct the model to be certain it properly achieves the objectives.
- Write code to automate testing, analytics, data collection, and data processing
- Take charge for data preparation phase that covers all activities to construct the final dataset (data that will be fed into the modeling tool(s)) from the initial raw data.
- Conduct root cause analysis to proactively analyze findings and identify opportunities.
- Conduct ad hoc analyses to support key R&D initiatives.
- Explore data to discover insights and use analytics to derive actionable recommendations.
- Conduct research needed to support high level decision making.

- Produce, communicate, and present data driven insights.
- Actively participate in meetings and effectively produce and communicate analysis, recommendations, risks and opportunities.
- Ensure that meaningful analysis and reports are prepared to support various levels of reviews and presentations.
- Simplify and communicate complex ideas to general audiences.
- To help develop proposals and feasibility studies for small to medium projects.
- Participate in Proof of Concept or Proof of Technology projects.
- Conduct technology research, evaluate analytics tools and produce strategy/direction papers.
- Provide expertise & training to users.

Specialties could include but are not limited to:

- Big Data Analytics technologies: Hadoop – HDFS, Pig, Hive, Oozie, Storm, Spark, Flume, Sqoop, Hbase, MapReduce
- Strong knowledge of design, development, and implementation experience utilizing Analytics technologies.
- Some knowledge in Analytics technology integration and architecture.
- Hadoop administration, analyzing cluster performance and bottlenecks, and capacity planning.
- Working experience in frontend web development using Javascript frameworks (Angular, Backbone, JQuery, etc.)
- Programming framework for data analysis (Python, R, SPSS, SAS)
- Data visualization skills
- Strong communication and presentation skills
- Experience collaborating with software developers
- Web technologies: JavaScript, CSS, HTML

4. MILITARY EXPERTISE

This section comprises the following resource categories:

E.1 - Intelligence Subject Matter Expert

E.2 - C2 Subject Matter Expert

4.1 E.1 - Intelligence Subject Matter Expert

Experience Levels

- Level 2: more than 5 and less than 10 years of practical operational experience in Intelligence
- Level 3: 10+ years of practical operational experience in Intelligence

Responsibilities could include but are not limited to:

- Extracting key information for military strategic and operational decision making, e.g., situation awareness, Counter Insurgency Operations (COIN), IPB/IPOE (Intelligence Preparation of the Battlefield / Intelligence Preparation of the Operating Environment), organizational and team factors, individual factors, exploitation of information and actionable knowledge.
- Development of representative military scenarios for evaluating Intelligence in a broad range of operational settings.
- Development of systems and/or processes related to military intelligence (CAN-US-NATO).
- Planning, design and management of Intelligence military exercises, wargames and experiments.
- Provide advice with respect to the military processes for intelligence production and analysis, joint intelligence and the use of intelligence products.
- Support transition activities.
- Provide advice with respect to military requirements.
- Develop training materials.
- Conduct training courses.

Specialties could include but are not limited to:

- Intelligence for Royal Canadian Air Force, Canadian Army, Royal Canadian Navy and Joint Canadian Forces .

4.2 E.2 - Command & Control Subject Matter Expert

For the purpose of this SOW, the Command and Control Subject Matter Expert (C2 SME) must have experience and expertise in Command and Control in the following C2 topics, as described in Annex C ST Fields and Topics:

- C2 Doctrine and Concepts;
- C2 Processes;
- C2 Tasks;
- Military C2 Organization;
- C2 Systems (Applications).

Experience Levels

- Level 2: At least seven (7) years of practical operational experience in C2 functions.
- Level 3: At least fourteen (14) years of practical operational experience in C2 functions.

Responsibilities could include but are not limited to:

- Extract key factors in military strategic and operational decision making, e.g., situation awareness cognitive sub-processes; organizational and team factors; individual factors; exploitation of information and actionable knowledge.
- Develop representative military scenarios for evaluating C2 in a broad range of operational settings.
- Develop systems and/or processes related to military C2 (CAN-US).
- Plan, design and management of military exercises, wargames and experiments.
- Operate at the military processes for mission planning, joint decision-making and the use of C2 products.
- Support transition activities.
- Provide advice with respect to military requirements.
- Develop training materials.
- Conduct training courses.

Specialties could include but are not limited to:

- Royal Canadian Air Force, Canadian Army, Royal Canadian Navy and Joint Canadian Forces.

5. SYSTEMS ENGINEERING

This Section comprises the resource categories required to perform comprehensive work in Systems Engineering, as described:

G.1 - Systems Engineering Specialist

G.2 - Hardware Engineer

G.3 - Modelling and Simulation Specialist

G.4 - Network Engineer

G.5 - Communications Systems Specialist

G.6 - Electronic Warfare Specialist

5.1 G.1 - Systems Engineering Specialist

The role of the Systems Engineering Specialist is to required to provide a range of systems engineering support, at both the system and capability levels. He may be required to develop, modify and upgrade various Concepts of Operations (CONOPS), functional decompositions and architectures describing the DRDC R&D C2I Integration laboratories and various experiments and organizations working within the Information Systems Sector. He may provide the technical support required to support experimentation, operate, expand, build, modify and upgrade the DRDC R&D C2I Integration laboratories, and he may be required to support the design, development, testing and building of DRDC's C2I prototype software in a R&D Integration laboratory environment.

The Systems Engineering Specialist must have at least a relevant Bachelor diploma in any of following disciplines or in another similar discipline; or equivalent combination of education and experience:

- Artificial Intelligence;
- Computer Engineering;
- Computer Science or computer-related field;
- Computer Systems;
- Engineering;
- Electrical, Electronic Systems Engineering;
- Software Engineering;
- Software Systems Engineering.

Experience Levels:

- Level 1: At least one (1) year of experience as a Systems Engineering Specialist.
- Level 2: At least five (5) years of experience as a Systems Engineering Specialist.
- Level 3: At least ten (10) years of experience as a Systems Engineering Specialist.

Without being restricted, the required services could include:

- Create and maintain a System of Systems design of R&D C2I Integration laboratories and create variants for each experiment and training event;
- Document the System of Systems in both DoDAF and DNDAF views;
- Conduct functional analysis and functional modelling of systems and capabilities;
- Conduct requirements analysis of both systems and capabilities;
- Establish requirements in management processes for specific projects;

- Design and develop schema for the (ingration and interoperability) of data between systems;
- Define tools that may enhance the execution and operational utility of the R&D C2I Integration laboratories;
- Support the development of the metrics (MOE's, MOP's) required to continuously evaluate the R&D C2I Integrtion laboratories architectural options against the present capability;
- From a systems engineering perspective, complete assessments of the future architectural options along each of the Personnel, R&D, mainly in the C2I domain, Infrastructure; Concepts, Doctrine & Experiments, Information Technology; and Hardware Infrastructures;
- Document how the R&D C2I Integration laboratoriesfits with the other services Command and Sense Functions;
- Develop system architecture, system design, software prototyping, testing and integration of various M&S or C4ISR systems;
- Install and integrate new hardware and software (COTS, GOTS) into the current R&D C2I Integration laboratories;
- Create, update or maintain the R&D C2I Integration laboratoriesConcept of Operations document and Libraries;
- Update and maintain the maintenance procedures for the hardware and network items of the R&D C2I Integration laboratories;
- Support the updating and maintaining the Configuration Control Management plan and ressources documentation; and
- Update and maintain networks protocol architecture for the test bed.

5.2 G.2 - Hardware Engineer

The role of the Hardware Engineer is to support the integration and interoperability of the R&D C4ISR Integration laboratories, Network, and M&S infrastructure and may need to produce various DoDAF and DNDAF products.

The Hardware Engineer must have at least a relevant Bachelor Engineering diploma in any of following disciplines or in another similar discipline:

- Computer Engineering;
- Computer hardware engineering;
- Computer Science;
- Computer Systems;
- Computer Science or computer-related field;
- Engineering;
- Electrical, Electronic Systems Engineering;
- Hardware Engineering.

Experience Levels:

- Level 1: At least one (1) year of experience as a Hardware Engineer.
- Level 2: At least five (5) years of experience as a Hardware Engineer.
- Level 3: At least ten (10) years of experience as a Hardware Engineer.

Without being restricted, the required services could include:

- Install and integrate new hardware into R&D C2I Integration laboratories;
- Update and maintain the R&D C2I Integration laboratories Concept of Operations document;
- Update and maintain the maintenance procedures for the hardware and network items of the R&D C2I Integration laboratories;
- Update and maintain the Configuration Control Management Board documentation;
- Update and maintain the Internet Protocol architecture for the test bed;
- Define tools that may enhance the execution and operational utility of R&D C2I Integration laboratories;
- Support the development of the metrics required to continuously evaluate R&D C2I Integration laboratoriesarchitectural options against the present capability;
- Apply standard engineering methods and techniques for solving problems, and implement, test, and validate designs from developers and designers;
- Support developers and designers in carrying out application development analysis and design, to provide extensive user support for application usage such as scenario development and generation;
- Install and configure application architecture and provide first line debug support, and provide programming support towards developing new applications or prototypes
- Integrate GFE, GOTS or COTS software or systems;
- Support the design of new tools to be integrated into the test bed, as well as provide integration recommendations for bringing GOTS and COTS tools into the test bed;
- Perform integration of new hardware elements into the architecture;
- Provide subject matter expertise regarding protocols, standards and guidelines with regards to integration of components and tools into R&D C2I Integration laboratories;
- Provide support to the technical staff for the deployment of R&D C2I Integration laboratories;
- Provide recommendations on the options for additional hardware and network equipment to ensure a successful deployment of the R&D C2I Integration laboratories;
- Define and assemble the experimentation infrastructure, develop tools to manage and inject information into the experiments, and capture transaction data through the experiment;
- Implement designs according to specifications;
- Develop and review unit and integrated test plan(s), and create test environment(s) and test sub-systems;
- Develop design specifications for new hardware according to project requirements;
- Resolve deficiencies and maintain required documentation;
- Provide the Technical Authority or designates with technical solutions, designs and applications following sets of predefined requirements;
- Develop data capture and inject tools for experiments;
- Determine how various tools will be integrated;

- Oversee the testing of the tools and writing test reports; and
- Provide technical support to R&D C2I Integration laboratoriesin a live exercise or human-in-the-loop simulations, or both.

5.3 G.3 – Modelling and Simulation Specialist

The role of the Modelling and Simulation (M&S) Specialist is to develop and maintain models, create terrain databases and other tasks necessary to enable the synthetic world to support to experimentation and training activities, and conduct identification of new capabilities for M&S, verification of models with respect to the scenario (vignettes) and experiment or training objectives. The M&S Specialist may also need to produce training guides and acceptance test guides.

The M&S Specialist must have at least a relevant Bachelor diploma in any of following disciplines or in another similar discipline; or equivalent combination of education and experience:

- Artificial Intelligence;
- Computer Engineering;
- Computer Science;
- Computer Systems;
- Computer Science or computer-related field;
- Modelling and Simulation Engineering;
- Software Systems Engineering.

Experience Levels:

- Level 1: At least one (1) year of experience as a M&S Specialist.
- Level 2: At least five (5) years of experience as a M&S Specialist.
- Level 3: At least ten (10) years of experience as a M&S Specialist.

Without being restricted, the required services could include:

- Maintain the existing synthetic environments plus other synthetic environments as they are introduced into R&D C2I Integration laboratories;
- Develop a consistent and cohesive synthetic environment for all the different Computer Generated Forces (CGFs) and for the real systems utilizing the same area;
- Develop models for CAF entities within selected CGFs;
- Integrate behavioral models;
- Ensure that the simulations function correctly during experimentation and training events;
- Identify lessons learned;
- Produce various lessons learned;
- Identify tools to convert or interface models to be High Level Architecture (HLA) or Distributed Interactive Simulation (DIS) compliant and to manage these models within the repository and any simulations that will use them;
- Conduct HLA or DIS conversion activities;
- Resolve any HLA or DIS or Real Time Infrastructure (RTI) issues detected during experimentation;
- Create and maintain Object Model Templates, Simulation Object Models (SOM) and Federations Object Models (FOM) and related processes for the test bed;

- Develop and maintain models, create terrain databases, and other tasks necessary to enable the synthetic world to interface with the C2 systems and support the experimentation and training activities;
- Facilitate geospatial data requirements for experimentation;
- Validate geospatial information coming in from own and coalition partner sources;
- Organize the structure of the Theatre Geospatial Data Store (TGDS);
- Ensure the presence of authoritative M&S assets in the repository by developing a user-friendly Verification, Validation and Accreditation (VV&A) or Technical Certification Inspection (TCI) process, and implement in the Capability Components (Navy, Army, Air Force, Joint);
- Federate M&S software such as OneSAF as may be required; and
- Provide technical support to R&D C2I Integration laboratories in a live exercise or human-in-the-loop simulations, or both.

Without being restricted, the required specialities and technologies could include:

- STAGE, SADM, OneSAF, HLA, DIS, SIMDIS.

5.4 G.4 - Network Engineer

The role of the Network Engineer is to provide administration, technical and engineering support to distributed network (CFXNet, CFBLNet, R&DNet, CANARI) and implement hardware and software access controls to ensure the integrity and security of the systems. The Network Engineer may also be required to provide network support to the R&D C2I Integration laboratories for experimentation, training, demonstration and for C4ISR requirements. The Network Engineer may need to produce various Scripts and Networks schemas. The Network Engineer will not be in possession of, or work with crypto or any keyed material.

The Network Engineer must have at least a relevant Bachelor diploma in any of following disciplines or in another similar discipline:

- Computer Engineering;
- Communications Systems Engineering;
- Computer Science or computer-related field;
- Electrical, Electronic Systems Engineering;
- Network Engineering;
- Software Systems Engineering.

Experience Levels:

- Level 1: At least one (1) year of experience as Network Engineer.
- Level 2: At least five (5) years of experience as Network Engineer.
- Level 3: At least ten (10) years of experience as Network Engineer.

Without being restricted, the required services could include:

- Provide administration, technical and engineering support to distributed network capabilities (CFXNet, CFBLNet, R&DNet, CANARI);
- Implement hardware and software access controls to ensure the integrity and security of the networks and C4ISR systems;

- Provide network support to the LIDS for experimentation, training, demonstration, and integration of C4ISR requirements;
- Support the installation of networks across Canada;
- Produce various DoDAF and DNDAF products;
- Prepare network designs;
- Prepare site accreditation documentation;
- Develop IP mapping schema;
- Work with the application SMS to define the applications, ports and protocols requiring access to the network;
- Monitor network performance and provide recommendations for improvements
- Test networks and systems to identify vulnerabilities;
- Research security and software devices as directed in security related projects;
- Provide cryptographic security support for IP networks using crypto tools installed in the LIDS;
- Execute tasks related to network security and WAN or LAN security administration including, but not necessarily limited to, VLANs, TACACS, access lists, IP subnetting, OSPF, GRE Tunnels, configure or reconfigure routing protocols, preventive maintenance to include router optimization, Cisco VoIP Phones, creating documentation and Visio diagrams;
- Troubleshoot connectivity and hardware issues for initiatives being developed and conducted in the labs;
- Ensure technical solutions are communicated with other JIIM staff in support of multiple and concurrent experiments, development campaigns and training sessions;
- Create, maintain and review documentation of designs, configurations and operations, and provide recommendations on the Network and Joint Synthetic Environment Laboratory or Joint Battle Laboratory support documentation;
- Provide support to the development of SOP documentation.

5.5 G.5 - Communications Systems Specialist

The role of the Communications Systems Specialist is to design, install and maintain communications/telecommunications devices, networks and systems within an organisation or between organisations.

The Communications Systems Specialist must have at least a relevant Bachelor diploma in any of following disciplines or in another similar discipline:

- Communications Systems Engineering;
- Computer Engineering;
- Computer Science or computer-related field;
- Engineering;
- Electrical Engineering;
- Electronic Systems Engineering;
- Telecommunications Technologies Engineering.

Experience Levels:

- Level 1: At least one (1) year of experience as Communications Systems Specialist.
- Level 2: At least five (5) years of experience as Communications Systems Specialist.
- Level 3: At least ten (10) years of experience as Communications Systems Specialist.

Without being restricted, the required services could include:

- Plan network installations by studying technical specifications; preparing an installation schematic;
- Design video, data, and voice communication systems;
- Design, install and maintain telecommunications devices and networks;
- Establishes voice and data networks by programming features;
- Establish interfaces and integrations; following industry standards; activating remote access tools;
- Verifiy service by testing and re-programming circuits, equipment, and alarms; identifying and correcting problems; conferring with engineers;
- Establish and test network back-up procedures;
- Document network by recording configuration diagrams and programming;
- Maintain network including testing, troubleshooting and repairing outages;
- Maintain a secure communication environment by following military standards and policies;
- Update communications system documentation;
- Provides support for network and communications hardware or software systems;
- Monitors and controls systems configuration and technology upgrades;
- Advises on latest technologies available and compatibility with current systems.

Without being restricted, the required specialities and technologies could include:

- Radio and antenna systems.
- Computer systems.
- Radio, satellite and microwave broadband technology.
- Fibre and copper broadband.
- Voice and Data delivery services.
- Radio communications and information security.
- Installation and operation of communication and information systems.
- Maintenance and operation of power generating systems.
- Communication and information systems maintenance and repair techniques.
- Installation and maintenance of fibre and copper systems.

5.6 G.6 - Electronic Warfare Specialist

The role of the Electronic Warfare Specialist is to advise, design, install and maintain Electronic Warfare (EW) devices, networks and systems for electronic warfare operations involving the use of the electromagnetic spectrum or directed energy to control the spectrum, attack of an enemy, or

impede enemy assaults via the spectrum. This is not limited to radio or radar frequencies but includes infrared (IR), visible, ultraviolet, and other less used portions of the EM spectrum.

The Electronic Warfare Specialist must have at least a relevant Bachelor diploma in any of following disciplines or in another similar discipline; or equivalent combination of education and experience:

- Computer Engineering;
- Computer Systems;
- Computer Science or computer-related field;
- Electrical Engineering;
- Electronic Systems Engineering;
- Military Science;
- Physics or Physical Engineering.

Experience Levels:

- Level 1: At least one (1) year of experience as Electronic Warfare Specialist.
- Level 2: At least five (5) years of experience as Electronic Warfare Specialist.
- Level 3: At least ten (10) years of experience as Electronic Warfare Specialist.

Without being restricted, the required services could include:

- Provide requirement specifications of simulation of real-time EO/IR, RF and Avionics environment for testing EW systems.
- Design software in connection with devices, networks and systems for electronic warfare operations;
- Support the development, production and maintenance of systems of systems and avionics in connection devices, networks and systems for electronic warfare operations;
- Plan, coordinate and execute electronic attacks, electronic support and electronic protection;
- Lead research projects in Electronic Warfare and Avionics Systems Hardware in the loop test environments.

Without being restricted, the required specialities and technologies could include:

- Test equipment requirements, technical analysis, design electronic equipment and usage;
- Training and instruction on topics such as radar, electronic warfare, and relevant tactics;
- Common interface protocols such as MIL-STD-1553, Ethernet, serial, discrete and analog interfaces;
- HW/SW system debug/troubleshooting;
- Radar systems, particularly airborne surveillance systems.

ANNEX C

SCIENCE AND TECHNOLOGY FIELDS AND TOPICS

Cognitive Engineering

- Cognitive Task/Work/Function Analysis
- Storyboarding
- Cognitive Work/Task Analysis Methods and Framework
- Behavioural Analysis
- Joint Cognitive System Engineering
- Requirements Analysis
- Business Process Analysis
- User's Preferences Modelling
- Human Factors Related to C2
- Psychology (Cognitive, Social, Organization and Experimental)

Human Factors

- Requirement Analysis
- Development of Operational Concepts
- Development of Metrics
- Expertise Development and Sustained Attention
- Sociotechnical Systems Analysis
- Usability and Effectiveness
- Environmental Design
- Human Systems Integration
- Situation Awareness
- Reasoning under Uncertainty
- Adaptation
- Human Errors
- Workload Transition
- Adaptive User Interfaces
- Human Systems Interaction (HSI)
- Psychology (Cognitive / Social / Organization / Experimental)
- Support to Experimentation and Demonstration
- Team Decision-Making
- Team Situation Awareness (Shared Awareness)
- Decision-Making

Human-Autonomy Teaming

- Trusted Autonomy
- Cognitive & Decision Support
- Cognitive Modeling
- Cognitive Science
- Cognitive System Engineering
- Function Allocation
- Supervisory control/Human in the Loop
- Mixed-Initiative Approaches
- Process Analysis & Modeling
- Augmented Operators
- Human-Machine Interaction
- Visualization
- Virtual Reality

Automation & Autonomy

- Automated Planning & Scheduling
- Automated Reasoning
- Responsible and Ethical Autonomy
- Adaptive Autonomy
- Autonomous Systems
- Context-Aware Autonomy
- Automated Control
- Countering Autonomous Systems

- Countering Counter-Autonomous Systems
- Robotics / Swarming

Experimentation

Military Exercises

- Training
- Demonstration
- Exercise Setup

Experimental Environments

- Laboratory (Synthetic Environment)
- Field Trials (Live Exercises)

Experimental Plan

- Storyboard and Scenario Development
- Data Collection
- Performance Measures (MOPs, MOEs)
- Data Analysis
- Operations Analysis

Information and Knowledge Management

Knowledge Engineering

- Knowledge Engineering
- Knowledge Discovery and Data Integration
- Knowledge Based Systems
- Data and Knowledge Collection

Knowledge Representation – Formalisms

- Taxonomies
- Ontology Engineering
- Semantic Networks
- Semantic Web Technologies
- Rules

Data Management

- Standards/STANAGS for Information Storage & Exchange
- Metadata, Metadata Standards
- Data/Information Properties Modeling
- Data/Information Sources Characterization
- Military Data Models, JC3IEDM
- Data Storage, Conversion
- Large-scale Databases, Big data
- Heterogeneous, Multi-Sources, Multi-dimensional Data Integration
- Mobile Data Management

Data Science & Analytics

- Data mining
- Classification/Pattern Recognition/ Clustering
- Computational Statistics
- Machine Learning
- Data/Information/Knowledge Discovery
- Business Analytics
- Big Data Analytics and Visualization
- Big Data and Internet of Things
- Big Data Mining and Knowledge Discovery

Information Management Services

- Information Search and Retrieval
    - Federated Search, Semantic Search, Spatial Search
- Filtering, Alert, Notification
- Publish-Subscribe
- User-Centric, Context-Based IM

Data Quality

- Data Assurance, Metrics
- Data/Information Pedigree
- Uncertainty Representation and Management
- Incompleteness
- Data Cleansing

Document / Content management

Natural Language Processing

- Text Parsing, Semantic Tagging, Annotation, Entity Resolution
- Text Mining/Text Analytics
    - Relations - Link Analysis
- Text Summarization
- Translation, Multilingual Processing
- Text Generation
- Named Entity Extraction and Disambiguation

Multimedia (i.e., image, map, audio, video, web)

- Indexing, Annotation
- Extraction, Mining
- Metadata Management

Collaboration

- Social Networking
- Portal Technologies, Webs 2 & 3, wiki, chat
- Information Sharing – Interoperability

Social Media

- Social Networks Analytics
- Social Media Platforms
- Trend Analysis
- Sentiment Analysis
- Target Audience Analysis

Security / Privacy

- Cyber Security and Warfare
- Cyber Reconnaissance, Surveillance and Defence
- Information Protection
- Trust
- Role-based Access Control

Decision Support and Operations Research

Adaptive Intelligent Interfaces, Decision Oriented Displays and Multi-agents Systems

Dashboard and Business Intelligence Systems, Self-regulated Systems, Control Systems

Collaboration and Coordination

- Coordination
- Collaboration/Cooperation
- Distributed Environments
- Synchronisation

Decision-Making

- Decision theories
- Decision boards
- Group decision models
- Decision aids methodologies
- Decision support systems
- Group decision support systems

Graph Theory

- Network Modelling, Network Flow
- Shortest Path Problems
- Assignment Problems
- Influence Graphs
- Causal graphs

Heuristics, Meta-heuristics

- Evolutionary computation
- Co-evolution

Knowledge-based Systems

- Reinforcement Learning
- Link Analyses
- Automated Diagnostic Systems
- Goal Oriented Systems
- Knowledge Acquisition and Maintenance
- Reasoning Mechanisms
- Explanation and Justification Capabilities

Mathematical Modelling and Optimization

- Multi-Objective Combinatorial Optimization
- (Constrained) Optimization
- Mathematical Programming
- Dynamic and Stochastic Programming
- Markov Chains
- Heuristics and Meta-heuristics
- Constraint Satisfaction Problems
- Distributed Constraint Satisfaction Problems

Modelling and Simulation

- Discrete event simulation
- Monte Carlo Simulation
- Stochastic simulation

Multi-Criteria Analysis

- Multi-Criteria Decision Aid Methods
- Fuzzy Multi-Criteria Analysis
- Multi-Attribute Utility Functions
- Goal Programming
- Analytic Hierarchy Process
- Robustness Analysis
- Preference Handling

Network Analysis

- Graph Network Theory
- Social Network Analysis
- Knowledge Mapping

Resource Allocation

Resource Management and Logistics

- Planning models, Scheduling and Tasking
- Queuing Theory
- Collaborative planning-scheduling
- Dynamic planning and scheduling
- Forecasting, Monitoring
- Deviation Detection, Traceability
- Plan Repair, Plan Adaptation

Resource Visibility

- Performance Analysis
- Readiness Analysis
- Cost Estimate
- Risk analysis
- What-if Analysis
- Trend Analysis
- Forecasting
- Deviation Detection

Uncertainty

- Decision under Uncertainty
- Neural Networks
- Decision Trees
- Bayesian Networks
- Systems and Fuzzy Sets
- Evidence Theory (Dempster & Shafer theory)

Human-Computer Interaction (HCI) and Visualization

Information Visualization
- Very Large Data Sets
- Graphs and Trees and Networks and Other Relational or Structured Data
- High-Dimensional Data and Dimensionality Reduction
- Multivariate Data and Heterogeneous Data
- Non-Numeric Data (Categorical Data, Nominal Data, etc.)
- Spatial Data Visualized with New Spatial Mapping
- Streaming or Time-Varying Data

Visual Analytics
- Analytical Reasoning
- Visual Data Representations and Transformations

Scientific Visualization
- Surface Rendering
- Volume Rendering
- Manipulation of Spatial Data
- Simulation
- Animation

Interaction
- Multi-Sensory Interfaces (Speech, Sound, Haptics)
- Metaphor Interfaces (Gesture, Avatars in Augmented or Virtual Reality World)
- Game Controllers
- Multi-touch Tables
- Serious Game Interfaces
- Neural Interfaces
- Biometry
- Interactive Data Visualization
- Navigation Strategies

Virtual /Augmented/Mixed Reality
- 3D Interactions
- Input Devices
- Computer Graphics Techniques
- Multi-user and Distributed Environments

Intelligent User Interfaces
- User input
- Interface
- Help and Persuasive Technologies
- Personalization
- Social Computing
- Data Visualization Design

Smart Room Environments
- Intelligent Meeting Room Services
- Sensory/Perceptual systems
- Ubiquitous Computing
- Smart Spaces
- Simulation
- Multi-Modal Interaction

Display Technology
- Large Group Displays
- 3D Displays
- Immersive Displays
- Organic User Interfaces
- Flexible Displays
- Wearable Displays, Head-Mounted Displays

Collaborative Working Technologies
- Audio/Video Conferencing/ Telepresence
- Chat/Instant Messaging
- Electronic White Board
- Program Sharing/Application Sharing
- Groupware, Wiki
- Online Bulletin Board
- Virtual worlds

Cognitive Engineering
- Analysis of Cognitive Processes, e.g., Diagnosis, Decision Making and Planning
- Enhancing Performance of Cognitive Tasks

Sensemaking

Situation Analysis

- Threat Analysis/Evaluation
- Plan, Activity, and Intent Recognition
- Situational Awareness
- Opportunity Analysis
- Vulnerability Analysis
- Predictive Analytics
- Visual Analytics
- Network Analytics
- Text Analytics

Data and Information Fusion / Situation Awareness

- JDL Model
- Uncertainty Reduction
- Detection
  - Anomaly Detection
  - Pattern of Life
- Association
- Correlation
- Estimation
- Shared Situation Awareness
- Team Situation Awareness

Network Analysis

- Graph Network Theory
- Social Network Analysis
- Knowledge Mapping

Reasoning

- Automated Reasoning
  - Case-Based Reasoning
  - Description Logic
  - Rule-Based Reasoning
- Reasoning Under Uncertainty
- Spatial Reasoning
- Temporal Reasoning
- Truth Maintenance Systems

Psychology

- Cognitive Psychology
- Social Psychology
- Behavioural Analysis

Artificial Intelligence

- Machine Learning
  - Neural networks
  - Reinforcement Learning
  - Supervised Learning
  - Unsupervised Learning
  - Classifiers and Statistical Learning Methods
- Logic
- Probabilistic Methods for Uncertain Reasoning
- Intelligent Agents
- Game Theory
- Responsible/Ethical/Trusted/Explainable AI
- Reasoning (under uncertainty)
- Countering AI
- Countering Counter-AI
- Knowledge-Based Systems
- Natural Language Processing
- Distributed AI
- Computational Intelligence
- Control Theory
- Genetic Algorithms
- Explanation and Justification Systems

Probability and Statistics

Uncertainty

- Neural Networks
- Decision Trees
- Bayesian Networks
- Fuzzy Sets and Systems
- Evidence theory (Dempster & Shafer theory)

Command and Control

C2 Doctrine and Concepts

- C2 Theory
- OODA loop

C2 Processes

- Battle Command
- Deliberate Planning
- Battle Planning
- Battle Management
- Situational Awareness Process
- Operational Planning Process
- Military Operations and Missions
- Theater, Campaign, Battle Context
- Strategic, Operational, Tactical
- Engagement, Targeting
- Civil-Military Operations
- Joint Interagency Multinational Public
- Effects-Based Operations
- Military Operations Other than War
- C4ISR
- Military Networks, Electronic Warfare
- STANAGs

C2 Tasks

- Planning
- Directing
- Coordinating
- Controlling

Military C2 Organization

- Operational Structures (Canada, NATO, NORAD, Allies)
- Chains of Command
- Operational Centers

C2 Systems (Applications)

- Air Information Systems
- Army Information Systems
- Navy Information Systems
- Joint Information Systems

System, Software and Prototype Development

Systemic Approach

- Complex Systems
- Intelligent Systems
- Distributed Systems
- Socio-Technical Systems
- Cyber-Physical Systems
- Multi-Agent Systems
- Dynamic Systems
- Real-Time Systems
- Networked Systems & Entities
- System of Systems
- System Integration

Computer Systems

- Algorithmics
- Data Compression
- Data Exchange Formats
- Computability
- Indexing Systems
- Quantum Computing
- Information Technology Enablers
- Infrastructure Virtualization
- Machine-to-Machine Interaction
- Exploitation of Virtual Environments

Enterprise Architecture (EA) Development

- EA Planning
- Business Vision
- Strategic Requirements
- Requirements Management
- EA Governance
- Architecture Principles
- Current and Actual Architecture
- Gap Analysis
- Migration Planning
- EA Assessment
- EA Program Assessment
- EA Modeling Methods & Tools

Business Analysis

- Enterprise Analysis
- Requirements Planning and Management
- Requirements Elicitation
- Requirements Communication
- Requirements Analysis and Documentation
- Solution Assessment and Validation

Service-Oriented Architecture

Software Systems Development

- Requirements Management
- Architecting
- Development/Programming
- Integration
- Testing & Maintenance
- Performance Assessment

Software Development Management

- Requirements Analysis
- Scope Definition
- Software Project Planning
- Software Project Enactment
- Review and Evaluation

Software Development Process

- Process Definition and Assessment

Software Configuration Management

- Configuration Identification
- Configuration Control
- Release Management

Software Development Tools and Methods

- Software Modelling

Software Quality

- Software Quality Management
- Processes

Data Architecture Management

- Enterprise Data Modelling

Data Management Quality

- Analysis
- Specification
- Measurement
- Improvement

Data Development

- Data Modelling
- Analysis
- Database Design
- Implementation

Metadata Management

- Architecture
- Integration
- Control

Information Security Management

- Administration
- Authentication
- Standards

Distributed Computing

- Architecture
- Implementation

Big Data Processing

- Business analytics
- Big Data Design, implementation, evaluation
- Big Data Analytics and Visualization
- Big Data and Internet of Things
- Big Data mining and Knowledge Discovery
- Scalable data storage
- Big Data in the Cloud

Mobile Computing

- Architecture
- Implementation

Pervasive Computing

- Architecture
- Implementation

Cloud Computing

- Architecture
- Implementation

Private Cloud Computing

- Architecture
- Implementation

High Performance Computing

- Architecture
- Implementation

Virtualization

- Architecture
- Implementation
- Exploitation of Virtual Environments

Web Development

- Web services
- Web Information Services
- Web Application Development

Information Technology Management

Government of Canada / Gouvernement du Canada

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Contract Number / Numéro du contrat
W7701-176500/A
Security Classification / Classification de sécurité
N/C

SECURITY REQUIREMENTS CHECK LIST (SRCL)
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE

1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine nationale	2. Branch or Directorate / Direction générale ou Direction
Ministère de la Défense	R&D pour la Défense Valcartier

3. a) Subcontract Number / Numéro du contrat de sous-traitance	3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant

4. Brief Description of Work / Brève description du travail
R&D Activities in C4ISR

5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?	☒ No Non	☐ Yes Oui
5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations? Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques?	☒ No Non	☐ Yes Oui
6. Indicate the type of access required / Indiquer le type d'accès requis		
6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c)	☐ No Non	☒ Yes Oui
6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé.	☒ No Non	☐ Yes Oui
6. c) Is this a commercial courier or delivery requirement with no overnight storage? S'agit-il d'un contrat de messagerie ou de livraison commerciale sans entreposage de nuit?	☒ No Non	☐ Yes Oui

7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès

Canada ☒	NATO / OTAN ☒	Foreign / Étranger ☒

7. b) Release restrictions / Restrictions relatives à la diffusion

No release restrictions Aucune restriction relative à la diffusion ☒	All NATO countries Tous les pays de l'OTAN ☒	No release restrictions Aucune restriction relative à la diffusion ☒
Not releasable À ne pas diffuser ☐		
Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐	Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐	Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐

7. c) Level of information / Niveau d'information

PROTECTED A / PROTÉGÉ A ☒	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ ☒	PROTECTED A / PROTÉGÉ A ☒
PROTECTED B / PROTÉGÉ B ☒	NATO RESTRICTED / NATO DIFFUSION RESTREINTE ☒	PROTECTED B / PROTÉGÉ B ☒
PROTECTED C / PROTÉGÉ C ☐	NATO CONFIDENTIAL / NATO CONFIDENTIEL ☐	PROTECTED C / PROTÉGÉ C ☐
CONFIDENTIAL / CONFIDENTIEL ☐	NATO SECRET / NATO SECRET ☐	CONFIDENTIAL / CONFIDENTIEL ☐
SECRET / SECRET ☐	COSMIC TOP SECRET / COSMIC TRÈS SECRET ☐	SECRET / SECRET ☐
TOP SECRET / TRÈS SECRET ☐		TOP SECRET / TRÈS SECRET ☐
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐		TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐

PART A (continued) / PARTIE A (suite)

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?
If Yes, indicate the level of sensitivity:
Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

Short Title(s) of material / Titre(s) abrégé(s) du matériel :
Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

☒ RELIABILITY STATUS / COTE DE FIABILITÉ	☐ CONFIDENTIAL / CONFIDENTIEL	☐ SECRET / SECRET	☐ TOP SECRET / TRÈS SECRET
☐ TOP SECRET– SIGINT / TRÈS SECRET – SIGINT	☐ NATO CONFIDENTIAL / NATO CONFIDENTIEL	☐ NATO SECRET / NATO SECRET	☐ COSMIC TOP SECRET / COSMIC TRÈS SECRET
☐ SITE ACCESS / ACCÈS AUX EMPLACEMENTS			

Special comments:
Commentaires spéciaux : Off-site work only

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.
REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work? — ☐ No / Non ☒ Yes / Oui
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?
If Yes, will unscreened personnel be escorted? On DND premises, unscreened pers. may only access public/reception zone — ☒ No / Non ☐ Yes / Oui
Dans l'affirmative, le personnel en question sera-t-il escorté?

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises? — ☐ No / Non ☒ Yes / Oui
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

11. b) Will the supplier be required to safeguard COMSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC?

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises? — ☒ No / Non ☐ Yes / Oui
Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ?

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data? — ☐ No / Non ☒ Yes / Oui
Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS?

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency? — ☒ No / Non ☐ Yes / Oui
Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale?

PART C - *(continued)* / PARTIE C - *(suite)*

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.
Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form **online** (via the Internet), the summary chart is automatically populated by your responses to previous questions.
Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category / Catégorie	PROTECTED / PROTÉGÉ			CLASSIFIED / CLASSIFIÉ			NATO				COMSEC					
	A	B	C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET	NATO RESTRICTED / NATO DIFFUSION RESTREINTE	NATO CONFIDENTIAL / NATO CONFIDENTIEL	NATO SECRET	COSMIC TOP SECRET / COSMIC TRÈS SECRET	PROTECTED / PROTÉGÉ A	PROTECTED / PROTÉGÉ B	PROTECTED / PROTÉGÉ C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRES SECRET
Information / Assets / Renseignements / Biens	X	X					X									
Production																
IT Media / Support TI	X	X					X									
IT Link / Lien électronique																

SM

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?
La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☒ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?
La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☒ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).

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Contract Number / Numéro du contrat
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Security Classification / Classification de sécurité
N/C

SECURITY REQUIREMENTS CHECK LIST (SRCL)
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE

1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine nationale: Ministère de la Défense

2. Branch or Directorate / Direction générale ou Direction: R&D pour la Défense Valcartier

3. a) Subcontract Number / Numéro du contrat de sous-traitance:

3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant:

4. Brief Description of Work / Brève description du travail:
R&D Activities in C4ISR

5. a) Will the supplier require access to Controlled Goods? / Le fournisseur aura-t-il accès à des marchandises contrôlées? — ☐ No / Non ☒ Yes / Oui

5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control *Regulations*? / Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques? — ☒ No / Non ☐ Yes / Oui

6. Indicate the type of access required / Indiquer le type d'accès requis

6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? / Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) / (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c) — ☐ No / Non ☒ Yes / Oui

6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. / Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé. — ☒ No / Non ☐ Yes / Oui

6. c) Is this a commercial courier or delivery requirement with **no** overnight storage? / S'agit-il d'un contrat de messagerie ou de livraison commerciale **sans** entreposage de nuit? — ☒ No / Non ☐ Yes / Oui

7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès

Canada ☒	NATO / OTAN ☒	Foreign / Étranger ☒

7. b) Release restrictions / Restrictions relatives à la diffusion

Canada	NATO / OTAN	Foreign / Étranger
No release restrictions / Aucune restriction relative à la diffusion ☒	All NATO countries / Tous les pays de l'OTAN ☒	No release restrictions / Aucune restriction relative à la diffusion ☒
Not releasable / À ne pas diffuser ☐		
Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐	Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐	Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐

7. c) Level of information / Niveau d'information

Canada	NATO	Foreign / Étranger
PROTECTED A / PROTÉGÉ A ☒	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ ☒	PROTECTED A / PROTÉGÉ A ☒
PROTECTED B / PROTÉGÉ B ☒	NATO RESTRICTED / NATO DIFFUSION RESTREINTE ☒	PROTECTED B / PROTÉGÉ B ☒
PROTECTED C / PROTÉGÉ C ☐	NATO CONFIDENTIAL / NATO CONFIDENTIEL ☒	PROTECTED C / PROTÉGÉ C ☐
CONFIDENTIAL / CONFIDENTIEL ☒	NATO SECRET / NATO SECRET ☒	CONFIDENTIAL / CONFIDENTIEL ☒
SECRET / SECRET ☒	COSMIC TOP SECRET / COSMIC TRÈS SECRET ☐	SECRET / SECRET ☒
TOP SECRET / TRÈS SECRET ☐		TOP SECRET / TRÈS SECRET ☐
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐		TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐

Government of Canada / Gouvernement du Canada

W7701-176500/B

Security C[illegible]cation / Classification de sécurité
N/C

PART A *(continued)* / PARTIE A *(suite)*

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?
If Yes, indicate the level of sensitivity:
Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

Short Title(s) of material / Titre(s) abrégé(s) du matériel :

Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

☒ RELIABILITY STATUS / COTE DE FIABILITÉ	☐ CONFIDENTIAL / CONFIDENTIEL	☒ SECRET / SECRET	☐ TOP SECRET / TRÈS SECRET
☐ TOP SECRET– SIGINT / TRÈS SECRET – SIGINT	☐ NATO CONFIDENTIAL / NATO CONFIDENTIEL	☒ NATO SECRET / NATO SECRET	☐ COSMIC TOP SECRET / COSMIC TRÈS SECRET
☐ SITE ACCESS / ACCÈS AUX EMPLACEMENTS			

Special comments:
Commentaires spéciaux : On-site and off-site work

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.
REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work? — ☐ No / Non ☒ Yes / Oui
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?
If Yes, will unscreened personnel be escorted? On DND premises, unscreened pers. may only access public/reception zone — ☒ No / Non ☐ Yes / Oui
Dans l'affirmative, le personnel en question sera-t-il escorté?

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises? — ☐ No / Non ☒ Yes / Oui
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

11. b) Will the supplier be required to safeguard COMSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC?

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises? — ☒ No / Non ☐ Yes / Oui
Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ?

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data? — ☐ No / Non ☒ Yes / Oui
Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS?

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency? — ☒ No / Non ☐ Yes / Oui
Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale?

PART C - *(continued)* / PARTIE C - *(suite)*

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.
Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form **online** (via the Internet), the summary chart is automatically populated by your responses to previous questions.
Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category / Catégorie	PROTECTED / PROTÉGÉ			CLASSIFIED / CLASSIFIÉ			NATO				COMSEC					
	A	B	C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET	NATO RESTRICTED / NATO DIFFUSION RESTREINTE	NATO CONFIDENTIAL / NATO CONFIDENTIEL	NATO SECRET	COSMIC TOP SECRET / COSMIC TRÈS SECRET	PROTECTED / PROTÉGÉ A	PROTECTED / PROTÉGÉ B	PROTECTED / PROTÉGÉ C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRES SECRET
Information / Assets / Renseignements / Biens	☒	☒	☐	☒	☒	☐	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐
Production	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
IT Media / Support TI	☒	☒	☐	☒	☒	☐	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐
IT Link / Lien électronique	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?
La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☒ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?
La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☒ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).

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Contract Number / Numéro du contrat: V7701-176500/C

Security Classification / Classification de sécurité: N/C

SECURITY REQUIREMENTS CHECK LIST (SRCL)
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE

1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine nationale: Ministère de la Défense

2. Branch or Directorate / Direction générale ou Direction: R&D pour la Défense Valcartier

3. a) Subcontract Number / Numéro du contrat de sous-traitance:

3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant:

4. Brief Description of Work / Brève description du travail: R&D Activities in C4ISR

5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?	☐ No Non	☒ Yes Oui
5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations? Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques?	☒ No Non	☐ Yes Oui
6. Indicate the type of access required / Indiquer le type d'accès requis		
6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c)	☐ No Non	☒ Yes Oui
6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé.	☒ No Non	☐ Yes Oui
6. c) Is this a commercial courier or delivery requirement with **no** overnight storage? S'agit-il d'un contrat de messagerie ou de livraison commerciale **sans** entreposage de nuit?	☒ No Non	☐ Yes Oui

7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès

Canada ☒	NATO / OTAN ☒	Foreign / Étranger ☒

7. b) Release restrictions / Restrictions relatives à la diffusion

Canada	NATO / OTAN	Foreign / Étranger
No release restrictions / Aucune restriction relative à la diffusion ☒	All NATO countries / Tous les pays de l'OTAN ☒	No release restrictions / Aucune restriction relative à la diffusion ☒
Not releasable / À ne pas diffuser ☐		
Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐	Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐	Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐

7. c) Level of information / Niveau d'information

Canada	NATO	Foreign / Étranger
PROTECTED A / PROTÉGÉ A ☒	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ ☒	PROTECTED A / PROTÉGÉ A ☒
PROTECTED B / PROTÉGÉ B ☒	NATO RESTRICTED / NATO DIFFUSION RESTREINTE ☒	PROTECTED B / PROTÉGÉ B ☒
PROTECTED C / PROTÉGÉ C ☐	NATO CONFIDENTIAL / NATO CONFIDENTIEL ☒	PROTECTED C / PROTÉGÉ C ☐
CONFIDENTIAL / CONFIDENTIEL ☒	NATO SECRET / NATO SECRET ☒	CONFIDENTIAL / CONFIDENTIEL ☒
SECRET / SECRET ☒	COSMIC TOP SECRET / COSMIC TRÈS SECRET ☐	SECRET / SECRET ☒
TOP SECRET / TRÈS SECRET ☒		TOP SECRET / TRÈS SECRET ☒
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐		TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐

Government of Canada / Gouvernement du Canada

W7701-176500/C

Security Classification / Classification de sécurité
N/C

PART A (continued) / PARTIE A (suite)

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?
If Yes, indicate the level of sensitivity:
Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

Short Title(s) of material / Titre(s) abrégé(s) du matériel :

Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

☐ RELIABILITY STATUS / COTE DE FIABILITÉ	☐ CONFIDENTIAL / CONFIDENTIEL	☐ SECRET / SECRET	☒ TOP SECRET / TRÈS SECRET
☐ TOP SECRET– SIGINT / TRÈS SECRET – SIGINT	☐ NATO CONFIDENTIAL / NATO CONFIDENTIEL	☒ NATO SECRET / NATO SECRET	☐ COSMIC TOP SECRET / COSMIC TRÈS SECRET
☐ SITE ACCESS / ACCÈS AUX EMPLACEMENTS			

Special comments:
Commentaires spéciaux : Top Secret work willl always be performed on-site

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.
REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work? — ☒ No / Non ☐ Yes / Oui
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?

If Yes, will unscreened personnel be escorted? — ☐ No / Non ☐ Yes / Oui
Dans l'affirmative, le personnel en question sera-t-il escorté?

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises? — ☒ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

11. b) Will the supplier be required to safeguard COMSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC?

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises? — ☒ No / Non ☐ Yes / Oui
Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ?

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data? — ☒ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS?

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency? — ☒ No / Non ☐ Yes / Oui
Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale?

PART C - *(continued)* / PARTIE C - *(suite)*

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.
Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form **online** (via the Internet), the summary chart is automatically populated by your responses to previous questions.
Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category / Catégorie	PROTECTED / PROTÉGÉ			CLASSIFIED / CLASSIFIÉ			NATO				COMSEC					
	A	B	C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET	NATO RESTRICTED / NATO DIFFUSION RESTREINTE	NATO CONFIDENTIAL / NATO CONFIDENTIEL	NATO SECRET	COSMIC TOP SECRET / COSMIC TRÈS SECRET	PROTECTED / PROTÉGÉ A	PROTECTED / PROTÉGÉ B	PROTECTED / PROTÉGÉ C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRES SECRET
Information / Assets / Renseignements / Biens	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Production	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
IT Media / Support TI	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
IT Link / Lien électronique	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?
La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☒ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?
La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☒ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).

National Défense
Defence nationale

TASK AUTHORIZATION
AUTORISATION DES TÂCHES

All invoices/progress claims must show the reference Contract and Task numbers.
Toutes les factures doivent indiquer les numéros du contrat et de la tâche.

Contract no. – N° du contrat

Task no. – N° de la tâche

Amendment no. – N° de la modification	Increase/Decrease – Augmentation/Réduction	Previous value – Valeur précédente

To – À

Delivery location – Expédiez à

Delivery/Completion date – Date de livraison/d'achèvement

TO THE CONTRACTOR

You are requested to supply the following services in accordance with the terms of the above reference contract. Only services included in the contract shall be supplied against this task.

Please advise the undersigned if the completion date cannot be met. Invoices/progress claims shall be prepared in accordance with the instructions set out in the contract.

À L'ENTREPRENEUR

Vous êtes prié de fournir les services suivants en conformité des termes du contrat mentionné ci-dessus. Seuls les services mentionnés dans le contrat doivent être fournis à l'appui de cette demande.

Prière d'aviser le signataire si la livraison ne peut se faire dans les délais prescrits. Les factures doivent être établies selon les instructions énoncées dans le contrat.

Date

for the Department of National Defence
pour le ministère de la Défense nationale

Contract item no. Nº d'article du contrat	Services	Cost Prix
	GST/HST TPS/TVH	
	Total	

APPLICABLE ONLY TO PWGSC CONTRACTS: The Contract Authority signature is required when the total of the DND 626 exceeds the threshold value specified in the contract.

NE S'APPLIQUE QU'AUX CONTRATS DE TPSGC : La signature de l'autorité contractante est requise lorsque valeur totale du formulaire DND 626 est la supérieure au seuil précisé dans le contrat.

for the Department of Public Works and Government Services
pour le ministère des Travaux publics et services gouvernementaux

Design: Forms Management 993-4050
Conception : Gestion des formulaires 993-4062

Instructions for completing DND 626 - Task Authorization

Contract no.
Enter the PWGSC contract number in full.

Task no.
Enter the sequential Task number.

Amendment no.
Enter the amendment number.when the original Task is amended to change the scope or the value.

Increase/Decrease
Enter the increase or decrease total dollar amount including taxes.

Previous value
Enter the previous total dollar amount including taxes.

To
Name of the contractor.

Delivery location
Location where the work will be completed, if other than the contractor's location.

Delivery/Completion date
Completion date for the task.

for the Department of National Defence
Signature of the DND person who has delegated **Authority** for signing DND 626 (level of authority based on the dollar value of the task and the equivalent signing authority in the PAM 1.4). **Note:** the person signing in this block ensures that the work is within the scope of the contract, that sufficient funds remain in the contract to cover this task and that the task is affordable within the Project/Unit budget.

Services
Define the requirement briefly (attach the SOW) and identify the cost of the task using the contractor's quote on the level of effort. The Task must use the basis of payment stipulated in the contract. If there are several basis of payment then list here the one(s) that will apply to the task quote (e.g. milestone payments; per diem rates/labour category hourly rates; travel and living rates; firm price/ceiling price, etc.). All the terms and conditions of the contract apply to this Task Authorization and cannot be ignored or amended for this task. Therefore it is not necessary to restate these general contract terms and conditions on the DND 626 Task form.

Cost
The cost of the Task broken out into the individual costed items in **Services**.

GST/HST
The GST/HST cost as appropriate.

Total
The total cost of the task. The contractor may not exceed this amount without the approval of DND indicated on an amended DND 626. The amendment value may not exceed 50% (or the percentage for amendments established in the contract) of the original value of the task authorization. The total cost of a DND 626, including all amendments, may not exceed the funding limit identified in the contract.

Applicable only to PWGSC contracts
This block only applies to those Task Authorization contracts awarded by PWGSC. The contract will include a specified threshold for DND sole approval of the DND 626 and a percentage for DND to approve amendments to the original DND 626. Tasks that will exceed these thresholds must be passed to the PWGSC Contracting Authority for review and signature prior to authorizing the contractor to begin work.

Note:
Work on the task may not commence prior to the date this form is signed by the DA Authority - for tasks within the DND threshold; and by both DND and PWGSC for those tasks over the DND threshold.

Instructions pour compléter le formulaire DND 626 - Autorisation des tâches

N° du contrat
Inscrivez le numéro du contrat de TPSGC en entier.

N° de la tâche
Inscrivez le numéro de tâche séquentiel.

N° de la modification
Inscrivez le numéro de modification lorsque la tâche originale est modifiée pour en changer la portée.

Augmentation/Réduction
Inscrivez le montant total de l'augmentation ou de la diminution, y compris les taxes.

Valeur précédente
Inscrivez le montant total précédent, y compris les taxes.

À
Nom de l'entrepreneur.

Expédiez à
Endroit où le travail sera effectué, si celui-ci diffère du lieu d'affaires de l'entrepreneur.

Date de livraison/d'achèvement
Date d'achèvement de la tâche.

pour le ministère de la Défense nationale
Signature du représentant du MDN auquel on a délégué le **pouvoir d'approbation** en ce qui a trait à la signature du formulaire DND 626 (niveau d'autorité basé sur la valeur de la tâche et le signataire autorisé équivalent mentionné dans le MAA 1.4). **Nota :** la personne qui signe cette attache de signature confirme que les travaux respectent la portée du contrat, que suffisamment de fonds sont prévus au contrat pour couvrir cette tâche et que le budget alloué à l'unité ou pour le projet le permet.

Services
Définissez brièvement le besoin (joignez l'ET) et établissez le coût de la tâche à l'aide de la soumission de l'entrepreneur selon le niveau de difficulté de celle-ci. Les modalités de paiement stipulées dans le contrat s'appliquent à la tâche. Si plusieurs d'entre elles sont prévues, énumérez ici celle/celles qui s'appliquera/ront à la soumission pour la tâche à accomplir (p.ex. acompte fondé sur les étapes franchies; taux quotidien ou taux horaire établi selon la catégorie de main-d'œuvre; frais de déplacement et de séjour; prix fixe ou prix plafond; etc.). Toutes les modalités du contrat s'appliquent à cette autorisation de tâche et ne peuvent être négligées ou modifiées quant à la tâche en question. Il n'est donc pas nécessaire de répéter ces modalités générales afférentes au contrat sur le formulaire DND 626.

Prix
Mentionnez le coût de la tâche en le répartissant selon les frais afférents à chaque item mentionné dans la rubrique **Services**.

TPS/TVH
Mentionnez le montant de la TPS/TVH, s'il y lieu.

Total
Mentionnez le coût total de la tâche. L'entrepreneur ne peut dépasser ce montant sans l'approbation du MDN, formulaire DND 626 modifié à l'appui. Le coût de la modification ne peut pas être supérieur à 50 p. 100 du montant initial prévu dans l'autorisation de tâche (ou au pourcentage prévu dans le contrat pour les modifications). Le coût total spécifié dans le formulaire DND 626, y compris toutes les modifications, ne peut dépasser le plafond de financement mentionné dans le contrat.

Ne s'applique qu'aux contrats de TPSGC
Le présent paragraphe s'applique uniquement aux autorisations de tâche accordées par TPSGC. On inscrira dans le formulaire DND 626 un plafond précis qui ne pourra être approuvé que par le MDN et un pourcentage selon lequel le MDN pourra approuver des modifications au formulaire DND 626 original. Les tâches dont le coût dépasse ces plafonds doivent être soumises à l'autorité contractante de TPSGC pour examen et signature avant qu'on autorise l'entrepreneur à débuter les travaux.

Nota :
Les travaux ne peuvent commencer avant la date de signature de ce formulaire par le responsable du MDN, pour les tâches dont le coût est inférieur au plafond établi par le MDN, et par le MDN et TPSGC pour les tâches dont le coût dépasse le plafond établi par le MDN.